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Klamath River Basin: Background and Issues

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Summary

The Klamath River Basin on the California-Oregon border is a focal point for local and national discussions on water allocation and species protection. Previously, water and species management issues have exacerbated competition and generated conflict among several interests—farmers, Indian tribes, commercial and sport fishermen, federal wildlife refuge managers, environmental groups, and state, local, and tribal governments. As is true in many regions in the West, the federal government plays a prominent role in the Klamath Basin's waters. This role stems primarily from (1) operation and management of the Bureau of Reclamation's Klamath Water Project; (2) management of federal lands, including six national wildlife refuges; and (3) implementation of federal laws such as the Endangered Species Act.

Allocation of the Klamath Basin's water has been contentious in the past. Controversy peaked in 2001 when the federal government halted irrigation water deliveries to protect species listed as threatened under the federal Endangered Species Act. Later issues with basin fisheries exacerbated these conflicts. Efforts to permanently settle many of the basin's water and species issues began during the Bush Administration and were continued by the Obama Administration.

In 2010, the Secretary of the Interior and the governors of Oregon and California, along with multiple interest groups, announced two interrelated settlement agreements, supported by the federal government and signed by numerous other parties. These agreements are meant to address many of the previous conflicts in the basin. The first agreement, known as the Klamath Basin Restoration Agreement (KBRA), provides for restoration, water deliveries, and related actions, including a defined range of water supplies for Reclamation project users as well as projects to restore and protect threatened and endangered fish species. The second agreement, known as the Klamath Hydroelectric Settlement Agreement (KHSA), lays out a process for studies and a decision by the Secretary of the Interior regarding whether the removal of four dams in the Lower Klamath Basin (funded by power customers in Oregon and California, as well as the State of California) would be in the public interest. Together, removal of the dams would constitute one of the largest, most complex dam removal projects ever undertaken.

More than forty groups are signatories (or "parties") to the Klamath agreements, including the states of Oregon and California, three area tribes, Reclamation Project irrigators, environmental interests, and others. In addition to these parties, many who were not formally involved in negotiations also support the agreements. Opponents of the agreements include a subset of non-Reclamation project ("off-project") irrigators, as well as some other environmental groups, tribes, Siskiyou County in California, and other area residents. The Obama Administration has endorsed the Klamath agreements, but Congress has to formally authorize both agreements for the federal government to move forward with most of their actions.

Legislation currently before Congress (H.R. 3398 and S. 1851) would authorize the agreements, including approximately $800 million for federal actions (mostly in the KBRA). Considerations related to the Klamath agreements may include whether the federal government is obligated to act beyond current activities in the Klamath Basin (and, if so, to what extent) and what specific strategies should be authorized.

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Introduction

The Klamath River Basin, a region along the California-Oregon border, has become a focal point for local and national discussions on water and species management.[1] Water management issues were brought to the forefront when severe drought conditions in 2001 exacerbated competition for scarce water resources and generated conflict among several interests—farmers, anglers (commercial and sport), other recreationists, federal wildlife refuge managers, environmental organizations, and state, local, and tribal governments. Subsequent issues with Klamath Basin fisheries, including events in 2002 and 2006, exacerbated these conflicts.

As is true in many regions in the West, the federal government plays a prominent role in the Klamath Basin's water management. This role stems from (1) operation and management of the Bureau of Reclamation's Klamath Water Project; (2) management of federal lands in the basin, including several national wildlife refuges managed by the Fish and Wildlife Service (FWS); and (3) implementation of federal laws, such as the Endangered Species Act (ESA), Clean Water Act (CWA), and National Environmental Policy Act (NEPA).

The Klamath Basin Restoration Agreement (KBRA) and the Klamath Hydroelectric Settlement Agreement (KHSA), collectively referred to as the "Klamath agreements" in this report, aim to settle many of the outstanding issues in the basin. The agreements were signed in 2010 by more than 40 groups, including state and non-federal interests. The KBRA defines limits to water allocations for irrigators and wildlife refuges under a range of conditions, and lays out restoration actions, monitoring and other actions that aim to recover fish species and provide economic stability for basin tribes. The KHSA lays out a process that could lead to removal of four non-federal hydroelectric dams currently owned and operated by a private entity. Under the KHSA, the Secretary of the Interior determines whether removal of these dams is in the public interest.

Congress has oversight over federal activities in the Klamath and has held hearings and appropriated funding to address issues in the Klamath Basin. In the past, congressional debate has focused on the role of the ESA in water management, the operation of the Klamath Project, and other topics, such as supplemental support for parties impacted by federal policies. Current congressional consideration is likely to focus on the agreements themselves. The agreements require congressional authorization to move forward on some of their most important components, which may result in Congress revisiting previous questions, as well as new ones.

Background on the Klamath Basin

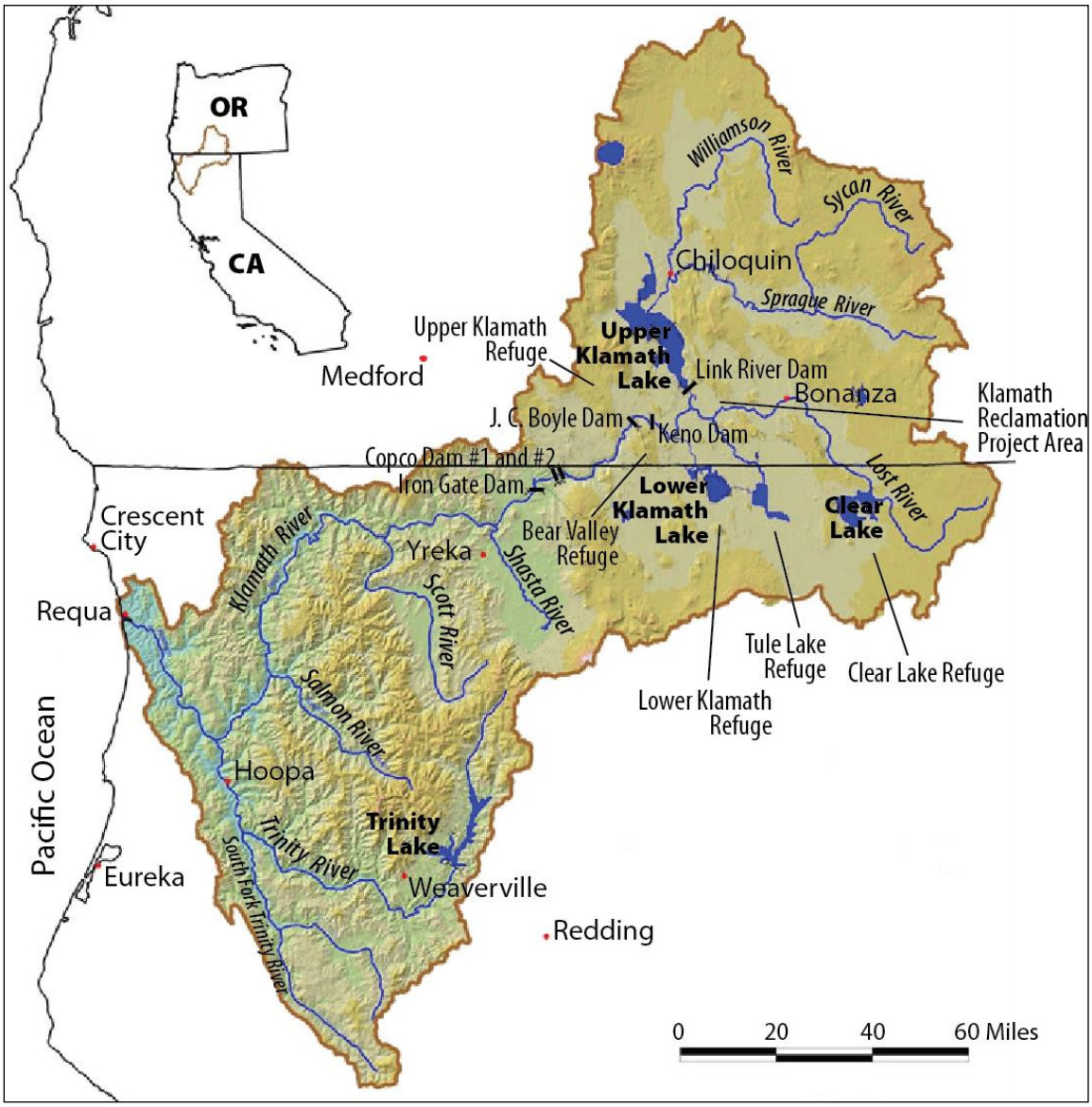
The Klamath River Basin (also referred to in this report as the Klamath Basin) drains approximately 16,000 square miles in Oregon and California. It drains into the Klamath River, which originates in southern Oregon and travels 253 miles before emptying into the Pacific Ocean near Crescent City, California. Combined with the Trinity River, the system is the largest in the western United States other than the Sacramento and Columbia rivers in terms of flow and salmon production.[2] However, the basin is also a sparsely populated area with some of the lowest per-capita incomes in either state. The total population is approximately 287,000, and total

[1] See **Figure 1** for a map of the basin. For the purposes of this report, the area referred to as the "Klamath River Basin" also includes the Lost River Basin.

[2] National Academy of Sciences, National Research Council. *Hydrology, Ecology, and Fishes of the Klamath River Basin*, Washington, DC, 2008, p. 31. Hereinafter referred to as the 2008 NRC Report.

economic output in the basin was approximately $10 billion as of the late 1990s.[3] Native American tribes account for 6% (15,000) of the basin's total population.

Figure 1. Klamath River Watershed



Source: Bureau of Reclamation, adapted by CRS.

For water management purposes, the Klamath Basin is divided into two distinct subbasins. The Upper Basin lies upriver and east of Iron Gate Dam on the Klamath River, and contains Oregon's largest lake, Upper Klamath Lake. The Lower Basin includes nearly 200 miles of the Klamath

[3] In 1998, the Upper Basin produced approximately $4 billion in total output, while the Lower Basin produced $5.9 billion in output. National Academy of Sciences, National Research Council, *Endangered and Threatened Fishes in the Klamath River Basin: Causes of Decline and Strategies for Recovery* (Washington, DC: 2004). p. 52. Hereinafter referred to as the 2004 NRC Report.

River between Iron Gate Dam and the Pacific Ocean. Both basins contain smaller lakes, tributaries, and wildlife refuges that also play an important role in water allocation.

Upper Klamath Basin

The Upper Klamath Basin is an area with limited water resources. It represents approximately 50% (8,060 square miles) of the Klamath Basin land area, but accounts for only 12% of its water runoff.[4] Upper basin issues center largely around Upper Klamath Lake (UKL), a large, shallow natural lake covering about 60,000 acres. UKL has an active storage capacity of approximately 500,000 acre feet. It is naturally eutrophic (i.e., high in nutrients) because of its shallow depth and natural sources of nutrients, and these conditions have worsened over the past century in part due to agricultural development.[5] As a result, the lake is now considered to be "hypereutrophic," a condition which can cause excessive algae blooms and, in some instances, harm fish and other resident species.

Management of Upper Basin water largely revolves around the Klamath Project, a federal project operated by the Bureau of Reclamation. The Klamath Project diverts Klamath and Lost River flows between Link River Dam, at the outlet of the UKL, and Keno Dam to the Southeast.[6] When it was built in 1905, the project (fed by the Klamath River) converted some lands and waters that had historically been fish habitat into farmland. Today it provides irrigation water for approximately 210,000 acres in the Upper Basin, including an estimated 1,400 farms.[7] The Klamath Project is different from other Reclamation projects because of its reliance on UKL, a natural lake, for project storage. Because of the shallowness of UKL, it is it difficult to store significant amounts of water for irrigation from year to year. As a result, the project is highly dependent on annual precipitation and snowmelt for its water supply. Additionally, in contrast to some Reclamation Projects, there is no hydroelectric component to the Klamath Project, which means that irrigators must look elsewhere for low-cost power for irrigation pumping.[8]

Irrigated lands in the upper basin also include approximately 180,000 acres of lands that are not dependent on the Klamath Project for deliveries. This land is located predominantly around the northern part of UKL and on the surrounding tributaries of the Sprague, Williamson, and Wood rivers. Irrigators operating in these areas are often referred to as "off-project" irrigators.

Agriculture is a major part of the Klamath Basin's economy. Major crops supported by irrigation in the Upper Basin include wheat, malt barley, potatoes, onions, and alfalfa. According to Reclamation, crops watered by the Klamath Project had an estimated annual value of $156 million in 2007.[9] On off-project lands, water is mainly used to maintain pastures and forage crops.

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[4] 2008 NRC Report, p. 25.

[5] According to the Oregon Lakes Association, the average depth of UKL is 4.2 meters (or approximately 14 feet). The average surface elevation of UKL is 1262 meters, or 4140 feet above sea level. The USGS provides a more detailed description of the lake's water quality levels, including historic trends, at http://or.water.usgs.gov/klamath/.

[6] Farms on the eastern part of the project also draw water from Gerber and Clear Lake reservoirs.

[7] Different acreage estimates have been reported for the Project. Although Reclamation reports 210,000 acres of irrigable lands for the project, actual crop land irrigated is usually less than this amount. For instance, Reclamation reported that 191,592 acres were irrigated in 2008. Project details are available at http://www.usbr.gov/projects/Project.jsp?proj_Name=Klamath%20Project&pageType=ProjectDataPage#Group531045 . Hereinafter Klamath Project Data.

[8] In this case, prior to 2006, irrigators received low cost power from the Klamath Hydroelectric Project, under an arrangement between the owners of these private dams, the Bureau of Reclamation, and Klamath irrigators.

[9] Klamath Project Data. Available at http://www.usbr.gov/projects/Project.jsp?proj_Name=Klamath+Project.

In the late 1990s it was estimated that agriculture accounted for 10% of the jobs and 7.3% of the direct economic activity in the region. As the region's largest industry, agricultural activity also supports other economic sectors.

The Upper Klamath Basin also includes six wildlife refuges near the Klamath Project, collectively referred to as the Klamath Basin National Wildlife Refuge Complex (or "Klamath Refuges").[10] These refuges contain wetlands that are major stopping points for approximately three-quarters of migratory birds on the Pacific Flyway.[11] Additionally, a portion of the irrigation water from the Klamath Project is used downstream to provide water to the Lower Klamath National Wildlife Refuge (NWR) and the Tule Lake NWR, lands that were included as part of the original Klamath Project but that were subsequently converted. (See **Figure 1**.) These refuges also have a unique agreement (known as "lease-land farming") in which parts of the refuge are leased out for farming.[12]

Two species of Upper Basin fish are listed as endangered under the Endangered Species Act (ESA) and figure prominently into water allocation debates (see **Appendix A**). The Lost River and shortnose suckers both live in UKL and were once plentiful enough to support commercial fisheries.[13] After steep declines during the last half of the 20th century, they were listed under the Endangered Species Act in 1988.[14] Their decline has been attributed to factors such as poor water quality, habitat loss and degradation, dams on UKL tributaries, and entrainment in irrigation diversions. Suckers are particularly important to the Klamath Tribe, who use the fish for ceremonial purposes, but historically relied on the fish for sustenance. Upper Basin tribes and recreational anglers also reportedly used to catch salmon. However, Iron Gate Dam, constructed in 1962, permanently blocked upstream passage of salmon. Previous studies by government biologists have concluded that historically, significant runs of Chinook and coho salmon existed north of Iron Gate Dam and on the tributaries of Upper Klamath Lake, although some dispute these conclusions.[15]

Lower Klamath Basin

The Lower Klamath Basin lies below and west of Iron Gate Dam. The Klamath River at this point runs unobstructed to the Pacific Ocean. Where the Lower Basin represents approximately half (7,470 square miles) of the basin's land area, it is the origin of 88% of its runoff.[16] Much of this water flows into the Lower Klamath from four tributaries: the Shasta, Scott, Salmon, and Trinity rivers.

As in the Upper Basin, agriculture is a prominent activity in the Lower Basin. In particular, irrigated agriculture uses water from the Shasta, Scott, and Trinity rivers.[17] The number of Lower

[10] The refuges are Upper Klamath, Lower Klamath, Tule Lake, Clear Lake, Bear Valley, and Klamath Marsh (located on the Williamson River).

[11] Federal biologists estimate that 1 to 2 million birds use these refuges.

[12] Approximately 22,000 acres within the refuges are leased for agricultural purposes. This arrangement was made permanent by Congress in the Kuchel Act of 1964 (P.L. 88-567).

[13] Although suckers live in lakes, both species migrate to tributaries to spawn.

[14] Since this time, Reclamation has had to consult with FWS on the operation of the Klamath Reclamation Project.

[15] J. Hamilton et al., "Distribution of Anadromous Fishes in the Upper Klamath River Watershed Prior to Hydropower Dams—A Synthesis of the Historical Evidence," *Fisheries*, vol. 30, no. 4 (2005).

[16] *2004 NRC Report*, p. 52.

[17] Unlike the Klamath Project on Upper Klamath Lake, these diversions are not associated with a federal reclamation project.

Basin farms and their associated production value, however, are less than half of that found in the Upper Basin.[18] In addition to agriculture, much of the acreage in the Lower Basin is managed by the U.S. Forest Service for multiple purposes (e.g., timber production, recreation, fish and wildlife habitat, etc.).

The Lower Klamath River provides habitat for 13 anadromous fish species, including three species of salmon: coho salmon, Chinook salmon, and steelhead (see **Appendix A**).[19] Below Iron Gate Dam, the Klamath River is inhabited by the Southern Oregon/Northern California Coast population of coho, which has declined significantly since the mid-20th century.[20] Coho were listed as threatened under the ESA in 1997.[21] While coho are the only Lower Basin salmonid currently listed under the ESA, a petition to list the Upper Klamath and Trinity Rivers Chinook salmon evolutionarily significant unit (ESU) was submitted to the National Marine Fisheries Service (NMFS) in January 2011.[22] Listing alternatives include listing the entire ESU (both fall and spring runs), listing the spring run as a separate ESU, or listing the spring run as a distinct population segment within the ESU.[23] NMFS announced that the petition warranted review, and a finding as to whether a listing as threatened or endangered is warranted is expected in early 2012. The Klamath is inhabited by a significant fall run of Chinook salmon, although this population is thought to be a fraction of the historical run.[24] Winter and summer runs of steelhead also inhabit most of the Klamath basin below Iron Gate Dam. Although steelhead have also declined to a fraction of their former population size, the population is not considered to be in danger of extinction.[25]

Salmon are an important resource for tribes in the Lower Basin, including the Yurok, Hoopa Valley, and Karuk. In the late 1980s, the Yurok's commercial fishery harvest represented a direct value to the tribe of $3 million and additional income to the region's businesses.[26] The Hoopa Valley and Yurok tribes also reported significant catches over this time period. These tribes, which have rights to 50% of the total allowable harvest of Chinook salmon, have reportedly been harmed by declines of Klamath fish.[27] Furthermore, the decline in salmon has undermined

[18] *2004 NRC Report,* p. 81, 91.

[19] Anadromous fish grow to adulthood in saltwater but swim into freshwater to spawn.

[20] In 1983 coho were estimated to have declined 70% since the 1960's. See 2008 NRC Report, p. 48.

[21] National Oceanic and Atmospheric Administration, 62 CFR, p. 24588, May 6, 1997, and 64 CFR, p. 24099, May 5, 1999. An "evolutionarily significant unit" (ESU) is the marine species equivalent of "distinct population segment" used for terrestrial species under the ESA. Salmon are also named according to the timing of their spawning run.

[22] The ESA allows listing of "distinct population segments." In the case of salmon, this is applied through a policy establishing separate populations as "ESUs" based on two requirements: (1) substantial reproductive isolation; and (2) important component of the evolutionary legacy of the species. NMFS previously determined in 1998 that Upper Klamath and Trinity River Chinook salmon did not warrant listing under the ESA, but the current petitioners (Center for Biological Diversity, Oregon Wild, Environmental Protection Information Center, and the Larch Company) have requested the NMFS revisit this decision. Both the spring and fall runs of the ESU are under consideration.

[23] National Oceanic and Atmospheric Administration, "Listing Endangered and Threatened Species; 90-Day Finding on a Petition to List Chinook Salmon," 76 *Federal Register* 20302, April 12, 2011.

[24] Fall runs of Chinook averaged 120,000 annually from 1978 to 2009.

[25] U.S. Department of the Interior, *Klamath Facilities Removal: Draft Environmental Impact Statement/Environmental Impact Report*, State Clearinghouse #2010062060, Sacramento, CA, September 21, 2011, http://klamathrestoration.gov/Draft-EIS-EIR/download-draft-eis-eir. Hereinafter Draft EIS.

[26] Klamath River Basin Fisheries Task Force, *Long Range Plan for the Klamath River Basin Conservation Area Fishery Restoration Program* (January 1991), pp 1-6. Available at http://www.krisweb.com/biblio/gen_usfws_kierassoc_1991_lrp.pdf. Hereinafter KRBFTF Plan.

[27] The Draft Environmental Impact Statement of the Department of the Interior included extensive information on each tribe's historical dependence on fishery resources, reportedly based on consultations with the tribes. See U.S.

cultural events such as the First Salmon Ceremony, which marks the passing of the first spring Chinook salmon up the Klamath River.[28]

Salmon and other anadromous fish from the Klamath River also support commercial and sport fisheries off California and Oregon coasts. In past years, more than one-third of the 600,000 Chinook salmon taken by commercial fisherman on the ocean between Fort Bragg, CA, and Coos Bay, OR, are estimated to have originated in the Klamath Basin.[29] Beyond the direct revenues of nearly $6 million annually since 1986, commercial fishing also supports various businesses in fishing ports that contribute substantially to local economies. Local economies have reportedly been harmed by restrictive fishing regulations and low fish populations during the last decade, including restrictions on fishing subsequent to the 1997 ESA listing of the coho salmon in the Klamath Basin.[30]

Some Lower Basin waters are also managed by Reclamation as part of the California Central Valley Project and are discussed in the context of Klamath restoration.[31] Among these is the Trinity River Division (TRD) of the Central Valley Project, which was completed in 1964. The Trinity River is the largest tributary of the Klamath River, and enters the river not far from where the Klamath meets the Pacific Ocean (see **Figure 1**). The TRD takes water from the Trinity River system and transports it into the separate watershed of the Sacramento River for use in water-deficient areas to the south.[32] Due to the impact of these diversions on the Trinity River ecosystem, in 1984 Congress directed the Secretary of the Interior to develop a separate restoration program for that river to restore fish and wildlife levels on the river and meet trust obligations to the Hoopa Valley Tribe.[33] These and additional actions have resulted in increased Trinity River flows and other restoration activities, many of which are ongoing.[34] As a result of the connection between the two rivers, water quality and other issues on the Lower Klamath River affect species that migrate up the Lower Klamath to the Trinity River, including Trinity River salmon. Thus, stakeholders on the Trinity River, including most prominently the Hoopa Valley Tribe, also figure into Klamath River restoration debates.

Department of the Interior, *Klamath Facilities Removal: Draft Environmental Impact Statement/Environmental Impact Report*, State Clearinghouse #2010062060, Sacramento, CA, September 21, 2011, http://klamathrestoration.gov/sites/klamathrestoration.gov/files/3.12_Tribal%20Trust.pdf.

[28] The Draft Environmental Impact Statement of the Department of the Interior included extensive information on each tribe's historical dependence on fishery resources, reportedly based on consultations with the tribes. See U.S. Department of the Interior, *Klamath Facilities Removal: Draft Environmental Impact Statement/Environmental Impact Report*, State Clearinghouse #2010062060, Sacramento, CA, September 21, 2011, http://klamathrestoration.gov/sites/klamathrestoration.gov/files/3.12_Tribal%20Trust.pdf. (Hereafter "Draft EIS.")

[29] KRBFTF Plan, p 1-6.

[30] For instance, fishing restrictions were notably severe in 2006, and prompted Congress to appropriate $60.4 million in supplemental appropriations under P.L. 110-28 to assist affected fisherman. See below section, "2006 Klamath Fishery Disaster Determination."

[31] Congress authorized initial features of the Central Valley Project (CVP) in the 1937 Rivers and Harbors Act. The project consists of canals and water transfer facilities that work in conjunction with the California State Water Project (SWP) to supply water to the Central Valley of California and metropolitan areas in the southern area of the state.

[32] At its peak, the TRD diverted up to 90% of flows into Trinity Lake south to the Sacramento River watershed.

[33] P.L. 98-541. Also, in 1992 (Title 34 of P.L. 102-575), Congress further directed minimum flows for the Trinity River and completion of a river flow study. This study was completed in 1999, and a record of decision was issued in 2000. This resulted in increased Trinity River flows, a new round of fish and wildlife restoration activities, and creation of the Trinity River Restoration Program (an interagency partnership including federal, state, and tribal governments).

[34] Information on these ongoing activities is available at http://www.trrp.net/.

Klamath Dams

Southeast of Klamath Lake, there are seven dams on the Klamath River and its tributaries. Six of these dams are owned by PacifiCorp (a private company) and collectively known as the Klamath Hydroelectric Project (KHP). The dams produce hydroelectric power for the basin (including power for irrigators), as well as other areas.[35] The first dam to the southeast of Klamath Lake, Link River Dam, is a non-hydroelectric dam owned by the Bureau of Reclamation and operated by PacifiCorp. Together with Keno Dam (a non-hydroelectric dam owned by PacifiCorp), these dams regulate water for hydroelectric generation at other dams (Keno Dam also serves as a diversion structure for irrigators).[36] Four other hydroelectric dams operate on the mainstem of the Klamath downstream of Keno Dam, including (in order, going downstream) JC Boyle Dam, Copco Dams 2 and 1, and Iron Gate Dam. These dams were built between 1918 and 1962 by the California, and together account for approximately 2% of PacifiCorp's total electric generating capacity.[37] Two of the dams, J. C. Boyle and Iron Gate, include structures to meant to mitigate for effects on fisheries.[38] Although these dams are primarily operated for hydroelectric generation, they also serve other purposes, including recreation (e.g., white-water rafting), and provide a small amount of operational flexibility during floods.[39] The KHP also includes one other smaller dam on a tributary of the Klamath (Fall Creek Dam).

The Federal Energy Regulatory Commission (FERC) is responsible for the licensing of non-federal dams under the Federal Power Act.[40] The original FERC license to operate the KHP, originally issued in 1956, expired in 2006. PacifiCorp applied for relicensing of the KHP in 2004 and, subsequently, in 2007, FERC issued an environmental impact statement on relicensing, including recommendations for fish passage and other environmental upgrades of the dams. To date, a new long-term license has not been granted for the project because of the lack of state certification under Section 401 of the Clean Water Act, as well as ongoing uncertainty related to fish passage upgrades and the status of negotiations (which eventually resulted in the agreements discussed below).[41] The KHP is currently operating on a temporary annual license until other issues pertaining to dam removal, discussed later in this report, are clarified.

[35] Power costs for pumping are significant for area irrigators, who rely on the KHP for power. (Unlike other Reclamation projects, there is no power component to the Klamath Project.) As a result of the expiration of the KHP's 50-year FERC license in 2006, increased power prices have been phased in by PacifiCorp, and have been challenged in court by some irrigators who view them as a violation of their original contracts with the dam owner. The increases have thus far been upheld in state court.

[36] Both Link River Dam and Keno Dam include fish passage structures.

[37] On average, the KHP produces about 82 MW annually, or about 0.25% percent of the electricity produced in California in 2009. Water Education Foundation, *Layperson's Guide to the Klamath River* (2011), p. 11.

[38] Specifically, J. C. Boyle has a fish ladder, and Iron Gate dam has a fish ladder, hatchery facilities, and other structures.

[39] See Part II of this report for additional information on other major uses, specifically discussion under "What Are Some Other Potential Effects of the Agreements on the Basin?"

[40] 16 U.S.C. §790 et seq.

[41] Under the CWA, a FERC-issued license must include any conditions that the state deems necessary to maintain state-developed water quality standards. 33 U.S.C. §401 et seq. Under the KHSA, the states have agreed to keep this process in abeyance, which effectively puts the FERC relicensing process on hold.

Klamath Tribes

Six federally recognized tribes make up approximately 6% of the basin's total population and figure prominently in the basin's natural resource debates. The Yurok, Klamath,[42] Karuk, Hoopa Valley, Quartz Valley, and Resighini Rancheria tribes are all federally recognized. The tribes range in size, from more than 5,000 enrolled members (the Yurok Tribe) to 36 enrolled members (the Resighini Rancheria). The tribes are marked by cultural and socioeconomic distinctions, and live on different parts of the river in the Upper and Lower Basins. As noted above, fisheries in both the Upper and Lower Basins (including salmon and sucker fisheries), as well as other natural resources, are important for all of these tribes. However, the importance of individual resources varies among the tribes.[43] Similarly, the interests of the different tribes in the agreements vary and at times may conflict. To date, three of the six tribes in the Klamath Basin have signed the Klamath agreements (discussed later in this report): the Klamath, Yurok, and Karuk Tribes.[44]

In the Klamath Basin, the extent of rights held by the Klamath Tribe has been particularly contentious and has led to conflict over basin water supplies. Congress entered into a treaty with the Klamath Tribe in 1864, which created a reservation for the tribe to settle and provided an exclusive right to fish in the waters of the reservation.[45] The U.S. Supreme Court has long recognized that the reservation of land also secures the implied water rights necessary to fulfill the purpose of the reservation of that land.[46] In this case, the Klamath Tribe would need enough water to maintain the purposes of the former Klamath Reservation, including fishing, hunting, and gathering. Because reserved water rights are given a priority date of the time of the reservation, the Klamath Tribe's claims for water have high seniority among other competing claims for the water.[47] However, because the Klamath Tribe's reservation was terminated by Congress in 1954,[48] the tribe's claims for water rights have been a source of tension among Klamath River water users for decades.

Other Klamath Basin water users have challenged whether the Klamath Tribe's water rights survived the congressional termination of the Klamath Reservation and have attempted to clarify the extent of the tribe's rights to water in the basin.[49] Courts have generally recognized the tribe's reserved water rights and have indicated that the water rights necessary to support hunting and

[42] The "Klamath Tribe" is actually composed of three historically distinct tribal groups: the Klamath, the Modoc, and the Yahooskin band of Snake Indians. Frequently, the United States would make a treaty with "one" tribe, which actually consisted of a combination of several tribes that were historically distinct.

[43] See Draft EIS, Section 3.12.

[44] The two smallest tribes, the Quartz Valley and the Resighini Rancheria, were not included in negotiations because their interest in Klamath fisheries was not deemed sufficient. As discussed later in this report, the Hoopa Valley Tribe was included in negotiations but has opposed the agreements.

[45] Treaty of October 14, 1864, art. I, 16 Stat. 707.

[46] These are often referred to as "reserved" water rights. See *Winters v. United States*, 207 U.S. 564 (1908); *Cappaert v. United States*, 426 U.S. 128 (1976). See also CRS Report RL32198, *Indian Reserved Water Rights Under the Winters Doctrine: An Overview*, by Cynthia Brougher.

[47] See *Winters*, 207 U.S. 564.

[48] *Kimball v. Callahan*, 493 F.2d 564 (9th Cir. 1974).

[49] See *United States v. Adair*, 478 F.Supp. 336 (D. Or. 1979 (Adair I), aff'd *United States v. Adair*, 723 F.2d 1394 (9th Cir. 1984) (Adair II); *United States v. Adair*, 187 F.Supp.2d 1273 (D. Or. 2002) (Adair III), vacated *United States v. Braren*, 338 F.3d 971 (9th Cir. 2003).

fishing have a priority date of "time immemorial," while irrigation and domestic use water rights have a priority date of 1864.[50]

Even with the previous decisions recognizing the Klamath Tribe's water rights, tension between the different tribes in the Klamath Basin and other non-tribal water users has continued in part because these rights have not been quantified. Without quantification, junior water users cannot rely on what amount may be available and may not be able to fulfill their claims for water if and when tribal water rights are exercised. Accordingly, the state of Oregon has undertaken a water rights adjudication to quantify historic water rights that vested without quantification, including tribal reserved water rights.[51] The adjudication is ongoing, but the results are expected to clarify the tribal rights at issue. (See box below.)

Klamath Water Rights Adjudication

The questions related to the quantification of tribal water rights are interconnected with the determination of water rights within the Klamath Basin. The Klamath Basin is "over-allocated," meaning that claims to water exceed the amount available in most years. This often leads to legal conflicts over the proper allocation of limited resources. Allocation of water resources is largely determined by state law. Western states generally follow a system of prior appropriation, which provides certain quantities of water to water users depending on their relative seniority in acquiring water rights.[52] State appropriative rights can be complicated by federal water rights such as those of tribes claiming water rights reserved by the creation of the tribal reservation. In addition to tribal reserved water rights, other federal rights such as those associated with federal land reservations like national forests and national wildlife refuges also may not be quantified.[53] The uncertainties resulting from the lack of quantification of these rights has led to ongoing legal disputes over the allocation of water within the Klamath Basin.

Oregon has undertaken a general adjudication of water rights in the Klamath Basin (known as the Klamath Basin Adjudication, or KBA) to address these disputes. The KBA began in the 1970s to determine water rights among various users in the Klamath Basin.[54] The final claims in the KBA are expected to be determined in the spring of 2012. However, even with the conclusion of the administrative adjudication, parties that are dissatisfied with the outcome may pursue judicial appeals. The general process of the adjudication is as follows: parties with claims or contests must file with the Oregon Water Resources Department (OWRD); an administrative panel then hears the contests and issues proposed orders based on the hearing; and the OWRD reviews the proposed orders and issues its final findings and order, which is filed with a state court.[55] Following the OWRD's final determinations, parties may file "exceptions to the Determination" with the state court.[56] Following the state trial court's decision, litigants may appeal through the state's court of appeals, state supreme court, and possibly the U.S. Supreme Court. Thus, although the KBA is nearing completion of its administrative process, many observers expect that disputes over the allocation of the Klamath Basin's water resources will continue for many years.

Previous Events

While water and species management issues have been prevalent throughout the history of the Klamath Project, seminal events in 2001, 2002, and 2006 brought the region into the national spotlight. These events resulted in a number of legal conflicts, studies, and negotiations that frame the recent history of the Klamath Basin. First in 2001, as a result of previous biological

[50] See *Adair I*, 723 F.2d at 350.

[51] For an overview, status, and claims of the adjudication, see Klamath Basin Adjudication/ADR, Oregon Water Resources Department, available at http://www.oregon.gov/OWRD/ADJ/index.shtml.

[52] See supra note 50, Tarlock, "Prior Appropriation Doctrine."

[53] See id. at ch. 37, "Reserved Water Rights."

[54] See Or. Rev. Stat. 539.010 et seq.

[55] See *United States v. Braren*, 338 F.3d at 973-74.

[56] Id.

opinions by the FWS and NMFS, Reclamation severely curtailed water deliveries to the Klamath Project to provide more water for endangered fish in the basin.[57] Later, in 2002, thousands of fish (mainly Chinook salmon) died largely due to poor water conditions and fish health in the Lower Klamath. Finally, in 2006 NOAA severely restricted ocean fishing for salmon due to low numbers of naturally spawning adults in the region (due in part to residual effects of the 2002 fish kill), resulting in a large decrease in that year's salmon catch compared to previous years.

The federal government provided emergency funding in response to these and other events in the Klamath. The funding included at least $170 million in addition to regular programmatic expenditures over the last decade. For instance, for the 2001 and 2006 events, the federal government provided approximately $35 million and $60 million in emergency aid, respectively.[58] Aid in addition to regular agency programs and appropriations was also provided in other years. Between 2002 and 2007, Reclamation spent $14 million on a pilot water bank for the Klamath to alleviate water shortages.[59] Due to drought events in 2010, an additional $10 million in supplemental appropriations was provided to the Klamath Basin in that year, and $2 million was provided for a Klamath Drought Initiative by the U.S. Department of Agriculture (USDA).[60] The 2002 farm bill provided $50 million was provided to the Klamath Basin, and USDA funding was also provided under other general authorities and programs authorized in the 2002 and 2008 farm bills.[61]

These events are discussed in **Appendix B** to this report. The remainder of this report focuses on the settlement agreements that resulted from these events, which are currently under consideration by Congress.

2010 Klamath Settlement Agreements

In response to the earlier conflicts and other issues in the Klamath basin, the federal government led talks among multiple groups between 2002 and 2010, with a goal of achieving long-term solution to the water and endangered species issues in the Klamath Basin. This included a solution to previous problems with irrigation deliveries and instream flows for fish, as well as potential ongoing issues associated with the Klamath Basin Water Rights Adjudication. Participants included state governments, tribes, counties, irrigators, fishermen, and conservation groups.

[57] Although irrigators have continued to face uncertainty since this time, there have not been restrictions on the scale seen in 2001. The most significant restrictions on water supplies for irrigation since 2001 occurred in 2010.

[58] The 2001 figures are based on 2002 estimates by Oregon State University. See William S. Braunworth, Jr., Teresa Welch, and Ron Hathaway et al., *Water Allocation in the Klamath Reclamation Project, 2001*, Oregon State University Agricultural Extension Service, Special Report 1037, 2002, p. 267, http://extension.oregonstate.edu/catalog/html/sr/sr1037-e/. This includes approximately $20 million in aid that was provided from USDA under the Supplemental Appropriations Act, 2001 (P.L. 107-20), $2.2 million provided from BOR for payments to farmers for groundwater, and an additional $13 million in USDA funding provided under other emergency authorities, including crop insurance. For the 2006 fishery disaster declaration, the full funding amount was provided to through the Commerce Department under the U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007 (P.L. 110-28).

[59] Personal correspondence, Bureau of Reclamation, June 6, 2012.

[60] The 2010 funding was provided to Reclamation under the Supplemental Appropriations Act, 2010 (P.L. 111-212). For more information on the USDA funding, see http://www.or.nrcs.usda.gov/programs/klamath/index.html.

[61] The 2002 farm bill (P.L. 107-171) provided $50 million to aid water conservation efforts in the Klamath. Additionally, funding under general authorities was provided under both the 2002 farm bill and the 2008 farm bill (P.L. 110-246), although exact amounts are not available.

On February 18, 2010, two agreements were announced and signed by many of the participants in the settlement process. The first agreement, known as the Klamath Basin Restoration Agreement (KBRA), lays out numerous actions by local, state, and federal parties that would restore river and ocean fish populations, establish water and power supplies for certain agricultural, municipal, and environmental users, and provide for various other actions. The second agreement, known as the Klamath Hydroelectric Settlement Agreement (KHSA), lays out the process for removing four dams owned by PacifiCorp, as well as other related actions.

Before many of the agreements' provisions can be implemented, numerous actions must take place, including several notable congressional requirements: (1) congressional authorization of both agreements; (2) a secretarial determination on dam removal (which itself must be authorized by Congress); and (3) funding (via federal appropriations) for federal components of both agreements by Congress.[62] Many other contingencies do not involve Congress directly, but are required for full implementation of the agreements.

The two agreements were negotiated separately, but are officially linked. Their signatories have agreed to support their simultaneous enactment. Beyond this legislative linkage, some provisions of the agreements are linked (i.e., they assume other actions will take place).[63] The below sections summarize the agreements and selected provisions that may be of interest to Congress. They are not an exhaustive summary of either agreement.

Klamath Basin Restoration Agreement

The KBRA was largely negotiated between 2005 and 2010, and contains actions that have been agreed to by parties, or signatories, to the agreement.[64] The final agreement, signed in 2010, is divided into eight sections that are intended to achieve three overarching goals:

- restore and sustain natural production of fish species throughout the Klamath Basin;
- establish reliable water and power supplies for agricultural users, communities, and area wildlife refuges; and
- contribute to the public welfare and sustainability of communities.

Broadly speaking, the KBRA would provide assurances that the Klamath Project and wildlife refuges will receive water allocations that correlate to inflow scenarios in a given year, with "surplus" supplies to be allocated to other uses (e.g., other diversions, environmental water). While expected allocations under the agreement may be less than current levels during years with above-average inflows, they may also increase the predictability of available water supplies during drier years. Under the agreement, environmental interests would gain additional federal and state funding for fisheries restoration in the basin, as well as related assurances for dam removal under the KHSA. For their part, tribes would agree not to assert water and fishery rights

[62] Funding for most actions would occur subsequent to authorization of the agreements, but is an important requirement for implementation.

[63] To take one example, observers note that the fisheries restoration in the Lower Basin which is envisioned by many supporters depends on both dam removal under the KHSA and water quality and water storage improvements expected to be achieved under the KBRA.

[64] There are 45 non-federal parties to the KBRA. See *Klamath Basin Restoration Agreement for the Sustainability of Public and Trust Resources and Affected Communities*, February 18, 2010, pp 3-4, at http://klamathrestoration.gov/sites/klamathrestoration.gov/files/Klamath-Agreements/Klamath-Basin-Restoration-Agreement-2-18-10signed.pdf. Hereinafter KBRA.

over the aforementioned Klamath Project water allocations in exchange for fisheries restoration actions and additional economic aid (and dam removal). All parties would also agree to support actions and funding to expand water and power supplies (including power for irrigators to replace low-cost power formerly available from the hydroelectric project) and to avoid litigation by first pursuing other dispute resolution processes laid out under the agreement. Under the agreement, implementation of the Endangered Species Act would also continue.

Two important notes frame federal responsibilities for the KBRA. First, the federal government (and federal agencies) are not "party" to the KBRA until Congress enacts authorizing legislation.[65] Therefore, the considerable number of federal agency actions in the KBRA represent expectations for federal actions by the non-federal parties, not promises or obligations on the part of the federal government to act.[66] Secondly, if authorization is provided by Congress and the federal government becomes party to the agreements, funding for KBRA actions would be discretionary, not mandatory. Thus, even if the agreements are authorized, the federal government would not be bound to implement actions or expend funds in absence of additional direction by congressional appropriators. Under the agreement, state governments are afforded the same flexibility.[67]

The sections below discuss actions of potential interest to Congress in the KBRA as they relate to the three goals of the agreement: fisheries restoration, reliable water supplies, and support for communities/other goals.

Fisheries Restoration

Restoring Klamath Basin fisheries is one of the primary objectives of both Klamath basin agreements. The KBRA's fisheries program aims to complement the KHSA, which would open 420 miles of habitat above Iron Gate Dam to anadromous species such as salmon, steelhead, and lamprey. The KBRA aims to achieve this through a number of measures, including measures to achieve habitat restoration throughout the basin; measures to reintroduce fish; measures to monitor fisheries; and actions intended to improve flow conditions and water quality for fish.

The general goals of the KBRA fisheries program are to:[68]

- restore and maintain ecological functionality and connectivity of historic fish habitats;
- re-establish and maintain naturally sustainable and viable populations of fish; and
- provide for the full participation in harvest opportunities for fish species.

The fish restoration process established by the KBRA would occur in two general phases. In the first phase, the restoration plan would establish priorities and criteria for selecting projects over the next 10 years. Examples of likely actions include re-establishing and protecting riparian vegetation, restoring stream channels, repairing or improving fish passage, and preventing entrainment of fish into diversions. Phase I actions would be monitored, primarily by the federal government, to determine their effectiveness and for developing phase II of the restoration plan.

[65] KBRA, p. 2.

[66] If Congress enacts authorizing legislation, the relevant federal entities automatically become party to the agreement. Notably, the federal government has existing authorities that allow for a number of ongoing actions to be implemented now. Some of these actions are included in the KBRA.

[67] KBRA, p. 13.

[68] KBRA, p. 37.

Fish managers would develop phase II by collaborating with the parties, including the Klamath Basin Coordinating Council, and by considering public input.[69] Based on the results of phase I, phase II would establish plan elements, restoration priorities, and an adaptive management process for the remaining term of the KBRA.

One of the main goals of the fish program of the KBRA would be to reestablish anadromous species in the Upper Basin above Iron Gate Dam, including tributaries to Upper Klamath Lake. As part of the re-introduction plan, the Oregon Department of Fish and Wildlife has adopted a policy to establish natural and self-sustaining populations of Chinook, steelhead, and lamprey in these areas. The plan is expected to include near-term investigations to determine those resources and actions needed to initiate and accomplish reintroduction of fish populations, and actions to manage these populations once they are reestablished. An important component of this plan is screening of Klamath Reclamation Project irrigation diversions to prevent entrainment of re-introduced fish.

The Water Resources Program (WRP) of the KBRA, discussed below, is closely related to the goals of the fisheries restoration program. The WRP would provide more water for fish by limiting the quantity of water diverted from UKL and the Klamath River for the Klamath Reclamation Project. Additional measures in the WRP that could add storage and increase water available for fish include water leasing, water conservation, and additional storage (see section on "Water and Power Supplies"). The KBRA would reserve most of the additional flows/storage generated by these actions for the benefit of fish.

The reintroduction of salmon and other aquatic species above Iron Gate Dam could have regulatory or legal consequences for users of water and land in the Upper Klamath Basin. The KBRA includes commitments by the parties to avoid or minimize any adverse impact resulting from introduction or reintroduction of aquatic species to currently unoccupied habitats or areas. The KBRA requires the National Marine Fisheries Service (NMFS) and FWS to consider whether there are any alternatives to limitations on diversion, use, and reuse of water related to the Klamath Reclamation Project. Although the ESA would still be in effect for listed fish species, the KBRA attempts to minimize future potential impacts on the supply of water for basin interests, especially farmers. It also commits parties to attempt dispute resolution before a party initiates litigation to limit water diversion.

Water and Power Supplies

The allocation and reliability of water and power supplies has historically been a contentious issue in the Klamath Basin. The KBRA proposes to settle many of these issues by establishing a Water Resources Program (WRP) for the basin that attempts to settle certain long-standing water resource issues through modification of the existing water management regime in the basin. The changes would include, among other things, set schedules and plans that define a range of expected diversions for project and refuge uses under most inflow scenarios in the basin.[70] The KBRA would also fund efforts to increase water supplies and develop new, low-cost power to replace that previously provided by the hydroelectric project. Costs for these portions of the agreement are estimated to be approximately $258 million in federal funds.[71]

[69] See below section, "Coordination and Oversight" for more information on this body.

[70] As previously noted, Tule Lake NWR and Lower Klamath NWR receive water from the irrigation project.

[71] For recent cost estimates, see Ed Sheets Consulting, "Klamath Basin Restoration Agreement Revised Cost Estimates." June 17, 2011, http://216.119.96.156/Klamath/2011/06/RevisedCostEstimates.pdf. Hereinafter Revised

On-Project Plan

The agreement's provision for a defined range of water diversions for the Klamath Project and refuges, as well as other provisions (collectively known as the "on-project plan"), is a key component to the KBRA.[72] Historically, Reclamation has delivered project supplies to project irrigators under long-term contracts. Allocations are made annually, depending on water supply levels, projected runoff, and other obligations (including ESA consultation with FWS and NMFS). These decisions have been subject to legal challenges when there was disagreement with Reclamation's allocations, and led to the aforementioned shut off of Klamath Project waters in 2001. The KBRA would attempt to make such a scenario less likely by establishing diversion limits for the Klamath Project and the Klamath Refuges that are tied to forecast water inflows for April-September. Assuming other conditions under the KBRA are met, other parties agree to support water availability in these amounts for the specified users and scenarios, potentially rendering legal action less likely. (See **Table 1**.)

The KBRA's diversion limits for the Klamath Project and Klamath Refuges would be determined based on annual forecast inflows into Upper Klamath Lake, as defined by the Natural Resources Conservation Service (NRCS). Under the agreement, parties support diversions for the project and refuges under three broad inflows scenarios: (1) less than 287,000 acre-feet (a/f); (2) 287,000 a/f to 569,000 a/f; and (3) 569,000 a/f or more. Each of these scenarios would trigger corresponding allocations for the Klamath Project and Refuges for two different periods: March-October and November- February.[73]

Table 1. Water Diversions Supported Under the KBRA

	Water Forecast[a]		
	"Dry" Year[b]	**"Average" Year[c]**	**"Wet" Year[d]**
Gross Diversions: Project, Refuges[f]	**March-Oct: 330,000** **Nov-Feb: 45,000**	**March-Oct (formula-based): 330,000-385,000** **Nov-Feb: 45,000**	**March-Oct: 385,000** **Nov-Feb: 45,000**
Amounts Available for:			
Diversions to Wildlife Refuges[e]	March-Oct: 48,000 Nov-Feb: 35,000	March-Oct (Formula-based): 48,000-60,000 Nov-Feb: 35,000	March-Oct: 60,000 Nov-Feb: 35,000
Reclamation Project	[Portion not diverted to Refuges Above]	[Portion not diverted to Refuges Above]	[Portion not diverted to Refuges Above]

Source: Klamath Basin Restoration Agreement, Appendix E-1, p. E-25.

Notes: Units in whole acre-feet. Columns indicate a given forecast scenario. Rows indicate the diversion reserved for a specific location.

Cost Estimates.

[72] See generally, KBRA, ibid., pp 54-76 and Appendix E.

[73] Typically, the March through October allocation receives the most scrutiny, as that is the peak period for snowpack melt and irrigation diversions.

a. Forecast references the March 1 Natural Resources Conservation Service Forecast for Net Inflow into Upper Klamath Lake for the period April 1-September 30.
b. "Dry" is shorthand for inflows less than 287,000 a/f. Notably, Section 19.2.2.B.v of the KBRA provides that if an "extreme drought" is declared by OWRD and voluntary water conservation measures triggered under the KBRA are insufficient, diversions may be reduced below the levels specified in the KBRA. "Extreme drought" is defined as water conditions similar to 1992.
c. "Average" indicates forecast inflows ranging from 287,000 a/f- 569,000 a/f.
d. "Wet" indicates forecast inflows of more than 569,000 a/f.
e. Refuge allocations are to be made available out of the total diversion in a given year.
f. Additional water is expected to be available for other valid water rights. For instance, some off-project diversions are assumed in the KBRA, but specific diversion limits are not quantified. Water for instream flows for fisheries is also assumed based on excess water/flows not diverted by on or off-project irrigators. Estimated instream flows based on these assumptions data is provided in appendix E-5 of the KBRA.

Generally speaking, the limitations in the KBRA could result in greater diversions for the Reclamation Project in some "dry" years, but largely presume decreased allocations compared to past diversions for most other water year types.[74] This decrease would be expected to be achieved by efforts funded under the KBRA which are assumed to reduce project-related surface water demand.[75] The exact mix of these strategies and their effect on the project has yet to be delineated. For their part, refuges would generally receive more water than was previously provided, and on a more set schedule.[76]

Support for the aforementioned diversions is not required for years designated as an "extreme drought" by the State of Oregon. The agreement includes a placeholder for a "Drought Plan" to provide for additional water to fish and wildlife in low water years, and this could modify the allocations for some "dry" years. The KBRA and subsequent documents have outlined a number of potential strategies in the event of a drought designation, including payments for additional reduced irrigation diversions.[77]

Off-Project Settlement and Additional Water Supplies

Another significant component of the WRP is the Off-Project Water Program.[78] The actions under this program would initiate a process, known as the Off-Project Water Settlement, that would settle certain longstanding water rights disputes between off-project irrigators, tribes, and the Bureau of Indian Affairs (see previous box on Klamath Water Rights). In addition to the resolution of these claims, this part of the KBRA also proposes a Water-Use Retirement Program (WURP) that would attempt to provide additional inflows into Klamath Lake from off-project lands, assumed to result in an average annual addition of 30,000 a/f of inflow into UKL.[79]

[74] Annual diversions to the Klamath Project for the 1985 to 2000 time period were approximately 384,000 a/f, while average annual diversions from 2000 to 2009 were 351,000 (plus water from additional sources.

[75] Estimated costs for the on-project plan portion of the WRP are approximately $92 million. Presumably some of this funding would go toward leasing or purchase of water that was historically diverted to project lands.

[76] Diversion data provided in correspondence with the Bureau of Reclamation, May 2011.

[77] The Drought Plan was released in June 2011. It proposes thresholds for drought and would designate the Oregon Department of Water Resources as the ultimate arbiter of these thresholds. The Draft Plan is available at http://67.199.95.80/Klamath/DraftDroughtPlan2011-02-28.pdf.

[78] "Off-project irrigators" refers to irrigators who do not receive water through the Klamath Reclamation Project and who are claimants in the Klamath Basin Adjudication. Notably, not all off-project users signed the final KBRA. See Restoration Agreement, p. 105.

[79] Funding requirements for the off-project program (which is part of the larger WRP are estimated to be $45 million over the next 10 years. Revised Cost Estimates, p. 7.

The WRP would also expand water storage and availability in the basin through several new or ongoing efforts. The KBRA states that parties will support funding for additional storage and lake expansion, including a proposed effort to reconnect Barnes Ranch and Agency Lake Ranch to Agency Lake for an additional 63,700 a/f of storage and the reconnection of Wood River Wetlands to Agency Lake Wetlands for an additional 16,000 a/f of storage. Parties also pledge to support a study by Reclamation investigating additional storage options of up to 350,000 a/f in Long Lake under the Klamath Basin Water Supply Enhancement Act of 2000 (P.L. 106-498).[80]

Environmental Water

The term "environmental water" as used in the KBRA refers to any quantity or quality of water intended to benefit fish species and aquatic resources in the Klamath Basin, including both Klamath Lake and the Klamath River. While the KBRA does not define specific water allocations for environmental water (e.g., instream flows), it is assumed that any excess water not provided for above or diverted for other valid water rights will go toward these purposes. Additionally, some of the additional water supplies provided for in the aforementioned actions (e.g., water retirement and additional storage) are assumed to benefit fish and aquatic species.

Lease-Land Farming

As previously noted, two refuges in the Klamath Basin, the Lower Klamath and Tule Lake refuges, have a somewhat unique history that has allowed for leasing of several thousand acres of farmland within their boundaries. The KBRA would allow for the continuance of this practice, and also provides for support of the parties, noting that the Secretary may make use of practices that enhance waterfowl management while optimizing agricultural use and lease revenues, such as walking wetlands and incentive programs.[81]

Water Rights Claims

The KBRA does not determine or quantify water rights.[82] However, the KBRA does provide a framework for the settlement of disputes between Klamath Project users and tribal water rights holders. Under the KBRA, Reclamation and FWS, along with various irrigation users, agreed to limit certain diversions in the Klamath Basin in order to enhance fisheries in the basin.[83] In exchange, tribes that are parties to the KBRA have agreed not to assert their claims against the United States that relate to water management decisions or the failure to protect tribal water rights.[84] The KBRA further provides for the withdrawal of certain claims and contests in the Klamath Basin Adjudication (see earlier box), if the administrative panel adopts the parties' negotiated settlement of the dispute.[85]

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[80] This project has subsequently been determined by Reclamation to have a low return on investment and is not expected to be further pursued. The associated studies by Reclamation are available at http://www.usbr.gov/newsroom/newsrelease/detail.cfm?RecordID=34462.

[81] KBRA, §15.4.3.

[82] KBRA §2.2.11.

[83] See KBRA §15.3.1.

[84] See KBRA §§15.3.5–15.3.7. The KBRA does not provide for all tribal claims to be relinquished.

[85] See KBRA Appendix E.

Power Program

Low-cost power to replace power previously generated by the hydropower project is a significant component of the KBRA.[86] Several provisions of the KBRA would attempt to provide low-cost power supplies for Klamath Project and off-project irrigators, specifically at a target rate at or below the average cost for similarly situated Reclamation projects in the surrounding area.[87] If authorized, the KBRA would provide funding for development of new renewable power to replace that previously received from the Klamath Hydroelectric Project.[88] The KBRA would also direct Reclamation to undertake other efforts to replace power previously generated by the dams, including pursuit of an allocation of preference power from the Bonneville Power Administration for on- and off-project irrigators. The total costs for these power provisions are estimated at approximately $50 million.[89]

Sustainable Communities and Other Activities

Those actions which fall outside of the categories of fish restoration and water/power supplies are collectively referred to in the agreement as actions to ensure "sustainable communities." Of these actions, the most prominent relate to the economic well-being of the basin's tribes and counties. These provisions are discussed below.

Tribal Commitments

Four basin tribes participated in KBRA negotiations: the Klamath, Yurok, Karuk, and Hoopa Valley tribes. Three of the four tribes (the Klamath, Yurok, and Karuk tribes) are parties to the KBRA and would agree not to assert their rights over the defined allocations in the KBRA if the agreement is authorized and other stipulations are met.[90] In exchange, tribes would receive direct support for economic revitalization projects (i.e., projects to revitalize tribal subsistence and traditional ways of life), as well as support for fisheries restoration discussed above. The KBRA would also provide funding to facilitate the transfer of approximately 90,000 privately owned acres of the Mazama Forest to the Klamath Tribe.[91] The total federal cost for these tribal commitments was estimated at $87 million in June 2011, but could be more if the Hoopa Valley Tribe were to become party to the KBRA.[92]

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[86] Klamath Project irrigators and other area irrigators previously received project power at low-cost, set rates pursuant to an agreement between Reclamation, Copco, and the Klamath Water Users Association that was signed in 1918. Under the agreement, Copco (and later, PacifiCorp) gained the right to control flows for the hydroelectric project at Reclamation-owned Link River Dam, in exchange for low-cost power. The agreement was not renewed when the hydroelectic project's 50-year federal license expired in 2006, and PacifiCorp has raised its rates as a result.

[87] KBRA,

[88] This power would come from a source or sources to be named later, and would be managed and utilized by an entity composed of on and off-project users, known as the Klamath Basin Power Alliance.

[89] The majority of these costs are for the development of renewable power, which are expected to cost $40 million.

[90] For more information on water rights, see previous section, "Water Rights Claims" and previous box "Klamath Water Rights Adjudication."

[91] This land was historically a part of the Klamath Tribes' reservation, but was sold after Congress terminated the Trust Relationship with the Klamath in 1954 (Congress restored this relationship, but not this land, in 1986). For more information on the transfer, see KBRA, Section 33.2. For background on termination and the tribes, see http://klamathrestoration.gov/sites/klamathrestoration.gov/files/3.13_Cultural%20and%20Historic%20Resources.pdf, p. 3.13-13.

[92] See Revised Cost Estimates. Section 38 of the Restoration Agreement provides that the Hoopa Valley Tribe would be eligible for similar funding levels to the other tribes if it becomes a party to the agreement.

Counties Program

The KBRA also includes a program to mitigate economic impacts on counties associated with dam removal and other actions. The agreement would provide compensation for lost property taxes to Klamath and Humboldt counties. These provisions are estimated to cost approximately $23 million, and are largely intended as mitigation for the effects of the KHSA (discussed below).[93] The states of Oregon and California have recently clarified that they expect to cover these payments (see below section, "Cost of Implementation").[94]

Regulatory Assurances

The KBRA contains provisions pertaining to federal and state regulations that, while not representing new regulations in and of themselves, are described as "assurances" related to existing regulatory processes. These regulatory assurances lay out actions expected to take place and information which parties would expect federal agencies take into consideration in implementing regulations relevant to the KBRA. For instance, the federal government would agree to avoid (or seek to minimize) new regulations and/or actions related to fish reintroduction that could have a negative impact on users. The KBRA would also provide a process under which the FWS and NMFS would issue their biological opinion for proposed operations of the Klamath Project under the ESA. If authorized, the KBRA would direct the agencies to consider several actions contemplated under the KBRA (e.g., water retirement, wetlands restoration) that are expected to benefit fisheries.[95] The resulting effect of these assurances is not fully understood, and is a matter of contention among some stakeholders.[96]

Coordination and Oversight

Coordination and oversight of the KBRA would be conducted primarily by the Klamath Basin Coordinating Council (hereinafter referred to as the Council.[97] The Council would promote collaboration among stakeholders and coordinate the implementation of the agreement. The Council would also be responsible for oversight and administration of restoration activities and implementing dispute resolution.[98] The Council would make decisions and establish protocols to implement the agreement, although none of its authorities exceed the pre-existing authorities of individual parties.

Under the KBRA, the Council would foster public involvement by allowing participation in meetings and consideration of public input when making decisions. This input would come mostly through other committees formed under the KBRA. In addition to federal and state representatives, these committees would be comprised of stakeholders that include agriculture, recreation, commercial fishing, environmental, tribal, recreational, and county interests. Most stakeholder groups have participated in the process and have committed themselves to continue work on the agreements as they are implemented.

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[93] KBRA, Appendix C-2, p. C.6.

[94] Revised Cost Estimates.

[95] KBRA, Section 151, pp 153-154.

[96] For more information, see below section, "How Do the Agreements Affect Endangered Species Act Implementation?"

[97] Parties to the KBRA are represented on the Council by one voting member.

[98] KBRA, Appendix D-1, p. D.2.

Several advisory groups would assist in the coordination and implementation of the KBRA. A summary of three of these groups follows:

- The Klamath Basin Advisory Council (KBAC) would provide advice and recommendations for federal agency parties as necessary for implementing the Restoration Agreement after execution of a charter pursuant to the Federal Advisory Committee Act (FACA). Prior to execution of the charter, advice would be provided by the Interim Advisory Council. All parties would be provided the opportunity to participate in meetings of KBAC, but voting members would be limited to the parties specified for Council voting.[99]
- A Technical Advisory Team (TAT) would be created to provide recommendations to the Council, KBAC, and agencies on water management and fisheries restoration activities governed by the Restoration Agreement. The TAT would gather data, make recommendations for management of resources, provide technical expertise, and evaluate management and make recommendations concerning environmental water in the Klamath Basin.[100]
- An Upper Basin Team (UBT) would be created to oversee the planning and implementation of the Water Use Retirement Program. The UBT would be a subcommittee of KBAC and its recommendations would be provided to KBAC. The four voting members of the UBT would include two representatives of the Klamath Tribe and two representatives from the Upper Klamath Water Users Association.[101]

The KBRA estimates funding needed to conduct coordination and oversight activities at $3.3 million. Oversight of the implementation would also be supported by an adaptive management program. This process under the agreement is broadly described, and would be expected to include objectives to measure performance, monitoring and evaluation procedures, and a process to use these results to inform future management actions.

Klamath Hydroelectric Settlement Agreement

The Klamath Hydroelectric Settlement Agreement (referred to here as the KHSA) lays out a process for additional studies and environmental review by the Secretary of the Interior to consider removal of the four hydroelectric dams on the Klamath River that are owned by PacifiCorp (J.C. Boyle, Iron Gate, Copco 1, and Copco 2). The KHSA addresses the interim operation of the dams as well as processes that could lead to transfer, decommissioning, and removal of the dams. Additionally, the KHSA includes provisions for PacifiCorp to transfer Keno Dam to the Bureau of Reclamation and to relinquish its current role as operator of Link River Dam. In contrast to the KBRA, the federal government is a party to the KHSA. However, similar to the KBRA, implementation of certain components of the KHSA requires authorization by Congress.[102]

Some actions within the KHSA have been interpreted by Reclamation not to require an explicit authorization by Congress, and are currently ongoing. For example, the central component of the

[99] KBRA, Appendix D-1, p. D.6.

[100] KBRA, Appendix D-2, p. D.9

[101] KBRA, Appendix D-1, p. D.14

[102] Federal parties to the settlement include National Marine Fisheries Service, U.S. Department of the Interior, Bureau of Indian Affairs, Bureau of Land Management, Bureau of Reclamation, and Fish and Wildlife Service.

KHSA, the dam removal study, is being conducted under Reclamation's general authorities. However, parties to the KHSA agree that a congressional authorization is necessary to finalize the Secretary's determination on dam removal (which would result from these studies).[103] Under the KHSA, the Secretary is expected to make "best efforts" to come to a final determination on whether to remove the dams by late March of 2012.

Secretarial Determination on Dam Removal

The Secretary of the Interior's dam removal determination is the central component of the KHSA. As previously mentioned, the KHSA lays out the process and expectations underpinning this study. First and foremost, the settlement directs the Secretary to answer two central questions related to dam removal: (1) Will facilities removal advance restoration of salmon fisheries? (2) Is facilities removal in the public interest?[104] The Secretary, in consultation with other federal and state agencies, is to use his best efforts to finalize this determination by March 31, 2012.[105] In addition to a determination on the primary questions mentioned above, the KHSA also stipulates that the Secretary prepare a "Detailed Plan" that provides additional analysis and a potential plan forward for implementing dam removal.[106]

Negative Determination

If the Secretary of the Interior recommends against dam removal (i.e., if the Secretary finds that proceeding with dam removal will not restore salmon fisheries and/or be in the public interest), the KHSA would terminate unless parties come to a new agreement that would serve as a "cure" to a negative determination. In the event of a negative determination, the KHSA requires that the Secretary of the Interior provide prior notice of this decision so the parties can meet and consider potential changes to the original agreement. Assuming no such "cure" is agreed to and the settlement is terminated, all dams would remain under PacifiCorp's ownership, and the FERC relicensing process would resume.[107]

Affirmative Determination

The agreement provides considerable detail and requirements in the event of an affirmative determination on dam removal. Such a decision could take several forms depending on what type of entity (i.e., federal, non-federal) is designated as the dam removal entity. Additionally, pursuant to the KHSA, a determination recommending in favor of dam removal may not be finalized until several other preconditions have been met. Some of these preconditions include

- **Authorizing Legislation**—passage of federal authorizing legislation for both Klamath settlement agreements.

[103] Section 3.3.4 of the KHSA states that a final Secretarial determination on dam removal may not be made until federal legislation has been enacted. KHSA, p. 20. Available at http://klamathrestoration.gov/sites/klamathrestoration.gov/files/Klamath-Agreements/Klamath-Hydroelectric-Settlement-Agreement-2-18-10signed.pdf. Hereinafter KHSA.

[104] For the purposes of the dam removal determination, "public interest" includes, but is not limited to, impacts on tribes and local communities.

[105] See KHSA, Section 3.3.4.

[106] This plan has been released. Bureau of Reclamation, *Detailed Plan for Dam Removal- Klamath River Dams*, Department of the Interior, Denver, CO, September 15, 2011, http://klamathrestoration.gov/sites/klamathrestoration.gov/files/Klamath_DetailedPlan2011.pdf. Hereafter *Detailed Plan.*

[107] KHSA, p. 58.

- **State Funding Authorizations**—authorization/approval of funding for dam removal by the states of California and Oregon.[108]
- **Cost Overrun Plan**—if the Secretary determines that costs will exceed $450 million, parties must develop a plan to address these excess costs.
- **State Concurrence with DRE-Designate**—the Secretary must recommend a dam removal entity (DRE) and the states must concur with this designation.

Assuming all of these actions take place along with an affirmative dam removal determination, ownership of the dams would eventually be transferred from PacifiCorp to the dam removal entity, in accordance with the schedule laid out in the Secretary's "Detailed Plan." However, after ownership is transferred, PacifiCorp would continue to operate the dams for electricity generation until at least 2019 (with dam removal scheduled for 2020 at the earliest). Whatever DRE is designated (i.e., federal or non-federal), the entity would be expected to develop a "Definite Plan" that builds on the aforementioned Detailed Plan to further specify actions associated with dam removal.

Dam Removal Costs

Responsibility for costs associated with dam removal are an important component of future dam removal actions. The KHSA assumes a "cap" of $450 million for dam removal costs. Of these costs, $200 million is assumed from a 2% ratepayer increase by PacifiCorp customers in Oregon ($184 million) and California ($16 million).[109] An additional $250 million is assumed to come from the State of California, either through water bonds (which have yet to be approved by voters) or other means.[110] Finally, regardless of whether or not the DRE is the federal government (e.g., the Department of the Interior) or another entity, the KHSA provides that under no circumstance will the federal government be responsible for costs associated with dam removal, including liability for dam removal.[111] PacifiCorp is similarly protected from liability under the settlement. Preliminary estimates by DOI have provided a range for potential dam removal costs from $238 million to $493 million. Based on initial studies, DOI has cited a preliminary estimate of $292 million for dam removal.[112]

Stakeholder Views on the Klamath Agreements

Stakeholder views on the Klamath agreements can broadly be divided into those supporting the agreements and those opposed to one or both of the agreements. However, such a simple characterization may not do justice to the motivation and preferences of many groups. While a majority of interest groups involved in initial settlement negotiations endorsed both agreements, reasons for support among these groups are varied, and in some cases are likely to be contingent on specific parts of one agreement or another (e.g., water certainty, dam removal) going forward.

[108] The initial components of this funding, (rate increases for PacifiCorp customers) have been approved, although as of late 2011, the California bond funding had not been approved. Notably, the KHSA provides an exception for this bond funding: if the Secretary finds that future approved bond funding would be sufficient, he may make a determination. See KHSA, p.21.

[109] These rate increases have been approved by the Oregon Public Utilities Commission and the California Public Utilities Commission.

[110] See KHSA, Section 4.1.2.

[111] KHSA, p. 31.

[112] *Detailed Plan*, p. 7.

Among those opposed to the agreements, reasons for opposition also vary widely, and include perceptions of economic damages resulting from the agreements, overall lack of environmental protections and/or subversion of existing federal or state laws.

Support for Agreements

Among those supporting the Klamath agreements are all of the parties (or signatories) to the KBRA and the KHSA. For the KBRA, this includes the states of Oregon and California, three tribes, two counties, parties representing to the Reclamation Project and some off-project interests, and several other groups (including environmental interests). These same groups are also party to the KHSA.[113] Other groups and individuals were not "party" to the agreements but have stated their support for them. Notably, supporters who were party to one agreement have agreed to support authorizing legislation for the other (e.g., KBRA signatories back enactment of the KHSA), and have generally argued that the agreements themselves must be linked.

The States of California and Oregon, as well as the Obama Administration, support the agreements because as a whole, they represent a potential solution to the protracted resource conflicts in the Upper and Lower Basins. Government representatives often note the costs that resulted from previous conflicts in the basin, including supplemental funding, crop insurance payments, direct actions by federal agencies, and litigation costs (including damages claimed against the federal government) arising from the 2001 and 2006 events. According to supporters, most of these costs would be rendered less likely through implementation of the agreements.

Other groups representing narrower interests also support the end of these conflicts, and also focus on specific provisions that they view as necessary. Generally speaking, they have pledged to support for other provisions as part of the overall compromise.[114] For instance, environmental groups have pledged to support the allocations for irrigation absent a similar allocation for fish (which they previously have opposed), in exchange for assurances of dam removal under the KHSA and other promised fisheries restoration actions under the KBRA. Among irrigators, those on the Klamath Project have pledged to support the agreements, and approximately half of the off-project irrigators support the agreements.[115]

For its part, PacifiCorp supports removal of its four dams under the KHSA because retirement of the dams under the terms of the KHSA represents the most cost-effective option for its ratepayers.[116] Previously there have been disagreements over which option the company would pursue in absence of the KHSA: FERC relicensing for ongoing operations on all four dams (which would entail costly improvements for fish passage, and altered operations for water quality) or decommissioning of some or all of the KHP.[117] Both options would be costly for

[113] See KHSA, pp 1-2.

[114] General obligations to support the agreement for non-federal parties is laid out in Part I of the KBRA.

[115] According to the Klamath Water Users Association, entities representing approximately 175,000 acres (97%) of the Klamath Project support the agreements. The Upper Klamath Water Users Association, which has also signed the agreements, represents land owners of approximately half of the "off-project" acreage, while other landowners and the Klamath Off-Project Water Users Association are opposed to the agreements. Personal correspondence, Klamath Water Users Association, February 3, 2012.

[116] "Klamath Dam Agreement Unveiled," September 30, 2009, press release. Available at http://www.pacificorp.com/about/newsroom/2009nrl/kdau.html.

[117] A previous study by the California Energy Commission and the Bureau of Reclamation found that removal of all dams would be the most cost-effective action for PacifiCorp (i.e., less expensive than modification of the dams). Some have argued that this suggests that even without a dam removal agreement or outside funding, PacifiCorp would choose to remove the dams on its own. Thus, the dam removal agreement and related concessions were unnecessary. However,

PacifiCorp and its ratepayers, and could cost PacifiCorp more than the proposed arrangement under the KHSA, which provides for dam removal partially funded by ratepayers (with the other portion funded by the State of California), and also allows the company to operate the dams under the current management regime through 2019.

Opposition to Agreements

A number of groups and individuals have opposed the Klamath agreements and now argue against their authorization. Some of these parties were initially involved in settlement negotiations but dropped out for various reasons, while others were not invited to participate in negotiations because they were not seen as representing significant interests. Notable opponents of one or both of the Klamath agreements include Siskiyou County in California, the Klamath Off-Project Water Users Association, the Hoopa Valley and Resighini Rancheria and Quartz Valley tribes, the Northcoast Environmental Center (NEC), Waterwatch of Oregon, Oregon Wild, and others.

Some groups oppose the agreements because they believe they will further damage the region's economy. Some off-project users are opposed to the Klamath agreements and have argued in previous testimony before Congress that the agreement will put farmers (in particular, off-project irrigators) out of business.[118] Siskiyou County opposes the agreements for a number of reasons, including the assertion by some that the PacifiCorp dams provide flood protection and economic benefits for downstream areas.[119] Some residents and officials in these areas also oppose dam removal because of an expected loss of property taxes associated with certain lands that will lose lake frontage when the dams are removed.[120]

Others argue that the agreements do too little to benefit fisheries, and give up too much to farmers and other interests. For instance, the Hoopa Valley Tribe has been critical of the agreements because they do not provide defined amounts of water for fish, and the federal appropriations for restoration actions are unlikely to be funded. Some have also highlighted the uncertain nature of fisheries restoration in the Klamath under the KBRA. Some believe that these uncertainties were highlighted in expert panels as a part of the larger DOI dam removal study process, but were not adequately acknowledged by DOI in its final studies.[121] Some of these groups favor dam removal, but argue that it could be achieved through other processes (i.e., traditional FERC relicensing), which would not be tied to the KBRA. They note that by providing a stay from this process for PacifiCorp, the Klamath agreements allow the company to avoid project upgrades (or removal) that would otherwise be paid for by the company and benefit fisheries in the short term.[122]

PacifiCorp has argued that relicensing would actually cost less than decommissioning, and that if the government tried to force it to pay for removal, the company might contest removal of some or all of the dams.

[118] Approximately half of off-project land owners are represented by the Klamath Off-Project Water Users Association, which opposes the agreements. See also U.S. Congress, House Committee on Natural Resources, Subcommittee on Water and Power, Testimony of Thomas Mallams, Klamath Off Project Water Users Association, *The Bureau of Reclamation and the American Recovery and Reinvestment Act: A Progress Report and Planning for the Future*, Hearing on the American Recovery and Reinvestment Act, 111th Cong., 2nd sess., July 15, 2010.

[119] In its draft EIS, DOI asserts that most of these concerns are unfounded. See below section, "What Are Some Other Potential Effects of the Agreements on the Basin?"

[120] This is particularly the case in Siskiyou County, where 79% of voters expressed opposition to removal of the three PacifiCorp dams in California.

[121] In particular, the expert panels associated with Chinook and Coho salmon pointed out uncertainties associated with ongoing water quality issues and have been highlighted by opponents.

[122] Thomas P. Schlosser, "Dewatering Trust Responsibility: The New Klamath River Hydroelectric and Restoration Agreements," *Washington Journal of Environmental Law and Policy*, vol. 1, no. 1 (July 2011), p. 42. Available at

Combined with a lack of performance metrics for fisheries restoration provisions in the KBRA, these opponents assert that the agreements disproportionately benefit PacifiCorp and irrigators at the expense of fisheries.

Some environmental groups oppose other provisions of the Klamath agreements and dropped out of negotiations as a result. Waterwatch of Oregon and Oregon Wild find fault with a number of the provisions in the agreements, including the lack of defined water supplies for fish and the inclusion of lease-land farming on wildlife refuges.[123] Similar to the Hoopa Valley Tribe, these groups have called for voiding the KHSA and resuming water quality certification processes under the Clean Water Act in order to force dam upgrades or removal through a separate process, which they argue will be more expedient and cost less for state and federal taxpayers (i.e., a process to be funded by PacifiCorp).[124]

Congressional Interest

As previously discussed, both Klamath agreements require congressional authorization to move forward, and companion bills to authorize the Klamath agreements have been introduced in the 112th Congress in both the House and Senate (H.R. 3398 and S. 1851, respectively). The bills authorize the agreements by reference, and reinforce other provisions in the agreements, seemingly without significant changes to the contents of the agreements. If it chooses to consider these bills, Congress might focus on a number of issues, including whether it endorses the strategies and specific actions (e.g., dam removal, water allocations, restoration actions, and aid for tribal and local interests) in the agreements. In addition to deciding whether it agrees with the strategies/actions themselves, Congress might also consider the broader obligation of the federal government to act on the agreements, and whether federal expenditures on these actions are justified (and if so, how much).

Obligation of the Federal Government

The role of the federal government in the Klamath Basin is likely to be a central question related to congressional consideration of the Klamath agreements. Both agreements assume numerous actions by the federal government, and it is unlikely that many of the agreement's provisions could go forward under existing authorities (i.e., without explicit authorizations by Congress). In particular, without congressional authorization for the Secretary to make a dam removal determination, the four dams could not be removed under the process currently envisioned in the KHSA. Further, without authorization of its provisions, it is also unlikely that many of the programs under the KBRA could go forward. In considering authorization of the Klamath legislation, Congress may decide whether the federal government has an obligation to act on the agreements and, if so, to what extent.

Supporters of the Klamath agreements argue that because of the federal government's prominent role in the basin, including its role in the area's resource allocation conflicts, it has a responsibility to help solve these issues. These groups note that federal involvement, including operation of the Reclamation Project, implementation of ESA, and management of fisheries and

http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1043/1WJELP042.pdf?sequence=1. Hereinafter Schlosser.

[123] See KBRA, Section 15.4.3.

[124] Ani Kame'enui and Alexander Borack, "Op-ed: Water Quality Suffers as Congress Dithers," *Redding Record Searchlight,* June 13, 2011.

federal lands, is not likely to diminish. They argue the agreements represent a delicate consensus achieved by differing factions and are the best opportunity to solve the region's problems. They also argue that the agreements are likely to save the federal government from future expenditures associated with litigation and emergency financial support, and that the agreements will be a valuable source of jobs within the basin.[125]

Some of those opposed to the agreements note that the federal government has no clear obligation to authorize the Klamath agreements and implement their provisions. Some of these entities have argued that many of the activities represented in both agreements, including dam removal and water quality improvements, could potentially occur without the proposed agreements, potentially through pre-existing federal processes.[126] Others, including off-project water users and some local interests, note that the agreements, like previous federal actions in the Klamath, amount to federal overreach and are actually more likely to harm the local economy, especially in the agricultural and recreation industries. Finally, others argue against federal authorization of the settlement agreements because they believe that the agreements themselves will undermine existing federal laws (e.g., the Endangered Species Act) or undermine federal responsibilities (e.g., tribal trust responsibilities), or that they will fail to achieve their stated goals (e.g., fisheries restoration).

Cost of Implementation

The cost to the federal government to implement actions proposed under the Klamath agreements is among the most contentious issues associated with congressional authorization. In particular, most of the actions in the KBRA are funded by the federal government, including most of the costs for the water resources, fisheries restoration, and tribal components of the agreement. The original 2010 KBRA included an estimate of $970 million in total costs from 2010 to 2020.[127] Since that time, estimates have been revised downward.[128]

According to current estimates, federal costs to implement the Klamath agreements would be $798.5 million over 15 years. Estimates note that approximately $262 million in ongoing "base funding" for Klamath restoration (i.e., funding currently spent in the Klamath under existing authorities) would be available for redirection toward actions in the KBRA, resulting in a lower figure (approximately $536 million) for "new" federal funding to implement the KBRA.[129] Both estimates ($798 million and $536 million) have been cited as the federal cost to implement the agreements. Any proposals for "new" federal funding under existing authorities would potentially alter this split further.[130]

[125] DOI has estimated that dam removal itself will create approximately 1,400 jobs in the one-year timeframe for this project, while other actions under the KBRA will create 4,600 jobs over 15 years, with additional gains to farming and fisheries industries See draft EIS, Klamath Regional Economics Fact Sheet, available at http://klamathrestoration.gov/sites/klamathrestoration.gov/files/Econ.Fact.Sheet.Sept.21.pdf.

[126] See for instance, Schlosser, p. 60. For a rebuttal to these arguments as they pertain to the KHSA, see Michael A. Swiger and Sharon L. White, "Rebuttal In Defense of the Klamath Hydroelectric Settlement Agreement," *Washington Journal of Environmental Law & Policy*, vol. 1, no. 2 (2011), pp. 297-309. Available at http://digital.law.washington.edu/dspace-law/bitstream/handle/1773.1/1082/1WJELP297.pdf?sequence=1.

[127] KBRA, Appendix C-2, p. C.6. Costs for the agreement were estimated in 2007 dollars.

[128] Revised Cost Estimates, p. 10.

[129] Revised Cost Estimates, p. 3.

[130] For instance, the FY2013 President's Budget proposed $7.5 million in funding for new KBRA activities under existing authorizations.

Cost estimates to implement the KHSA have not changed substantially since the original agreement, and may not garner as much attention from Congress since states are the primary entities responsible for funding dam removal under the KHSA.[131] Initial studies by DOI looking at the potential costs of dam removal have estimated potential costs of approximately $290 million for dam removal. One potential issue related to these costs is whether the Secretary will recommend the federal government as the dam removal entity. If the Secretary recommends the federal government as the dam removal entity, a major question may be how the department would handle additional costs for dam removal, such as costs resulting from lawsuits.

There is no formal estimate of potential future savings to state and federal governments associated with the agreements. Supporters note that previous costs to federal and state governments, including at least $170 million in additional aid for irrigators and fisheries beyond "regular" appropriations that was provided from 2001 to 2011, would be less likely to be necessary if the agreements were enacted.[132] Additionally, although the agreements would not prevent future litigation, supporters argue that, if authorized, they would obligate parties to pursue other dispute resolution mechanisms and would thus render future litigation costs less likely. Opponents note that none of these savings are guaranteed under the agreements, and that supplemental appropriations and expenditures for litigation may still be necessary.

Supporters also argue that in addition to potential savings, the KBRA and KHSA could create significant economic benefits (in terms of both traditional and "non-use" benefits). Studies commissioned as part of the dam removal process by DOI estimated the potential value of restoration, including non-use values.[133] The department estimated the value of restoring the Klamath at $15-$84 billion, depending on the assumptions and methodology used.[134] Many dispute these estimates, seeing them as unrealistically large and as derived from questionable methodologies.

Obtaining authorization of new funds and, subsequently, appropriations for these activities, may be difficult. For new authorizations, there are procedural hurdles that need to be overcome in the House. New authorization bills may not be eligible for consideration without an "offset" of another authorization, pursuant to House "Cut-Go" protocol (see box below). Beyond authorization of new funds, some observers have also noted the unlikelihood of obtaining the appropriations envisioned for the KBRA in a constrained budgetary environment. Hypothetically, a lack of discretionary appropriations or progress associated with future actions initially assumed in the KBRA could affect the status of support for either agreements among the parties, and thus cause additional conflicts or fracturing of that agreement's coalition.

[131] The KHSA provides that the states of California and Oregon are responsible for up to $450 million of the costs for dam removal, but makes no provision for costs beyond this cap. If estimates conclude that costs are likely to exceed $450 million, then the Secretary must put off a determination until a plan to address these costs is developed.

[132] See "Previous Events" section for a breakdown of this funding.

[133] Non-use values were calculated based on regional and national surveys which asked respondents to estimate their willingness to pay for different restoration scenarios

[134] Department of the Interior, *Draft Secretarial Overview Report for the Secretary of the Interior*, An Assessment of Science and Technical Information, January 23, 2012, p. 170, http://klamathrestoration.gov/sites/klamathrestoration.gov/files/DDDD.SDOR.Full.1.24.12.pdf..

Cut-Go for Discretionary Authorizations in the 112th Congress[135]

Discretionary authorizations do not have a direct effect on the federal budget. Instead, they authorize, explicitly or implicitly, the enactment of appropriations for specified purposes. It is the subsequent appropriations, and not the authorization of appropriations, that provide the legal authority to obligate funds. As a result, such discretionary authorizations do not, by themselves, increase federal spending or increase the federal deficit.

Current budget enforcement rules are intended to constrain congressional action on legislation directly affecting the federal budget. For instance, the Senate's PAYGO rule (Section 201 of S.Con.Res. 21, 109th Congress), or the House's Cut-Go rule (clause 10 of Rule XXI), do not apply to most discretionary authorizations, and currently there are no budget enforcement rules that would constrain the levels of discretionary authorizations provided in legislation.[136] However, the House Majority Leadership has established a "protocol" relating to legislation authorizing discretionary appropriations, which is intended to guide "the scheduling and consideration of [such] legislation on the House floor."[137] The "Cut-Go for Discretionary Authorizations" protocol generally requires that any discretionary authorizations for a new program, and any increase in discretionary authorizations for an existing program, be offset by an equivalent reduction in discretionary authorizations of an existing program.

How the protocol is applied depends on three key determinations. The first two determinations relate to what discretionary authorizations need to be offset. First, the protocol requires that any discretionary authorizations for "any new agency, office, program, activity, or benefit" would need to be offset. This determination would seem to depend on what constitutes "new." While a new agency or office might be self-evident, what constitutes a new "program, activity, or benefit" might be open to interpretation. For example, a discretionary authorization for a specific activity could be construed as part of a more general ongoing activity, and therefore not be considered "new" for purposes of the protocol. In contrast, "new" could be construed very strictly, and require that any newly specified authorized activity (i.e., any proposed authorization not currently existing in statute) would require an offset.

Second, the protocol basically defines an increase in an existing program authorization as any amount in excess of "the overall increase in the relevant function area in the most recent budget resolution." That is, the discretionary authorizations for an existing program may be increased as long as it is assumed in the most recent budget resolution.[138] For example, if the budget resolution assumes that an existing program authorization would increase by $2 million each year, then such an increase in discretionary authorization for such program presumably would not need to be offset. In contrast, if the discretionary authorization for the same program proposed an increase of $3 million each year, then $1 million each year presumably would need to be offset.

Finally, the third key determination relates to what would constitute an appropriate discretionary authorization offset. The protocol requires a "reduction in the authorization of current ongoing spending" to offset the "full value" of an applicable discretionary authorization.[139] It defines such reduction as "a new authorization level below the amount actually appropriated for such purposes in the most recent fiscal year." An appropriate offset under the protocol, therefore, is not a cut in existing authorized levels for a particular purpose but rather the establishment of an authorization level for such purpose that is below the amount of appropriations provided in the most recent fiscal year. For example, if $20 million in budget authority was provided in an appropriations act in the most recent fiscal year for an ongoing activity, then the establishment of an authorization level of $10 million for such activity presumably would qualify as a $10 million offset, regardless of the existing authorization level, or lack thereof, for such activity.[140]

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[135] This section was written by Bill Henniff, Jr., Analyst in Congress and the Legislative Process.

[136] The amount of spending for such authorizations ultimately is determined in the annual appropriations process. Such annual appropriations are subject to certain budget enforcement rules. Appropriations are capped in each fiscal year through allocations to the House and Senate Committees on Appropriations. These allocations are intended to control the overall level of discretionary appropriations on an annual basis.

[137] The House Majority Leadership's "Legislative Protocols for the 112th Congress" are available at http://www.majorityleader.gov/Protocols/.

[138] The most recently adopted budget resolution is the FY2010 budget resolution (S.Con.Res. 13, 111th Congress).

[139] The protocol does not indicate the time frame of an appropriate discretionary authorization offset. That is, the protocol might require an equivalent offset for each fiscal year for which the applicable discretionary authorization is provided, or it might require an equivalent offset for the total of all fiscal years for which the applicable discretionary authorization is provided.

[140] In general, under House Rule XXI (as well as Senate Rule XVI), an appropriation in excess of the authorized level is considered an unauthorized appropriation and is prohibited. The establishment of a new authorized level apparently

Dam Removal Determination

Some assert that congressional authorization of the agreements would be an implicit endorsement not only of federal actions, but of the agreements' other provisions (i.e., actions by non-federal entities). This is true for one of the most controversial actions represented in the agreements: dam removal. While the federal government would not fund dam removal under the current version of the KHSA, DOI is directing the study process to determine whether dam removal is in the public interest (subject to state concurrence), and requires congressional authorization to make the final determination.

Authority for the Secretary of the Interior to make a final determination on dam removal is a key step in the dam removal process, and some argue that Congress's action on the legislation will be crucial in determining whether dam removal takes place. Since draft findings have raised few major drawbacks associated with removal, opponents of dam removal argue that providing the Secretary with authority to make this decision will be tantamount to congressional approval for dam removal itself, and should thus be avoided at all costs. On the other hand, some note that congressional refusal to authorize the secretarial determination would not necessarily stop dam removal, especially if PacifiCorp pursued an alternative dam removal process that did rely on the federal government to go forward (such as the KHSA does).

Other Frequently Asked Questions

The Klamath agreements bring up a number of complex questions that may be considered by Congress. This section includes questions that are common regarding the Klamath agreements.

Will the Agreements End Litigation in the Klamath Basin?

A central argument for congressional authorization of the Klamath agreements is that the agreements will end or limit conflicts in the Klamath Basin. As previously discussed, if authorized by Congress, the agreements would provide for the settlement of some legal conflicts in the basin (see section on "Water Rights Claims"). Furthermore, by laying out a suite of actions that are acceptable to those stakeholders who are party to the agreements, many argue that the agreements render future lawsuits less likely.

However, the Klamath Basin agreements do not determine water rights in the basin, nor do they provide for the resolution of all water rights claims in the basin. The Klamath Basin Adjudication would continue to adjudicate outstanding claims asserted by water users. Although some claims between Klamath Project water users and tribal water users may be withdrawn under the agreements, the KBRA nonetheless contemplates the possibility of future claims by other parties (i.e., those unrelated to water management decisions or the failure to protect water rights). The agreements are analogous to contracts between consenting parties. As such, any party who wishes to withdraw from the terms and conditions of the agreements would be liable under contract principles.

is based on the idea that a Member could raise a point of order under the rule against an appropriation in excess of the authorized level when the subsequent appropriations legislation is considered on the House floor. In this way, the discretionary authorization protocol may lead to a reduction in the actual amount appropriated.

Will the Agreements Result in Restored Fish Populations in the Klamath Basin?

The causes of fish population declines are numerous and vary depending on species and location within the Klamath Basin. Similarly, fish restoration is likely to depend on integrating numerous restoration efforts required by both Klamath agreements, and the success of these efforts may not be uniform for all of the basin's fisheries. Further, the outcomes and timing of restoration efforts are subject to uncertainties because of the complexity of interrelated elements of the Klamath ecosystem and the effects of exogenous factors on fish abundance such as ocean conditions and climate change.

Removal of the four lower dams on the Klamath River mainstem would open 420 miles of historical fish habitat that is currently closed off to anadromous fish such as salmon, steelhead, and lamprey.[141] Dam removal may also decrease the incidence of blue-green algal blooms that are harmful to fish and other aquatic organisms and allow gravel previously retained behind dams to contribute to spawning habitat. The KBRA intends to complement dam removal by improving habitat, screening diversions, and increasing instream flows to mimic natural river conditions. Survival of outmigrating salmon may improve because flows, water temperature, and other conditions would be likely to more closely resemble historical conditions that existed prior to dam construction, while the risk of extended low flows also may be minimized.[142] In 2011 DOI issued a draft environmental impact study (EIS), as well as numerous other reports and documents that are expected to inform the Secretary's dam removal determination. A draft of one of these reports, widely cited by DOI, concluded that removal of the four dams would lead to long-term benefits for fisheries, including an increase of approximately 81% in Chinook salmon production.[143] The effect on other fish populations, including coho salmon, is more uncertain, but DOI has asserted that approximately 68 miles of potential coho habitat would be restored, and that water quality would be enhanced.[144]

Most of the primary supporters of the KHSA believe that dam removal would result in net long-term gains for the Klamath Basin's fisheries. However, some have argued that the long-term improvements from dam removal will be outweighed by short-term harm from the release of sediments that that have accumulated behind the dams. DOI concluded that the short-term negative effects of sediments on fisheries would be somewhat negligible, but could be negated by timing the removal of dams for the winter (so as to not coincide with major upstream or downstream fish migrations).[145] According to an expert panel funded by (but not representing) the Fish and Wildlife Service, suspended sediment would be high for up to eight months, and although the effect of these concentrations on migrations may be minimal, spawning gravels may be impacted by silt for up to several years. This study also concluded that the extent of benefits

[141] John Hamilton, Dennis Rondorf, and Mark Hampton et al., *Synthesis of the Effects to Fish Species of Two Management Scenarios for the Secretarial Determination on Removal of the Lower Four Dams on the Klamath River*, Biological Subgroup for the Secretarial Determination Regarding Potential Removal of the Lower Four Dams on the Klamath River, June 13, 2011. Hereinafter Synthesis of the Effects, 2011.

[142] Synthesis of the Effects, 2011.

[143] Noble Hendrix, *Forecasting the Response of Klamath Basin Chinook Populations to Dam Removal and Restoration of Anadromy Versus No Action*, Department of the Interior, Review Draft, Redmond, WA, September 20, 2011, p. 2, http://klamathrestoration.gov/sites/klamathrestoration.gov/files/EDRRA%20Report%20Hendrix%209.21.11%20Draft.pdf.

[144] See Department of the Interior, *Klamath Secretarial Determination Process: Summary of Key Conclusions.* September 21, 2011. p. 1, http://klamathrestoration.gov/sites/klamathrestoration.gov/files/Final.Summary.Sept.21.pdf.

[145] Draft Environmental Impact Statement, p. ES-40.

that can be expected from dam removal will depend heavily on the extent to which pre-existing water quality issues in the Klamath River can be resolved. Since these issues are purportedly addressed in the KBRA, some note that removal of the four dams alone will not be sufficient to restore salmon and other fish unless it is tied to successful implementation of the KBRA.

Dam removal would have little or no effect on resident species of the Upper Klamath Basin such as Lost River and shortnose suckers. However, these species are likely to benefit from the KBRA fisheries and water programs, which seek to improve water flows, quality, and habitat, particularly in Upper Klamath Lake.[146] Some, including DOI, have noted that that improving water quality in Klamath Lake will be difficult because of the lake's natural conditions. Stream flows and water quality improvements related to KBRA actions may also increase productivity of these species.

What Are Some Other Potential Effects of the Agreements on the Basin?

Besides the aforementioned effects on fisheries, other potential impacts to the basin resulting from dam removal have been noted and, in some cases, studied. According to DOI, potential impacts include the loss of a small amount of flood storage on the Klamath River (mostly in the area immediately downstream of Iron Gate Dam), reduced property values for some reservoir frontage property (including 127 single family homes, mostly around Iron Gate Dam and J.C. Boyle Dam), and some reductions in white water rafting opportunities upstream of J.C. Boyle Dam.[147] Dam removal will also result in a loss of hydroelectric power produced by PacifiCorp. According to DOI , the dams represent approximately 2% of PacifiCorp's total generating capacity, and produce an annual average of approximately 716,00 megawatt-hours (MWh) electricity, of which 686,000 MWh would need to be replaced under the proposed dam removal plan.[148] DOI has also acknowledged a potential increase in greenhouse gas emissions due to this loss, and the expected sources of replacement power.

The cumulative economic effects of both agreements (including the economic effects of fisheries restoration) is one of the many items that has been studied by DOI.[149] Preliminary analysis of National Economic Development benefits by DOI concluded that approximately $225 million in benefits to irrigated agriculture, fishing, and other sectors would result from the agreements, although DOI noted that several potentially substantive benefits (e.g., tribal fisheries and cultural values) remained unquantified as of December 2011. In addition to the implementation costs of the agreements, these studies projected approximately $1.32 billion in forgone hydropower benefits (not included operations/maintenance savings), as well as $41 million in forgone reservoir and whitewater recreation benefits.[150]

[146] Synthesis of the Effects 2011.

[147] Regarding flood control, according to DOI only Iron Gate and Copco 1 provide noteworthy protection during flood events (approximately 5% attenuation, according to DOI). In its draft environmental impact statement, DOI states that the 100-year floodplain downstream of Iron Gate Dam would change slightly as a result of removal, and proposed mitigation measures as a result. See Draft Environmental Impact Statement, p. 3.6.30.

[148] Draft Environmental Impact Statement, p 3.10-27.

[149] See Bureau of Reclamation, *Economics and Tribal Summary Technical Report*, Department of the Interior, Denver, CO, September 2011, pp. ES-4, http://klamathrestoration.gov/sites/klamathrestoration.gov/files/EIS-EIR-Draft/Econ-Reports/Economics-Tribal_9-12_FULL%28accessible%29.pdf. Hereinafter Economics Summary.

[150] Economics Summary, p. ES-5.

How Do the Agreements Affect Endangered Species Act Implementation?

Whether the Klamath agreements will alter implementation of the Endangered Species Act (ESA), and to what extent, is a matter of disagreement. Previous biological opinions established minimum flows on the Klamath River for coho salmon, as well as actions intended to aid the recovery of Lost River and shortnose suckers. According to supporters, the Klamath agreements will be considered to the maximum extent practicable under the Endangered Species Act.[151] At the same time, both agreements state that implementation of the agreements shall not affect implementation of the Endangered Species Act by the Department of the Interior or the National Marine Fisheries Service.[152] Currently it is unclear how both claims would be accommodated.

While the agreements do not "waive" application of the ESA, some groups that were not signatories argue that certain provisions, in particular the defined water allocations for irrigators, would have the effect of undermining the ESA. These groups note that the defined allocations for irrigators would provide more water than irrigators received under ESA regulations during recent "low" water years, and will thus provide less water for the environment and harm fish species. They also note that while other processes under the ESA will go forward apart from the KBRA, the "assurances" in the agreements, if adopted in legislation, could result in additional pressure on rulemaking agencies to adopt biological opinions that allow the flows set forth in the Water Resources Program.

Supporters note that the Klamath agreements are likely to provide more resources and effort to improve environmental quality for listed fish species, which would in effect provide for positive mitigation actions for listed species. Improvements under the KBRA, including new fish habitat and improved water quality, are assumed to result greater fish abundance, which would in turn allow managers to forgo restrictive measures under the ESA. Furthermore, if landowners perceive that success of fish restoration efforts are in their long-term interest, they may become more receptive to voluntary actions such as screening diversions and improving habitat under the terms of the agreements. In other words, some believe that the KBRA could also encourage more "cooperative" actions (as opposed to regulatory actions) that would improve the likelihood of the recovery of listed species.

What Happens If the Agreements Are Split Up or Changed?

Some might argue that one or both agreements will have a better chance of being enacted if they are considered separately by Congress, or else altered to remove controversial parts (e.g., dam removal). Officially, signatories to the Klamath agreements have stated that their support for the agreements is contingent on concurrent authorization of both agreements. Also, as previously noted, the agreements contain a number of interrelated actions. Splitting up the agreements might thus result in a fracturing of the coalition of current signatories, and would likely be opposed by at least some of the current coalition of supporters. However, whatever federal activities are authorized could hypothetically go forward.

If Congress does decide to materially change the agreements, it could trigger meet and confer and/or dispute resolution processes under the agreements. Specifically, Section 3.2.4.B.vi of the KBRA provides that any party who believes that enacted authorizing legislation is not "materially consistent" with the KBRA can seek a resolution that would result in either amendment of the

[151] Klamath Basin Coordinating Council, "Summary of the Klamath Basin Settlement Agreements," May 2010, available at http://216.119.96.156/Klamath/Summary%20of%20Klamath%20Settlement%20Agreements%204-5-10.pdf.

[152] For example, see KBRA Sections 2.1, 19.1, 20.3.1, and 22.5.

authorizing legislation or amendment of the KBRA. The KHSA provides for similar meet-and-confer procedures (and potential termination of the agreement) in the event of enacted legislation that is materially inconsistent with the KHSA.

What Are the Alternatives to the Klamath Agreements?

Some have pointed out that there are alternative solutions to the issues that the Klamath agreements aim to settle, some of which would not require congressional involvement in the form of authorizations and appropriations for specific actions. For instance, some groups opposed to the agreements but in favor of dam removal or other environmental improvements have argued that, were it not for some of the protections in the KHSA, processes that would otherwise proceed under the Clean Water Act or the FERC relicensing process would potentially force PacifiCorp to add fish passage and/or remove some (or all) of the dams on its own, potentially on a timeline sooner than the 2020 deadline envisioned in the current agreements.[153] Supporters of the KHSA generally disagree with this idea, and note that such a process would likely be contentious, involving years of litigation and no guarantee of dam removal at the same scale and in the same time frame currently promised under the KHSA.

Others point out that the status quo, while imperfect, may be preferable to many of the provisions included in the Klamath agreements, including the array of additional actions by federal and state governments. These interests point out that a considerable amount of federal spending and planning already takes place in the Klamath, and the likely future costs of litigation and the expected needs for more federal action will not outweigh the considerable new investments envisioned under the agreements. These interests also note that while proceeding under an ad-hoc approach that prolongs conflicts in the basin up to this point may not be ideal, it is preferable to some of the trade-offs which have been made under the agreements.

What Happens If Congress Chooses Not to Authorize the Agreements?

If Congress does not authorize the agreements, many (but not all) of the federal actions in the agreements could not be implemented. As previously noted, some actions could go forward under existing authorities, although the scope of those actions has not been fully delineated by DOI. DOI has stated that absent congressional authorization of the KHSA, the Secretary will not be able to make a final determination on dam removal, a key step in the restoration process.[154] Other notable parts of the KBRA that are not currently authorized, and may potentially be unable to go forward without congressional authorization, include the water rights assurances and the water retirement program, as well as other provisions.[155] Other ongoing activities would likely continue regardless of the status authorization of the agreements (e.g., operation of the Klamath projects and enforcement activities required under the ESA).

Another potential effect of Congress not enacting the agreements could be "termination" of one or both of the agreements. Each agreement contains termination provisions that provide the option for termination if Congress does not enact the legislation, although termination is not automatic for either agreement. Section 8.11 of the KHSA outlines the process for termination, while Section 7.6 of the KBRA outlines the process under that agreement. Alternatively, parties to the agreements can also go back and amend the agreements so as to make them more palatable to Congress or alter their current structure.

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[153] Schlosser.

[154] Communication with DOI Solicitor's Office, September 19, 2011.

[155] CRS has not conducted a formal analysis to analyze whether these provisions are possible under current authorities.

Conclusion

To many, the Klamath agreements represent a potential solution to a series of conflicts between a complex array of interest groups with a history of conflicting values and perspectives. To others, they represent an unfair and unnecessary resolution to contentious issues that should be solved in other venues. The ability of the two interrelated agreements to solve long-term issues in the Klamath Basin will depend on a number of factors, including complex ecological and hydrological processes that are not fully understood. In considering the preferred course of action in the Klamath Basin, Congress may weigh these factors along with the potential costs and benefits of implementing the agreements, and how they compare to other potential scenarios.

Appendix A. Klamath Basin Fish Species

Table A-1.Listed Freshwater Fish Species of the Klamath River

Range, Condition, and Threats

Fish Species/Life History	Range	Condition	Threats
Lost River Sucker *Deltistes luxatus* Lake dwelling, but spawn in tributaries	Endemic to the Upper Klamath Basin of southern Oregon and northern California, currently found in Upper Klamath Lake and its tributaries, Clear Lake Reservoir and it tributaries, Tule Lake and Lost River up to Anderson-Rose Dam, Klamath River downstream to Copco Reservoir, and probably to Iron Gate Reservoir	Listed as endangered under the federal ESA and the California ESA	Damming tributaries, instream flow diversions, competition and predation by invasive species, habitat loss and degradation, and poor water quality, Upper Klamath Lake anoxic conditions result in die-offs and algal toxins believed to harm juvenile health
Shortnose Sucker *Chasmistes brevirostris* Lake dwelling, but spawn in tributaries	Endemic to the Upper Klamath Basin of southern Oregon and northern California, currently found in Upper Klamath Lake and its tributaries, Clear Lake Reservoir and it tributaries, Tule Lake and Lost River up to Anderson-Rose Dam, Klamath River downstream to Copco Reservoir, Gerber Reservoir, and probably to Iron Gate Reservoir	Listed as endangered under the federal ESA and the California ESA	Damming rivers, instream flow diversions, competition and predation by invasive species, habitat loss and degradation and poor water quality, Upper Klamath Lake anoxic conditions result in die-offs and algal toxins believed to harm juvenile health
Bull trout *Salvelinus confluentus*	Historically occurred throughout the Klamath Basin, currently found in two streams of the Upper Klamath watershed, six streams in the Sprague river watershed, and one stream in the Sycan River watershed	Listed as threatened under the federal ESA	High nutrient levels resulting in algal blooms in impoundments behind dams. Generally poor water quality and degraded habitat

Source: CRS, based on Public Draft Klamath Facilities Removal EIS/EIR 2011.

Table A-2. Selected Anadromous Species of the Klamath Basin

(range and condition)

Fish Species	Current Range	Former Range	Condition
Coho Salmon (*Oncorhychus kisutch*) Southern Oregon/Northern California ESU	Throughout the Klamath River system below Iron Gate Dam	Formerly widely distributed in the Klamath watershed including areas above Iron Gate Dam to the vicinity of Spencer Creek.	Listed as threatened under the federal ESA and California ESA
Chinook Salmon (*Oncorhychus kisutch*) Southern OR/Northern CA ESU	The Southern OR/Northern CA ESU includes all naturally spawned Chinook salmon in the Lower Klamath River downstream from the Trinity River confluence		Populations reduced from historical levels, but a 1999 status review determined that a listing was not warranted for either ESU
Upper Klamath/Trinity River ESU (both fall and spring runs are included in the ESU	The Upper Klamath/Trinity River ESU includes all naturally spawned Chinook upstream of the confluence of the Klamath and Trinity Rivers, the spring run is generally limited to the Salmon and Trinity Rivers	Formerly widely distributed in the Klamath watershed including areas above Iron Gate Dam in the Upper Klamath Basin and tributaries of Upper Klamath Lake	The Upper Klamath/Trinity River ESU is a candidate for ESA listing, alternatives include listing the entire ESU (fall and spring runs), the spring run within the existing ESU, or the spring run as a separate ESU, (the spring run has relatively low abundance and varies widely by year)
Steelhead Trout (*Oncorhynchus mykiss*) Summer and winter runs are part of Klamath mountain province ESU	Throughout the Klamath River below Iron Gate Dam	Formerly above Iron Gate Dam in the Upper Klamath Basin likely including the tributaries to Upper Klamath Lake	Reduced population level, but not in danger of extinction
Coastal Cutthroat Trout (*Oncorhynchus clarki clarki*) Southern Oregon and California Coast ESU	Primarily in small tributaries to the lower 22 miles of the Klamath River mainstem	Likely similar to current range, generally species do not move more than 100 miles from the coast, no accounts of coast cutthroat above Iron Gate dam	A status review in 1999 determined the ESU did not warrant an ESA listing.
Pacific Lamprey (*Lampetra tridentate*) (only anadromous species, there are six Klamath resident species of lamprey)	Klamath River and tributaries below Iron Gate Dam,	Formerly above Iron Gate Dam to Spencer Creek and possibly to Upper Klamath Lake.	Petitioned for ESA listing in 2003, but USFWS halted status review in 2004 due to inadequate information
Green Sturgeon (*Acipenser medirostris*) Northern green sturgeon distinct population segment	Spawn primarily in the lower 67 miles of the Klamath mainstem, in the Trinity, and Lower Salmon River	Likely similar to current range, no evidence of native sturgeon above Iron Gate dam	Northern population segment is a species of concern, in Klamath the population appears to be stable

Source: CRS, based American Fisheries Society, 2005, and Public Draft Klamath Facilities Removal EIS/EIR 2011.

Appendix B. Summary of Previous Events

The 2001 "Water Crisis"

Recent controversies in the Klamath Basin have resulted from the interaction of Reclamation's annual operation of the Klamath Project for irrigation with other purposes and legal considerations—specifically, the appropriate levels of and releases from Upper Klamath Lake—and the effect of that operation on threatened and endangered species in the basins. The most well known of these controversies occurred under drought conditions in April 2001, when the FWS and NMFS each issued biological opinions concluding that Reclamation's proposed operation of the project for 2001 would jeopardize the continued existence of the two species of suckers and the population of coho salmon. As a result, on April 6, 2001, Reclamation announced that "no water [would] be available" for farms normally receiving water from Upper Klamath Lake to avoid jeopardizing the listed species in question.[156] The projected effect of this decision would be to curtail irrigation water deliveries to approximately 200,000 acres of farm and pasture lands within the roughly 235,000-acre Klamath Project service area. In the face of having no water for the coming growing season in much of the project area, farmers threatened to open Reclamation head gates by force, and federal officials were reportedly threatened. The crisis made national news and created a virtual stand-off between federal officials and farmer activists.

Subsequently, in late July 2001, well into the growing season, Secretary of the Interior Gale Norton announced that additional water would be released from Upper Klamath Lake. Coupled with other water supplies, Klamath Project irrigators eventually had access to approximately 30% of their typical water supply in 2001;[157] however, much of this water came from groundwater supplies at added cost. While Lower Klamath National Wildlife Refuge received no water from Upper Klamath Lake in 2001, the refuge subsequently received water from Clear Lake and a number of other sources (including additional rainfall).[158]

Regional economic losses resulting from the 2001 Reclamation plan were partially mitigated by measures, including more than $30 million in federal disaster payments (as well as additional state payments), additional water allocations after the initial shutoff, and water from water banks and groundwater pumping. A 2002 study estimated that the regional economy "fared better than most observers expected in 2001" due to federal crop insurance and other disaster assistance programs.[159] However, the report also noted that regional economic effects of the curtailed deliveries varied widely for individual irrigators, depending on whether they owned or leased land, and other factors.[160] Also, as noted above, not all project water users were affected by the

[156] See http://www.usbr.gov/mp/kbao/klamath_project.html. Prior to 2001, "normal" (non-dry or non-critically dry) net water deliveries for agricultural use from the lake usually ranged from 325,000 af to 400,000 af. Written Communication, U.S. Bureau of Reclamation, April 22, 2010.

[157] Braunworth et al, p. 258.

[158] In sum, the refuge received approximately 23,815 af from May 1 through October 31 (74% of the minimum figure required in the Biological Opinion). Under FWS's Biological Opinion of April 5, 2001, the Refuge was to receive a minimum of 32,255 af of any extra water that might be available from the Upper Klamath Lake. Communication from Tim Mayer, Region 1, Fish and Wildlife Service, U.S. Dept. of the Interior, on April 2, 2002.

[159] Braunworth et al., p. 14. Klamath water users previously cited a significantly higher number of between $160 million and $220 million in impacts before the relief efforts took hold.

[160] Braunworth et al., p. 276. For example, federal disaster payments in most cases went to landowners, not tenants who may have not found other farm work—whereas well drillers were in high demand. Likewise, the impacts on agricultural suppliers who experienced declines in demand for their services and products was different from firms

April 6 cut-off decision. Thus, while some farmers faced severe water shortages for several months, others in the surrounding area did not.

Because of the controversy surrounding the 2001 biological opinions, the Secretary of the Interior sought and secured review of the scientific decisions by the National Research Council (NRC), an arm of the National Academy of Sciences. The committee concluded that scientific data were insufficient to support any of the Upper Klamath Lake level management regimes proposed by federal agencies for the 2001 growing season, although it did find support for other measures included in the NMFS and FWS biological opinions.[161]

The "Fish Crisis" of 2002

While Klamath fisheries have declined significantly from historical levels, a dramatic event in 2002 renewed water management concerns throughout the Lower and Upper Basins. In September 2002, thousands of adult salmon died in the lowermost 40 miles of the Klamath River mainstem. While fall-run Chinook salmon were the primary species affected, coho salmon, steelhead trout, and other species were also lost.[162] This loss, reportedly one of the largest recorded in U.S. history, prompted renewed focus on Klamath Project operations. Some believe Klamath Project water management decisions—made in the spring of 2002—were responsible for the 2002 fish kill; others dispute this view.

On March 29, 2002, Reclamation began water deliveries to farms for the 2002 growing season based on two-month (April and May) "letters of concurrence" issued by the NMFS and the FWS. By late April 2002, Reclamation had reduced mainstem flow below Iron Gate Dam to 1,350 cubic feet per second (cfs), despite significantly increased rainfall in the Klamath Basin. This flow was 350 cfs less than the amount identified by NMFS's 2001 biological opinion as the minimum flow necessary to prevent coho salmon extinction. The Pacific Coast Federation of Fishermen's Associations (PCFFA) and others filed suit to enjoin these reduced flows, in a suit in which many counties and Tribes intervened.[163] Although the court determined the 2002 biological opinion and resulting agency action to be arbitrary and capricious, it allowed their continued implementation as to short-term flows.

On April 25, 2002, the FWS released its draft biological opinion on the impact of the Klamath Water Project on Upper Klamath Basin species, indicating that Reclamation's proposed 10-year (June 1, 2002, through March 31, 2012) plan would jeopardize the continued existence of sucker species, and noting a number of actions needed to mitigate impacts. Higher lake levels were not required except in dry and critically dry years. On May 16, 2002, NMFS released its draft biological opinion, also concluding that Reclamation's 10-year plan would likely jeopardize the downriver coho salmon. The PCFFA lawsuit was the first challenge to Reclamation's 10- year plan, although the plan was criticized by fishermen and the California Department of Fish and

supplying goods and services to well drillers and other economic activities in the basin.

[161] National Academy of Sciences, National Research Council, *Endangered and Threatened Fishes in the Klamath River Basin: Causes of Decline and Strategies for Recovery* (Washington, DC: 2004), pp 5-9. http://www.nap.edu/openbook.php?isbn=0309090970

[162] State of California, *September 2002 Klamath River Fish-Kill: Final Analysis of Contributing Factors and Impacts*, Department of Fish and Game, July 2004, http://www.pcffa.org/KlamFishKillFactorsDFGReport.pdf. (Hereafter "California Analysis.")

[163] Pacific Coast Federation of Fishermen's Associations v. Bureau of Reclamation, 2003 U.S. dist. LEXIS 13745 (N.D. Cal.2003).

Game as reducing the chances for successful fish restoration and having devastating impacts on down-river salmon fisheries.

The final biological opinions from both FWS and NMFS were released on May 31, 2002. Both Final Opinions found Reclamation's 10-year plan likely to jeopardize the continued existence of ESA-listed species. The NMFS jeopardy determination focused on incremental depletions of Iron Gate Dam flows over the 10-year plan, increasing risk to coho salmon. The FWS jeopardy determination focused on (1) sucker "entrainment" losses[164] at Project dams and diversions in Upper Klamath Lake; (2) adverse Project effects on water quality and sucker health in Upper Klamath Lake; and (3) sucker habitat loss in Upper Klamath Lake. FWS and NMFS each developed "reasonable and prudent" alternatives to avoid the jeopardizing effects of Project operations. On June 3, 2002, however, Reclamation formally rejected both final biological opinions for the 10-year plan, and opted instead to operate under a one-year plan that it asserted complied with the opinions.

Although Reclamation asserted that its plan complied with the NMFS and FWS biological opinions, more than 33,000 adult salmon died in September 2002. Most of the salmon killed, however, were Chinook salmon, not the ESA-listed coho (which enter the Klamath at a different time). Coming on the heels of Reclamation's controversial decision to curtail flows from Upper Klamath Lake in 2001 and then to resume irrigation flows, many believed water management decisions in the Upper Basin contributed to the 2002 fish kill; others believed flows similar to 2001 would not have prevented the fish kill. Regardless, the *direct* cause of this fish kill was an epizootic disease.[165] Several factors contributed to stressful conditions for fish, which ultimately led to the epizootic disease—(1) an above average number of Chinook salmon entered the Klamath River from the ocean between the last week in August and the first week in September 2002; (2) river flow and volume of water in the fish-kill area were atypically low (due in part to drought); and (3) water temperatures were very warm.[166] These three factors resulted in high fish densities which may have been further exacerbated by impeded fish passage upstream due to low water depths of certain riffles, perhaps caused by higher Trinity water flows several years earlier that may have changed the stream bed. The warm water temperatures and high fish density created ideal conditions for pathogens to infect salmon and spread quickly; however, neither the flows nor the temperatures that occurred were unprecedented.[167] It is not clear to what degree Reclamation's spring 2002 decisions contributed to these factors, but the NRC postulated that the flows in the Trinity River "could be most effective in lowering temperatures," presumably in the future.[168]

2006 Klamath Fishery Disaster Determination

Chinook salmon stocks that spawn in California and Oregon rivers intermingle in the ocean and are harvested together in the commercial salmon troll fishery off the coasts of these states.[169] Klamath River fall Chinook salmon is a key stock with respect to both landings and regulation of

[164] Entrainment (i.e., entrapment) occurs when sucker larvae, juveniles, sub-adults, and adults enter water diversions and become trapped. Screening of water diversions to reduce sucker entry is the primary means to address this concern.

[165] This epizootic disease was a combination of ubiquitous ich (the ciliated protozoan parasite *Ichthyophthirius* sp.) and columnaris (infection by the bacterium *Flexibacter columnaris*) pathogens.

[166] California Analysis.

[167] 2004 NRC Report, p. 9.

[168] 2004 NRC Report, p. 9.

[169] There also is a significant recreational ocean fishery for Chinook and coho salmon.

the fishery. When Klamath returns are projected to fall below 35,000 naturally spawning adults, the Pacific Fishery Management Council (PFMC) is required to recommend a closure of the salmon fisheries between Cape Falcon, Oregon and Point Sur, California (the Klamath impact area). Although other salmon stocks may be in good condition, a weak Klamath Chinook salmon stock may constrain a large portion of the West coast ocean salmon fishery.

In 2006, the number of naturally spawning adults was below the minimum conservation objective of 35,000 naturally spawning adults. According to the National Oceanic and Atmospheric Administration (NOAA), the low number of fish returning to the Klamath River likely resulted from a combination of factors including poor ocean conditions, dry water years, and diseases resulting from poor in-river conditions.[170] PFMC recommended, and NOAA issued regulations to restrict catch by closing most areas off Oregon and California from May 1, 2006, to August 31, 2006. Although a complete closure of the fishery was avoided, landings decreased in 2006 by 81% when compared to the average of the preceding five years.[171]

The governors of Oregon and California requested a fishery disaster determination from the Secretary of Commerce based on the 2006 forecast of Klamath River fall Chinook salmon returns and the actions taken in the spring of 2006 by the PFMC and NMFS. On July 6, 2006, the Secretary of Commerce declared a commercial fishery failure under Section 308(b) of the Interjurisdictional Fisheries Act, and on August 10, 2006, under Section 312(a) of the Magnuson Stevens Fishery Conservation and Management Act. In May 2007, the U.S. Troop Readiness, Veterans' Care, Katrina Recovery, and Iraq Accountability Appropriations Act, 2007, (P.L. 110-28) allocated $60.4 million to NOAA for eligible recipients affected by the commercial fishery failure. Assistance was distributed by the Pacific States Marine Fisheries Commission to Oregon and California fishermen and Indian tribes that rely on salmon. Salmon troll fishery landings and revenue improved during the 2007 season, but in 2008 the ocean fishery was limited by low fall Chinook salmon returns to the Sacramento River.

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[170] See http://www.swr.noaa.gov/klamath/klam_disast_relf.htm.

[171] From 2001 to 2005, the dressed weight of Oregon and California troll salmon landings averaged 8.025 million pounds, but in 2006 landings dropped to 1.529 million pounds. For West coast troll salmon fishery statistics, see http://www.pcouncil.org/salmon/salbluebook/salbluebook.html.

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