

Columbia River System Operations and the Future of the Lower Snake River Dams

Updated August 3, 2026

Congressional Research Service

<https://crsreports.congress.gov>

R49059



Columbia River System Operations and the Future of the Lower Snake River Dams

Congress has repeatedly debated how to operate and allocate resources from federal water resources projects—such as multipurpose federal dams—to serve various human needs while protecting or conserving species listed under the Endangered Species Act (ESA; 16 U.S.C. §§1531-1544). The Columbia River Basin, which includes the Snake River, is home to numerous federal and nonfederal dams that provide an array of services within the basin and whose operations affect certain fish species. Four dams on the Lower Snake River that are owned and operated by the U.S. Army Corps of Engineers are a focal point for these debates.

The Columbia River Basin supports anadromous salmon and steelhead trout populations, many of which are now listed as endangered or threatened under the ESA. Four of these listed populations inhabit the Snake River watershed, a subbasin that encompasses more than 40% of the larger Columbia River Basin. Federal courts have recognized that certain fish populations in the Columbia River Basin have economic and religious importance to local Tribes, and the federal government has acted to establish and protect the treaty fishing rights of Tribes occupying the Columbia River Basin. Despite federal and nonfederal efforts to protect and recover fish populations through actions such as altered dam operations and habitat-focused initiatives, listed salmon and steelhead trout populations remain low in the Columbia River Basin.

Due to the potential effects on listed species from operating federally owned Columbia River Basin dams, federal agencies operating these dams have consulted with the National Marine Fisheries Service under the ESA since the mid-1990s regarding agency plans for dam operations. Stakeholders have repeatedly sued the federal government over the resulting biological opinions (BiOps) and decision documents. Much of the litigation has centered on whether the federal agencies have properly justified their operational plans in light of alternative actions that some argue would better protect listed species. Debate has included whether the federal agencies should evaluate the alternative of breaching one or more of the four Lower Snake River dams. Consistent with the federal court's directive in *National Wildlife Federation v. National Marine Fisheries Service* (184 F. Supp. 3d 861 (D. Or. 2016)), the federal agencies considered removal of the dams as one course of action in a 2020 environmental impact statement (EIS). This option was not selected for implementation. Rather, in a 2020 record of decision (ROD), the agencies selected an alternative approach that retains the dams and increases the flow at certain times through several of the dams in the system to benefit migrating fish.

In response to the 2020 ROD, the plaintiffs in the ongoing litigation added claims related to the 2020 BiOp, EIS, and ROD. In February 2024, the court granted certain parties' request to stay the litigation through 2028 to allow them to implement a memorandum of understanding (MOU). In the MOU, the federal government agreed to implement commitments in support of the Columbia Basin Restoration Initiative, a restoration proposal developed by four Tribes and two states, and agreed to 10-year interim operations of the dams to balance fish and energy needs. In June 2025, President Trump directed a withdrawal from the MOU, after which the court lifted the stay, and the litigation over the 2020 BiOp, EIS, and ROD resumed in September 2025. In March 2026, the court issued a preliminary injunction directing the federal government on how to operate the dams while the litigation proceeds (i.e., following an operations plan similar to the 2025 fish operations plan).

Legislative options regarding federal dam operations in the Columbia River Basin and the lower Snake River include whether to continue or alter dam operations and whether to remove the lower Snake River dams. Some Members of Congress have proposed legislative options that would address these issues in recent Congresses. These proposals and other options typically entail tradeoffs between the benefits that the dams currently provide and the recovery of ESA-listed fish populations, among other issues. Significant uncertainty remains as to the potential effects and costs of most options under consideration. For example, estimates of the cost to replace existing benefits provided by the lower Snake River dams have ranged from \$10 billion to \$31 billion, mostly for electricity generation and grid services. Congress's preferred course on how to address Columbia River System operations, including the lower Snake River dams, may also impact the solutions considered for other similarly situated federal projects and listed species habitats.

R49059

August 3, 2026

Anna E. Normand,
Coordinator
Specialist in Natural
Resources Policy

Pervaze A. Sheikh,
Coordinator
Specialist in Natural
Resources Policy

Erin H. Ward, Coordinator
Coordinator of Research
Planning/ALD

Contents

Introduction	1
Columbia River System.....	4
Lower Snake River Dams	5
Navigation Supported by the Lower Snake River Dams	7
Water Provided by Lower Snake River Dams for Irrigation, Municipal, and Industrial Use.....	8
Hydropower from Lower Snake River Dams	9
Columbia River System Operations	10
Snake River Salmon and Steelhead Trout Populations Listed Under the ESA	12
Population Trends.....	14
Factors Affecting Snake River Salmon and Steelhead Trout Populations	18
Dams and Their Operations	19
Habitat Loss and Alteration	22
Water Quality	23
Predation	24
Drought.....	25
Climate Change.....	25
Conserving and Restoring Snake River Fishes	26
Bonneville Power Administration Fish and Habitat Initiatives.....	26
NOAA Pacific Salmon Management and Conservation Activities.....	28
Columbia River Basin Tribal History and Current Activities	31
Recent Litigation Challenging Agency Actions Related to the Lower Snake River Dams.....	34
Litigation over FCRPS Biological Opinions and Supplements from 2000 to 2014.....	37
2020 Biological Opinion, Environmental Impact Statement, and Record of Decision.....	38
Litigation and Administration Actions Following the 2020 Record of Decision.....	39
2023 Memorandum of Understanding and Litigation Stay	40
Trump 2025 Presidential Memorandum and Resumption of Litigation	44
Congressional Considerations	46
Selected Member Proposals and Legislation	47
Selected Issues and Questions for Congress	47

Figures

Figure 1. Columbia River System	5
Figure 2. Lower Snake River Dams	6
Figure 3. Anadromous Salmon and Steelhead Trout Life Cycle	14
Figure 4. Adult Passage of Chinook Salmon Runs at Lower Granite Dam.....	16
Figure 5. Systems Used to Improve Juvenile Passage Through Dams.....	22
Figure 6. Federal and Tribal Lands in the Columbia River Basin	33

Tables

Table 1. Annual Net Generation from the Lower Snake River Dams, 2015-2025	10
---	----

Table 2. Snake River Salmon and Steelhead Trout Species Segments and ESA Status	13
Table 3. Identified Past and Recent Snake River Salmon and Steelhead Trout Populations.....	17
Table 4. Columbia River Basin Fish and Wildlife Program Goals and Objectives	27

Contacts

Author Information.....	50
-------------------------	----

Introduction

Dams serve many purposes, such as generating hydroelectric power, enabling navigation, and controlling water supply. Dams also can negatively affect ecosystem processes and aquatic species mobility. For example, dams may impede anadromous fish migrating between the ocean and upriver spawning areas.¹ Congress has repeatedly debated how to allocate resources and operate federal projects—such as multipurpose federal dams—to serve human needs while also protecting ecosystems and facilitating the recovery of depleted fish and other species, including species that are threatened with extinction and listed under the Endangered Species Act (ESA; 16 U.S.C. §§1531-1544).

One area of continued interest to Congress is the Columbia River Basin, which contains numerous federal and nonfederal dams that provide an array of services within the basin, and whose operations some consider controversial for their effects on certain fish species.² The Columbia River Basin supports Pacific salmon and steelhead trout populations, many of which are now listed as endangered or threatened under the ESA. Four of these listed populations inhabit the Snake River watershed, which encompasses over 40% of the larger Columbia River Basin.³

While the U.S. Army Corps of Engineers (USACE) and the Bureau of Reclamation (Reclamation) are obligated to operate federal dams that they manage within the Columbia River Basin to serve the dams' authorized purposes, they and all federal agencies also have obligations under the ESA to facilitate the recovery of listed species and ensure that their actions do not jeopardize the continued existence of such species. They also have obligations under the National Environmental Policy Act (NEPA; 42 U.S.C. §§4321 et seq.) to consider the effects of their actions on the human environment. In addition, federal courts have recognized the treaty rights of some federally recognized Tribes ("Tribes") to access fish in the Columbia River Basin.⁴ Accordingly, federal agencies have implemented conservation efforts and considered the effects of how federal dams in the Columbia River Basin are operated through consultation under the ESA, environmental review under NEPA, and engagement with stakeholders such as Tribes.

Despite federal and nonfederal efforts to protect and recover salmon and steelhead trout populations (e.g., modifying dam operations and restoring habitat), several populations remain

¹ Fish are *anadromous* if they spend most of their lives in salt water and then swim up a river to spawn in freshwater. Young anadromous fish hatch in freshwater and then swim downstream to grow to adulthood in the ocean. For example, most salmon and some sturgeon species are anadromous.

² *Federal dams* are dams owned by the federal government and managed by one or more federal agencies. Federal dams include dams that were constructed based on congressional authorizations specific to each dam (e.g., most dams managed by the U.S. Army Corps of Engineers [USACE] and the Bureau of Reclamation [Reclamation]) and dams that were constructed or acquired through broader authority not specific to an individual dam (e.g., most dams managed by federal land management agencies). For individually authorized dams, the authorizing statute for each dam provides the primary guidance for the dam's management to satisfy authorized purposes; subsequent acts may provide additional operating authority.

³ National Oceanic and Atmospheric Administration (NOAA), National Marine Fisheries Service (NMFS), *Rebuilding Interior Columbia Basin Salmon and Steelhead*, September 30, 2022, pp. 1-42, <https://repository.library.noaa.gov/view/noaa/46461>, (hereinafter NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*).

⁴ A *federally recognized Tribe* ("Tribe") is an American Indian or Alaska Native entity that is recognized as having a government-to-government relationship with the United States, which makes the entity eligible for certain programs and services. For the 2024 list of Tribes, see Department of the Interior (DOI), Bureau of Indian Affairs (BIA), "Indian Entities Recognized by and Eligible To Receive Services from the United States Bureau of Indian Affairs," 89 *Federal Register* 99899, December 11, 2024, <https://www.federalregister.gov/documents/2024/12/11/2024-29005/indian-entities-recognized-by-and-eligible-to-receive-services-from-the-united-states-bureau-of>.

listed under the ESA.⁵ The low population sizes of listed salmon and steelhead trout in the Columbia River Basin combined with ongoing stressors such as dams, climate change, and drought have led to concerns among several stakeholders. Efforts and proposed actions to address these declines have met resistance from other stakeholders advocating to retain federal dam operations for the services they provide, such as hydropower, navigation, and irrigation, among others. These stakeholders have expressed concern that these services may be diminished to support listed fish species. The debate over which resources and services to prioritize among stakeholders with different interests in the region has led to various proposals and approaches to address the issue.

Some stakeholders have pursued their interests through litigation. For example, the decline of salmon and steelhead trout populations prompted some stakeholders to sue the federal government under the ESA and other environmental statutes for failing to adequately protect listed fish in operations plans for dams in the Columbia River Basin. While cases challenging Columbia River Basin dam operation plans and associated ESA consultation and NEPA review documents date back to the 1990s—shortly after the first fish populations were listed—the litigation that has shaped agency actions the last two decades was originally filed by the National Wildlife Federation (NWF) and other nongovernmental organizations to challenge a 2000 biological opinion (BiOp) on the operations of certain federal dams in the basin.⁶

NWF’s most recent supplement to its complaint raises claims under the ESA, NEPA, and Administrative Procedure Act (APA) related to a BiOp, NEPA review, and final agency record of decision (ROD) issued in 2020.⁷ In December 2023, the court granted the parties’ request to stay the litigation for five years while the federal government implemented a memorandum of understanding (MOU) that outlined commitments in support of a Columbia Basin Restoration Initiative (CBRI) developed by four Tribes and the states of Washington and Oregon.⁸ On June 12, 2025, President Trump issued a memorandum directing the heads of federal agencies to take all appropriate steps to withdraw from the MOU, among other actions.⁹ On September 11, 2025, the plaintiffs filed a motion to lift the stay and resume litigation, which the court granted the same day.¹⁰ Accordingly, the litigation over the 2020 BiOp, EIS, and ROD resumed. On March 2, 2026, the court granted the plaintiffs’ request for a preliminary injunction.¹¹ The preliminary injunction

⁵ NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*.

⁶ A *biological opinion* (BiOp) is a written statement from NMFS or the U.S. Fish and Wildlife Service (FWS), or both, analyzing whether a federal agency’s proposed action is likely to jeopardize the continued existence of listed species or adversely modify or destroy critical habitat. The BiOp sets forth the agency’s opinion and provides supporting information for the analysis. 16 U.S.C. §§1536(a)-(b).

⁷ Bonneville Power Administration (BPA), “Record of Decision; Columbia River System Operations Environmental Impact System,” 85 *Federal Register* 63834, October 8, 2020, <https://www.govinfo.gov/content/pkg/FR-2020-10-08/pdf/2020-22147.pdf>.

⁸ Joint Motion to Stay Litigation Through 2028, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. December 14, 2023). The Tribes that developed the Columbia Basin Restoration Initiative include the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation, and the Nez Perce Tribe.

⁹ Executive Office of the President, “Stopping Radical Environmentalism to Generate Power for the Columbia River Basin,” June 12, 2025, <https://www.whitehouse.gov/presidential-actions/2025/06/stopping-radical-environmentalism-to-generate-power-for-the-columbia-river-basin/>.

¹⁰ Joint Motion to Lift Stay, Expedited Consideration Requested, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. September 11, 2025).

¹¹ Amended Opinion and Order, NWF v. NMFS, No. 3:01-CV-00640, at 40-43 (D. Or. March 2, 2026); Amended Preliminary Injunction Order, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. March 3, 2026).

generally retains spill and reservoir levels as set out in the 2025 fish operations plan.¹² The government has appealed the preliminary injunction order to the U.S. Court of Appeals for the Ninth Circuit.¹³

In addition to challenging agency actions related to the dams through litigation, some Tribes, states and environmental groups have proposed plans to recover listed fish populations in the basin. Some proposals promoted by stakeholders with interests in the listed species and river ecosystems include actions in support of removing (i.e., *breaching*) four federally owned dams on the lower Snake River (collectively referred to as the *lower Snake River dams*) in the Columbia River Basin. These dams are owned and operated by USACE for congressionally authorized purposes of navigation, hydropower, and irrigation, among other benefits. Estimates of the cost of replacing the benefits currently provided by the lower Snake River dams generally have ranged from \$10 billion to \$31 billion, with replacement of electricity generation and grid services comprising most of these costs.¹⁴ Stakeholders with various interests in the services provided by the dams, as well some Members of Congress and the Trump Administration, have opposed proposals to remove the dams.¹⁵

In light of the repeated litigation and competing stakeholder interests, Congress may consider legislative options regarding the operations of federal dams in the Columbia River Basin. Potential legislative options may include dictating specific operational plans and activities related to the lower Snake River dams, directing how the federal agencies are to prioritize competing uses, or pursuing dam removal and replacement of benefits. Some Members of Congress have proposed various legislative options in the recent Congresses related to these strategies. Any administrative or legislative actions are likely to entail tradeoffs between the benefits that the dams provide and actions to promote the recovery of ESA-listed fish populations. In addition, potential actions may inform how federal agencies, stakeholders, and Members consider approaches to other similarly situated federal projects and listed species habitats.

This report provides background on the lower Snake River dams in the context of federal dam operations in the Columbia River Basin, ESA-listed Snake River fish populations and associated recovery initiatives, and recent litigation over operation plans and associated ESA consultation and NEPA review documents. The report provides selected context for lower Snake River dam

¹² Amended Opinion and Order, *NWF v. NMFS*, No. 3:01-CV-00640, at 40-43 (D. Or. March 2, 2026). Some changes from the 2025 fish operations plan include more fall and winter spill and full summer spill duration, instead of a reduced August spill. The court did order flexibility for the federal government to adjust spills and reservoir levels for emergency power generation and transportation needs. For more information on the 2025 fish operations plan, see USACE Northwestern Division, *Fish Operations Plan Implementation Report*, April 2025, https://public.crohms.org/tmt/documents/FOP_Implementation_Reports/Older/2025_04_FOP-Implementation-Report_Final.pdf.

¹³ *NWF v. Reclamation*, No. 26-2139 (9th Cir. April 8, 2026).

¹⁴ See Table 2 in the *Lower Snake River Dams: Benefit Replacement Report*, August 2022, published by the Office of Governor Jay Inslee of Washington jointly with Sen. Patty Murray. The report was prepared by a consulting team composed of Seattle-based firm Ross Strategic and DC-based Kramer Consulting. The cost estimate largely reflects the range of estimates from other groups including BPA and dam breaching advocates. Costs are expressed as the present value of total costs in 2022 dollars. The methodology for discounting and converting costs from all studies into 2022 dollars is explained in the report. The report excludes some high-end estimates from earlier studies that relied primarily on new wind and solar energy as replacement resources, because “Senator Murray and Governor Inslee have determined an energy replacement portfolio only relying on intermittent resources is not a valid path forward.” The report is at https://governor.wa.gov/sites/default/files/2022-11/LSRD%20Benefit%20Replacement%20Final%20Report_August%202022.pdf (hereinafter Murray and Inslee, *Lower Snake River Dams*).

¹⁵ White House, “Fact Sheet: President Donald J. Trump Stops the Green Agenda in the Columbia River Basin,” June 12, 2025, <https://www.whitehouse.gov/fact-sheets/2025/06/fact-sheet-president-donald-j-trump-stops-the-green-agenda-in-the-columbia-river-basin/>.

operations with respect to commerce and ecosystem impacts. The report also discusses potential considerations for Congress, particularly regarding the lower Snake River dams, efforts to recover ESA-listed Snake River fish populations, recent Administrations' actions, and litigation developments.

Columbia River System

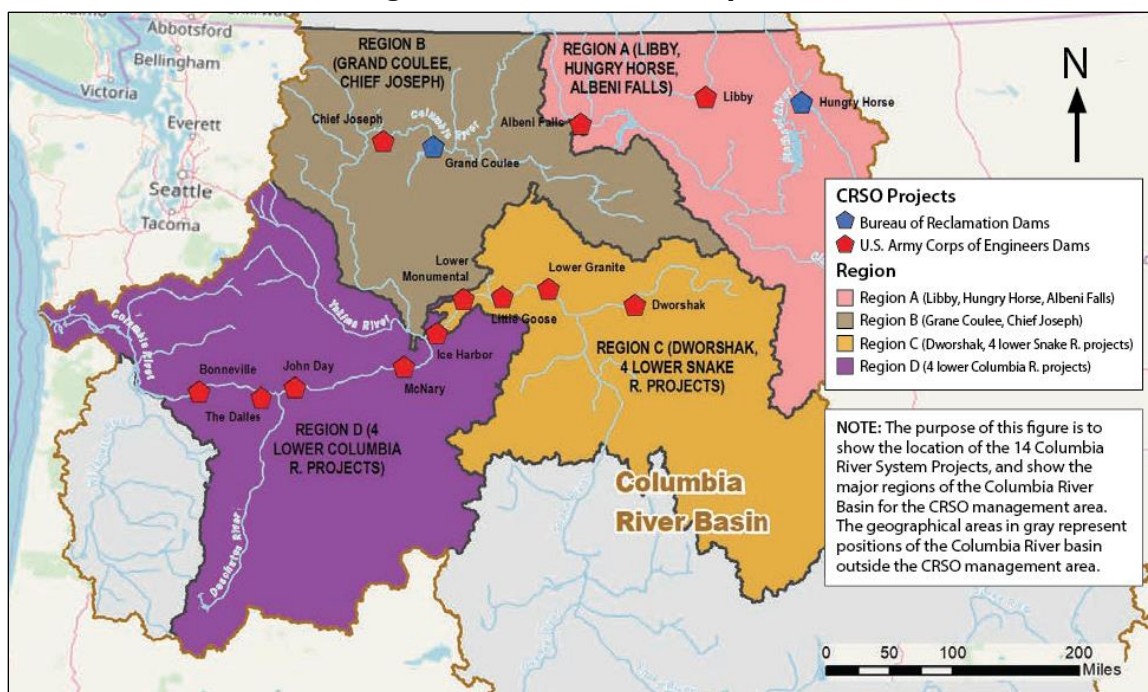
Federal dams have affected salmon and steelhead trout populations in the Columbia River Basin since the 1938 construction of Bonneville Dam, the first dam in the Federal Columbia River Power System (FCRPS). The FCRPS now includes 31 federal hydropower dams in the Columbia River Basin operated by either USACE or Reclamation.¹⁶ The Bonneville Power Administration (BPA) markets electric power from these projects.¹⁷ USACE, Reclamation, and BPA are generally referred to in this context as the *action agencies*. The action agencies consider 14 of the FCRPS federal dams in the Columbia River Basin to be primary mainstem facilities and refer to these dams as the *Columbia River System* (see **Figure 1**).¹⁸ This system includes the four lower Snake River dams operated by USACE.

¹⁶ Reclamation, "Federal Columbia River Power System," <https://www.usbr.gov/pn/fcrps/index.html>.

¹⁷ In 1937, the Bonneville Project Act (P.L. 75-329; 50 Stat. 731) created the Bonneville Power Project and the BPA to market and transmit power from federal dams in Pacific Northwest, particularly to public bodies and cooperatives. BPA is one of four federal power marketing administrations (PMAs). BPA differs from the other three PMAs in that it is self-financed: it receives no federal appropriations. The Federal Columbia River Transmission System Act of 1974 (16 U.S.C. §838) authorized BPA to cover its operating costs through power rates set to ensure repayment to the Treasury of capital and interest on funds used to construct the Columbia River power system.

¹⁸ Fourteen of the Federal Columbia River Power System (FCRPS) projects are operated as a coordinated system known as the Columbia River System within the interior Columbia River Basin in the states of Idaho, Montana, Oregon, and Washington. Projects in the upper Snake, Willamette, and Rogue River Basins are excluded from the Columbia River System because these projects are coordinated and operated separately. Therefore, the multipurpose operation of these other FCRPS projects is generally not factored into the coordinated planning scenarios of the Columbia River System. USACE, Reclamation, and BPA, *Columbia River System Operations Environmental Impact Statement*, July 31, 2020, p. 3-374, <https://www.nwd.usace.army.mil/CRSO/Final-EIS/> (hereinafter USACE, Reclamation, and BPA, 2020 EIS).

Figure I. Columbia River System



Source: CRS modification of map obtained from U.S. Army Corps of Engineers, Bureau of Reclamation, and Bonneville Power Administration, "Executive Summary," in *Columbia River System Operations Environmental Impact Statement*, July 31, 2020, p. 6, <https://usace.contentdm.oclc.org/utis/getfile/collection/p16021coll7/id/14957>.

Notes: This figure depicts the 14 dams of the Federal Columbia River Power System that comprise the Columbia River System within the interior Columbia River Basin. Other Federal Columbia River Power System dams and nonfederal dams in the Columbia River Basin are not shown.

Lower Snake River Dams

Some studies have identified the Snake River as being one of the most productive and largest salmon-producing tributaries of the Columbia River prior to the construction of dams in the basin.¹⁹ Additionally, some tributaries flowing into the Snake River between the lower Snake River dams and Hells Canyon Dam (e.g., the Salmon River) may provide undammed habitat for salmon and steelhead trout in areas upstream of the Lower Snake River dams.²⁰

The lower Snake River reach, as defined by the 2020 Environmental Impact Statement (EIS), extends approximately 178 river miles between Cache Creek (which is upriver from Lewiston, ID) through the Clearwater River confluence near Lewiston to the Columbia River confluence downstream near Pasco, WA (see **Figure 2**).²¹ Over this reach, USACE constructed four dams

¹⁹ Randall F. Schalk, "Estimating Salmon and Steelhead Usage in the Columbia Basin Before 1850: The Anthropological Perspective," *Northwest Environmental Journal*, vol. 2, no. 2 (1986), pp. 1-29; D.J. Nemeth and Russell B. Kiefer, "Snake River Spring and Summer Chinook Salmon—The Choice for Recovery," *Fisheries*, vol. 24, no. 10 (1999), pp. 16-23 (hereinafter Nemeth and Kiefer, "Snake River Spring and Summer Chinook Salmon," 1999).

²⁰ While the lower Snake River dams have fish passage facilities, the private hydropower Hells Canyon Dam approximately 140 miles upstream does not include fish passage facilities. Terry R. Maret and Christopher A. Mebane, "Historical and Current Perspectives on Fish Assemblages of the Snake River, Idaho and Wyoming," *American Fisheries Society Symposium*, vol. 45 (2005), pp. 41-59.

²¹ Inflow contributions to the lower Snake River comprise regulated outflows from the upper Snake River Basin and (continued...)

that began operation between 1962 and 1975: Ice Harbor, Lower Monumental, Little Goose, and Lower Granite.²² (See the “Origins of the Lower Snake River Dams” text box below for information on the authorization and construction of these dams.) The four dams are run-of-river systems that are equipped with fish passage facilities.²³

Figure 2. Lower Snake River Dams



Source: CRS modification of map obtained from U.S. Army Corps of Engineers, Bureau of Reclamation, and Bonneville Power Administration, *Columbia River System Operations Environmental Impact Statement*, July 31, 2020, pp. 3-374, <https://www.nwd.usace.army.mil/CRSO/Final-EIS/>.

Origins of the Lower Snake River Dams

Congress initially authorized the U.S. Army Corps of Engineers (USACE) in 1902 and 1910 to provide open river improvements for sections of the lower Snake River. USACE ultimately determined that these methods were not adequate to ensure a five-foot channel depth between the mouth of the Snake River and Lewiston, ID. The 1925 Rivers and Harbors Act (43 Stat. 1186) directed the Secretary of War, through USACE, and the Federal Power Commission to estimate the cost of studying the navigable streams and tributaries of the United States for navigation improvement in combination with the most efficient development of hydropower, flood control, and irrigation needs. In response, the Secretary of War submitted a report to Congress in 1926 (known as the *308 Report*) proposing rivers to study, including the Columbia River and minor tributaries and the Snake River and tributaries. Congress authorized USACE to conduct some of these studies in the 1927 Rivers and Harbors Act (44 Stat. 1010).

unregulated flows from the Salmon, Grande Ronde, and Imnaha Rivers. Tributary inflows downstream of the Snake and Clearwater confluence are fairly limited. The Idaho Power Company completed construction of the Hells Canyon Dam in 1967, which is upstream of the four lower Snake River dams, and blocked fish passage to the upper Snake River Basin. USACE, Reclamation, and BPA, *2020 EIS*, p. C-2-14.

²² USACE, “Lower Snake River Dams,” <https://www.nww.usace.army.mil/Missions/Lower-Snake-River-Dams/>.

²³ A *run-of-river system* uses a river’s current to generate electricity. In contrast, *storage systems* use reservoirs to store water to generate electricity. U.S. Energy Information Administration, “Hydropower Explained,” updated April 20, 2023, <https://www.eia.gov/energyexplained/hydropower/>.

USACE transmitted a report to Congress in 1938 following direction from the Rivers and Harbors Act of 1935 (49 Stat. 1028) and a 1938 resolution from the Senate Commerce Committee to further surveys authorized in 1927 while also taking into account economic, scientific, and environmental changes and “relief of unemployment.” The report recommended general plans for the development of the Columbia and Snake Rivers between the Bonneville Dam (which began operation in 1938) and Lewiston, ID, for the combined interests of navigation, irrigation, and hydroelectric power. The report also recommended that Congress authorize and modify portions of the plan as desired. The Rivers and Harbors Act of 1945 (P.L. 79-14; 59 Stat. 10) authorized USACE to construct the McNary Dam (on the Columbia River) and authorized “construction of such dams as are necessary, and open channel improvement for purposes of providing slack water navigation and irrigation” along the lower Snake River from its confluence with the Columbia River to Lewiston. The act also directed that surplus electric energy generated at the dams be disposed of in accordance with the Bonneville Project Act (P.L. 75-329; 50 Stat. 731). USACE sited and constructed four dams with lockage facilities: Ice Harbor (began operation in 1962), Lower Monumental (began operation in 1969), Little Goose (began operation in 1970), and Lower Granite (began operation in 1975). Completion of the series of dams allowed a barge route from Portland, OR, to the port of Lewiston, ID, starting in 1975.

Sources: Public laws and reports to Congress from the Secretary of the Army.

Despite operation of fish passage facilities and other conservation measures, investigations have reported that construction and operation of these dams, in addition to effects from four dams downstream on the Columbia River, have, in part, resulted in an overall decrease of salmon returns to the Snake River basin.²⁴ Some scientists have suggested that the lower Snake River dams are the primary limiting factor for attaining healthy Snake River salmon and steelhead trout populations listed under the ESA and that restoring some level of pre-dam ecosystem function has the greatest probability of achieving healthy and harvestable populations of fish.²⁵ Other studies have identified additional factors affecting salmon and their potential impact on populations (see “Factors Affecting Snake River Salmon and Steelhead Trout Populations”).

Navigation Supported by the Lower Snake River Dams

Each of the four lower Snake River dams has navigation locks allowing for boat and barge transportation of people and goods to and from the Pacific Ocean and inland ports.²⁶ USACE established water elevations behind each dam to maintain an authorized 14-foot channel depth for the river. The federal government funds operation and maintenance of the locks and navigation channels on the Snake River. Barge and cruise transportation would not be possible on the Snake River without the USACE dams and locks.

Wheat is the primary commodity carried on the Snake River; it is transported for export at ship loading terminals at Portland, OR, and at Vancouver, WA, Kalama, WA, and Longview, WA.²⁷ Snake River shipping contributes about 2.5-3 million tons, or a little more than 20%, of the wheat

²⁴ Nemeth and Kiefer, “Snake River Spring and Summer Chinook Salmon,” 1999; H. A. Schaller et al., “Contrasting Patterns of Productivity and Survival Rates for Stream-Type Chinook Salmon (*Oncorhynchus tshawytscha*) Populations of the Snake and Columbia Rivers,” *Canadian Journal of Fisheries and Aquatic Sciences*, vol. 56, no. 6 (1999), pp. 1031-1045 (hereinafter Schaller et al., “Contrasting Patterns of Productivity and Survival Rates for Stream-Type Chinook Salmon,” 1999).

²⁵ Nemeth and Kiefer, “Snake River Spring and Summer Chinook Salmon,” 1999; Schaller et al., “Contrasting Patterns of Productivity and Survival Rates for Stream-Type Chinook Salmon,” 1999; NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022.

²⁶ Run-of-river dams pass water at the dam at nearly the same rate it enters, but some water backs up behind the dam. Levels of the water behind these run-of-river dams typically vary from three to five feet in normal operations. Maintaining water levels within the normal operating range allows the facilities at the dams (e.g., navigation locks, hydropower turbines, fish ladders, juvenile fish bypass facilities) to function as designed.

²⁷ Washington State, Department of Transportation, *Lower Snake River Dams Transportation Study*, December 2024, <https://wsdot.wa.gov/sites/default/files/2024-12/Lower-Snake-River-Dams-Transportation-Study-Dec2024.pdf>.

loaded at the deep-draft terminals between Portland and Longview.²⁸ To help contextualize the Snake River's wheat tonnage, a commonly sized grain ship loads about 60,000 tons, so the Snake River in a typical year transports the equivalent of around 42 shiploads of wheat; this represents about 15% of the nation's total wheat exports.²⁹ Several barge-loading elevators are dispersed along the segment of the Snake River that traverses Washington State and in Lewiston, ID.³⁰ In a typical year, about two-thirds of the wheat shipped on the Snake River originates from the eastern region of the segment of the river with navigation locks in Washington State.³¹ The Columbia River Basin also hosts cruise and riverboat passenger operations. Passengers typically board at Portland, OR. Some operators sail up the Snake River as far as Clarkston, WA, which is adjacent to Lewiston, ID.

Water Provided by Lower Snake River Dams for Irrigation, Municipal, and Industrial Use

Both small- and large-scale nonfederal pumping plants divert slack water behind the four lower Snake River dams for irrigation at an average of 316,000 acre-feet of water annually.³² These dams are authorized for irrigation, but no water is stored for irrigation purposes and the projects do not include specific features to accommodate irrigation or have federal irrigation contracts.³³ As of 2022, agriculture production in the Lower Snake River Basin comprises a diverse mix of tree fruit, herbs, hay, vegetables, cereal grains, pulse crops, and grapes.³⁴ In general, acreage devoted to cereal grains and pulse crops in this region is not irrigated (e.g., dryland wheat). The region's irrigated crops tend to be higher-value annual and perennial crops (e.g., apples, grapes, onions, and potatoes). The approximately 50,000 average annual irrigated acres are primarily located near Ice Harbor dam.³⁵

Water users along the Snake River also divert slack water behind the lower Snake River dams for municipal and industrial (M&I) purposes. The largest surface water withdrawals for M&I

²⁸ USACE, Institute for Water Resources Website, Waterborne Commerce Statistics Center, *Waterborne Commerce of the United States Annual Report, Lock Statistics by River*, <https://www.iwr.usace.army.mil/about/technical-centers/wcsc-waterborne-commerce-statistics-center/>. Railroads along the entire length of the Snake River's shoreline could carry the amount of wheat that is presently barged, but likely at higher cost to the shippers; a transition to rail also would likely require additional investment to upgrade track and build new facilities. Trucking also could transport wheat to Columbia River terminals, but the cost of trucking is even higher than the cost of wheat transport by rail. Trucking wheat may limit the quantity transported due to cost constraints. "Executive Summary" in USACE, Reclamation, and BPA, *2020 EIS*, p. 33.

²⁹ USACE, Institute for Water Resources Website, Waterborne Commerce Statistics Center, *Waterborne Commerce of the United States Annual Report*.

³⁰ Upriver from Lewiston, ID, the dams on the Snake River have no navigation locks; thus, there is no barge transportation service. Lewiston, ID, marks the eastern limit of commercial navigation on the Snake River.

³¹ USACE, Institute for Water Resources Website, Waterborne Commerce Statistics Center, *Waterborne Commerce of the United States Annual Report, Lock Statistics by River*.

³² USACE, Reclamation, and BPA, *2020 EIS*, p. 3-1302.

³³ USACE, Reclamation, and BPA, *2020 EIS*, p. 3-1297.

³⁴ U.S. Department of Agriculture, National Agricultural Statistics Service, Census of Agriculture, "Quick Stats," 2022, <https://quickstats.nass.usda.gov/>.

³⁵ The amount of annual irrigated acres varies by source. The USACE Reclamation, and BPA, *2020 EIS*, estimates 48,000 acres of irrigated agricultural production (p. 3-1320). The 2024 Reclamation draft report *Lower Snake River Water Supply Replacement Study* estimated average annual irrigation of 55,300 acres from Lower Snake River dam pools between 2018 and 2023 (p. 3-18). See "Water Provided by Lower Snake River Dams for Irrigation, Municipal, and Industrial Use" section for more on Reclamation's 2024 draft report.

purposes are from slack water behind the Lower Granite dam. M&I users of these water supplies include the cities of Lewiston, ID, and Clarkston, WA, as well as the Clearwater Paper Mill.³⁶

Hydropower from Lower Snake River Dams

The four lower Snake River dams all have hydropower facilities that generate electricity and provide additional grid services necessary for electric reliability. Debate about costs and benefits of the lower Snake River dams frequently encompasses the generation and grid services provided by the dams, as well as the potential costs of replacing those services if the dams were breached. Grid services provided by hydropower can be categorized as follows:

- **Capacity.** Capacity is a measure of the theoretical maximum potential output of an electric generator, typically measured in megawatts (MW).³⁷
- **Annual generation.** Annual generation (energy) is a measure of the actual output of an electric generator over the course of a year, typically measured in megawatt-hours (MWh).³⁸
- **Peak generation.** Peak generation is a measure of the output of an electric generator during particular hours of the year when electricity demand is highest.
- **Ancillary services.** Ancillary services is an umbrella term for a number of grid services that contribute to electric reliability over short timescales, typically minutes or less.³⁹

Some of these services, such as capacity and annual generation, are easy to quantify, and information about them is readily available. The capacity and annual generation of the lower Snake River dams are provided below. Information about other services, such as peak generation and ancillary services, is less readily available, because formal reporting mechanisms for these services do not exist. Peak generation and ancillary services are nonetheless important to consider because they are critical for maintaining electric reliability.

Combined, the lower Snake River dams have a nameplate capacity of more than 3,000 MW. Ice Harbor has a nameplate capacity of 603 MW,⁴⁰ and each of the other three dams has a nameplate

³⁶ USACE, Reclamation, and BPA, *2020 EIS*, pp. 3-1301–3-1303.

³⁷ Capacity can be reported for an individual electric generator or for the combined output of all generators at a particular facility (e.g., a dam). Capacity is typically determined by the manufacturer for standard conditions (*nameplate capacity*) but also can be reported as a function of typical weather conditions (e.g., *winter capacity*).

³⁸ Electric generation from hydropower facilities is sometimes reported in terms of average megawatt (aMW). One aMW is the amount of energy that a power plant with 1 megawatt (MW) capacity would generate if it operated continuously for a full year. Energy expressed in aMW can be converted to megawatt-hours (MWh) by multiplying by the number of hours in a year (i.e., 8,760 hours, when not accounting for leap years).

³⁹ For background on ancillary services, see the appendix in CRS Report R45764, *Maintaining Electric Reliability with Wind and Solar Sources: Background and Issues for Congress*, by Ashley J. Lawson; and Federal Energy Regulatory Commission, *Reliability Primer*, April 23, 2020.

⁴⁰ In 2016, USACE began replacing the power turbines at Ice Harbor, with the goals of improving fish safety, lowering maintenance costs, and increasing efficiency. The upgrades are expected to be completed in summer 2026. Walla Walla District USACE, “USACE Plans Fish Survival Testing This Fall on the Second Improved Fish Passage Turbine,” July 25, 2023, <https://www.nww.usace.army.mil/Media/News-Stories/Article/3470373/usace-plans-fish-survival-testing-this-fall-on-the-second-improved-fish-passage/>, and Walla Walla District USACE, “New Innovation Earns Ice Harbor Lock and Dam Recognition,” February 10, 2025, <https://www.nww.usace.army.mil/Media/News-Stories/Article/4061922/new-innovation-earns-ice-harbor-lock-and-dam-recognition/>.

capacity of 810 MW.⁴¹ The nameplate capacity of the lower Snake River dams represents about 17% of the total capacity in the FCRPS.⁴²

The lower Snake River dams' ability to provide generation and ancillary services changes depending on water levels, operational constraints, conditions within the regional grid, and other factors. Dry years and seasonal operational constraints for fish protection can limit the dams' ability to provide these services compared to wet years or when operational constraints are not limiting. **Table 1** shows these dams' annual generation for 2015-2024 and shows their high year-to-year variability. The annual generation from the lower Snake River dams is reportedly around one-tenth of BPA's total system-wide generation.⁴³ As noted above, information about peak generation and ancillary services from the dams is less readily available. According to the 2020 EIS, the dams provide "more than 2,000 MW of sustained peaking capabilities during the winter, and a quarter of Bonneville's [BPA's] current reserves holding capability."⁴⁴

Table 1. Annual Net Generation from the Lower Snake River Dams, 2015-2025

(generation in megawatt-hours [MWh])	
Year	Generation (MWh)
2015	6,487,225
2016	7,798,685
2017	10,283,840
2018	9,013,162
2019	8,257,768
2020	6,606,896
2021	5,437,905
2022	6,497,687
2023	6,004,119
2024	5,337,094
2025	6,038,438

Source: U.S. Energy Information Administration, Form 923, July 1, 2026, <https://www.eia.gov/electricity/data/eia923/>.

Notes: Net generation is total output from generating facilities minus any electricity consumed on-site. Data for 2025 are subject to change.

Columbia River System Operations

The action agencies' existing authorities for operating the Columbia River System provide significant discretion to operate the system for the respective projects' various authorized

⁴¹ BPA, *A Northwest Energy Solution: Regional Power Benefits of the Lower Snake River Dams*, March 2016, p. 4, <https://www.bpa.gov/-/media/Aep/about/publications/fact-sheets/fs-201603-A-Northwest-energy-solution-Regional-power-benefits-of-the-lower-Snake-River-dams.pdf>.

⁴² Based on FCRPS capacity of 17,462 MW from all resource types (i.e., hydropower, nuclear, and others).

⁴³ Murray and Inslee, *Lower Snake River Dams*, p. 66.

⁴⁴ USACE, Reclamation, and BPA, *2020 EIS*, p. 3-944. As described in the 2020 EIS, *reserves* are spare capacity within the FCRPS to "increase and sometimes to decrease generation so that electricity generation always equals demand for electricity." USACE, Reclamation, and BPA, *2020 EIS*, p. 3-822. Reserves are necessary to balance the grid in real time and maintain reliability.

purposes,⁴⁵ subject to legal requirements such as the ESA, NEPA, and the Pacific Northwest Electric Power Planning and Conservation Act (Northwest Power Act; P.L. 96-501; 16 U.S.C. §§839a-h).⁴⁶ These operations are also subject to available funding, which is generally provided by congressional appropriations or BPA revenues. For example, in a 2022 memorandum, USACE explained its understanding of the source of its authority and the nature of its discretion as follows:

[USACE] interprets its project authorities to require that constructed Civil Works projects be operated and maintained in such a manner that the projects continue to serve their Congressionally authorized purposes, subject to appropriations and budgeting principles. Only Congressional action to change the authorization or deauthorize an existing Civil Works project can alter or terminate this responsibility. However, the manner in which operation, maintenance, repair, replacement, and rehabilitation is performed is often discretionary and subject to ESA section 7 consultation.⁴⁷

For example, USACE has discretion to change the timing and frequency of how it operates a fish passage facility,⁴⁸ but USACE does not consider itself as having discretion to breach or decommission a congressionally authorized dam without action from Congress.⁴⁹ Discretionary decisions regarding the Columbia River System operations and maintenance plans, which include the lower Snake River dams, must comply with the ESA and NEPA.⁵⁰

⁴⁵ Congress enacted numerous specific statutes authorizing the construction and operation of each Columbia River System project, which may differ on the specific purposes for which Reclamation or USACE must operate a project and may vary in defining how that purpose is implemented at each specific project. Columbia River System projects' authorizing statutes include hydroelectric power generation, and most also include navigation. All USACE projects are authorized to support recreation and fish and wildlife conservation per general authorization under the Flood Control Act of 1944 (P.L. 78-534). The lower Snake River dams also are authorized to provide irrigation as an incidental benefit, and fish and wildlife mitigation of these projects resulted from negotiations under the Fish and Wildlife Coordination Act (P.L. 85-624).

⁴⁶ The Pacific Northwest Electric Power Planning and Conservation Act (P.L. 96-501; 16 U.S.C. §§839a-h) requires federal agencies, including the action agencies (USACE, Reclamation, and BPA), to exercise their responsibilities for operating and maintaining Columbia River System projects "to adequately protect, mitigate, and enhance fish and wildlife ... affected by such projects or facilities in a manner that provides equitable treatment for such and fish and wildlife with the other purposes" of the projects. The act also obligates the action agencies to take into account, at the relevant stages of their decisionmaking and to the fullest extent practicable, the Columbia River Basin Fish and Wildlife Program adopted by the Northwest Power and Conservation Council. For information on the program, see "Bonneville Power Administration Fish and Habitat Initiatives."

⁴⁷ USACE and NOAA, "Memorandum Between the Department of the Army (Civil Works) and NOAA," January 5, 2022, https://www.noaa.gov/sites/default/files/2022-01/NOAA%20and%20Army%20Civil%20Works%27%20joint%20memorandum%20to%20advance%20Endangered%20Species%20Act%20Consultations_0.pdf.

⁴⁸ USACE develops fish passage plans as part of its operation and maintenance strategy to improve fish survival in the Columbia River System, in accordance with all current and applicable Endangered Species Act (ESA; 16 U.S.C. §§1531-1544) Section 7 BiOps. Actions in the plan are to be in compliance with all other regulatory requirements (e.g., National Environmental Policy Act [NEPA; 42 U.S.C. §§4321 et seq.]) and regional agreements that are in effect at the time (e.g., fish accords, spill agreements). USACE Columbia River Operational Hydrometeorological Management System, "Fish Passage Plan (FPP) Homepage," <https://public.crohms.org/tmt/documents/fpp/>.

⁴⁹ For example, the Assistant Secretary of the Army for Civil Works testified at a 2024 hearing that the memorandum of understanding (MOU) signed by the federal government on December 13, 2023, "recognize[s] that any breaching of the lower Snake River dams would require specific authorization and appropriations from Congress." U.S. Congress, House Committee on Energy and Commerce, Subcommittee on Energy, Climate and Grid Security, *Exposing President Biden's Plan to Dismantle the Snake River Dams and the Negative Impacts to the United States*, 118th Cong., 2nd sess., January 30, 2024 (hereinafter *Snake River Dam hearing*, January 30, 2024).

⁵⁰ For more information on recent actions related to the ESA and NEPA for the lower Snake River dams, see "Recent Litigation Challenging Agency Actions Related to the Lower Snake River Dams."

The action agencies have issued a series of operations plans for various components of the FCRPS (e.g., the Columbia River System) or the system as a whole. The action agencies issued the latest ROD for an operations plan for the Columbia River System on September 28, 2020, after completing ESA consultation and NEPA review. The 2020 ROD contained the agencies' plan for operating and maintaining the dams through 2034.⁵¹ By agreement, the agencies subsequently incorporated amended spill operations into the operation plan (see section, "2020 Biological Opinion, Environmental Impact Statement, and Record of Decision").

Snake River Salmon and Steelhead Trout Populations Listed Under the ESA

The ESA was enacted to conserve species identified as endangered or threatened and their habitats.⁵² Three species of anadromous fishes listed under the ESA are currently found in the Snake River: Chinook salmon (*Oncorhynchus tshawytscha*), sockeye salmon (*O. nerka*), and steelhead trout (*O. mykiss*).⁵³ (Coho salmon [*O. kisutch*] previously occupied the Snake River but are considered to have been extirpated from the area prior to the 1950s.⁵⁴)

Anadromous salmonids are often subdivided into specific populations based on spawning run timing and other biological characteristics (e.g., reproductive isolation from other populations).⁵⁵ Salmon and steelhead trout populations can be designated as evolutionarily significant units (ESUs) or distinct population segments (DPSs) for listing under the ESA.⁵⁶ Under this classification, four segments (three ESUs and one DPS) of salmon and steelhead trout in the Snake River are listed as either threatened or endangered under the ESA (**Table 2**).⁵⁷ In the entire Columbia River Basin, 13 salmon and steelhead trout segments are listed as either threatened or endangered.

⁵¹ The consultation in the 2020 Columbia River System BiOp encompasses operations and maintenance of the Columbia River System for a 15-year period. USACE, Reclamation, and BPA, *2020 EIS*.

⁵² 16 U.S.C. §1531. For more detail on the listing of species, agency consultation requirements, and several other ESA processes, see CRS Report R46677, *The Endangered Species Act: Overview and Implementation*, by Pervaze A. Sheikh and Erin H. Ward.

⁵³ These Pacific salmon and steelhead trout species are all classified to the Salmonidae family. The term *salmon* is used in this report to include the three listed Snake River salmon and steelhead trout species. This report does not consider other resident fish species or other salmonids, such as bull trout. FWS, Environmental Conservation Online System (ECOS), <https://ecos.fws.gov/ecp/> (hereinafter FWS, ECOS).

⁵⁴ Extinction of the stock was acknowledged by NMFS in its 1991 notice for lower Columbia River coho salmon. NMFS, "Endangered and Threatened Species; Lower Columbia River Coho Salmon," 56 *Federal Register* 29553-29554, June 27, 1991.

⁵⁵ The migration of salmon from the sea upstream to spawn is known as a *run*.

⁵⁶ The evolutionarily significant unit (ESU) and distinct population segment (DPS) designations are used to identify meaningful biological units for listings of Pacific salmon and steelhead trout under the ESA. The stock must satisfy two criteria to be considered an ESU: (1) it must be substantially reproductively isolated from other nonspecific population units, and (2) it must represent an important component in the evolutionary legacy of the species. The DPS definition uses the term *marked separation* rather than *reproductive isolation*, which is used in the ESU definition. FWS and NOAA, NMFS, "Policy Regarding the Recognition of Distinct Vertebrate Population Segments Under the Endangered Species Act," 61 *Federal Register* 4722-4725, February 7, 1996; NOAA, NMFS, "Policy on Applying the Definition of Species Under the Endangered Species Act to Pacific Salmon," 56 *Federal Register* 58612-58619, November 20, 1991.

⁵⁷ Columbia River Basin Federal Caucus, "The Columbia River Basin Federal Caucus," <https://salmonrecovery.gov/>; FWS, ECOS.

Table 2. Snake River Salmon and Steelhead Trout Species Segments and ESA Status

Species	Segment	Status Under the ESA
Snake River spring/summer run Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	ESU	Threatened, listed in 1992
Snake River fall-run Chinook salmon (<i>Oncorhynchus tshawytscha</i>)	ESU	Threatened, listed in 1992
Snake River sockeye salmon (<i>Oncorhynchus nerka</i>)	ESU	Endangered, listed in 1991
Snake River steelhead trout (<i>Oncorhynchus mykiss</i>)	DPS	Threatened, listed in 1997

Sources: U.S. Fish and Wildlife Service, Environmental Conservation Online System (ECOS), <https://ecos.fws.gov/ecpl/>; National Oceanic and Atmospheric Administration, National Marine Fisheries Service, “Pacific Coastal Salmon Recovery Fund, Project and Performance Metrics Database: Snake River Coho Restoration IV,” https://www.webapps.nwfsc.noaa.gov/apex/f?p=309:19:::::P19_PROJECTID:48461776.

Notes: ESA = Endangered Species Act (16 U.S.C. §§1531-1544); DPS = distinct population segment; ESU = evolutionarily significant unit. Coho salmon (*Oncorhynchus kisutch*) previously occupied the Snake River but are considered to have been extirpated from the area prior to the 1950s. The Nez Perce Tribe is actively stocking the Snake River with coho salmon in an attempt to restore the salmon run.

The National Marine Fisheries Service (NMFS) has designated critical habitat for Snake River Chinook and sockeye salmon and steelhead trout under the ESA. This habitat includes four types of areas: (1) spawning and juvenile rearing areas, (2) juvenile migration corridors, (3) areas for growth and development to adulthood, and (4) adult migration corridors.⁵⁸

While Pacific salmon and steelhead trout generally have similar life cycles (**Figure 3**), the Snake River salmon ESUs and the steelhead trout DPS differ to some degree in their life history characteristics and habitat requirements. For example, Snake River sockeye salmon spawn in inland lakeshore gravel and develop in lakes for one to three years before migrating to the ocean.⁵⁹ The only remaining Snake River sockeye salmon population returns to Redfish Lake, ID, approximately 900 miles from the ocean.⁶⁰ Snake River fall-run Chinook salmon generally spawn in areas in or near the mainstem of the Snake River, and their juveniles spend less than a year in freshwater before migrating to the ocean.⁶¹ In contrast, Snake River spring/summer-run Chinook salmon spawn in tributaries, and their juveniles spend more than a year in the freshwater environment.⁶² Snake River steelhead trout use many of the same tributaries during their summer runs as Snake River spring/summer Chinook salmon.⁶³ They generally remain in these areas for

⁵⁸ For example, NOAA, NMFS, “Designated Critical Habitat: Revision of Critical Habitat for Snake River Spring/Summer Chinook Salmon,” 64 *Federal Register* 57399-57403, October 25, 1999. The ESA requires NMFS to designate critical habitat for any species it lists under the ESA. The ESA defines *critical habitat* as the areas within the geographical area occupied by the species at the time it is listed and the areas outside the geographical area occupied by the species at the time it is listed that are essential for the conservation of the species. 16 U.S.C. §1532.

⁵⁹ NMFS West Coast Region, *ESA Recovery Plan for Snake River Sockeye Salmon (Oncorhynchus nerka)*, June 8, 2015, pp. 1-431, <https://repository.library.noaa.gov/view/noaa/16001> (hereinafter NMFS West Coast Region, *ESA Recovery Plan for Snake River Sockeye Salmon*, 2015).

⁶⁰ NMFS West Coast Region, *ESA Recovery Plan for Snake River Sockeye Salmon*, 2015, pp. 47-53.

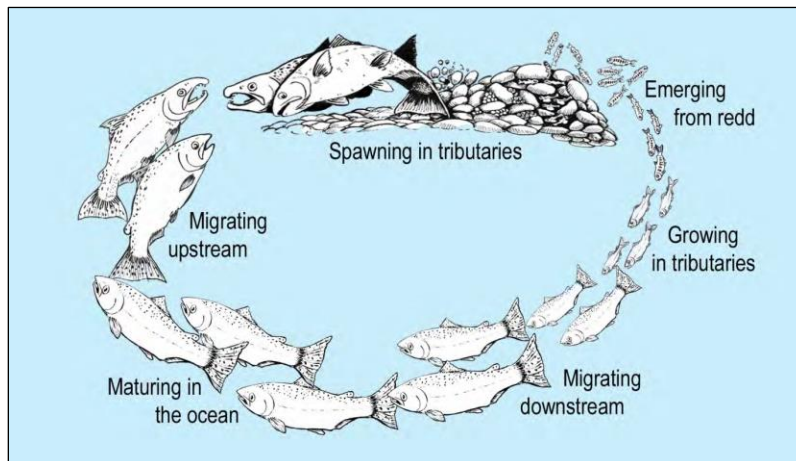
⁶¹ NMFS West Coast Region, *ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon (Oncorhynchus tshawytscha) & Snake River Basin Steelhead (Oncorhynchus mykiss)*, November 2017, pp. 1-282, <https://media.fisheries.noaa.gov/dam-migration/final-snake-river-spring-summer-chinook-salmon-and-snake-river-steelhead-recovery-plan-2017.pdf> (hereinafter NMFS, *Recovery Plan*, 2017).

⁶² NMFS, *Recovery Plan*, 2017.

⁶³ NMFS West Coast Region, *2022 5-Year Review: Summary & Evaluation of Snake River Basin Steelhead*, July 26, 2022, pp. 1-95, <https://repository.library.noaa.gov/view/noaa/45368> (hereinafter NMFS West Coast Region, *2022 5-Year Review*, 2022).

less than two years and reach maturity within streams.⁶⁴ All Pacific salmon species spawn once before dying at the end of their first breeding season, whereas steelhead trout may spawn more than once.⁶⁵

Figure 3. Anadromous Salmon and Steelhead Trout Life Cycle



Sources: National Marine Fisheries Service (NMFS), *ESA Recovery Plan for Snake River Spring/Summer Chinook Salmon* (*Oncorhynchus tshawytscha*) & *Snow River Basin Steelhead* (*Oncorhynchus mykiss*), November 2017, p. 64; NMFS, *ESA Recovery Plan for Snake River Sockeye Salmon* (*Oncorhynchus nerka*), June 8, 2015, pp. 39, 47; NMFS, *ESA Recovery Plan for Snake River Fall Chinook Salmon* (*Oncorhynchus tshawytscha*), November 2017, p. 30.

Notes: This graphic shows the life cycle for stream-type salmon and steelhead trout: those that mature for a year or more in freshwater before migrating to the ocean. In addition to growing in tributaries, Snake River sockeye salmon also rear in Redfish Lake for one to three years before beginning their downstream migrations. There are also ocean-type salmon, which migrate to the ocean in their first year, largely skipping the “Growing in Tributaries” step of this diagram. Unlike Pacific salmon species, steelhead trout can spawn more than once. A redd is a gravel nest.

Some ESUs, such as Snake River spring/summer-run Chinook salmon and Snake River steelhead trout, consist of different populations that are segregated by specific streams and waterbodies where they reproduce. Persistence of the ESUs depends on their resilience to threats, such as habitat alteration, poor water quality, and drought; their genetic diversity,⁶⁶ and their ability to adapt to changing conditions.⁶⁷

Population Trends

Over the last 150 years, many wild Pacific salmon and steelhead trout populations in the Pacific Northwest have declined; in some cases, their populations are now absent from specific rivers or

⁶⁴ NMFS West Coast Region, *2022 5-Year Review*, 2022.

⁶⁵ NMFS West Coast Region, *Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat (EFH) Consultation*, WCRO-2020-00624, July 22, 2020, p. 27, https://repository.library.noaa.gov/view/noaa/29126/noaa_29126_DS1.pdf (hereinafter NMFS, *Biological Opinion*, 2020).

⁶⁶ Shawn R. Narum et al., “Genetic Variation Associated with Adult Migration Timing in Lineages of Steelhead and Chinook Salmon in the Columbia River,” *Evolutionary Applications*, vol. 17 (2024), e13626, pp. 1-24.

⁶⁷ NMFS, *Biological Opinion*, 2020; Lisa G. Crozier et al., “Climate Vulnerability Assessment for Pacific Salmon and Steelhead in the California Current Large Marine Ecosystem,” *PLoS ONE*, vol. 14, no. 7 (2019), article e0217711, pp. 1-49 (hereinafter Crozier et al., “Climate Vulnerability Assessment”). The Crozier et al. study identifies Snake River sockeye salmon as one of the species most vulnerable to climate change and Snake River spring/summer and fall Chinook salmon among species that are high in their adaptive capacities to climate change.

tributaries.⁶⁸ The current return of wild salmon to the Columbia River Basin is less than 10% of those values estimated to have been present in the mid-1800s.⁶⁹ According to scientists, these declines resulted from many factors, including overfishing, habitat loss, water quality, climate change, and dam construction, as discussed in the section “Factors Affecting Snake River Salmon and Steelhead Trout Populations.”⁷⁰

Experts have estimated that at least 16 million salmon and steelhead trout returned to the Columbia River Basin annually during the 1800s.⁷¹ Although specific previous abundance of salmon and steelhead trout in the Snake River is uncertain, some experts estimate an abundance of approximately 2.4 million fishes during that time.⁷² During the mid-1950s through the 1960s, an estimated average of 16,000 wild Chinook salmon were harvested annually in Idaho.⁷³ From 1962-1967, the five years following the initial operation of the first lower Snake River dam, approximately 45,000 adult spring and summer Chinook salmon entered the Snake River basin.⁷⁴ During the five years immediately following the initial operation of the Lower Granite Dam in 1975, the return of wild spring and summer Chinook salmon declined to approximately 27,000 fish annually, representing “a 40% decrease from 1962-1966 averages.”⁷⁵

Trends of listed fish populations have fluctuated over various time spans, and illustrate the interannual variability associated with their abundance estimates. For example, adult passage counts—estimates of the actual number of passing fish moving upstream at a particular point—for Snake River Chinook salmon measured at the Lower Granite Dam have fluctuated since measurements began in 1975 (**Figure 4**). Adult passage counts are used to estimate abundance and migration of fish populations, and have fluctuated in roughly 2- to 10-year spans. At times, values have been two to three times greater than values observed since 2022. These variations may be the result of natural and human-associated factors.⁷⁶ For example, peak adult passage

⁶⁸ NMFS, “Endangered and Threatened Species; Lower Columbia River Coho Salmon,” 56 *Federal Register* 29553-29554, June 27, 1991.

⁶⁹ Columbia Basin Partnership Task Force of the Marine Fisheries Advisory Committee, *A Vision for Salmon and Steelhead: Goals to Restore Thriving Salmon and Steelhead to the Columbia River Basin Phase 1 and Phase 2 Report*, NOAA, 2019 and 2020, <https://www.fisheries.noaa.gov/vision-salmon-and-steelhead-goals-restore-thriving-salmon-and-steelhead-columbia-river-basin> (hereinafter Columbia Basin Partnership Task Force, Phase 1 and 2 Report).

⁷⁰ Columbia Basin Partnership Task Force, *Phase 1 and 2 Report*.

⁷¹ Randall F. Schalk, “Estimating Salmon and Steelhead Usage in the Columbia Basin Before 1850: The Anthropological Perspective,” *Northwest Environmental Journal*, vol. 2, no. 2 (1986), pp. 1-29; Nemeth and Kiefer, “Snake River Spring and Summer Chinook Salmon,” 1999; and Richard M. Robinson, “Columbia River and Salmon Passage,” in *Restoring America’s Rivers: The Movement for Dam Deconstructions and Rehabilitations* (Cham, Switzerland: Springer Nature, 2025), pp. 167-197.

⁷² NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022, p. 8.

⁷³ These harvest estimates were reported for all Chinook salmon cumulatively and independent of seasonal spawning run. J.F. Keating, *The Harvest of Salmon and Steelhead as Determined from Salmon and Steelhead Permits*, Annual completion report. Statewide Fishing Harvest Survey, Federal Aid in Sport Fish Restoration. Project F-18-R-14, Boise, ID, 1969; J.F. Keating et al., *Annual Survey of the Salmon and Steelhead Sport Fishery Harvest in Idaho, Check Station surveillance of Chinook Salmon Fisheries*, Annual completion report. Statewide Fishing Harvest Survey, Federal Aid in Sport Fish and Wildlife Restoration. Project F-18-R-17, Boise, ID, 1971; Nemeth and Kiefer, “Snake River Spring and Summer Chinook Salmon,” 1999.

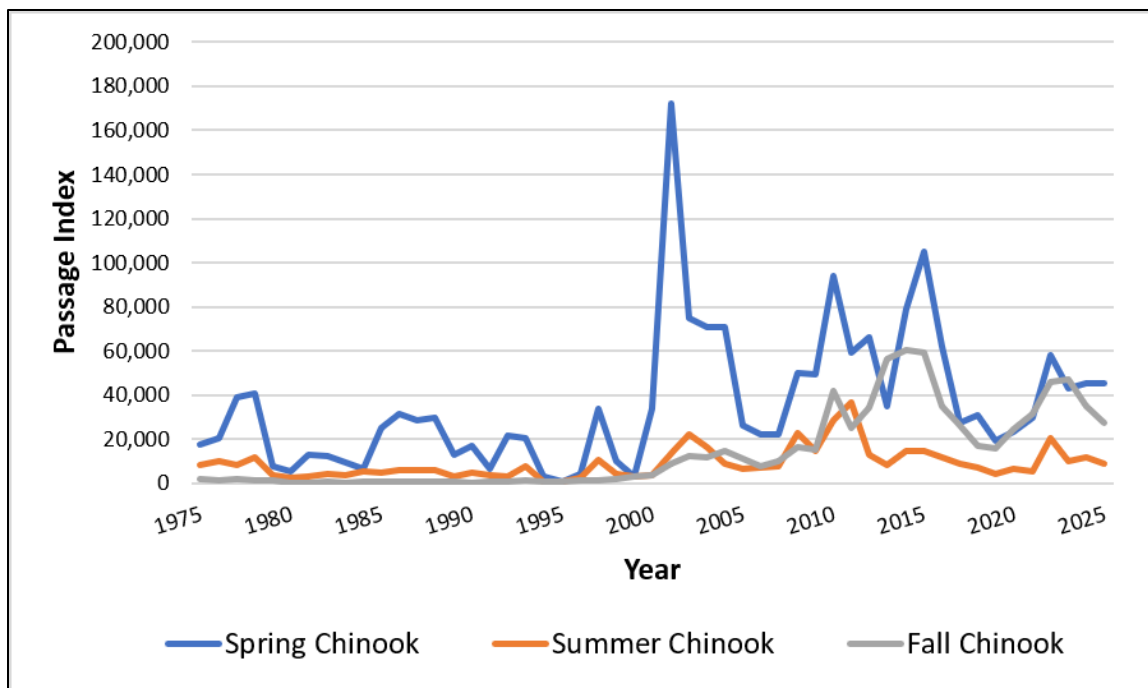
⁷⁴ Washington Department of Fish and Wildlife (WDFW) and Oregon Department of Fish and Wildlife (ODFW), *Status Report, Columbia River Fish Runs and Fisheries (1938-96)*, Clackamas, OR, 1997 (hereinafter WDFW and ODFW, *Status Report, Columbia River Fish Runs and Fisheries (1938-96)*, 1997); Nemeth and Kiefer, “Snake River Spring and Summer Chinook Salmon,” 1999.

⁷⁵ WDFW and ODFW, *Status Report, Columbia River Fish Runs and Fisheries (1938-96)*, 1997; Nemeth and Kiefer, “Snake River Spring and Summer Chinook Salmon,” 1999.

⁷⁶ See, for example, NMFS West Coast Region, *2022 5-Year Review: Summary & Evaluation of Snake River Spring/Summer Chinook Salmon*, 2022, <https://repository.library.noaa.gov/view/noaa/45367>.

counts observed during 2001 included high passage counts during April (i.e., approximately 91,000 adults) and May (i.e., approximately 61,000 adults) in excess of typical values measured during those months. One study observed greater escapement rates of spring-summer Chinook salmon during 2001, which the authors concluded may be associated with decreased seasonal Columbia River discharge, as measured at Bonneville Dam.⁷⁷ They propose that higher discharge rates may lead to passage difficulty, increased passage delay, disorientation, or bioenergetic exhaustion for certain salmon species.

Figure 4. Adult Passage of Chinook Salmon Runs at Lower Granite Dam (1975-2025)



Source: Columbia Basin Research, "Columbia River DART (Data Access in Real Time)," University of Washington, School of Aquatic and Fishery Sciences, accessed July 2026, <https://www.cbr.washington.edu/dart>.

Notes: This figure sums annual adult passage visual counts of Chinook salmon observed during particular times of the year (i.e., spring Chinook counts from March 1 to June 17, summer Chinook counts from June 18 to August 17, and fall Chinook counts from August 18 to December 15 of a given year). The passage index is not a population estimate but is used to adjust collection counts for daily fluctuations in the site's or project's operations. It is considered representative of population trends.

Table 3 provides information about identified past (i.e., since the 1800s) and recent populations for each of the four Snake River salmon and steelhead trout populations listed under the ESA. Despite efforts to improve tributary and mainstem habitat and dam passage conditions since the species were listed under the ESA in the 1990s, most of the populations remain at low abundance compared to earlier estimates, according to scientists.⁷⁸ An August 2025 study published by

⁷⁷ M.L. Keefer et al., "Escapement, Harvest, and Unknown Loss of Radio-Tagged Adult Salmonids in the Columbia River Snake River Hydrosystem," *Canadian Journal of Fisheries and Aquatic Sciences*, vol. 62, no. 4 (2005), pp. 930-949.

⁷⁸ As examples, NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022; NMFS, *Snake River Fall-Run Chinook Salmon Status of the Species*, July 2024, pp. 1-6, <https://www.fisheries.noaa.gov/s3/2024-08/status-species-snake-river-fall-chinook-salmon-jul-2024.pdf>; NMFS, *Snake River Basin Steelhead Status of the Species* (continued...)

NMFS scientists observed that multiple ESA-listed salmonid populations had increasing abundance trends from 1995 to 2020, with those in the Pacific Northwest having higher median trends than those in California.⁷⁹ Additionally, the study found that the five-year geometric mean abundances of fall-run Snake River Chinook salmon and Snake River sockeye salmon (from 2016 to 2020) had increased more than tenfold beyond their mean abundance values from 1995 to 1999.⁸⁰ The researchers also noted that concurrent stressors related to freshwater and marine climate negatively affected West Coast salmon populations, and that despite these higher mean abundance values most salmon populations still remain below their recovery goals.⁸¹

Table 3. Identified Past and Recent Snake River Salmon and Steelhead Trout Populations

ESU/DPS	Number of Populations Identified Since the 1800s	Number of Currently Identified (Extant) Populations	ESA Listing Status	Approximate Mean Abundance from 2010 to 2019 (Calculated as a Geometrical Mean)
Snake River spring/summer-run Chinook salmon ESU	68	28	Threatened	Approximately 7,000
Snake River fall-run Chinook salmon ESU	2	1	Threatened	Approximately 9,200
Snake River sockeye salmon ESU	9	1	Endangered	Approximately 46
Snake River steelhead trout DPS	40	25	Threatened	Approximately 18,700
Snake River coho salmon ESU	6	2	Extirpated	Approximately 100 being restocked by the Nez Perce Tribe

Sources: CRS, with data from National Marine Fisheries Service (NMFS), Rebuilding Interior Columbia Basin Salmon and Steelhead, September 30, 2022; Columbia Basin Partnership Task Force of the Marine Fisheries Advisory Committee, A Vision for Salmon and Steelhead: Goals to Restore Thriving Salmon and Steelhead to the Columbia River Basin Phase 1 and Phase 2 Report, National Oceanic and Atmospheric Administration (NOAA), 2019 and 2020; Joint Columbia River Management Staff, Washington Department of Fish and Wildlife and Oregon Department of Fish and Wildlife, 2023 Joint Staff Report: Stock Status and Fisheries for Fall Chinook Salmon, Coho Salmon, Chum Salmon, Summer Steelhead, and White Sturgeon, July 10, 2023, https://www.dfw.state.or.us/fish/oscrp/crm/reports/23_reports/2023%20OR%20WA%20Fall%20Joint%20Staff%20Report_FINAL_23.07.10.pdf; Joint Columbia River Management Staff, Washington Department of Fish and Wildlife and Oregon Department of Fish and Wildlife, 2023 Joint Staff Report: Stock Status and Fisheries for Spring Chinook, Summer Chinook, Sockeye, Steelhead, and Other Species, February 2, 2023, https://www.dfw.state.or.us/fish/oscrp/crm/reports/23_reports/2023%20OR_WA%20Spring%20Joint%20Staff%20Report.pdf; W.P. Connor et al., “A Retrospective (circa 1800-2015) on Abundance, Spatial Distribution, and Management of Snake River Basin Fall Chinook Salmon: Draft 2

Update, July 2024, pp. 1-6, <https://www.fisheries.noaa.gov/s3/2024-08/status-species-snake-river-basin-steelhead-july-2024.pdf>; William J. Lubenau et al., “Encounter Rates and Catch-and-Release Mortality of Steelhead in the Snake River Basin,” *North American Journal of Fisheries Management*, vol. 44, no. 1 (2024), pp. 3-20; Joint Columbia River Management Staff, *Stock Status and Fisheries for Spring Chinook, Summer Chinook, Sockeye, Steelhead, and Other Species*, Oregon Department of Fish and Wildlife and Washington Department of Fish and Wildlife, February 4, 2021.

⁷⁹ Michael J. Ford et al., “Abundance Trends of Pacific Salmon During a Quarter Century of ESA Protection,” *Fish and Fisheries*, vol. 26, no. 6 (August 31, 2025), pp. 1087-1106 (hereinafter Ford et al., “Abundance Trends of Pacific Salmon,” 2025).

⁸⁰ Ford et al., “Abundance Trends of Pacific Salmon,” 2025.

⁸¹ Ford et al., “Abundance Trends of Pacific Salmon,” 2025.

Parts I, II, and III,” 2016; NMFS, Biological Viability Assessment Update for Pacific Salmon and Steelhead Listed Under the Endangered Species Act: Pacific Northwest, NOAA Technical Memorandum NMFS-NWFSC-171, January 2022, <https://repository.library.noaa.gov/view/noaa/34363>; NMFS West Coast Region, Endangered Species Act Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response for the Continued Operation and Maintenance of the Columbia River System, WCRO-2020-00624, July 22, 2020; NMFS, *ESA Recovery Plan for Snake River Fall Chinook Salmon* (*Oncorhynchus tshawytscha*), NOAA, 2017; NMFS West Coast Region, *ESA Recovery Plan for Snake River Sockeye Salmon* (*Oncorhynchus nerka*), June 8, 2015, pp. 1-431, <https://repository.library.noaa.gov/view/noaa/16001>; Columbia Basin Partnership Task Force, *A Vision for Salmon and Steelhead: Goals to Restore Thriving Salmon and Steelhead to the Columbia River Basin*, National Oceanic and Atmospheric Administration, Phase 2 Report of the Columbia Basin Partnership Task Force of the Marine Fisheries Advisory Committee, October 2020, p. 161, https://s3.amazonaws.com/media.fisheries.noaa.gov/2020-10/MAFAC_CRB_Phase2ReportFinal_508.pdf?null; L.A. Fulton, *Spawning Areas and Abundance of Steelhead Trout and Coho, Sockeye, and Chum Salmon in the Columbia River Basin-Past and Present*, NMFS, Special Scientific Report, No. 618, Washington, DC, December 1970, pp. 1-37, <https://spo.nmfs.noaa.gov/SSRF/SSRF618.pdf>.

Notes: DPS = distinct population segment; ESU = evolutionarily significant unit. Approximate mean abundances (2010-2019; the most recent estimates available) for fall Chinook salmon include release mortalities. Approximate mean abundances (2010-2019; the most recent estimates available) for spring/summer Chinook salmon include Lower Granite River Dam passage plus Tucannon River escapement. Approximate mean abundances (2010-2019; the most recent estimates available) for steelhead trout are based on passage from July 1 to June 30 the following year. NMFS calculated approximate mean abundance values from 2010 to 2019 as a geometric mean, which is defined as the n th root of n products. Experts consider geometric means to be a better measure than simple averages of central tendency for fish abundance data, which are typically skewed. The geometric mean also smooths the contribution of periodic large run sizes that can inflate simple averages relative to typical population values. Scientists typically select a 10-year period to represent an interval of sustained abundance across multiple generational cycles. Geometric means do not provide exact values of abundance as they have variance associated with them; NMFS typically does not report that variance in its assessments and reports.

Factors Affecting Snake River Salmon and Steelhead Trout Populations

Dams in the Columbia River Basin, and in the Snake River specifically, may change the natural flows, temperature, and turbidity of rivers and may create barriers to salmon and steelhead trout migration. These factors may alter habitat and affect water quality for fish species. Other activities, apart from dams, may also affect salmon and steelhead trout populations. These activities include climate change, drought, predation, development, and nonpoint and point source pollution, among others. These activities may affect species by altering stream, tributary, and estuary habitats; lowering water quality; and increasing predation of fish from pinnipeds,⁸² native and non-native fishes, and colony nesting waterbirds.

In many cases, these activities affect fish populations throughout the Columbia River Basin, but may be particularly impactful on endangered or threatened species. Also, some of these factors have occurred consistently over time, but may have greater impacts in recent and future years. Some factors may be sensitive to dam operations, while others may be less so. Some salmon and steelhead trout runs are fished for commercial, tribal, and recreational uses. Harvest-related mortality was a significant contributor to the initial decline of these species; however, this is not a major contributor to the decline of salmon and steelhead trout today.⁸³ The following sections discuss selected key factors that affect Snake River salmon and steelhead trout populations.

⁸² Pinnipeds are aquatic mammals in the order Pinnipedia. Seals and sea lions are the most relevant pinnipeds for the purposes of this report.

⁸³ NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022.

Dams and Their Operations

Dams and their operations may change water quantity in rivers, alter natural flow rates and temperature, and change turbidity.⁸⁴ These alterations can change river structure and alter aquatic and riparian habitat, which can affect salmon and steelhead trout species during their life cycles and natural migrations.⁸⁵ Dams structurally affect fish species by preventing migration and causing entrainment in hydropower blades. For example, dams can make it more difficult for adult fish to migrate upstream to spawning grounds, thus cutting salmon and steelhead trout off from their once occupied spawning habitats. Operations that reduce water velocity behind dams, often creating reservoirs, slow juvenile migrations, alter the food web, increase water temperature and create habitat for native and non-native predators and competitors.⁸⁶

Scientists note that the lower Snake River dams act as a barrier for fish swimming upstream trying to access portions of their identified spawning habitat and for fish swimming downstream to the ocean.⁸⁷ In addition, some scientists note that passage through dam complexes (e.g., passage through fish ladders) can stress fish populations and possibly cause delayed mortality.⁸⁸ They assert that the effect of dams on fish species varies with how many dams the fish must pass. Populations of Chinook salmon and steelhead trout species in the Columbia River Basin that pass through four or fewer dams have higher survival rates than those populations that must pass through eight dams, such as Snake River spring/summer Chinook salmon.⁸⁹ Scientists found that summer steelhead trout originating in the Yakima subbasin, which must pass only four mainstem dams, also exhibit greater survival rates than those originating in the Snake River Basin.⁹⁰

Scientists calculate *smolt-to-adult return rates* (SARs) of Snake River salmon and steelhead trout to estimate the effects of various factors on their population viability.⁹¹ An estimated minimum SAR of 2% is required to consistently sustain populations, whereas an SAR of >2% is indicative of population growth and an SAR of >4% is estimated to lead to a high likelihood of recovery.⁹²

⁸⁴ NMFS, *Biological Opinion*, 2020, p. 101.

⁸⁵ NMFS, *Recovery Plan*, 2017, pp. 126, 140-149.

⁸⁶ NMFS, *Biological Opinion*, 2020, p. 140. Northwest Power Council, *Dams: Impacts on Salmon and Steelhead*, <https://www.nwcouncil.org/reports/columbia-river-history/damsimpacts/>. Adam J. Storch et al., “A Review of Potential Conservation and Fisheries Benefits of Breaching Four Dams in the Lower Snake River (Washington, USA),” *Water Biology and Security*, vol. 1 (2022) (hereinafter Storch et al., “Review of Potential Conservation and Fisheries Benefits,” 2022).

⁸⁷ NMFS, *Biological Opinion*, 2020, p. 299.

⁸⁸ Storch et al., “Review of Potential Conservation and Fisheries Benefits,” 2022.

⁸⁹ Storch et al., “Review of Potential Conservation and Fisheries Benefits,” 2022.

⁹⁰ Storch et al., “Review of Potential Conservation and Fisheries Benefits,” 2022.

⁹¹ *Smolt-to-adult return rate* (SAR) is the survival rate of salmon and steelhead trout from when they are smolts to when they return to a certain point as adults. SARs are an indicator of survival and population health for salmon and steelhead populations. SARs in the Snake River are typically calculated for each of the listed population segments. SARs for populations could be for wild fish only, hatchery-origin fish, or both combined. Michele DeHart et al., *Comparative Survival Study of PIT-Tagged Spring/Summer/Fall Chinook, Summer Steelhead, and Sockeye 2023 Annual Report*, Comparative Survival Study Oversight Committee and Fish Passage Center, December 2023, <https://www.fpc.org/documents/CSS/CSS%20Report%202023%20Final.pdf> (hereinafter DeHart et al., *Comparative Survival Study*, 2023).

⁹² D.R. Marmorek et al., *Plan for Analyzing and Testing Hypotheses (PATH)*, ESSA Technologies, Ltd., Final Report for Fiscal Year 1998, Vancouver, British Columbia, December 16, 1998, p. 41, http://rem-main.rem.sfu.ca/papers/peterman/PATH_final_report_for_fiscal_year_1998.pdf; DeHart et al., *Comparative Survival Study*, 2023; David W. Welch et al., “A Synthesis of the Coast-wide Decline in Survival of West Coast Chinook Salmon (*Oncorhynchus tshawytscha*, Salmonidae),” *Fish and Fisheries*, vol. 22, no. 1 (2021), pp. 194-211 (hereinafter Welch et al., “A Synthesis of the Coast-wide Decline in Survival of West Coast Chinook Salmon (*Oncorhynchus tshawytscha*, Salmonidae),” 2021).

These criteria reportedly have informed Northwest Power and Conservation Council regional stock rebuilding goals for Snake River and upper Columbia River salmon and steelhead trout (i.e., SARs in the 2-6% range).⁹³

The annual Comparative Survival Study (CSS) measures the effects of hydropower operations on juvenile and adult salmon and steelhead trout survival in the Columbia River System.⁹⁴ The CSS reported SARs for salmon and steelhead trout most recently in 2023.⁹⁵ For the majority of wild populations, current SAR estimates were <3.5%, while current SAR values for Upper Columbia wild Sockeye salmon ranged from 2.5% – 9.6% depending on location.⁹⁶ The CSS also predicted that climate change, poor ocean conditions, and poor flow conditions (which is affected by dams) would prevent salmon and steelhead trout populations from meeting SAR goals noted above.⁹⁷ Some studies have characterized the SAR goals as being ambitious, and questioned the feasibility of achieving them in light of these stressors.⁹⁸ One study also noted the inability for some salmon populations in more “pristine” conditions than in the Columbia River (e.g., southeast Alaska) to achieve these SAR percentages, suggesting that larger scale environmental factors may be impeding their productivity and recovery more broadly.⁹⁹

The CSS reported that the most important factors influencing SARs for salmon and steelhead trout are water transit time,¹⁰⁰ the number of dam passages, and certain indices of ocean conditions (e.g., upwelling, sea surface temperature).¹⁰¹ Other studies have emphasized the importance of broad ocean drivers and harvest as key factors affecting SARs and salmon production as well.¹⁰² Dam operations affect water transit times (e.g., fish bypasses and

⁹³ Northwest Power and Conservation Council, *Columbia River Basin Fish and Wildlife Program 2014*, October 2014, p. 29, https://www.nwccouncil.org/sites/default/files/2014-12_1.pdf; Welch et al., “A Synthesis of the Coast-wide Decline in Survival of West Coast Chinook Salmon (*Oncorhynchus tshawytscha*, Salmonidae),” 2021.

⁹⁴ DeHart et al., *Comparative Survival Study*, 2023. The annual Comparative Survival Study measures the effects of hydropower operations on juvenile and adult salmon and steelhead trout survival in the Columbia River System; see also B.P. Sanford and S.G. Smith, “Estimation of Smolt-to-Adult Return Percentages for Snake River Basin Anadromous Salmonids, 1990-1997,” *Journal of Agricultural, Biological, and Environmental Statistics*, vol. 7 (2002), pp. 243-263 (hereinafter Sanford and Smith, “Estimation of Smolt-to-Adult Return,” 2022).

⁹⁵ DeHart et al., *Comparative Survival Study*, 2023, Appendix B, pp. B-1 to B-125.

⁹⁶ DeHart et al., *Comparative Survival Study*, 2023, Appendix B, pp. B-1 to B-125.

⁹⁷ DeHart et al., *Comparative Survival Study*, 2023; Sanford and Smith, “Estimation of Smolt-to-Adult Return,” 2022.

⁹⁸ Welch et al., “A Synthesis of the Coast-wide Decline in Survival of West Coast Chinook Salmon (*Oncorhynchus tshawytscha*, Salmonidae),” 2021; NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022, p. 3.

⁹⁹ Welch et al., “A Synthesis of the Coast-wide Decline in Survival of West Coast Chinook Salmon (*Oncorhynchus tshawytscha*, Salmonidae),” 2021; see also B. Dörner et al., “Spatial and Temporal Patterns of Covariation in Productivity of Chinook Salmon Populations of the Northeastern Pacific Ocean,” *Canadian Journal of Fisheries and Aquatic Sciences*, vol. 75, no. 7 (2018), pp. 1082-1095.

¹⁰⁰ The Comparative Survival Study Oversight Committee and Fish Passage Center define *water transit time* as “the time it takes the average particle of water to pass through a reservoir (or series of reservoirs). It measures water velocity through a reservoir in [a] way that accounts for reservoir volume relative to the discharge at a dam. It is calculated by dividing the reservoir volume relative to the discharge at a dam.” DeHart et al., *Comparative Survival Study*, 2023, p. 20.

¹⁰¹ DeHart et al., *Comparative Survival Study*, 2023.

¹⁰² Welch et al., “A Synthesis of the Coast-wide Decline in Survival of West Coast Chinook Salmon (*Oncorhynchus tshawytscha*, Salmonidae),” 2021; N.J. Mantua et al., “A Pacific Interdecadal Climate Oscillation with Impacts on Salmon Production,” *Bulletin of the American Meteorological Society*, vol. 78, no. 6 (1997), pp. 1069-1079; Steven L. Haeseker et al., “Assessing Freshwater and Marine Environmental Influences on Life-Stage-Specific Survival Rates of Snake River Spring-Summer Chinook Salmon and Steelhead,” *Transactions of the American Fisheries Society*, vol. 141, no. 1 (2012), pp. 121-138 (hereinafter Haeseker et al., “Assessing Freshwater and Marine Environmental Influences on Life-Stage-Specific Survival Rates of Snake River Spring-Summer Chinook Salmon and Steelhead,” 2012).

reservoirs), in most cases increasing them. Scientists note that increased water transit times may disrupt the natural timing of ocean entry and have negative latent effects on fishes.¹⁰³ The CSS stated that water transit times of Snake River fish populations did not significantly improve between 1994 and 2023.¹⁰⁴ Furthermore, additional studies have related SARs and survival of Snake River salmon with water transit time, the timing of ocean entry, and the percentage of river flow spilled over dams.¹⁰⁵

In some cases, dams and their operations can benefit fish species in a multiuse situation. Dams can be operated to supplement low water flows and decrease water temperature downstream for fish and their habitats during periods of drought.¹⁰⁶ In multiuse systems where water is allocated to the environment, agricultural uses, hydropower, and other uses, dams provide operators with increased control over water flows. For example, one study asserted that managed flows were better than natural flows for reducing non-native species and achieving societal needs (e.g., hydropower, agricultural water supply).¹⁰⁷ This assertion was based on a comparison between managed flows and simulated natural flows.

Some dam owners have constructed infrastructure to mitigate the effects of dams on fish (see **Figure 5** for systems specific to juvenile passage). For example, USACE has added surface passage facilities such as spillway weirs, implemented surface passage structures, and modified turbine designs to reduce entrainment at the lower Snake River dams to reduce juvenile mortality.¹⁰⁸ These systems can improve how and where fish maneuver through the river in the presence of dams.¹⁰⁹ Juvenile survival also is enhanced by bypass systems and turbine improvement programs to help juveniles travel downstream to the ocean.¹¹⁰ Fish ladders allow adult fish returning from the ocean to spawn to bypass dams. USACE constructed ladders when it built the lower Snake River dams and have modified the ladders over time.

Dam owners also may modify operations to reduce fish mortality. For example, USACE adjusts spill (i.e., the amount of water that is allowed to pass through spillways and over dams) at the lower Snake River dams to improve the survival of juvenile fish passing through the dams.¹¹¹

¹⁰³ Ernest T. Smerdon et al., *Managing the Columbia River: Instream Flows, Water Withdrawals, and Salmon Survival*, National Research Council, 2004, p. 94.

¹⁰⁴ DeHart et al., *Comparative Survival Study*, 2023.

¹⁰⁵ Haeseker et al., “Assessing Freshwater and Marine Environmental Influences on Life-Stage-Specific Survival Rates of Snake River Spring-Summer Chinook Salmon and Steelhead,” 2012; Erin L. Rechisky et al., “Estuarine and Early-Marine Survival of Transported and In-River Migrant Snake River Spring Chinook Salmon Smolts,” *Scientific Reports*, vol. 2, no. 1 (2012), 448, pp. 1-9.

¹⁰⁶ Kristen Sellheim et al., “Informed Water Management Alternatives for an Over-Allocated River: Incorporating Salmon Life Stage Effects into a Decision Tree Process During Drought,” *Fisheries Management and Ecology*, vol. 27, no. 5 (2020), pp. 498-516.

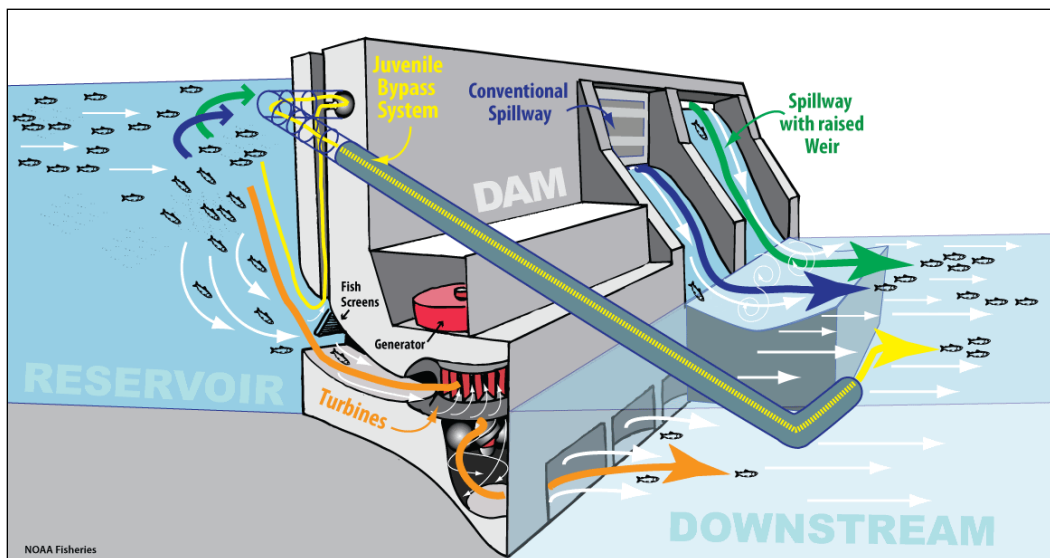
¹⁰⁷ William Chen and Julian D. Olden, “Designing Flows to Resolve Human and Environmental Water Needs in a Dam-Regulated River,” *Nature Communications*, vol. 8, no. 1 (December 18, 2017).

¹⁰⁸ Surface passage structures allow fish to move through spillways and over dams, whereas bypass channels guide fish around dams.

¹⁰⁹ NMFS, *Biological Opinion*, 2020, p. 201.

¹¹⁰ USACE, “Lower Snake River Dams,” <https://www.nww.usace.army.mil/Missions/Lower-Snake-River-Dams/>.

¹¹¹ NMFS, *Biological Opinion*, 2020, p. 140.

Figure 5. Systems Used to Improve Juvenile Passage Through Dams

Source: National Marine Fisheries Service, “Juvenile Downstream Passage on the West Coast,” <https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/juvenile-downstream-passage-west-coast>.

Habitat Loss and Alteration

Habitat loss affects salmon and steelhead trout populations, especially if it alters spawning or rearing areas. It can be caused by many factors, including urbanization along stream and river corridors; resource extraction, such as logging, mining, and agriculture; channelization of streams; water withdrawals; and dams and other physical barriers that alter water flows. The condition of salmon habitat varies throughout the Columbia River Basin. In protected areas, such as federal wilderness areas, spawning and rearing habitat may remain in near-pristine condition. In areas more accessible to humans, past and present human activities have left habitat in conditions ranging from marginally to highly degraded. For instance, more than 70% of the original marshes and spruce swamps of the Columbia River estuary (a key habitat used by juvenile and adult salmon during their migration to and from the ocean) have been converted to industrial, transportation, recreational, agricultural, or urban areas.¹¹² Some scientists also note various biological effects on habitats such as lower or excess nutrients in some tributaries. Habitat degradation in the Snake River Basin leads to (1) reduced stream complexity and channel structure, (2) excess fine sediment, (3) elevated summer water temperature, (4) diminished streamflow during critical periods, (5) reduced floodplain connectivity and function, and (6) degraded riparian condition.¹¹³

Estuary habitat degradation also affects fish. In the Columbia River estuary, downriver of the Snake River, some scientists estimate that, in the last 100 years, mean river flow has declined 16% and peak spring flows have declined 44%.¹¹⁴ Lower flows into the estuary can alter habitat

¹¹² NMFS, *Recovery Plan*, 2017, p. 187.

¹¹³ NMFS, *Biological Opinion*, 2020, p. 349.

¹¹⁴ NMFS, *Columbia River Estuary ESA Recovery Plan Module for Salmon and Steelhead*, NMFS Northwest Region. Prepared for NMFS by the Lower Columbia River Estuary Partnership (contractor) and PC Trask Associates, Inc., subcontractor, Portland, OR, 2011, pp. 3-6 and 4-3, <https://repository.library.noaa.gov/view/noaa/17401>; NMFS, *ESA Recovery Plan for Snake River Fall Chinook Salmon (Oncorhynchus tshawytscha)*, NOAA, 2017.

and cause mortality. For Snake River populations, the estimated mortality of juvenile salmon (not due to predation) from habitat impacts in the estuary ranges from approximately 15% to 30%, with greatest impacts observed for fall-run Chinook salmon and summer-run steelhead trout.¹¹⁵

Water Quality

Various activities, including agricultural, urban, and industrial activities, contribute pollutants to the Columbia River Basin. For instance, excess nutrients from sewage or agricultural runoff helps catalyze algal blooms that decrease the dissolved oxygen content in the water, causing hypoxia, which can be lethal to fish.¹¹⁶ These factors, together with other chemical pollutants, can be detrimental for salmonid growth, immune function, and survival.¹¹⁷

Temperature is another component of water quality that can affect the health of fish populations. Low water flows, high air temperature, and other factors may cause high water temperatures. For example, in 2015, high water temperatures led to significant mortality of Upper Columbia River and Snake River sockeye salmon populations as these populations migrated through the rivers of the Columbia River Basin.¹¹⁸ To address high water temperatures in the Columbia and lower Snake Rivers, the U.S. Environmental Protection Agency (EPA) established the Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load (TMDL).¹¹⁹ The TMDL provides information about the primary sources of temperature impairments in the Columbia River Basin. With this information, federal, state, and tribal governments, and the public may engage on ways to reduce temperatures in the Columbia and lower Snake Rivers, including as impacted by dams and their operations. (For more information, see the text box below.)

Temperature Total Maximum Daily Load for the Columbia and Lower Snake Rivers

The U.S. Environmental Protection Agency (EPA) established a temperature total maximum daily load (TMDL) for the Columbia and lower Snake Rivers in 2020, pursuant to Section 303(d) of the Clean Water Act (33 U.S.C. §1313(d)). The EPA established this TMDL after the states of Washington and Oregon identified portions of the Columbia and lower Snake Rivers as impaired due to water temperatures that exceeded state water quality standards. EPA found that water temperatures frequently exceeded values that protect salmonid and steelhead trout migration, especially in August at two of four monitoring locations on the lower Snake River. (The warmest temperatures in the Snake River have occurred in the lower part of the river.)

EPA's TMDL analysis considered all known sources of temperature impairments in the lower Snake River. It found that climate change and nonpoint source dam impacts are the dominant sources of impairment. According to the EPA, warming trends since the 1960s have led to increases in water temperatures. The EPA also noted that dams and their operations can cause higher sustained river temperatures in the summer, higher temperatures at the water surface and in fish ladders, and delayed cooling in the fall. The EPA estimated that dams on the lower Snake River have a warming impact on the mainstem river in the late-summer period.

¹¹⁵ Columbia Basin Partnership Task Force, *A Vision for Salmon and Steelhead*, 2020, p. 63.

¹¹⁶ John R. Waldman and Thomas P. Quinn, "North American Diadromous Fishes: Drivers of Decline and Potential for Recovery in the Anthropocene," *Science Advances*, vol. 8, no. 4 (January 28, 2022).

¹¹⁷ Lyndal Johnson et al., "Persistent Organic Pollutants in Juvenile Chinook Salmon in the Columbia River Basin: Implications for Stock Recovery," *Transactions of the American Fisheries Society*, vol. 142, no. 1 (2013), pp. 21-40; James P. Meador et al., "Altered Growth and Related Physiological Responses in Juvenile Chinook Salmon (*Oncorhynchus tshawytscha*) from Dietary Exposure to Polycyclic Aromatic Hydrocarbons (PAHs)," *Canadian Journal of Fisheries and Aquatic Sciences*, vol. 63, no. 10 (October 2006).

¹¹⁸ Lisa G. Crozier et al., "Snake River Sockeye and Chinook Salmon in a Changing Climate: Implications for Upstream Migration Survival During Recent Extreme and Future Climates," *PLoS ONE*, vol. 15, no. 9 (2020).

¹¹⁹ U.S. Environmental Protection Agency (EPA), *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load*, August 13, 2021, <https://www.epa.gov/system/files/documents/2022-06/tmdl-columbia-snake-temperature-errata-update-05102022.pdf>.

Dam owners can use temperature control strategies to manage water temperatures. For example, deep reservoirs with temperature control structures (e.g., Dworshak Dam above the lower Snake River dams) can release cold water and reduce temperatures over substantial distances downstream (e.g., to the upper portion of the lower Snake River in the summer). National Pollutant Discharge Elimination System permits issued to be consistent with the TMDL include a requirement to implement temperature control strategies and meet the load allocations in the Columbia and lower Snake Rivers TMDL.

Sources: EPA, *Columbia and Lower Snake Rivers Temperature Total Maximum Daily Load*, August 13, 2021, <https://www.epa.gov/columbiariver/tmdl-temperature-columbia-and-lower-snake-rivers>; EPA, “Discharge Permits for Federal Hydroelectric Projects in the Lower Snake River,” <https://www.epa.gov/npdes-permits/discharge-permits-federal-hydroelectric-projects-lower-snake-river>.

Predation

Salmon and steelhead trout have numerous natural predators, including birds, pinnipeds (e.g., seals, sea lions), orcas, fish, and terrestrial mammals (e.g., bears).¹²⁰ Many of the predator-prey dynamics between salmonids and other species are affected by anthropogenic changes in the Columbia River Basin. For example, construction and operation of the Columbia River System and disposal of dredge material in the tributaries of the Columbia and Snake Rivers and in the Columbia River estuary have altered species’ habitats. These altered habitats support a wide range of predator species, including native and non-native predatory fish species, such as North pikeminnow (*Ptychocheilus oregonensis*); predatory birds, such as terns, cormorants, gulls, mergansers, and pelicans; and marine mammals.¹²¹

In addition, seals and sea lions are key predators of salmon in the mouth of the Columbia River. These pinnipeds consume salmon entering the ocean and may lower salmon populations.¹²² Sea lions are also observed to concentrate downstream of the Bonneville Dam to feed on salmon and steelhead trout staging for passage through fish ladders.¹²³ Populations of pinnipeds in the Pacific Ocean have increased substantially since the Marine Mammal Protection Act (MMPA; P.L. 92-522; 16 U.S.C. §§1361-1423h) was enacted in 1972.¹²⁴ The MMPA lowered pinniped harvests by humans, resulting in increases to some pinniped populations. To address pinniped predation of salmon, the MMPA allows the Secretary of Commerce to authorize the intentional lethal removal of “individually identifiable pinnipeds” causing significant negative impacts to certain salmonid species.¹²⁵

¹²⁰ NMFS, *Recovery Plan*, 2017, p. 156.

¹²¹ NMFS, *Recovery Plan*, 2017, p. 156.

¹²² Daniel Schindler et al., *Pinniped Predation on Salmonids in the Washington Portions of the Salish Sea and Outer Coast*, Washington State Academy of Sciences, November 2022, p. 7, https://app.leg.wa.gov/ReportsToTheLegislature/Home/GetPDF?fileName=Pinniped%20Predation%20on%20Salmonids%20in%20the%20Washington%20Portions%20of%20the%20Salish%20Sea%20and%20Outer%20Coast_5d43c6d6-3aad-442a-9271-0315d351eaf2.pdf (hereinafter Schindler et al., *Pinniped Predation*, 2022).

¹²³ Columbia Basin Partnership Task Force, *Phase 1 and 2 Report*. USACE, *2024 Evaluation of Pinniped Predation on Adult Salmonids and Other Fish in the Bonneville Dam Tailrace*, March 2025, https://public.crohms.org/tmt/documents/FPOM/2010/Task%20Groups/Task%20Group%20Pinnipeds/Final_2024_USACE_Pinniped_Annual_Report.pdf.

¹²⁴ Schindler et al., *Pinniped Predation*, 2022. For more information on the Marine Mammal Protection Act, see CRS Report R47892, *The Marine Mammal Protection Act (P.L. 92-522): Primer and Issues for Congress*, by Anthony R. Marshak.

¹²⁵ 16 U.S.C. §1389. The statute includes salmonid fishery stocks that have been listed as threatened or endangered species under the ESA. NOAA, *Marine Mammal Protection Act Section 120 Pinniped Removal Program*, (continued...)

Drought

Drought in the western United States plays a role in salmon survival. Drought causes streams to run low and warm during certain times of the year, which can impact fish populations. Several high water-temperature events provide examples of fish kills of salmon in the Pacific Northwest, as discussed in the “Water Quality” section above. Drought also can alter migration signals for salmon. For example, a study of salmon in California found that drought-induced low flows and warming altered migration signals for young coho salmon and led to a smaller timeframe for migration.¹²⁶ According to scientists, salmon that begin migration on a false signal, such as an isolated rain event during a drought, can become stranded and die in portions of streams or rivers that unexpectedly dry up because of the drought rather than increasing in water flow.¹²⁷

Climate Change

Climate change influences and exacerbates many of the existing threats to salmonids. Some scientists assert that climate change will increasingly imperil certain salmon populations.¹²⁸ For example, some scientists note that climate change is increasing water temperature, which can directly harm fishes, increase the range and populations of invasive species, and alter food webs.¹²⁹ Climate change also may exacerbate low flow rates in rivers or increase flooding from high-precipitation events. In addition, sea level rise might result in tidal wetland habitat loss in the Columbia River floodplain, which might affect salmon populations.¹³⁰

Some scientists provide a mixed assessment of the possible effects of climate change and existing conditions on salmon. For example, they contend that the effects of climate change on freshwater habitats of salmon may affect salmon species and populations differently at certain timescales. In some cases, they assert that climate change may lead to an increase in Chinook salmon survival in the short term, partially related to the species’ adaptive capacity, but that the effects of climate change may be detrimental in the long term.¹³¹

Climate change also may affect ocean habitat in ways that may impact salmon. Climate change may increase the frequency and magnitude of marine heat waves, change the intensity and timing of coastal upwelling, increase hypoxia events, and increase ocean acidification.¹³² For example, rising sea surface temperatures could harm migrating salmon in the Pacific Northwest. Additionally, coho salmon returns to Puget Sound, WA, and to coastal waters off Washington and

<https://www.fisheries.noaa.gov/west-coast/marine-mammal-protection/marine-mammal-protection-act-section-120-pinniped-removal>. For more background, see CRS In Focus IF11045, *Sea Lion Predation on Columbia River Salmon and Steelhead*, by Anthony R. Marshak.

¹²⁶ Brian Kastl et al., “Migration in Drought: Receding Streams Contract the Seaward Migration Window of Endangered Salmon,” *Ecosphere*, vol. 13, no. 12 (December 2022), pp. 1-11.

¹²⁷ For example, approximately 65,000 wild salmon in Canada reportedly perished due to false migration signals and dried up streams caused by drought, according to some scientists. See Leyland Cecco, “Thousands of Salmon Found Dead as Canada Drought Dries Out River,” *Guardian*, October 5, 2022, <https://www.theguardian.com/environment/2022/oct/05/canada-dead-salmon-drought-british-columbia>.

¹²⁸ NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022, p. 9; and Zanna Stutz, “*Salmon Don’t Have Time for Us to Fix the Climate*”: *The Politics of Climate Change and Dam Breaching on the Lower Snake River*,” (undergraduate thesis, Dartmouth College, 2024), pp. 1-125.

¹²⁹ Crozier et al., “Climate Vulnerability Assessment,” 2019.

¹³⁰ Columbia Basin Partnership Task Force, *Phase 1 and 2 Report*.

¹³¹ Xiao Zhang et al., “On the Variable Effects of Climate Change on Pacific Salmon,” *Ecological Modelling*, vol. 397, no. 1 (2019), pp. 95-106.

¹³² Lisa G. Crozier et al., “Climate Change Threatens Chinook Salmon Throughout Their Life Cycle,” *Communications Biology*, vol. 4, no. 222 (2022) (hereinafter Crozier et al., “Climate Change Threatens Chinook Salmon,” 2022).

Oregon were among the lowest on record following the 2013-2015 Pacific marine heatwave.¹³³ Rising marine temperatures also may alter the marine community, leading to changes in zooplankton, krill, squid, and other fish that salmon consume.¹³⁴

Conserving and Restoring Snake River Fishes

Federal, state, local, and tribal stakeholders have conducted activities to conserve and restore Snake River salmon and steelhead trout. Most federal activities aimed at restoring salmon and steelhead trout in the Columbia River Basin are implemented by NOAA and BPA, although other agencies also contribute to these efforts.¹³⁵ This section summarizes selected federal restoration efforts for conserving salmon and steelhead trout populations in the Columbia River Basin.

Bonneville Power Administration Fish and Habitat Initiatives

BPA has a fish and wildlife program that aims to protect, enhance, and mitigate adverse effects to fish and wildlife in the Columbia River Basin from the Columbia River System. BPA funds projects to improve fish passage through the Columbia River System, increase fish populations through hatcheries, monitor fish populations, and increase the conservation of wildlife and fish populations through land acquisitions and habitat restoration. BPA designed its fish and wildlife program to be consistent with provisions under the Northwest Power Act, the ESA, and other environmental laws, in addition to honoring the federal trust responsibility (including upholding tribal treaty rights). The program also is guided by the Northwest Power and Conservation Council (Council) program, discussed below.

The Northwest Power Act expanded BPA's responsibilities, adding a directive to mitigate the effects of the federal hydropower system on fish and wildlife in the Columbia River Basin.¹³⁶ The act also directed that fish and wildlife in the Columbia River Basin should be protected and enhanced.¹³⁷ The Northwest Power Act authorized the creation of the Council and directed it to develop a program to conserve and improve fish and wildlife.¹³⁸ BPA addresses its Northwest Power Act responsibilities for fish and wildlife mitigation by funding the implementation of the Council's Columbia River Basin Fish and Wildlife Program (FWP). The FWP has a set of goals and objectives (see **Table 4**) and a strategy to achieve them. The Council's fish and wildlife conservation activities are described in the *Columbia River Basin Fish and Wildlife Program, Draft 2026 Program 2014*.¹³⁹

¹³³ William Peterson, Nicholas Bond, and Marie Robert, "The Blob Is Gone but Has Morphed into a Strongly Positive PDO/SST Pattern," *North Pacific Marine Science Organization (PICES) Press*, vol. 24, no. 2 (2016), pp. 46-47, 50.

¹³⁴ Crozier et al., "Climate Change Threatens Chinook Salmon."

¹³⁵ In addition to funding fish and wildlife conservation, BPA, NMFS, and other federal agencies fund fish and wildlife restoration in the Columbia River Basin. These federal agencies are part of the Columbia Basin Federal Caucus and include USACE, Reclamation, EPA, FWS, NMFS, the U.S. Forest Service, and others. See Office of Management and Budget, *Analytical Perspectives, Budget of the United States Government, Fiscal Year 2025, Columbia River Basin Federal Crosscut Report*, Office of Management and Budget, March 11, 2024, <https://www.govinfo.gov/app/details/BUDGET-2025-PER/BUDGET-2025-PER-6-3-3>; Columbia River Basin Federal Caucus, "The Columbia River Basin Federal Caucus," <https://salmonrecovery.gov>.

¹³⁶ 16 U.S.C. §839.

¹³⁷ 16 U.S.C. §839.

¹³⁸ Two people from each of Idaho, Montana, Oregon, and Washington are appointed to be on the Northwest Power and Conservation Council. 16 U.S.C. §839b.

¹³⁹ Northwest Power and Conservation Council, *Columbia River Basin Fish and Wildlife Program, Draft 2026 Program*, Council Document 2025-5, December 17, 2025, <https://www.nwcouncil.org/fs/19694/2025-5.pdf>.

Table 4. Columbia River Basin Fish and Wildlife Program Goals and Objectives

Program Area	Description
Anadromous Salmon and Steelhead Goal and Objectives	Focus on increasing adult salmon and steelhead runs and abundance
All Other Native Aquatic Focal Species Goal and Objectives	Focus on protecting, enhancing, and mitigating impacts on other native aquatic species affected by the FCRPS, such as white sturgeon and Pacific lamprey
Wildlife Goal and Objectives	Focus on mitigation for wildlife losses caused by the FCRPS
Ecological Goal and Objectives	Address environmental conditions and processes to conserve the ecosystems that support native anadromous and resident fish and wildlife adversely affected by the FCRPS
Communication, Assessment, and Coordination Goal and Objectives	Aim to inform and involve the public in the Fish and Wildlife Program, track and report program implementation, and make program-related information and data available

Source: Northwest Power and Conservation Council, *2020 Addendum to the 2014 Columbia River Basin Fish and Wildlife Program*, Council Document 2020-9, October 2020, <https://www.nwccouncil.org/sites/default/files/2020-9.pdf>.

Note: FCRPS = Federal Columbia River Power System.

Restoration activities undertaken by BPA and other parties also have also been managed through the Columbia Basin Fish Accords.¹⁴⁰ BPA partnered with seven Tribes, two federal agencies, and three states to sign the Columbia Basin Fish Accords in 2008. The accords lay out plans for federal funding to address fish operations, habitat, and hatchery projects over a 10-year period. Federal funding was provided to Tribes and states over the period. Several entities have extended their accords multiple times; the most recent extension was to September 30, 2025.¹⁴¹ The accords were allowed to expire on September 30, 2025; it is unclear if future accords between BPA, states, federal agencies, and Tribes will materialize in the future.

BPA Fish and Wildlife Activities. BPA funds three types of fish and wildlife projects: (1) fish passage structures; (2) hatchery facility construction and maintenance, including in the Snake River Basin; and (3) land acquisition and maintenance, which involves projects that aim to protect and enhance fish and wildlife habitat throughout the Columbia River Basin. BPA coordinates its fish and wildlife priorities with the Council, federal resource management agencies (e.g., NMFS, USACE, Reclamation), states, Tribes, and other stakeholders. These investments and corresponding activities are in BPA strategic asset management plans.¹⁴²

BPA funds fish and wildlife activities in various ways. BPA incurs direct program costs for fish and wildlife projects for ESA-listed species, reimburses USACE and Reclamation for the agencies' operation and maintenance costs for fish and wildlife species, repays the U.S. Treasury for capital expenditures incurred by the federal government for constructing hatcheries and fish passage projects, and purchases power to supply customer demand when fish operations prevent electricity generation at its dams. In addition, BPA incurs opportunity costs when water is spilled over the dam to support ESA-listed species instead of using that water for power generation. BPA previously estimated that its annual investments in fish and wildlife program areas from 2015 to

¹⁴⁰ BPA, "Columbia Basin Fish Accords," <https://www.bpa.gov/environmental-initiatives/efw/columbia-basin-fish-accords>.

¹⁴¹ For more information and text of accords, see BPA, "Columbia Basin Fish Accords," <https://www.bpa.gov/environmental-initiatives/efw/columbia-basin-fish-accords>.

¹⁴² BPA's Strategic Asset Management Plans are at BPA, "Strategic Asset Management Plans," <https://www.bpa.gov/about/finance/strategic-asset-management-plans>.

2024 ranged from approximately \$450 million to \$1.4 billion per year.¹⁴³ In FY2024, the majority of BPA fish and wildlife expenditures were related to habitat restoration and protection (44%); research, monitoring, and evaluation (29%); and hatchery production (15%).¹⁴⁴

NOAA Pacific Salmon Management and Conservation Activities

NOAA management and conservation efforts for Pacific salmon and steelhead trout are guided by recovery plans and status reviews for listed species;¹⁴⁵ conservation plans; a fishery management plan for Pacific Salmon off the West Coast as developed by the Pacific Fishery Management Council;¹⁴⁶ and recommendations, treaties, and input from the Pacific States Marine Fisheries Commission, state agencies, and stakeholders.¹⁴⁷

NOAA collaborates with several entities to manage salmon and steelhead trout fisheries in the Columbia River Basin. Management is authorized and guided, in part, by the 2018-2027 *United States v. Oregon* Management Agreement.¹⁴⁸ The agreement's purpose is to protect and rebuild upper Columbia River salmon and steelhead trout runs while providing harvests for the Columbia River Treaty Tribes (*CRT Tribes*) and non-treaty fisheries.¹⁴⁹ The agreement sets up a process for management that is guided by CRT Tribes and selected states (Idaho, Oregon, and Washington) pursuant to state laws, treaties such as the Columbia River Compact and Pacific Salmon Treaty, and federal laws such as the ESA and Magnuson-Stevens Fishery Conservation and Management Act (MSA; 16 U.S.C. §§1801 et seq.). Fisheries managers meet throughout the year to review information, set regulations and seasons for fishing, and plan the operation of fisheries. The agreement extends to 2027.¹⁵⁰

¹⁴³ BPA, *2024 Report on Bonneville Power Administration's Fish and Wildlife Expenditures*, October 2, 2025, <https://www.nwcouncil.org/fs/19438/2025-4.pdf>. Hereafter, BPA, *2024 Report on Bonneville Power Administration's Fish and Wildlife Expenditures*.

¹⁴⁴ The remainder of the expenditures was for law enforcement, coordination, data management, predator removal, and harvest augmentation. BPA, *2024 Report on Bonneville Power Administration's Fish and Wildlife Expenditures*.

¹⁴⁵ Pacific salmon management in this context applies to salmon species occurring in the state and federal waters of California, Oregon, Washington, and Idaho. Recovery plans created by NOAA exist for all listed Snake River species of salmon and steelhead trout.

¹⁴⁶ As developed by the Pacific Fishery Management Council and implemented by NOAA. Pacific Fishery Management Council, *Pacific Coast Salmon Fishery Management Plan for Commercial and Recreational Salmon Fisheries off the Coasts of Washington, Oregon, and California as Revised Through Amendment 23*, December 2022, pp. 1-84, <https://www.pcouncil.org/documents/2022/12/pacific-coast-salmon-fmp.pdf/>.

¹⁴⁷ The Pacific States Marine Fisheries Commission (PSMFC) is an interstate compact agency that helps state resource agencies and the fishing industry manage ocean resources in a five-state region that includes California, Oregon, Washington, Idaho, and Alaska. Each state is represented by three Commissioners in the Commission. PSMFC, "Pacific States Marine Fisheries Commission," <https://relief.psmfc.org/>.

¹⁴⁸ This agreement was created under ongoing litigation in *United States v. Oregon*, Civil No. 68-513-MO (D. Or.). For more information and text of the agreement, see NMFS, FWS, Bureau of Indian Affairs, *Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion and Magnuson-Stevens Fishery Conservation and Management Act Essential Fish Habitat Response: Consultation on Effects of the 2018-2027 U.S. v. Oregon Management Agreement*, NMFS Consultation Number WCR-2017-7164, https://media.fisheries.noaa.gov/dam-migration/s7-_usvoregon_2018-2027_mgmamnt_final_signed.pdf.

¹⁴⁹ Columbia River Treaty Tribes are Tribes that are parties to the Columbia River Treaty and include the Confederated Tribes of the Warm Springs Reservation of Oregon, the Confederated Tribes of the Umatilla Indian Reservation, the Nez Perce Tribe, and the Confederated Tribes and Bands of the Yakama Nation.

¹⁵⁰ NMFS, "2018-2027 United States v. Oregon Management Agreement: Frequently Asked Questions," <https://www.fisheries.noaa.gov/west-coast/sustainable-fisheries/2018-2027-united-states-v-oregon-management-agreement>.

NOAA, through NMFS, also conserves ESA-listed salmon and steelhead trout species through several actions, including the following:

- **Planning and Implementing Recovery Actions.** NMFS prepares and implements recovery plans for Snake River listed species, as required by the ESA.¹⁵¹ Recovery plans contain actions that aim to restore listed species so they no longer need protection under the ESA. The plans do not create binding obligations for NMFS under the ESA but instead are organizing tools for guiding and coordinating recovery efforts across multiple stakeholders (i.e., federal, tribal, state, local, and private entities).¹⁵²
- **Restoring Habitat.** NMFS aims to improve wetlands, restore spawning and rearing habitat, and improve fish passage, among other goals, for Pacific salmon, steelhead trout, and other fish species.
- **Implementing Hatchery Programs** (see the text box below).
- **Improving Fish Passage.** NMFS improves upstream and downstream passage for salmon and steelhead trout, including by implementing culverts, fish screens, and tide gates.¹⁵³
- **Conducting Reintroduction Efforts.** The ESA authorizes the reintroduction of listed species, such as salmon, under Section 10(j) of the act.¹⁵⁴

Salmon and Steelhead Trout Hatcheries

Hatcheries aim to provide short-term conservation benefits for declining fish populations by increasing fishery production during periods of low natural abundance. Some experts also recommend multiple restoration approaches to restore declining fish populations that may include hatcheries and concurrent focus on habitat, genetic diversity of wild fish populations, and other factors for long-term conservation success. Further, some scientists suggest that potential adverse impacts from hatcheries to wild fish populations' genetic diversity (i.e., from interbreeding of potentially genetically inferior hatchery-reared individuals with wild individuals) might limit the efficacy of restoration efforts and limit certain wild fishes' adaptive capacity to changing climate.

Federal, state, and tribal entities produce hatchery salmon and steelhead trout in the Snake River and Columbia River Basin. Hatchery production for salmon and steelhead trout in the basin peaked at 200 million juvenile fish per year in the late 1980s and early 1990s and has reduced to approximately 140 million juvenile fish per year since 2010 due to concerns over protecting the genetic diversity of wild fish. Annual hatchery production in the Columbia River Basin is mostly composed of fall Chinook salmon (45%), with additional production of spring Chinook salmon (24%) and coho salmon (12%). Hatchery-origin fish account for approximately two-thirds of the total return of adults to the Columbia River Basin and comprise the majority of salmon and steelhead trout harvested in the basin.

Sources: Robin S. Waples, "Dispelling Some Myths About Hatcheries," *Fisheries*, vol. 24, no. 2 (1999), pp. 12-21; Columbia Basin Partnership Task Force, *A Vision for Salmon and Steelhead: Goals to Restore Thriving Salmon and Steelhead to the Columbia River Basin*, National Oceanic and Atmospheric Administration, Phase 2 Report of the Columbia Basin Partnership Task Force of the Marine Fisheries Advisory Committee, October 2020, pp. 53, 149; J.E. Siegel et al., "Environmentally Triggered Shifts in Steelhead Migration Behavior and Consequences for Survival in the mid-Columbia River," *PLoS ONE*, vol. 16, no. 5 (2021), article e0250831, p. 19; and John R. McMillan et al., "A Global Synthesis of Peer-Reviewed Research on the Effects of Hatchery Salmonids on Wild Salmonids," *Fisheries Management and Ecology*, vol. 30, no. 5 (2023), pp. 446-463.

¹⁵¹ 16 U.S.C. §1533(f).

¹⁵² See "Recovery Planning and Implementation" section at NMFS, "Pacific Salmon and Steelhead: ESA Protected Species," <https://www.fisheries.noaa.gov/species/pacific-salmon-and-steelhead>.

¹⁵³ In addition to annual appropriations, the Infrastructure Investment and Jobs Act (P.L. 117-58) provided NMFS with funding to improve fish passage. For instance, see funding announcements at NMFS, "Two NOAA Fish Passage Funding Opportunities Now Open, One Focused on Tribes," October 30, 2024, <https://www.fisheries.noaa.gov/feature-story/two-noaa-fish-passage-funding-opportunities-now-open-one-focused-tribes>.

¹⁵⁴ 16 U.S.C. §1539(j).

These conservation actions are implemented through several programs and activities within NMFS, including the Pacific Coastal Salmon Recovery Fund,¹⁵⁵ as well as Pacific salmon under the Protected Resource Science and Management budget line.¹⁵⁶

Salmon and steelhead trout conservation is informed by documents and plans generated by NMFS. For example, NMFS's 2022 report titled *Rebuilding Interior Columbia Basin Salmon and Steelhead* outlined actions aiming to achieve the Columbia River Basin Partnership's mid-range goals for salmon and steelhead trout abundance for 2050 (i.e., those exceeding low-range abundance thresholds and representing progress toward high-range goals).¹⁵⁷ The Columbia Basin Partnership has identified low-, mid-, and high-range natural-origin population abundance goals.¹⁵⁸ The low-range abundance goals are generally consistent for recovery under the ESA, whereas the high-range abundance goals are consistent with "healthy and harvestable stocks."¹⁵⁹ The "healthy and harvestable" standard of recovery is different from the standard set for species listed under the ESA. In the context of the ESA, NMFS generally defines the standard of recovery for ESA-listed salmon and steelhead trout as the abundance necessary to limit extinction risk to 5% over a 100-year timeframe.¹⁶⁰ The standard for "healthy and harvestable" stock levels are generally set at three-to-five-times the minimum abundance levels necessary to ensure the long-term survival of the population, stock, or species.¹⁶¹

In its 2022 report, NMFS qualitatively assigned priorities for rebuilding Columbia River basin salmon and steelhead trout populations based on five criteria: level of extinction risk; current spatial structure and diversity; importance to tribal communities; habitats available for essential life-cycle needs; and resilience of habitat to climate change.¹⁶² The rebuilding priorities assigned were "high," "higher," and "highest" (NOAA considered priority for rebuilding to be at least high for all populations).¹⁶³ NMFS asserts that the Snake River spring/summer Chinook salmon and Snake River steelhead trout populations are "critically important to Columbia River basin Tribes, as well as to the economy and overall ecological health of the region."¹⁶⁴ NMFS designated that

¹⁵⁵ For more information about the Pacific Coastal Salmon Recovery Fund, see CRS In Focus IF13096, *The Pacific Coastal Salmon Recovery Fund*, by Anthony R. Marshak.

¹⁵⁶ For more information on the implementation of salmon and steelhead conservation activities within NMFS, see NOAA, *National Oceanic and Atmospheric Administration Budget Estimates: Fiscal Year 2026, 2025*, <https://www.noaa.gov/sites/default/files/2025-06/NOAA%20FY26%20Congressional%20Justification.pdf>.

¹⁵⁷ The Columbia Basin Partnership was a Task Force chartered by NOAA's Marine Fisheries Advisory Committee in 2017 to develop a common vision and goals for the Columbia River Basin's salmon and steelhead. NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022.

¹⁵⁸ NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022.

¹⁵⁹ NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022. NOAA specifically states that "rebuilding healthy and harvestable stocks is a substantially more ambitious goal than meeting ESA recovery standards, which are intended to achieve delisting, or the mandates of ESA Section 7(a)(2), which are meant to avoid jeopardizing the continued existence of ESA-listed species."

¹⁶⁰ NMFS, *ESA Recovery Plan for Idaho Snake River Spring/Summer Chinook Salmon and Snake River Basin Steelhead*, Chapter 5, West Coast Region, November 2017, pp. 73, 114, 184, 219, 253, <https://media.fisheries.noaa.gov/2021-12/final-idaho-mu-recovery-plan-chapter-5.pdf>; NMFS, "Endangered and Threatened Species; Recovery Plans," 74 *Federal Register* 50165-51072, September 30, 2009.

¹⁶¹ For listed salmon and steelhead trout, these minimum abundance levels (i.e., low-range natural production goals) are, in most cases, consistent with ESA delisting goals. Columbia Basin Partnership Task Force, *A Vision for Salmon and Steelhead*, 2020, pp. 44-45 and Haley Ohms, "Salmon Recovery Must be Built on Ambitious, Achievable Goals Instead of Bare Minimums," *Trout Magazine*, June 21, 2023, <https://www.tu.org/magazine/conservation/barriers/dam-removal/salmon-recovery-must-be-built-on-ambitious-achievable-goals-instead-of-bare-minimums/>.

¹⁶² NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022, pp. 5-6.

¹⁶³ NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022, p. 6.

¹⁶⁴ NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022, p. 6.

rebuilding of those two Snake River populations to healthy and harvestable levels is “highest” priority.¹⁶⁵ The report recommended several actions that aim to achieve abundance goals, including the following:

- Reducing direct and indirect mortality resulting from mainstream dams on the Snake River;
- Restoring the Snake River through dam breaching;
- Managing predator and competitor species associated with salmon and steelhead trout;
- Restoring tributary and estuarine habitat and improving water quality;
- Enhancing passage and reintroducing fish in certain areas that are blocked, including the upper Columbia River;
- Securing a more functional salmon ocean ecosystem;
- Addressing effects of climate change on fish populations and habitat; and
- Reforming hatcheries and harvest levels.¹⁶⁶

Columbia River Basin Tribal History and Current Activities

Steelhead trout, Pacific lamprey, and other native fish have played a key role in the history, culture, religion, and economic development of Indigenous peoples in the Pacific Northwest. Salmon, in particular, has provided sustenance, strengthened social and cultural ties, and afforded economic opportunities. According to the Columbia River Inter-Tribal Fish Commission (CRITFC), “salmon are at the center of the diets, cultures, and religions of Columbia Plateau tribes.”¹⁶⁷ Fishing is central to many tribal ceremonies and traditions.

Due to their historical connection to salmon and other native fish, some of the Tribes in the Pacific Northwest reserved rights to continue hunting, fishing, or gathering on lands they ceded to the federal government by treaty. Many Tribes in the Columbia River Basin retain treaty reserved rights to hunt or fish in “usual and accustomed” places.¹⁶⁸ Courts have affirmed these rights even when the usual and accustomed places are not located within the boundaries of a reservation.¹⁶⁹ (See **Figure 6** for a map of the Columbia River Basin that includes federal and tribal lands.) Courts also have held that the right to fish by extension includes a right to protect the habitat on which the fish rely.¹⁷⁰ In addition, courts have recognized the federal trust responsibility, which

¹⁶⁵ NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022. Furthermore, p. 6 of the report identifies the rebuilding of Snake River fall Chinook salmon and sockeye salmon as “higher priority” among northwest salmon populations.

¹⁶⁶ NMFS, *Rebuilding Interior Columbia Basin Salmon and Steelhead*, 2022, p. 16.

¹⁶⁷ Columbia River Inter-Tribal Fish Council, “Tribal Salmon Culture,” <https://critfc.org/salmon-culture/tribal-salmon-culture/>.

¹⁶⁸ For example, see Treaty with the Yakima, 1855, Art. 3; Treaty with the Tribes of Middle Oregon, 1855; Treaty with the Walla Walla, Cayuse, etc., 1855, Art. 1; and Treaty with the Nez Perces, 1855, Art. III.

¹⁶⁹ See, for example, *United States v. Winans*, 198 U.S. 371 (1905) and *United States v. Washington*, 520 F.2d 676 (9th Cir. 1975) (“the Boldt Decision”). The Supreme Court also ruled that treaty Tribes are entitled to a maximum of 50% of the harvestable fish (*Washington v. Washington State Commercial Passenger Fishing Vessel Ass’n*, 443 U.S. 658 (1979)).

¹⁷⁰ *United States v. Washington*, 506 F. Supp. 187, 203 (W.D. Wash. 1980) and *United States v. Washington*, 853 F.3d 946, 963 (9th Cir. 2017).

can include obligations to protect tribal treaty rights, lands, assets, and resources on behalf of Tribes and tribal members.¹⁷¹

Throughout the 20th century, many Tribes in the Columbia River Basin opposed the construction and operation of dams because the dams would limit their access to historic tribal lands and off-reservation fishing rights.¹⁷² According to USACE, 19 Tribes may be affected by the Columbia River System.¹⁷³ The lower Snake River dams primarily affect five Tribes: the Nez Perce Tribe, the Confederated Tribes and Bands of the Yakama Indian Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Shoshone-Bannock Tribes of the Fort Hall Reservation.¹⁷⁴ As outlined in the “Factors Affecting Snake River Salmon and Steelhead Trout Populations” section of this report, the lower Snake River dams block fish species from accessing portions of their once occupied spawning habitat, which some Tribes have argued has reduced tribal access to the fish guaranteed by treaties.¹⁷⁵ Some Tribes have been parties to lawsuits relating to federal dam operations and fish management in the basin, including recent litigation in response to the operation of the Columbia River System (see below section “Recent Litigation Challenging Agency Actions Related to the Lower Snake River Dams”).

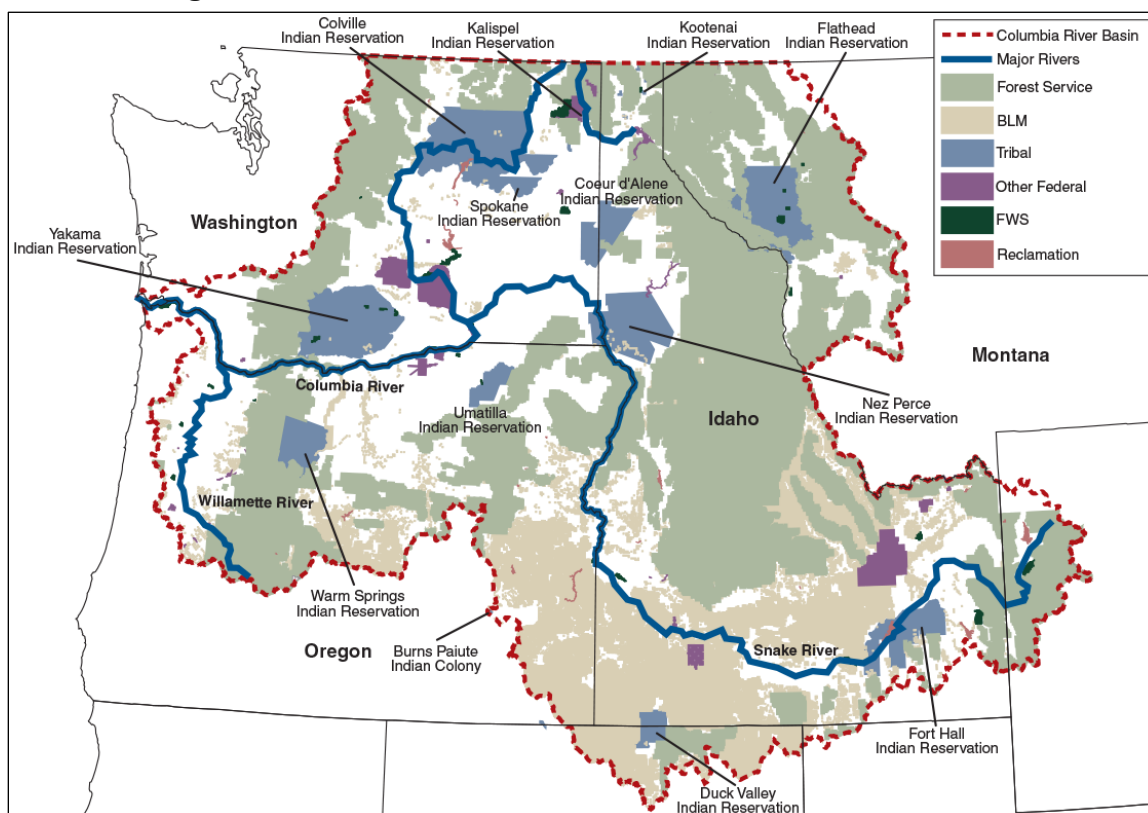
¹⁷¹ The federal trust responsibility is a legal obligation under which the United States, through treaties, acts of Congress, and court decisions, “has charged itself with moral obligations of the highest responsibility and trust” toward Tribes. *Seminole Nation v. United States*, 316 U.S. 286, 296-297 (1942). For a general overview of the trust relationship, see *United States v. Jicarilla Apache Nation*, 564 U.S. 162 (2011).

¹⁷² See, for example, Columbia River Inter-Tribal Fish Commission (CRITFC), *Tribal Circumstances & Impacts from the Lower Snake River Project on the Nez Perce, Yakama, Umatilla, Warm Springs, and Shoshone Bannock Tribes*, p. 3, https://critfc.org/wp-content/uploads/2021/10/circum_exec.pdf (hereinafter CRITFC, *Tribal Circumstances & Impacts*).

¹⁷³ “Executive Summary” in USACE, Reclamation, and BPA, *2020 EIS*, p. 11.

¹⁷⁴ Washington Governor’s Office, *Lower Snake River Dams Stakeholder Engagement Report*, p. 22, <https://www.washingtonpolicy.org/library/docLib/LSRD-Report.pdf>.

¹⁷⁵ NMFS, *Biological Opinion*, 2020, p. 299. See also CRITFC, *Tribal Circumstances & Impacts*, p. 9.

Figure 6. Federal and Tribal Lands in the Columbia River Basin

Source: CRS modification of map obtained from U.S. Government Accountability Office, *Columbia Basin Fish and Wildlife Activities*, 04-602, June 2004, p. 8, <https://www.gao.gov/assets/gao-04-602.pdf>.

As a way to secure their fishing rights, many Tribes in the Pacific Northwest have sought to influence regional fish management through intertribal fish commissions, advocacy targeting dam operations or removal, and restoration work. Tribes have used intertribal fish commissions such as the Northwest Indian Fisheries Commission and the CRITFC.¹⁷⁶ Furthermore, the MSA requires the Pacific Fishery Management Council to include a representative from a Pacific Northwest Tribe with fishing rights.¹⁷⁷ In addition to advocating for optimizing spill to benefit salmon at the dams and restoring salmon behind blocked areas in the basin, some Tribes have advocated for removal of the lower Snake River dams.¹⁷⁸ Several area Tribes also have established hatcheries to supplement fish stock in the basin.¹⁷⁹

¹⁷⁶ Pacific Fishery Management Council, "Tribes," <https://www.pcouncil.org/fishingcommunities/tribes/>.

¹⁷⁷ 16 U.S.C. §1852(b)(5). The required representative is appointed by the Secretary of Commerce. Representation rotates among the Tribes in consideration of individuals' qualifications, the rights of the Tribes involved, judicial cases that set forth the exercise of those rights, and geography.

¹⁷⁸ National Congress of American Indians (NCAI), "Calling on the President and Congress to Invest in Salmon and River Restoration in the Pacific Northwest," NCAI Resolution #AK-21-009, 2021. See also Affiliated Tribes of Northwest Indians (ATNI), "Calling on the President of the United States and the 117th Congress to Seize the Once-in-a-Lifetime Congressional Opportunity to Invest in Salmon and River Restoration in the Pacific Northwest, Charting a Stronger, Better Future for the Northwest, and Bringing Long-Ignored Tribal Justice to Our Peoples and Homelands," ATNI Resolution #2021-23.

¹⁷⁹ See the list of tribal restoration efforts in U.S. Government Accountability Office, *Columbia River Basin: Additional Federal Actions Would Benefit Restoration Efforts*, GAO-18-561, August 2018, pp. 87-92, <https://www.gao.gov/assets/gao-18-561.pdf>.

The Department of the Interior (DOI) and other federal agencies have collaborated with Pacific Northwest Tribes to ensure compliance with tribal treaty rights and other laws providing for tribal management of fisheries and access to fish harvests. For example, DOI's Bureau of Indian Affairs provides funding to support tribal fish hatchery, rearing, and stocking programs.¹⁸⁰ The Pacific Northwest Tribes operate 45 hatcheries and rearing facilities that benefit from this funding. The Nez Perce Tribe has also assumed full responsibility for fish production at the Dworshak National Fish Hatchery, which USACE built in the 1960s on the tribal reservation, near the Dworshak Dam.¹⁸¹

Congress has enacted laws to mitigate Columbia River Basin dam impacts on tribal treaty rights. For example, in 1938, Congress passed the Mitchell Act, which directed the Secretary of Commerce to establish one or more "salmon-cultural stations" in the Columbia River Basin.¹⁸² In 1988, Congress directed the Secretary of the Army to acquire land next to the Bonneville Pool/Dam (along the Columbia River) to provide certain Tribes with "treaty fishing access sites."¹⁸³ These sites were then transferred to DOI.¹⁸⁴

Recent Litigation Challenging Agency Actions Related to the Lower Snake River Dams

Operating the Columbia River System dams has the potential to affect species listed under the ESA and the Columbia River Basin environment in general. Due to these potential effects, the action agencies generally must consult with NMFS pursuant to Section 7 of the ESA and conduct environmental reviews pursuant to NEPA before finalizing proposed changes to the system's operating plans.¹⁸⁵

Both the ESA and NEPA impose certain procedural requirements on federal agencies when they propose or modify actions. The ESA also imposes a substantive constraint on federal agencies; Section 7 of the ESA generally requires federal agencies, such as the action agencies for the Columbia River System, to ensure—in consultation with the U.S. Fish and Wildlife Service (FWS) and NMFS (together, *the Services*)—that their actions do not jeopardize listed species or adversely modify critical habitat.¹⁸⁶ If the action agency or the relevant Service determines that a proposed federal action is likely to adversely affect listed species or critical habitat, the relevant Service issues a BiOp analyzing whether the action as proposed would in fact jeopardize the continued existence of a listed species or adversely modify its critical habitat.¹⁸⁷ If the Service concludes that the proposed action would jeopardize listed species, the Service is required to

¹⁸⁰ DOI, Bureau of Indian Affairs, *Budget Justifications and Performance Information Fiscal Year 2026, Bureau of Indian Affairs*, <https://www.doi.gov/sites/default/files/documents/2025-12/bia-2026-greenbook508.pdf>.

¹⁸¹ FWS, "Dworshak National Fishery," <https://www.fws.gov/fish-hatchery/dworshak>.

¹⁸² Mitchell Act, May 11, 1938, 52 Stat. 345 and 25 C.F.R. §248. NOAA administers the Mitchell Act program and supports hatcheries. The term *salmon cultural station* is not defined in statute (NOAA, *Final Environmental Impact Statement to Inform Columbia River Basin Hatchery Operations and the Funding of Mitchell Act Hatchery Programs*, 2014, <https://media.fisheries.noaa.gov/2021-11/mitchell-act-hatcheries-feis-final.pdf>).

¹⁸³ P.L. 100-581 and 25 C.F.R. §247.

¹⁸⁴ 25 C.F.R. §247.1.

¹⁸⁵ 16 U.S.C. §1536(a)(2); 42 U.S.C. §4332.

¹⁸⁶ 16 U.S.C. §1536(a)(2); 42 U.S.C. §4332.

¹⁸⁷ 16 U.S.C. §1536(b)(3). If the FWS and NMFS (together, *the Services*) or action agencies determine that the agency action is not likely to adversely affect listed species or critical habitat, the consultation process can be concluded without a BiOp.

suggest reasonable and prudent alternatives (RPAs) to the proposed action that the Service believes would avoid jeopardy.¹⁸⁸ The Service also must recommend mitigation measures to limit the action's impacts on the listed species.¹⁸⁹

Due to the potential impacts on listed salmon and steelhead trout species, the effects of operation plans for the FCRPS—or, more recently, for the Columbia River System specifically—on listed species and their designated critical habitats have been analyzed through the ESA Section 7 consultation process. Since 1992, the action agencies have consulted with NMFS on the potential effects of various proposed action plans for the FCRPS or the Columbia River System subset of dams, depending on the plan, and NMFS has issued a series of BiOps assessing those impacts.¹⁹⁰ The protective measures for the fish species that NMFS has included in RPAs or mitigation measures for those BiOps often require the action agencies to reduce energy generation or irrigation supply from the Columbia River System.¹⁹¹

Under the APA, stakeholders affected by federal agency actions, such as modifications to dam operating plans, generally may challenge the agency action or any related BiOps or NEPA documents in court.¹⁹² A variety of stakeholders have repeatedly challenged operating plans and associated review documents for the FCRPS or Columbia River System, resulting in a number of decisions that required the action agencies and NMFS to revisit the plans, BiOps, and NEPA reviews.¹⁹³ Courts have repeatedly determined that the BiOps NMFS has prepared with respect to the FCRPS are inconsistent with the ESA and/or the APA.¹⁹⁴ Although courts have consistently remanded the BiOps to NMFS for reconsideration, the courts generally have allowed the federal agencies to keep operating the FCRPS in accordance with all or portions of each BiOp, or a modified version thereof, to allow operations to continue while NMFS reconsidered its analysis in the BiOp.¹⁹⁵

Although numerous different cases have been filed since NMFS's BiOps were first challenged in the 1990s, the current litigation over Columbia River System operations and the associated BiOp and EIS stems from a complaint originally filed in 2001 by NWF and an array of other

¹⁸⁸ 16 U.S.C. §1536(b)(3).

¹⁸⁹ 16 U.S.C. §1536(b)(4)(ii).

¹⁹⁰ For copies of and information about the BiOps since 2000, see, for example, Federal Caucus, *NOAA Fisheries Biological Opinion for Operation and Maintenance of the Columbia River System Operations*, <https://www.salmonrecovery.gov/BiologicalOpinions/FCRPSBiOp.aspx>; NOAA Fisheries, *Federal Columbia River Power System Biological Opinion*, updated October 11, 2023, <https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/federal-columbia-river-power-system-biological-opinion>.

¹⁹¹ The reduction in electricity generation for fish and wildlife protection within the Columbia River Basin led to \$893 million in costs in FY2024. Foregone power revenues cost \$37 million and power purchases (e.g., buying power from wholesale markets when water was being spilled for fish protection instead of being used for electricity generation) cost \$856 million. For comparison, BPA estimates total costs for fish and wildlife protection operations for that year (inclusive of the above values) at \$1.369 billion. The majority of other costs (\$271 million) were for direct fish and wildlife program expenses (see such actions described in “Bonneville Power Administration Fish and Habitat Initiatives”). Northwest Power and Conservation Council, *2024 Report on Bonneville Power Administration's Fish and Wildlife Expenditures*, August 5, 2025, <https://www.nwccouncil.org/reports/2025-4/>.

¹⁹² 5 U.S.C. §704.

¹⁹³ For example, an original complaint and eight subsequent supplemental complaints have been filed in *NWF v. NMFS*, No. 3:01-CV-00640, in the U.S. District Court for the District of Oregon since 2001.

¹⁹⁴ See, for example, *Idaho Department of Fish & Game v. NMFS*, 850 F. Supp. 886 (D. Or. 1994), vacated as moot by *Idaho Dep't of Fish & Game v. NMFS*, 56 F.3d 1071 (9th Cir. 1995); *NWF v. NMFS*, 254 F. Supp. 2d 1996 (D. Or. 2003); *NWF v. NMFS*, 2005 WL 1278878 (D. Or. May 26, 2005); *Am. Rivers v. NOAA Fisheries*, 2006 WL 1455629 (D. Or. May 23, 2006); *NWF v. NMFS*, 839 F. Supp. 2d 1117 (D. Or. 2011).

¹⁹⁵ See, for example, *NWF v. NMFS*, 2005 WL 2488447 (D. Or. Oct. 7, 2005); *Am. Rivers v. NOAA Fisheries*, 2006 WL 2792675 (D. Or. Sept. 26, 2006); *NWF v. NMFS*, 839 F. Supp. 2d 1117 (D. Or. 2011).

nongovernmental advocacy organizations in federal court in the District of Oregon.¹⁹⁶ The 2001 complaint in *National Wildlife Federation v. National Marine Fisheries Service* challenged a 2000 BiOp issued by NMFS pursuant to Section 7 of the ESA.¹⁹⁷ In the 2000 BiOp, NMFS assessed the potential impact of an operating plan for the FCRPS on species listed under the ESA and their designated critical habitats.¹⁹⁸ In 2003, the district court remanded the 2000 BiOp to NMFS to address deficiencies related to the action area and mitigation actions.¹⁹⁹

NWF has supplemented the complaint eight times since it was initially filed to address new BiOps for revised operation plans. Each of the complaints includes allegations against the action agencies or agencies that issued BiOps under the ESA in connection with operation plans, for either the FCRPS as a whole or the Columbia River System specifically.²⁰⁰ The claims generally have alleged violations of the APA, the ESA, and, more recently, NEPA. The most recent supplemental complaint was filed in January 2021 and raised claims related to NMFS's 2020 BiOp for operations of the Columbia River System as well as the action agencies' 2020 EIS and a 2020 ROD.²⁰¹

This section provides an overview of recent litigation over various federal agency actions related to the FCRPS or Columbia River System operations (with a focus on decisions related to the lower Snake River dams), as well as how the agencies have adjusted the operation plans to address successive court orders and changing natural and political environments.

¹⁹⁶ Complaint for Declaratory and Injunctive Relief, *National Wildlife Federation (NWF) v. National Marine Fisheries Service (NMFS)*, No. 3:01-CV-00640 (D. Or. May 3, 2001). The same parties have filed a series of petitions against BPA in the U.S. Court of Appeals for the Ninth Circuit (Ninth Circuit) for BPA's related RODs. See, for example, Petition for Review, *Am. Rivers v. BPA*, No. 08-74597 (9th Cir. Nov. 6, 2008) (challenging BPA 2008 ROD); Petition for Review, *Am. Rivers v. BPA*, No. 10-72710 (9th Cir. Sept. 2, 2010) (challenging BPA 2010 ROD); Petition for Review, *Am. Rivers v. BPA*, No. 14-71475 (9th Cir. May 27, 2014) (challenging BPA 2014 ROD). Section 9(e)(5) of the Northwest Power Act requires that certain challenges against BPA's activities be filed in the Ninth Circuit. 16 U.S.C. §839f(e). As a result, although claims against NMFS, Reclamation, and the Army Corps are filed in federal district court, related claims against BPA must be filed in the Ninth Circuit if they fall under the types of challenges addressed by Section 9(e)(5) of the Northwest Power Act. The parties explained in a filing submitted to the court that they brought these challenges "as a precaution in the event that the district court proceedings do not provide Petitioners with the full relief sought." Reply in Support of Motion for Limited Reopening of Petition, *Pacific Coast Federation of Fishermen's Associations v. BPA*, No. 20-73761, at 5 (9th Cir. Jan. 27, 2026). The petitioners noted that the Ninth Circuit had stayed each of these petitions until the district court proceedings were resolved and that, in each case, the district court had ultimately granted the declaratory and injunctive relief sought and the petitioners had accordingly agreed to dismiss the petitions against BPA. Reply in Support of Motion for Limited Reopening of Petition, *Pacific Coast Federation of Fishermen's Associations v. BPA*, No. 20-73761, at 5 (9th Cir. Jan. 27, 2026).

¹⁹⁷ See Opinion and Order, *NWF v. NMFS*, No. 3:01-CV-00640 (D. Or. May 7, 2003).

¹⁹⁸ Opinion and Order, *NWF v. NMFS*, No. 3:01-CV-00640 (D. Or. May 7, 2003).

¹⁹⁹ *NWF v. NMFS*, 254 F. Supp. 2d 1196 (D. Or. 2003).

²⁰⁰ The action agencies generally have prepared operation plans for the entire FCRPS. The 2020 operation plan—and associated BiOp, environmental impact statement, and record of decision—addressed only the operation of the Columbia River System.

²⁰¹ Eighth Supplemental Complaint for Declaratory and Injunctive Relief, *NWF v. NMFS*, No. 3:01-CV-00640 (D. Or. Jan. 20, 2021). As with prior supplemental complaints, the same parties filed a parallel petition for review of BPA's ROD in the Ninth Circuit. Petition for Review, *Pacific Coast Federation of Fishermen's Associations v. BPA*, No. 20-73761 (9th Cir. Dec. 23, 2020). The petition for review has generally remained administratively closed while the federal district court litigation proceeded or was similarly stayed while settlement negotiations proceeded. See, for example, Order, *Pacific Coast Federation of Fishermen's Associations v. BPA*, No. 20-73761 (9th Cir. Oct. 29, 2021) (directing the clerk to temporarily close the docket for administrative purposes until August 2, 2022).

Litigation over FCRPS Biological Opinions and Supplements from 2000 to 2014

NMFS issued the 2020 BiOp in response to a 2016 court order, after the court concluded that NMFS's second supplement to its 2008 BiOp for FCRPS operations violated the ESA, APA, and NEPA. NWF had supplemented its complaint to challenge the 2008 BiOp after NMFS issued it in May 2008.²⁰² Before the court issued a decision on the 2008 BiOp, the federal defendants requested—and the court granted—a limited, voluntary remand of the 2008 BiOp. NMFS released a supplemental BiOp in May 2010 (2010 Supplement). NWF then amended its complaint to challenge both the 2008 BiOp and 2010 Supplement.²⁰³

The district court concluded that the portion of the 2008 and 2010 BiOps addressing operations through the end of 2013 complied with the ESA, identifying “specific and beneficial mitigation measures” to address effects on species.²⁰⁴ However, for the portion of the BiOp addressing operations between 2014 and 2018, the court held that NMFS relied on “habitat mitigation measures that are neither reasonably specific nor reasonably certain to occur, and in some cases not even identified.”²⁰⁵ The court remanded the 2008 and 2010 BiOps for further consultation on post-2013 operations.²⁰⁶ The court order required NMFS to produce a supplement by January 1, 2014, that considered “whether more aggressive action, such as dam removal and/or additional flow augmentation and reservoir modifications are necessary to avoid jeopardy.”²⁰⁷

In response to the court's order, NMFS issued a second supplement in January 2014 (2014 Supplement) to the 2008 BiOp. The 2014 Supplement concluded, as the 2008 BiOp had, that the agencies could avoid jeopardizing listed species through RPAs.²⁰⁸ The 2014 Supplement included RPA measures that had been included in the 2008 BiOp and 2010 Supplement as well as habitat mitigation projects that the action agencies had identified for implementation in 2014-2018.²⁰⁹

Following the issuance of the 2014 Supplement, the plaintiffs amended their complaint to challenge the 2014 Supplement under the ESA and the APA and, for the first time, included a claim for violating NEPA.²¹⁰ The action agencies had not prepared a NEPA analysis for the 2014

²⁰² Fourth Supplemental Complaint for Declaratory and Injunctive Relief, *NWF v. NMFS*, No. 3:01-CV-00640 (D. Or. July 14, 2008). NWF amended the complaint further in September 2008 to include additional actions by and information related to NMFS and to add Reclamation and USACE as defendants. Fifth Supplemental Complaint for Declaratory and Injunctive Relief, *NWF v. NMFS*, No. 3:01-CV-00640 (D. Or. Sept. 12, 2008).

²⁰³ Sixth Supplemental Complaint for Declaratory and Injunctive Relief, *NWF v. NMFS*, No. 3:01-CV-00640 (D. Or. Sept. 8, 2010).

²⁰⁴ *NWF v. NMFS*, 839 F. Supp. 2d 1117, 1121 (D. Or. 2011).

²⁰⁵ *NWF v. NMFS*, 839 F. Supp. 2d at 1125.

²⁰⁶ *NWF v. NMFS*, 839 F. Supp. 2d at 1130.

²⁰⁷ *NWF v. NMFS*, 839 F. Supp. 2d at 1130.

²⁰⁸ NMFS, *Endangered Species Act Section 7(a)(2) Supplemental Biological Opinion: Consultation on Remand for Operation of the Federal Columbia River Power System*, January 14, 2014, p. 36, <https://www.fisheries.noaa.gov/resource/document/supplemental-consultation-remand-operation-federal-columbia-river-power-system>.

²⁰⁹ NMFS, *Endangered Species Act Section 7(a)(2) Supplemental Biological Opinion: Consultation on Remand for Operation of the Federal Columbia River Power System*, January 14, 2014, p. 33, <https://www.fisheries.noaa.gov/resource/document/supplemental-consultation-remand-operation-federal-columbia-river-power-system>.

²¹⁰ Seventh Supplemental Complaint for Declaratory and Injunctive Relief, *NWF v. NMFS*, No. 3:01-CV-00640 (D. Or. July 9, 2014).

Supplement. The agencies instead relied on existing NEPA documents that had been prepared for prior operation plans for the FCRPS and other related actions.²¹¹

In May 2016, the district court held that the 2014 Supplement to the 2008 BiOp violated the ESA, the APA, and NEPA.²¹² In concluding that the BiOp violated the ESA, the court cited flaws in NMFS's conclusion that protected species could be "trending toward recovery" even if the overall population levels remained critically low.²¹³ The court also considered NMFS's habitat improvement data "too uncertain" to rely upon and found that NMFS did not properly analyze the effects of climate change.²¹⁴

The court held that the action agencies violated NEPA by failing to prepare a new EIS to support the decisions in their RODs about how they planned to operate the FCRPS pursuant to the 2014 Supplement. The court observed that, in conducting their NEPA analysis on remand, the action agencies would have to consider reasonable alternatives that may have to include the impacts and benefits of removing one or more of the four lower Snake River dams.²¹⁵

Although the court concluded that the 2014 Supplement was arbitrary and capricious, it opted not to vacate the BiOp. Instead, on July 6, 2016, the court remanded the BiOp and RODs to the agencies to reconsider their actions and issue a new BiOp and RODs consistent with the ESA, the APA, and NEPA.²¹⁶ In the interim, the court ordered that the 2014 Supplement would govern the operations of the FCRPS.

2020 Biological Opinion, Environmental Impact Statement, and Record of Decision

In response to the court's order and a presidential memorandum dated October 19, 2018,²¹⁷ NMFS issued a new final BiOp (2020 BiOp) for operation of the Columbia River System in July 2020.²¹⁸ The 2020 BiOp determined that Columbia River System operations would not jeopardize listed species and identified reasonable and prudent measures to minimize the impacts of

²¹¹ See USACE, Northwestern Division, Supplemental Record of Consultation and Statement of Decision: NOAA Fisheries' 2014 Supplemental Biological Opinion Endangered Species Act Section 7(a)(2) Supplemental Biological Opinion Consultation on Remand for Operation of the Federal Columbia River Power System, February 28, 2014, p. 10; Reclamation, Pacific Northwest Region, 2014 Supplemental Decision Document Following the January 2014 NOAA Fisheries Supplemental Consultation on Operation of the Federal Columbia River Power System, 11 Bureau of Reclamation Projects in the Columbia Basin, and ESA Section 10(a)(1)(A) Permit for Juvenile Fish Transportation Program, June 11, 2010, pp. 23-24, <https://www.usbr.gov/pn/fcrps/documents/2014supbiopdecision.pdf>; BPA, Record of Decision Following NOAA's January 2014 Supplemental Biological Opinion to the May 2008 FCRPS Biological Opinion and May 2010 Supplemental Biological Opinion for Operation of the Federal Columbia River Power System, February 27, 2014, pp. 25-26, <https://www.bpa.gov/-/media/Aep/about/publications/records-of-decision/rod-20140227-2014-bpa-rod-following-noaas-january-2014-supplemental-biological-opinion.pdf>.

²¹² *NWF v. NMFS*, 184 F. Supp. 3d 861 (D. Or. May 4, 2016) (order granting in part and denying in part motions for summary judgment).

²¹³ *NWF v. NMFS*, 184 F. Supp. 3d 861, 885-895 (D. Or. 2016).

²¹⁴ *NWF v. NMFS*, 184 F. Supp. 3d 861, 873-874 (D. Or. 2016).

²¹⁵ *NWF v. NMFS*, 184 F. Supp. 3d 861, (D. Or. 2016).

²¹⁶ *NWF v. NMFS*, No. 3:01-CV-00640, 2016 WL 9804599 (D. Or. July 6, 2016).

²¹⁷ A 2018 presidential memorandum directed the action agencies and NMFSs to develop a schedule to complete the Columbia River System EIS and the associated BiOp by 2020 (a year earlier than planned). Executive Office of the President, "Promoting the Reliable Supply and Delivery of Water in the West," 83 *Federal Register* 53961, October 25, 2018.

²¹⁸ NMFS, *Biological Opinion for Operation and Maintenance of the Fourteen Multiple-Use Dam and Reservoir Projects in the Columbia River System*, July 24, 2020, <https://www.fisheries.noaa.gov/resource/document/biological-opinion-operation-and-maintenance-fourteen-multiple-use-dam-and>.

incidental take associated with operation and maintenance.²¹⁹ USACE, Reclamation, and BPA released a final EIS for operation of the Columbia River System on July 31, 2020, which analyzed alternatives related to the operation of the system, including an alternative that considered breaching the four lower Snake River dams.²²⁰

On September 28, 2020, USACE, Reclamation, and BPA signed a joint ROD for the Columbia River System operations, which selected a *preferred operating alternative* that increased spill at eight dams to help migrating fish and kept the four lower Snake River dams in place.²²¹ According to the EIS, the intent of the preferred alternative was to benefit salmon and steelhead trout through a combination of measures, including increased spill at lower Columbia River and lower Snake River dams. The preferred alternative's flexible spill operation would spill more water for fish passage when power generation was less valuable and would spill less water when power generation was more valuable.²²² In addition, the preferred alternative included an adaptive management approach to implement new findings in future operations without a net reduction in fish or power benefits.²²³

Litigation and Administration Actions Following the 2020 Record of Decision

After the action agencies issued the 2020 ROD, NWF and the other plaintiffs in existing litigation over Columbia River System operations filed an eighth supplemental complaint in January 2021 seeking review of the 2020 BiOp, the Columbia River System Operations EIS, and the 2020 ROD.²²⁴ The complaint alleged violations of the ESA, the APA, and NEPA.²²⁵ (Plaintiffs included Tribes, as discussed in the text box below.)

²¹⁹ NMFS, *Biological Opinion for Operation and Maintenance of the Fourteen Multiple-Use Dam and Reservoir Projects in the Columbia River System*, July 24, 2020, <https://www.fisheries.noaa.gov/resource/document/biological-opinion-operation-and-maintenance-fourteen-multiple-use-dam-and->

²²⁰ USACE, Reclamation, and BPA, *2020 EIS*.

²²¹ BPA, "Record of Decision; Columbia River System Operations Environmental Impact System," 85 *Federal Register* 63834, October 8, 2020, <https://www.govinfo.gov/content/pkg/FR-2020-10-08/pdf/2020-22147.pdf>.

²²² The preferred alternative also required a study to evaluate the potential benefits and unintended consequences of significantly higher spill levels.

²²³ *Adaptive management* is the process of incorporating new scientific and programmatic information into the implementation of a project or plan to ensure the activity's goals are being reached efficiently. It promotes flexible decision-making to modify existing activities or create new activities if new circumstances arise (e.g., new scientific information) or if projects are not meeting their goals.

²²⁴ Eighth Supplemental Complaint for Declaratory and Injunctive Relief, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. Jan. 20, 2021). In addition to the NWF, the plaintiffs to the Eighth Supplemental Complaint include American Rivers, Pacific Coast Federation of Fishermen's Associations, Institute for Fisheries Resources, Sierra Club, Idaho Rivers United, Northwest Sportfishing Industry Association, NW Energy Coalition, Columbia Riverkeeper, and Idaho Conservation League, with the State of Oregon joining as an intervenor-plaintiff. The complaint is filed against the federal defendants, which are the NMFS, USACE, and Reclamation, with Northwest Irrigation Utilities, Public Power Council, Columbia-Snake River Irrigators Association, Washington State Farm Bureau Federation, Franklin County Farm Bureau Federation, Grant County Farm Bureau Federation, Northwest River Partners, Clarkston Golf & Country Club, Confederated Salish and Kootenai Tribes, the State of Montana, Inland Ports and Navigation Group, Kootenai Tribe of Idaho, and the State of Washington joining as intervenor-defenders.

²²⁵ Eighth Supplemental Complaint for Declaratory and Injunctive Relief, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. Jan. 20, 2021).

2023 Memorandum of Understanding and Litigation Stay

On October 21, 2021, the parties filed a joint request to stay the litigation while they engaged in settlement discussions.²²⁶ The request to stay included an agreement for short-term operations of the Columbia River System that modified how long certain dams provide increased spill for fish passage. The court granted the stay and ordered the agencies to operate the dams pursuant to the short-term operations agreement.²²⁷ While litigation was stayed, the Council on Environmental Quality (CEQ) engaged the Federal Mediation and Conciliation Service to facilitate dialogue with states, Tribes, and stakeholders in the region participating in the mediation.²²⁸

On September 27, 2023, President Biden signed a presidential memorandum (2023 Presidential Memorandum) that established the following points as federal policy for the Columbia River Basin:²²⁹

- Honoring the federal trust responsibility (including upholding tribal treaty rights);
- Restoring native fish populations;
- Securing a clean and resilient energy future;
- Supporting local agriculture; and
- Investing in communities.

The 2023 Presidential Memorandum directed federal agencies to assess, utilize, and prioritize their authorities and available resources to advance the policy, including the restoration of salmon, steelhead trout, and other native fish populations in the Columbia River Basin.²³⁰ The memorandum also directed the Chair of CEQ and the Director of the Office of Management and Budget to “explore opportunities and mechanisms to develop an intergovernmental partnership, including through a memorandum of understanding, to advance the policy.”²³¹

On December 14, 2023, NWF and other nonprofit plaintiffs, Oregon, Washington, four tribal groups, and the federal defendants (together, the *moving parties*) filed a joint motion requesting a new stay of the litigation for five years to implement an executed MOU, also referred to by some as the Resilient Columbia Basin Agreement.²³² Signed by the moving parties, the MOU stated that federal agencies agreed to implement the federal government’s commitments—consistent with the presidential memorandum and in partnership with Tribes, states, and other stakeholders

²²⁶ NWF v. NMFS, No. 3:01-CV-00640 (D. Or. Oct. 21, 2021).

²²⁷ Term Sheet for Stay of Preliminary Injunction Motion and Summary Judgment Schedule, NWF et al. v. NMFS et al. (3:01-cv-00640-SI), Joint Motion for Summary Judgment Ex. 1, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. Oct. 21, 2021).

²²⁸ Mediation facilitated by the Federal Mediation and Conciliation Service is confidential to the participating litigation parties. However, regarding public input into the process, the Council on Environmental Quality (CEQ) hosted six listening sessions with stakeholder groups in 2022 and the Federal Mediation and Conciliation Service hosted three public listening sessions in 2023. CEQ also published “Columbia River Salmon and Other Native Fish Request for Information,” 88 *Federal Register* 28532, on May 4, 2023, and received over 72,000 comments. Testimony of Brenda Mallory, Chair of the CEQ, for the *Snake River Dam hearing*, January 30, 2024.

²²⁹ Executive Office of the President, “Restoring Healthy and Abundant Salmon, Steelhead, and Other Native Fish Populations in the Columbia River Basin,” 88 *Federal Register* 67617, October 10, 2023.

²³⁰ The memorandum directed the federal agencies to report their assessment to the Director of the Office of Management and Budget.

²³¹ Executive Office of the President, “Restoring Healthy and Abundant Salmon, Steelhead, and Other Native Fish Populations in the Columbia River Basin,” 88 *Federal Register* 67617, October 10, 2023.

²³² Joint Motion to Stay Litigation Through 2028, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. December 14, 2023).

in the region—“to make headway on the objectives in the CBRI” (see description of the CBRI in the text box below).²³³ The MOU further stated that the parties were to work together to consider modifications to the commitments if there was congressional action to authorize and fund dam breaching. The MOU included commitments for 10-year interim operations (2024-2033), specified in an Appendix to the MOU, for the four lower Snake River dams and the four lower Columbia River dams.²³⁴ The MOU also contained provisions that addressed collaboration and communication among parties, dispute resolution, termination and withdrawal from the MOU, and enforceability of the MOU, among other things.

Columbia Basin Restoration Initiative

Several Tribes and other entities in the Columbia River Basin attempted to influence development of the 2020 record of decision (ROD) for the Columbia River System; however, some claimed that the federal agencies provided little feedback about whether their comments and suggestions were incorporated in the analysis for the ROD. After the ROD was published, some of these Tribes and environmental groups pursued litigation, as outlined in “Litigation and Administration Actions Following the 2020 Record of Decision,” to address tribal and other concerns.

Four basin Tribes (the Confederated Tribes and Bands of the Yakama Nation, the Confederated Tribes of the Umatilla Indian Reservation, the Confederated Tribes of the Warm Springs Reservation, and the Nez Perce Tribe), and the States of Oregon and Washington collectively developed the Columbia Basin Restoration Initiative (CBRI) proposal as a basis for settlement discussions with the federal government. The CBRI proposal states that it is a framework aimed at “restoring salmon and steelhead with other native species and their habitats and investing in fisheries infrastructure.” The CBRI proposal also notes that it is aimed at “modernizing and investing in clean energy, agriculture, and transportation,” and its purpose includes “honoring federal commitments to tribes.”

The CBRI proposal outlines six objectives to be supported by “key elements and actions.” The first objective includes advancing a strategy to restore salmon and steelhead trout to “healthy and abundant levels” consistent with National Oceanic and Atmospheric Administration’s *Rebuilding Interior Columbia Basin Salmon and Steelhead* report. The CBRI proposal also states that its strategy also is to “complete the actions and investments necessary to secure continuity of services associated with Lower Snake River (LSR) restoration prior to LSR dam breaching.” The CBRI calls for a coordinated federal approach using all available authorities and funding to execute the initiative. The initiative notes that some of its objectives may require Congress to authorize activities and appropriate funds.

Sources: U.S. Army Corps of Engineers, Bureau of Reclamation, Bonneville Power Administration, “Executive Summary,” in *Columbia River System Operations Environmental Impact Statement*, 2020; Joint Motion to Stay Litigation Through 2028, Ex. A, *National Wildlife Federation v. National Marine Fisheries Service*, No. 3:01-CV-00640 (D. Or. December 14, 2023).

The moving parties stated that they had further agreed to request in 2028 to extend the stay for another five years if the MOU was still in place and the moving parties were continuing to work

²³³ Joint Motion to Stay Litigation Through 2028, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. December 14, 2023).

²³⁴ According to BPA, this includes shifting some summer spill to the spring and limiting summer spill to the end of July. BPA states that this will allow more flexibility in August, when the area usually experiences increased power demand. *Snake River Dam hearing*, January 30, 2024.

in partnership on Columbia River Basin restoration.²³⁵ On February 8, 2024, the court granted the motion to stay the litigation through December 13, 2028.²³⁶

The federal government's commitments in the MOU included various programs and activities to be implemented by the Executive Office of the President; the Departments of the Interior, Commerce, Army, Energy, Transportation, and Agriculture; and the EPA.²³⁷

Federal commitments attached to the MOU were to broadly address the following:

- Energy analyses and activities for developing a tribal energy program and accounting for replacement power in case Congress authorizes the lower Snake River dams to be breached (e.g., the Department of Energy would facilitate the development of at least 1-3 gigawatts of tribally sponsored “clean energy resources” such as renewable energy, energy efficiency, and electricity transmission);²³⁸
- Evaluations and plans for alternatives to replace the services provided by the lower Snake River dams (e.g., transportation, recreation, water supply) in case Congress authorizes them to be breached;²³⁹
- Improvements for salmon and steelhead trout populations, which include restoring habitat, conducting interim fish operations to improve stocks, management and contracting reforms to fish and wildlife mitigation programs,

²³⁵ The MOU includes an agreement not to litigate over the Columbia River System operations for a period of 10 years, so long as the MOU remains in effect. The moving parties agreed to internal monthly status briefings and information sharing. In addition, the moving parties committed to meeting annually to review implementation progress and jointly develop and post online an annual progress report. Joint Motion to Stay Litigation Through 2028, NWF v. NMFS, No. 3:01-CV-00640, at *5 (D. Or. December 14, 2023). Several parties opposed staying the litigation. Inland Ports and Navigation Group's Response in Opposition to Joint Motion to Stay Litigation Through 2028, NWF v. NMFS, No. 3:10-cv-00640 (D. Or. December 21, 2023); State of Idaho's Response in Opposition to Joint Motion to Stay Litigation Through 2028, NWF v. NMFS, No. 3:10-cv-00640 (D. Or. December 22, 2023); Intervenor-Defendant State of Montana's Notice of Joinder in Intervenor-Defendant/Counterclaimant State of Idaho's Response in Opposition to Joint Motion to Stay, NWF v. NMFS, No. 3:10-cv-00640 (D. Or. December 28, 2023); Intervenor-Defendant Public Power Council's Response to Joint Motion to Reinstate Stay of Litigation Through End of CY2028, NWF v. NMFS, No. 3:10-cv-00640 (D. Or. December 29, 2023); Northwest River Partners' Opposition to the Joint Motion to Stay Litigation and Reservation of Rights, NWF v. NMFS, No. 3:10-cv-00640 (D. Or. December 29, 2023).

²³⁶ Amended Order, NWF v. NMFS, No. 3:10-cv-00640 (D. Or. Feb. 8, 2024).

²³⁷ The MOU notes that modifications may be needed over time and that the moving parties commit to engaging in regular discussions to advance the federal government's commitments to support the Columbia Basin Restoration Initiative. Joint Motion to Stay Litigation Through 2028, Ex. A, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. December 14, 2023).

²³⁸ Three gigawatts are approximately equal to the combined nameplate capacity of the four Lower Snake River dams. In addition, the federal government commits to completing a regional energy needs planning process to inform meeting the region's energy goals and the specific resources capable of replacing the energy services of the lower Snake River dams. Testimony of Brenda Mallory, Chair of the CEQ, at *Snake River Dam hearing*, January 30, 2024. The White House, “Biden-Harris Administration Announces Ten-Year Partnership with Tribes & States to Restore Wild Salmon, Expand Clean Energy Production, Increase Resilience, and Provide Energy Stability in the Columbia River Basin,” December 14, 2023, <https://bidenwhitehouse.archives.gov/ceq/news-updates/2023/12/14/biden-harris-administration-announces-ten-year-partnership-with-tribes-states-to-restore-wild-salmon-expand-clean-energy-production-increase-resilience-and-provide-energy-stability-in-the-col/>.

²³⁹ In late 2024, partnering federal agencies and nonfederal governments initiated studies regarding dam services: transportation, water supply, energy, and recreation. Components of some studies were subsequently published, while others were still in progress in early 2025. See footnote 248.

upgrades to fish hatcheries, evaluating water quality standards, and developing cold water refuges;²⁴⁰ and

- Ecosystem restoration through addressing ocean and estuary issues, water quality impacts, and fish passage improvements.²⁴¹

The federal commitment attachment to the MOU also outlined funding and authorities to implement the commitments. The Biden Administration stated that BPA would invest \$300 million over 10 years for some of these commitments (with an estimated BPA rate increase of 0.7%).²⁴² CEQ stated that the federal government would use previously appropriated funding from the Infrastructure Investment and Jobs Act (IIJA; P.L. 117-58), P.L. 117-169 (commonly referred to as the Inflation Reduction Act; IRA), annual appropriations, and BPA revenues to implement commitments in the MOU.²⁴³

Following the announcement of the MOU, the Biden Administration, in coordination with the moving parties, undertook various activities toward fulfilling the federal commitments.²⁴⁴ The following is a list of selected deliverables and activities as reported through mid-January 2025.

- Implementation of negotiated dam operations (e.g., spill and generation schedules);
- Crosscut budgets showing allocations of annual, IIJA, and IRA appropriations toward the commitments;²⁴⁵
- Increased fish restoration funding and publication of a NOAA 10-Year Mid-Columbia River Restoration Plan;²⁴⁶
- DOE replacement energy accounting framework and BPA preliminary rate agreement;²⁴⁷
- Progress on replacement studies characterizing the current status of the services the dams provide and how they could be replaced;²⁴⁸ and

²⁴⁰ Actions also include supporting other native fish in the Columbia River Basin such as sturgeon, bull trout, and sea lamprey.

²⁴¹ Commitments for fish passage improvements include funding for culvert removals and analysis of removing the nonfederal Enloe dam, which is located on the Similkameen River near the Canadian border.

²⁴² Of this amount, BPA will provide \$200 million to fund FWS for Lower Snake River Compensation Plan for hatchery modernization, upgrades, and maintenance, and \$10 million annually to the four tribal groups, Oregon, and Washington for fish restoration projects.

²⁴³ During her testimony, CEQ Chair Brenda Mallory stated that “the agreement does not commit dollars that have not already been appropriated.” *Snake River Dam hearing*, January 30, 2024.

²⁴⁴ Northwest Power and Conservation Council Meeting, *The Columbia Basin Restoration Initiative and Responsive USG Commitments*, January 14, 2025, https://www.nwccouncil.org/fs/19029/2025_01_3.pdf.

²⁴⁵ Office of Management and Budget (OMB), *Columbia River Salmon Budget Crosscut*, July 25, 2024, <https://bidenwhitehouse.archives.gov/wp-content/uploads/2024/07/OMB-Columbia-River-Salmon-Budget-Crosscut-July-2024.pdf>; OMB, *Columbia River Salmon Budget Crosscut Addendum*, December 2024, <https://bidenwhitehouse.archives.gov/wp-content/uploads/2024/12/OMB-Columbia-River-Salmon-Budget-Crosscut-Addendum-December-2024.pdf>.

²⁴⁶ NMFS, *Final Mid-Columbia River Restoration Plan*, December 13, 2024, https://salmonrecovery.gov/docs/mid_columbia_plan-508.pdf.

²⁴⁷ BPA, Preliminary Rate Assessment, <https://docs.house.gov/meetings/IF/IF03/20240130/116786/HHRG-118-IF03-Wstate-TakalaJ-20240130-SD023.pdf>.

²⁴⁸ Pursuant to the MOU, certain federal agencies, in partnership with nonfederal entities, began studies on how services the dams provided might be replaced, if the dams were removed. Reclamation and the Washington Department of Ecology contracted with Jacobs Engineering Group Inc., and other contractors to perform a technical analysis of (continued...)

- DOI report on impacts of the dams on Tribes and recommendations to further the federal government trust's responsibility.²⁴⁹

Trump 2025 Presidential Memorandum and Resumption of Litigation

On June 12, 2025, President Trump issued a memorandum revoking the 2023 Presidential Memorandum and directing the Secretaries of Commerce and Energy and the Assistant Secretary of the Army for Civil Works (ASACW) to take all appropriate steps to withdraw from the MOU.²⁵⁰ The President also directed USACE and Reclamation to rescind a “Notice of Intent to Prepare a Supplemental Environmental Impact Statement (SEIS) for the Columbia River System Operations” published in the *Federal Register* on December 18, 2024.²⁵¹ Those agencies are to develop a new schedule to complete a Columbia River SEIS, as appropriate, and reissue the Notice of Intent pursuant to that schedule and in alignment with any updated NEPA procedures.²⁵² On June 24, 2025, the federal agencies provided official notice of the United States’ withdrawal

water supply replacement options. For more information, see “Lower Snake River Water Supply Replacement Study,” https://web.archive.org/web/20250116012001/https://www.usbr.gov/pn/fcrps/lrsws/LSR_Water_Supply_Replacement_Study_FINAL_DRAFT_508.pdf. DOE’s Grid Deployment Office and the Washington State Department of Commerce funded the Pacific Northwest National Laboratory to conduct a study designed to identify resource development and infrastructure investment options available to address the energy needs and priorities of the Northwest. For more information, see DOE, “DOE Launches Pacific Northwest Regional Energy Planning Study to Explore Solutions to Energy Planning Challenges,” <https://www.energy.gov/gdo/articles/doe-launches-pacific-northwest-regional-energy-planning-study-explore-solutions-energy>. USACE and the Washington State Recreation and Conservation Office conducted a survey to inform a report on recreation. For more information, see “Lower Snake River recreation study,” <https://snakeriverrecreation.com/>. In addition, Washington State Department of Transportation is conducting a transportation study through several phases; phase 1, Understanding Needs, was completed in spring of 2025. For more information, see “Lower Snake River Dams Transportation Study,” <https://wsdot.wa.gov/construction-planning/search-studies/lower-snake-river-dams-transportation-study>.

²⁴⁹ DOI, “Biden-Harris Administration Releases Report Highlighting Historic and Ongoing Negative Impacts of Federal Columbia River Dams on Tribal Communities,” June 18, 2024, <https://www.doi.gov/pressreleases/biden-harris-administration-releases-report-highlighting-historic-and-ongoing>. DOI, *Historic and Ongoing Impacts of Federal Dams on the Columbia River Basin Tribes*, June 2024, <https://turtletalk.blog/wp-content/uploads/2025/09/tribal-circumstances-analysis.pdf>.

²⁵⁰ Executive Office of the President, “Stopping Radical Environmentalism to Generate Power for the Columbia River Basin,” June 12, 2025, <https://www.whitehouse.gov/presidential-actions/2025/06/stopping-radical-environmentalism-to-generate-power-for-the-columbia-river-basin/>.

²⁵¹ USACE and Reclamation, “Notice of Intent To Prepare a Supplemental Environmental Impact Statement (SEIS) for the Columbia River System Operations,” 89 *Federal Register* 102869, December 18, 2024.

²⁵² USACE and Reclamation are to submit the schedule to the Chair of CEQ, who is to convene regular meetings with the agencies and any additional appropriate federal stakeholders for updates on the status of the environmental review process. On January 29, 2025, Executive Order (EO) 14154, “Unleashing Energy Dominance,” directed CEQ to provide guidance on implementing NEPA and to propose rescinding CEQ’s NEPA regulations “to expedite and simplify the permitting process.” 90 *Federal Register* 8353, January 29, 2025, p. 8355. The EO directed the Chair of CEQ to ensure the guidance and any subsequent regulations would “expedite permitting approvals and meet deadlines established in the Fiscal Responsibility Act of 2023 [FRA] (P.L. 118-5).” 90 *Federal Register* 8353, p. 8355. The EO further directed that “all agencies must prioritize efficiency and certainty over any other objectives ... that do not align with the policy goals” of the EO “or that could otherwise add delays and ambiguity to the permitting process.” 90 *Federal Register* 8353, p. 8355. On February 19, 2025, CEQ issued the required guidance, which directs federal agencies to establish or revise their NEPA procedures consistent with (1) the FRA, which had amended the NEPA statute; EO 14154; and CEQ’s guidance. Katherine R. Scarlett, Chief of Staff, CEQ, “Implementation of the National Environmental Policy Act,” February 19, 2025, <https://ceq.doe.gov/docs/ceq-regulations-and-guidance/CEQ-Memo-Implementation-of-NEPA-02.19.2025.pdf>. On February 25, 2025, CEQ issued an interim final rule that rescinded all CEQ NEPA regulations effective April 11, 2025. CEQ, Removal of National Environmental Policy Act Implementing Regulations, 90 *Federal Register* 10610, February 25, 2025.

from the MOU, effective immediately.²⁵³ On July 7, 2025, USACE and Reclamation withdrew the notice of their intent to prepare the SEIS.²⁵⁴

On July 17, 2025, the nonfederal parties to the MOU notified the court of the June 12, 2025, presidential memorandum, the federal defendants' withdrawal from the MOU, and the withdrawal of the notice of intent to prepare the SEIS.²⁵⁵ On September 11, 2025, the plaintiffs filed a motion to lift the stay and resume litigation, which the court granted the same day.²⁵⁶ Accordingly, the litigation over the 2020 BiOp, EIS, and ROD resumed.

In October 2025, the plaintiffs asked the court for a preliminary injunction that would direct certain modifications to Columbia River System operations beginning in the spring of 2026.²⁵⁷ On March 2, 2026, the court granted in part the plaintiffs' requested preliminary injunction.²⁵⁸ In finding that the plaintiffs were likely to succeed on the merits—one of the four factors under the Supreme Court's framework in *Winter v. Natural Resources Defense Council*²⁵⁹ for determining whether to issue a preliminary injunction—the court identified “at least four reasons” the plaintiffs were likely to succeed in their claims that the 2020 BiOp and ROD violated the ESA.²⁶⁰ Specifically, the court concluded that the federal defendants in carrying out their jeopardy analysis had (1) employed a “flawed analytic approach” by using the incorrect environmental baseline—focusing only on how the operations were changing rather than operations as a whole; (2) relied on mitigating benefits that were insufficiently certain to occur; (3) failed to adequately account for climate change; and (4) focused on survival of the species without considering metrics needed to assess recovery, such as by relying on positive survival metrics related to population growth without assessing the species' starting population size and status.²⁶¹ Finding that the other three factors—likelihood of irreparable harm, the public interest, and the balance of the equities—were similarly met, the court determined that the plaintiffs were entitled to preliminary relief.²⁶²

While agreeing that the plaintiffs were entitled to relief, the court declined to grant some forms of relief requested by the plaintiffs—namely infrastructure repairs and maintenance activities and certain conservation measures unrelated to Columbia River System operations—and tailored the remaining requests for measures related to spill and reservoir levels to address more immediate risks of harm.²⁶³ The preliminary injunction generally retains spill and reservoir levels as set out

²⁵³ See https://www.energy.gov/sites/default/files/2025-06/Columbia%20River%20MOU%20Letter_6242025%201.pdf.

²⁵⁴ USACE and Reclamation, “Withdrawal of the Notice of Intent To Prepare a Supplemental Environmental Impact Statement (SEIS) for the Columbia River System Operations,” 90 *Federal Register* 29854, July 7, 2025.

²⁵⁵ Notice, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. July 17, 2025).

²⁵⁶ Joint Motion to Lift Stay, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. September 11, 2025).

²⁵⁷ Oregon's 2025 Motion for Preliminary Injunction and Supporting Memorandum, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. Oct. 14, 2025); NWF's Motion for Preliminary Injunction and Memorandum in Support, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. Oct. 14, 2025).

²⁵⁸ Amended Opinion and Order, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. March 2, 2026); Amended Preliminary Injunction Order, NWF v. NMFS, No. 3:01-CV-00640 (D. Or. March 3, 2026).

²⁵⁹ 555 U.S. 7, 20 (2008).

²⁶⁰ Amended Opinion and Order, NWF v. NMFS, No. 3:01-CV-00640, at 15-16 (D. Or. March 2, 2026).

²⁶¹ Amended Opinion and Order, NWF v. NMFS, No. 3:01-CV-00640, at 16-30 (D. Or. March 2, 2026).

²⁶² Amended Opinion and Order, NWF v. NMFS, No. 3:01-CV-00640, at 38-39 (D. Or. March 2, 2026).

²⁶³ Amended Opinion and Order, NWF v. NMFS, No. 3:01-CV-00640, at 40-45 (D. Or. March 2, 2026). The court, however, did order the federal government to report to the court quarterly on progress made in respect to certain conservation commitments. Amended Opinion and Order, NWF v. NMFS, No. 3:01-CV-00640, at 45 (D. Or. March 2, 2026).

in the 2025 fish operations plan.²⁶⁴ In its opinion, the court noted that the federal government's draft 2026 fish operations plan would have reduced spill further than levels set in the 2020 NMFS BiOp, and that this reduced spill would result in increased juvenile powerhouse passage and increased bypass encounters.²⁶⁵ The government has appealed the preliminary injunction order to the U.S. Court of Appeals for the Ninth Circuit.²⁶⁶

Congressional Considerations

The various administrative or legislative options for how to operate the federal dams in the Columbia River System, and in particular the lower Snake River dams, typically entail tradeoffs between the benefits that the dams provide and certain benefits to the ecosystems and species found there, including promotion of the recovery of ESA-listed fish populations. The tradeoffs involved in operating federal dams for their authorized project purposes while conserving listed species and other ecological resources are not unique to the Columbia River Basin. Other federal projects, such as the Central Valley Project in California and the Willamette Valley Project in Oregon, have similarities to the projects in the Columbia River Basin.²⁶⁷ Operating for authorized project purposes under environmental stresses, such as drought conditions, may constrain the quality and quantity of water available for aquatic species, including listed species and species of particular importance to local communities such as Tribes.

Action agencies regularly adjust project operations in an effort to balance competing uses, and these adjustments often lead to litigation. Against the backdrop of litigation and the uncertainty it brings to operations, some Members of Congress and some stakeholders have sought other potentially more sustainable or predictable solutions. The MOU for the Columbia River System and associated CBRI under the Biden Administration, paired with a long-term stay of the litigation while the MOU was to be implemented, was a new approach to some of these issues. Others have proposed a more direct approach, such as authorizing the removal of one or more of the lower Snake River dams. The current Trump Administration has withdrawn from the MOU. In addition, interest groups supporting the dams oppose dam removal as well as implementation of certain activities that were included in the MOU. As Congress and other stakeholders consider how to address Columbia River System operations, including the lower Snake River dams, they may also consider the precedential impact of the solutions they select on similar federal projects.

²⁶⁴ Amended Opinion and Order, *NWF v. NMFS*, No. 3:01-CV-00640, at 40-43 (D. Or. March 2, 2026). Some changes from the 2025 fish operations plan include more fall and winter spill and full summer spill duration, instead of a reduced August spill. The court did order flexibility for the federal government to adjust spills and reservoir levels for emergency power generation and transportation needs. For more information on the 2025 fish operations plan, see USACE Northwestern Division, *Fish Operations Plan Implementation Report*, April 2025, https://public.crohms.org/tmt/documents/FOP_Implementation_Reports/Older/2025_04_FOP-Implementation-Report_Final.pdf.

²⁶⁵ Amended Opinion and Order, *NWF v. NMFS*, No. 3:01-CV-00640, at 31-32, 39-40 (D. Or. March 2, 2026). The Fish Passage Center stated that these changes are associated with slower fish travel times, lower juvenile survivals, and lower SARs. The Fish Passage Center also determined that spring spill under the draft 2026 fish operating plan would be a reduction from the 2017 Court Ordered Injunction.

²⁶⁶ *NWF v. Reclamation*, No. 26-2139 (9th Cir. April 8, 2026).

²⁶⁷ For more information on the Central Valley Project, CA, see CRS Report R45342, *Central Valley Project: Issues and Legislation*, by Charles V. Stern, Pervaze A. Sheikh, and Erin H. Ward. For more information on the Willamette Valley Project, OR, see USACE, "About the Willamette Valley," <https://www.nwp.usace.army.mil/Locations/Willamette-Valley/Evaluation/>.

Selected Member Proposals and Legislation

Some Members of Congress have proposed various legislative options in recent Congresses related to the operations of federal dams in the Columbia River System, in particular the lower Snake River dams, and restoration measures for listed species in the Columbia River Basin. For example, in February 2021, Representative Mike Simpson released a \$33 billion proposal that included breaching the four lower Snake River dams and establishing a fund to support fish restoration and economic sectors affected by dam removal.²⁶⁸

In the 119th Congress, the House Natural Resources Subcommittee on Water, Wildlife, and Fisheries held a legislative hearing on H.R. 2073, which would prohibit the use of any federal funds to study the breach or functional alteration of the lower Snake River dams or for studies or technical assistance related to replacing the benefits that the dams provide.²⁶⁹ At the hearing, some opponents of the bill raised concerns about barring studies related to the dams benefits and operations.²⁷⁰ The bill also would bar any changes in spill operations at the lower Snake River dams unless approved by the Secretary of the Army and Administrator of BPA.²⁷¹ H.R. 626 and S. 182 also were introduced in the 119th Congress, which would direct the action agencies to “operate the FCRPS in a manner consistent with the reasonable and prudent alternative described” in the 2020 ROD. These bills would have allowed flexibility for the Secretaries of the action agencies to amend the operations in certain circumstances. They also would have required explicit authorization by federal statute to undertake any structural modification, action, study, or engineering plan that would restrict electrical generation at any FCRPS hydroelectric dam or limit navigation on the Snake River. Similar bills were introduced historically in prior Congresses. In addition, some bills in the 119th Congress propose expanding authorized lethal removals of pinnipeds to other portions of the Columbia River system and the Pacific Northwest (H.R. 9621) and/or including additional participants in these removals (H.R. 9621, H.R. 9637).²⁷²

Selected Issues and Questions for Congress

Litigation and the MOU. Litigation has resumed and is ongoing following the 2025 presidential memorandum and subsequent withdrawal from the MOU by the federal government. Litigation brings uncertainty as to how the Columbia River System will be operated going forward and makes it difficult to know when a resolution might be reached. Parties may reach a new agreement, or the court may render a decision. Congress may decide to wait for a court decision or agreement that resolves litigation, or enact legislation to address the issue. For example, Congress could address the operation of the federal dams in the Columbia River System or direct federal agencies to undertake, authorize, or fund other activities in the Columbia River Basin

²⁶⁸ See Rep. Mike Simpson, “The Columbia Basin Initiative,” https://simpson.house.gov/uploadedfiles/simpson_presentation_idaho.pdf. No legislation related to this proposal was introduced in the 117th or subsequent Congresses.

²⁶⁹ H.R. 7066 introduced in the 118th Congress included a similar provision, along with another provision that would bar federal funds to implement the CBRI, as proposed in the MOU.

²⁷⁰ U.S. Congress, House Natural Resources Committee, Water, Wildlife and Fisheries, *Legislative Hearing on H.R. 2073, H.R. 3692, H.R. 4255, H.R. 4256 and H.R. 4970 | Subcommittee on Water, Wildlife and Fisheries*, 119th Cong., 1st sess., September 3, 2025.

²⁷¹ H.R. 8157 introduced in the 118th Congress included a similar provision.

²⁷² On July 21, 2026, the House Natural Resources Subcommittee on Water, Wildlife, and Fisheries held a legislative hearing on H.R. 9621. U.S. Congress, House Natural Resources Committee, Water, Wildlife and Fisheries Subcommittee, *Legislative Hearing on H.R. 7332, H.R. 7466, H.R. 8876 and H.R. 9621*, 119th Cong., 2nd sess., July 21, 2026.

related to the ecological resources or benefits provided by the dams. Some questions Congress may consider are as follows:

- How are the statutory authorities governing dam operations prioritizing and balancing the use of resources in the Columbia River Basin? Are there ways Congress could reprioritize the use of resources to better achieve its goals for the region and the Columbia River System?
- What role does Congress want courts, federal agencies, and nonfederal stakeholders to play in determining how to operate federal dams in the Columbia River System?
- How might any potential approaches to long-term prioritization and use of resources in the Columbia River System inform efforts to address resource-balancing challenges for other water projects and similar infrastructure systems? How would these approaches and potential precedential effects differ based on the extent to which they were legislatively created, administratively crafted, or court directed?

Federal Actions Regarding the MOU. President Trump’s memorandum directed federal agencies to withdraw from the MOU, a multiyear agreement for operating the Columbia River System, while implementing federal commitments in support of the CBRI. Some questions that Congress might consider include the following:

- How could Congress conduct oversight or provide direction over withdrawal from the MOU? What are the potential effects of withdrawing from the MOU, including effects, if any, on populations of ESA-listed species?
- Should Congress consider enacting in law the MOU or parts of the MOU? If so, what parts of the MOU should be included in law?
- Outside of efforts outlined in the MOU, what is the appropriate level of federal expenditure to maintain benefits provided by the lower Snake River dams, including during droughts or periods of low water quality?

Restoring Fish Populations. Dams and other factors affect several species of Snake River fishes listed as threatened or endangered (see “Factors Affecting Snake River Salmon and Steelhead Trout Populations”). Congress may consider the extent to which existing or additional restoration activities are needed to conserve populations to the point where listing is no longer necessary or to serve other purposes, such as supporting cultural practices or providing economic benefits. Some questions Congress may consider are as follows:

- What are the potential benefits and challenges of restoring fish populations in the Basin to healthy and harvestable populations or restoring populations that no longer require listing under the ESA?
- What is the minimum level of investment and effort required to conserve and maintain the species such that they may be removed from the list of threatened and endangered species and remain delisted?
- Should Congress provide additional authorization and appropriations to restore ESA-listed fish and other native fish species in the Columbia River Basin, or are existing authorizations and appropriations sufficient?
- How can collaboration be increased among tribal, state, and private stakeholders to address fish populations, and what are the potential benefits or challenges of

creating a new collaborative entity to address fish populations (e.g., task force or advisory committee)?

Dam Removal. Congress might have a role in investigating, authorizing, and funding lower Snake River dam removal, or prohibiting such actions. Congress might consider several questions, including the following:

- What is the appropriate federal role in (1) studying the benefits and costs provided by the lower Snake River dams and (2) replacing benefits if dams are removed? Should Congress enact legislation to direct such roles?
- What does the best available science say about the impact of lower Snake River dam removal on ESA-listed species, and is there a need for further studies? How will factors other than the presence or removal of dams (e.g., drought and water quality) affect fish populations, including ESA-listed species, in the short and long term?

Tribal Concerns. Certain Tribes in the Pacific Northwest reserved rights to continue hunting, fishing, or gathering on lands they ceded to the federal government by treaty. In the Columbia River Basin, some Tribes advocate for changing dam operations to benefit salmon and for restoring salmon habitat, including four Tribes that created the CBRI along with two states. Several of these Tribes expressed disappointment when President Trump revoked the 2023 Presidential Memorandum and directed the federal withdrawal from the MOU.²⁷³ Some questions Congress may consider are as follows:

- What is the extent of the federal government's obligation to maintain federal trust and treaty rights to fish in the Columbia River System? How should the government balance tribal interests against other basin interests?
- Absent the 2023 Presidential Memorandum and MOU, how should DOI and other agencies support tribal management of fisheries and access to fish harvests?

²⁷³ U.S. Congress, House Natural Resources Committee, Water, Wildlife and Fisheries, Legislative Hearing on H.R. 2073, H.R. 3692, H.R. 4255, H.R. 4256 and H.R. 4970 | Subcommittee on Water, Wildlife and Fisheries, 119th Cong., 1st sess., September 3, 2025. Columbia River Inter-Tribal Fish Commission, "Statements on Trump Administration Withdrawal from Resilient Columbia Basin Agreement," June 12, 2025, <https://critfc.org/2025/06/12/21153/#:~:text=to%20official%20statement.-,Yakama%20Nation,innovative%2C%20holistic%20solutions%20we%20need.>

Author Information

Anna E. Normand, Coordinator
Specialist in Natural Resources Policy

Anthony R. Marshak
Analyst in Natural Resources Policy

Pervaze A. Sheikh, Coordinator
Specialist in Natural Resources Policy

John Frittelli
Specialist in Transportation Policy

Erin H. Ward, Coordinator
Coordinator of Research Planning/ALD

Megan Stubbs
Specialist in Agricultural Conservation and Natural
Resources Policy

Ashley J. Lawson
Specialist in Energy Policy

Elena H. Humphreys
Specialist in Environmental Policy

Mariel J. Murray
Specialist in Natural Resources Policy

Acknowledgments

Eric Nardi, Analyst in Natural Resources Policy, provided extensive research assistance.

Disclaimer

This document was prepared by the Congressional Research Service (CRS). CRS serves as nonpartisan shared staff to congressional committees and Members of Congress. It operates solely at the behest of and under the direction of Congress. Information in a CRS Report should not be relied upon for purposes other than public understanding of information that has been provided by CRS to Members of Congress in connection with CRS's institutional role. CRS Reports, as a work of the United States Government, are not subject to copyright protection in the United States. Any CRS Report may be reproduced and distributed in its entirety without permission from CRS. However, as a CRS Report may include copyrighted images or material from a third party, you may need to obtain the permission of the copyright holder if you wish to copy or otherwise use copyrighted material.