

September 2023

NEWSLETTER Issue No. 41



WaterWorks

IN THIS EDITION

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KWUA REQUESTS ESA CONSISTENCY AND FAIRNESS

In a series of written communications, Klamath Water Users Association (KWUA) has urged federal agencies to apply the Endangered Species Act (ESA) in a way that is fair and consistent with how the federal government applies the ESA in other areas of the country. The documents, dated [July 21, 2023](#), [August 23, 2023](#), and [September 5, 2023](#) focus on a range of issues.

Under the ESA, the Bureau of Reclamation (Reclamation) must ensure that its discretionary actions are not likely to cause jeopardy to species that are listed as threatened or endangered under the ESA. KWUA and member districts disagree with

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CURTAILMENT THREAT WITHDRAWN

On September 5, 2023, the U.S. Bureau of Reclamation (Reclamation) announced that it would not order further curtailment of irrigation water supplies for the Klamath Project (Project) this season. This notification came eighteen days after Reclamation sent Project contractors a letter stating that Reclamation would “likely” reduce the allocation of water for irrigation in the Klamath Project (Project) in 2023 and that during the week of August 21, “a determination with definitive actions” would be announced.

The September 5 notification is welcome, but its circumstances are not.

Klamath Water Users Association (KWUA) believes that water management decision-making for the Project is dysfunctional: the process is opaque, distant, and diffuse. To illustrate, it is useful simply to describe the events that led to the recent notice.

April 2020. Reclamation adopted the Interim Operations Plan (IOP) to govern Project operations from 2020 through September 30, 2022. The IOP provides the rules for determining the amount of water available for irrigation in each year, which depends on hydrologic conditions and forecasted runoff. The IOP was made necessary by the error of a consultant to federal agencies during Endangered Species Act (ESA) consultation, discovered by the same consultant when he was working for a non-federal party that sued the government over the error. See “*Stranger Than Fiction: Consultant Discovers Error After Taking New Job, and Litigation Results* (June 2019 *Waterworks*), <https://kwua.org/waterworks-3/>

2020 – 2022. The IOP yielded disastrous consequences for Project irrigation and wildlife refuges. In none of these years did the Project receive as much as half of the water needed, and in two of the years the water made available was less than one-quarter of what is needed.

Continued on next page



Irrigation of a potato field. Photo by Mat Trotman

Summer 2022. It came to light that federal agencies were considering an extension of the IOP beyond its September 30, 2022 expiration date. **On July 22, 2023,** KWUA and the Klamath Tribes jointly wrote to the Department of the Interior, stating that the Klamath Tribes and KWUA “firmly agree that the IOP is flawed, unworkable, and that its ‘extension’ would be neither in the public interest nor conducive to reducing conflict in the Klamath Basin[.]”

September 2022. Through a letter exchange, federal agencies extended the IOP through December 15, 2022.

December 15, 2022. Federal agencies extended the IOP through March 31, 2022.

March, 2023. Federal agencies extended the IOP through September 30, 2023.

April 1, 2023. Under the calculations required by the IOP, the Project Supply (irrigation water from Upper Klamath Lake) for 2023 is 285,000 acre-feet, and that announcement is required in early April.

April 13, 2023. At KWUA’s Annual Meeting, notwithstanding the IOP, Reclamation announced an “Initial” Project Supply of 215,000 acre-feet. (The IOP does not contemplate an “Initial” Project Supply or provide for announcing anything other than the IOP’s formula-based Project Supply.) Federal decision-makers decided not to make an IOP-based announcement because there was pending litigation in which the Yurok Tribe and other plaintiffs sought a preliminary injunction. In the preliminary injunction motion, the plaintiffs asked the court to impose an order requiring that Upper Klamath Lake not be allowed to drop below elevation 4139.2 in 2023. There was no technical justification accompanying this request.

ordered Reclamation to file the 2023 operations plan when issued, and afforded parties the opportunity to lodge any objections after that filing. The court stated that it assumed that the 2023 plan “will reflect that the Bureau’s going to be following the BiOp and the IOP” and that its assumption is that there would not be a basis for injunction in those circumstances.

May 19, 2023. Reclamation issued its 2023 Klamath Project Operations Plan. Rather than base the plan on the IOP, Reclamation announced a Project Supply of 260,000 acre-feet. It also announced an additional constraint: that Upper Klamath Lake could not to drop below elevation 4139.2 feet, exactly the elevation that had been requested by the Yurok Tribe in its motion for preliminary injunction. The 2023 Klamath Project Operations Plan provides no technical basis for the reduced Project Supply or the additional limitation that Upper Klamath Lake was not to drop below elevation 4139.2 feet.

July 5, 2023. Reclamation posted a 2023 “Drought Plan” on its website. The plan provides that certain contractors (Warren Act contractors) would be limited to 0.6 acre-feet per acre. This is approximately 15 percent of the water that can be applied to the affected land as a matter of Oregon water law.

May 19-August 1, 2023. Reclamation furnished weekly hydrologic updates showing diversion of 260,000 acre-feet Project Supply and Upper Klamath Lake remaining above elevation 4139.2 feet.

August 18, 2023. Reclamation issued letters to Project contractors stating that it had identified “a projected shortfall in the Upper Klamath Lake elevation of 4139.2 that was identified” in its May 19, 2023 Klamath Project Operations Plan. The August 18 letter also stated that there was a

likelihood of a reduction in Project Supply in order to reduce or eliminate the shortfall, and that “a determination with definitive actions will be announced next week.”

This news was unthinkable. Farm families had already made major investments in planting and raising crops, such as potatoes and onions. Access to irrigation water over the remainder of August and

during September is absolutely critical. The yield (edible portion of the plant)

increases dramatically in this time period. Undersized products are not marketable. Additionally, producers would experience huge yield losses for perennial crops, such as alfalfa. Further, if those crops are not healthy going into winter, they are much more susceptible to winter kill, disease, insect damage, and other problems.



Jeffrey Payne, Deputy Regional Director, U.S. Bureau of Reclamation and Alan C. Heck, Jr., Acting Area Manager, U.S. Bureau of Reclamation announce Project Supply.. Photo by Chelsea Shearer

May 10, 2023. The court heard arguments on the motion for preliminary injunction.

The court made clear that it saw no basis for issuing an injunction but was frustrated not to have received the operations plan for 2023 based on the IOP. The court

KWUA: RECLAMATION NOT READY OR CAPABLE TO TAKE OVER KENO DAM



Keno Dam Feb 8, 2023 Photo by Kellianne Sites

Klamath Water Users Association (KWUA) has formally objected to the proposal that the Bureau of Reclamation (Reclamation) take title to Keno Dam and related facilities at the end of 2023. The primary bases for KWUA's opposition are that: no one has completed (or even begun) studies and engineering work that Reclamation and others have agreed is necessary in order for Reclamation to take title; and Reclamation's legal authority and actual capacity to own and operate Keno Dam, and to make necessary modifications to that infrastructure, are very much in doubt.

KWUA filed its objections in response to an application by PacifiCorp to the Federal Energy Regulatory Commission (FERC). The "Keno Development" consists of Keno Dam and various properties (including Keno Camp / Recreation Area). In the application, PacifiCorp asks that FERC amend the license for PacifiCorp's Project 2082 by deleting the Keno Development from the license. That action would make it possible for PacifiCorp to transfer title to Keno Dam to Reclamation.

The Klamath Hydroelectric Settlement Agreement (KHSA) lays out a process for the removal of four PacifiCorp dams in the Klamath River. Keno Dam is not slated for removal, and the KHSA contemplates that Reclamation will take title to Keno Dam just prior to the lower four dams being removed.

KWUA does not oppose the KHSA. However, the KHSA itself specifies obligations that PacifiCorp and Reclamation must satisfy prior to transferring title to and responsibility for the Keno Development. These actions have not occurred, and there are no assurances whether and when they may occur. KWUA members and other local interests are put at risk by this lack of follow-through on the commitments in the KHSA.

Read KWUA's filing [here](#)

KWUA 14th Annual Fall Harvest Tour is almost here. Reserve your seat on the bus now. www.kwua.org

This tour allows KWUA the valuable opportunity to give the community opportunities to see first hand the impact agriculture has on our local and regional economy. Thanks to our sponsors this tour is at no cost to the public.

Save the Date

KWUA
Klamath Water Users Association

Fall Harvest Tour

OCTOBER 5, 2023
MORE INFORMATION TO FOLLOW
WWW.KWUA.ORG

THREAT WITHDRAWN
Cont. from pg. 2

Nonetheless, producers and districts braced themselves for the "determination with definitive action" that they were told would occur during the week of August 21.

Week of August 21, 2023. No determinations or definitive actions announced.

Week of August 28, 2023. No determinations or definitive actions announced.

September 5, 2023. Reclamation issued a letter to Project contractors stating that it was "no longer necessary" to curtail Project Supply below the already-deficient 260,000 acre-feet announced in May. This news was a relief, even if the circumstances could and should have been avoided.

In a September 5 post, KWUA stated: The uncertainties of this year are emblematic of a more profound issue of systemic water mismanagement. KWUA remains resolute in its mission, believing in the adage that 'sunlight is the best disinfectant.' We will persist in our efforts to illuminate and address the underlying issues plaguing agricultural producers in the region."

WATER MANAGEMENT OPPORTUNITIES DURING DAM REMOVAL

Moss Driscoll, Director of Water Policy, Klamath Water Users Association

Reprinted from September Edition of the Basin Ag News



Kiewit crews deconstruct Copco No. 2, one of four Klamath River dams slated for removal. Photo by Shane

The ongoing removal of four hydroelectric dams on the mainstem of the Klamath River presents opportunities for creatively managing water in the Klamath Basin that will never exist again. Yet those opportunities are likely to be lost amidst the complexities of dam removal, the uncertainties of hydrology, and the challenges of federal bureaucracy unless water users, tribes, and other stakeholders are better prepared to both identify and act upon them.

The purpose of this article is to generally explain the nature of the opportunities that are likely to exist. Keep in mind, the exact nature or timing of potential opportunities cannot be identified at present with any reasonable certainty. Likewise, don't fall into the trap of trying to identify volumes of water to potentially be managed and/or disposed of. Instead, the opportunities arising during dam removal will be driven by two primary factors in the construction logistics: 1) risk tolerances and 2) flow capacities. This means opportunities may not be reasonably known until they manifest, and how long they will exist cannot assuredly be known.

While potential opportunities cannot be predicted in advance with precision, we can identify parameters and actions now upon which we can all agree. If we give careful attention to the logistics associated with dam removal, closely coordinate, and communicate well, we may be able to objectively identify and take advantage of opportunities that otherwise pass us by. Finishing off this year's irrigation season, materially refilling and maintaining water levels in Tule Lake and Lower Klamath National Wildlife Refuges, providing reliable and timely water deliveries out of stored water in Upper Klamath Lake – those options should all be on the table, along with all other creative operations that stakeholders can envision.

*KWUA REQUESTS ESA CONSISTENCY AND FAIRNESS
continued from pg. 1*

federal agencies about various issues of law and science that relate to this duty for the Klamath Project (Project).

The emphasis of KWUA's recent communications, however, is that federal agencies need to focus on the effects of operation of the Project, nothing more, nothing less. The proper analysis requires agencies to compare the circumstances that would exist if the action were not being taken to the circumstances that will exist if the action is taken. If the answer is that the proposed action will cause jeopardy to the species, measures must be taken to mitigate the impact to a level of non-jeopardy.

This approach is used in other basins where ESA-listed species are present, but in the Klamath Basin, agencies have used an approach that is not based on the ESA or any adopted regulations. The ESA compliance process for the Project is instead driven by agency bargaining over allocations of water, with the Project being called upon to mitigate with water for conditions that are not caused by the Project.

KWUA has expressed concern that today's decision-makers may assume that the current process – represented by the Interim Operations Plan – is the result of an ordered, logical analysis that occurred sometime in the past. KWUA's September 5, 2023, document lays out in detail why this is not correct.

An understanding of all of these issues is important at this time because the federal agencies are again engaged in ESA "consultation" for the Project, which will result in operational criteria for an upcoming period of time.

WHAT HAS THE BOARD BEEN WORKING ON:

KWUA's Board of Directors strives to keep member districts, their patrons, and other interested parties informed. Board members help with the dissemination of information received at our monthly board meetings, and staff produces a monthly newsletter.

The KWUA board held its regular business meeting on August 16, 2023. Below is a recap of the ongoing activities. If you would like more in-depth information, we encourage you to contact your respective district board member listed on our website.

PUBLIC RELATIONS

KWUA has entered a contract with two entities jointly for consulting services on communications issues. KWUA staff identified for the board their plans for hiring an in-house employee. There will be bi-weekly PR committee meetings with the consultants.



ORGANIZATIONAL ASSISTANCE CONSULTANT FOLLOW-UP

At an August 7 meeting with the Board of Directors, Judge Dan Bunch provided his observations and recommendations for KWUA and districts to provide effective and coordinated service for the irrigation community generally. The board asked Judge Bunch to do

some focused follow-up with individuals from specific organizations. President Liskey will reach out to him about a contract extension/ modification to cover the

FROM YOUR DISTRICTS UPCOMING MEETINGS

- Klamath Irrigation District will hold its Board of Directors meeting on September 14 @ 1:00 pm at the KID office. www.klamathid.org
- Tulelake Irrigation District will hold its monthly Board of Directors meeting on September 11 @ 8:00 pm. www.tulelakeid.com
- KWUA will hold its monthly Board of Directors meeting/Annual Planning meeting on September 13 @ 2:00 pm. www.kwua.org
- Klamath Drainage District will hold its monthly Board of Directors meeting on September 21 @ 1:00 pm. www.klamathdrainagedistrict.org

Klamath Irrigation District patrons, did you know that KID has a newsletter with all the current water happenings. [Click here to read the latest issues.](#)

WATER POLICY DIRECTOR REPORT

Tribal Coordination. Moss Driscoll reported that he has been working to maintain contacts at both the technical and leadership level of tribal parties, such as communicating on the immediate Upper Klamath Lake issue. He has also asked for discussions on short-term operations, during dam removal, prior to Reclamation's reconsultation developing a new proposed action.

Agency Lake-Barnes Ranches Tour. In response to a request from KWUA, the Klamath Tribes recently hosted a tour and discussion with KWUA at the proposed Barnes / Agency Ranches restoration project. Chairman DuMont and Mark Buettner attended from the Klamath Tribes, as did representatives from the Modoc Nation. There was good turnout from the Klamath Project. Agency Lake Barnes Ranch

remains a high priority for tribes and the U.S. Fish and Wildlife Service. There meeting included a long discussion about the implications of the project for lake levels, sucker benefits, and the reconsultation. Water users communicated their concerns with the project, in terms of reduced water availability and the history of similar restoration projects. The purpose of these tours is for principals to establish working relationships and in that regard, it was a productive meeting.

Another tour was arranged September 5 for potential projects within the Klamath Project footprint, Klamath Tribes, Modoc Nation, and potentially one or more other tribes.

Water Management Opportunities with Dam Removal. Moss Driscoll summarized key information regarding the actual process planned for dam removal. See related article on page 4. District managers expressed frustration that for many

months they have been requesting dialogue on the subject of the coordination of Project operations and dam removal, and the requests have not been honored.

IRA Funding / Input. Reclamation requested input by August 18 on the distribution of the \$4 billion authorized under section 50233 of the Inflation Reduction Act, which is directed towards demand reduction in the Colorado River Basin and other basins similarly impacted by drought and ecosystem restoration. In addition, in order to plus-up the DRA's funding for this year's no-irrigation program, Moss worked with the Klamath Project Drought Response Agency to send a letter to Commissioner Touton requesting a program similar to 2018 and 2020 that provided compensation for water made available for wildlife use. He also stated that KWUA will ask Governors Kotek and Newsom to request that the Commissioner invoke the authority necessary to have a program in place.

EXECUTIVE DIRECTOR'S REPORT

Legislative and Administrations Outreach. On August 10, KWUA leaders and staff met with Senator Merkley's staff members Gavin Coble (Field Representative) and Meredith Booker (Appropriations Policy Advisor). A major focus for the meeting was A Canal funding. Klamath Irrigation District's Gene Souza, who attended the meeting, later had a chance to show Mr. Merkley's staff some of the problem areas on the canal. The Senator's office has secured "report language" in the Senate version of an appropriations bill that promotes emergency treatment and non-reimbursable funding.

Later on August 10, KWUA led a Project tour with Janet Coit, Assistant Administrator for NOAA Fisheries, as well as several other federal and Congressional staff members, including two each from Senators Merkley and Wyden's offices.

On August 15, Paul Simmons met with Geoff Huntington, Governor Kotek's Natural Resources Advisor, as well as the Governor's Regional Solutions Coordinator Courtney Warner Crowell, Richard Whitman and Tom Paul from OWRD, District 56 Representative Emily McIntire, and Klamath County Commissioner DeGroot. The discussion included the immediate water situation, Inflation Reduction Act funding, and other funding opportunities, and other topics. Paul discussed KWUA's adopted priorities for attention and action in the Biden Administration and requested support from state leadership.

KWUA has had ongoing communications with federal, state, and local elected leaders regarding threatened curtailments of Project Supply.

Water Rights Transfers to Lower Klamath National Wildlife Refuge. There has been increased activity and political advocacy related to water rights transfers for use on Lower Klamath National Wildlife Refuge. Among the recent events has been a request by California Waterfowl

Association for a \$400,000 grant from the Oregon Watershed Enhancement Board (OWEB). These funds would be applied toward a purchase price of \$7.5 million for a permanent transfer of water rights from the Thomas Ranch (which are currently subject to a temporary transfer). [KWUA's July 19, 2023 comment letter](#) on the application.

At the July 26 hearing, the OWEB approved the grant but subject to the conditions that: USFWS provide matching funds; the grant would only pay for The OWEB board approved the grant with these additional conditions.

ESA Re-Consultation. Klamath Project is nominally operated under the "Interim Operations Plan," which is currently expected to extend through September 30, 2024. Reclamation has undertaken re-consultation under the ESA in order to have ESA regulatory coverage for operations after that date, and recently has hosted a series of meetings that include other federal agencies, tribes, counties, and Project water users.

A large group meeting at the Running Y Resort on August 9 has been followed by a series of meetings of technical and policy groups. Reclamation is operating under schedule for completing a new biological assessment in order to obtain biological opinions covering Project operations from



Lower Klamath National Wildlife Refuge 2019, the last time the refuge had and significant water. Photo by Chelsea Shearer

October 1, 2024, through the three to five years after dam removal. This schedule involves completing a new "Proposed Action" by the end of September 2023. This schedule is a major concern: among other things, it gives rise to fear that the new Proposed Action will not amount to more than the current, Interim Operations Plan, with limited modification. KWUA believes the federal agencies have not had foresight or engaged in appropriate planning in order to give appropriate consideration to stakeholder input and "do it right" in this consultation. See related story on page 1.



Oregon Public Utility Commission Update. KWUA is an intervenor in a rate case in the Oregon Public Utility Commission concerning Pacific Power and Light Company’s proposed Transition Adjustment Mechanism (TAM) for 2024 electric utility rates. In general rates are set by general rate cases, but the TAM is a variable in the general rate formula that can change rates, up or down, on a yearly basis. The TAM is based on estimated annual costs for power production or purchase, and typically is driven by wholesale market costs, oil and natural gas prices, and similar considerations.

For 2024, PP&L’s proposed TAM is significantly greater than years past. KWUA has opposed the increase formally and is engaged with PP&L and other parties in efforts to settle the matter.

Electric power rates for 2024 will also be adjusted based on another variable, the Power Cost Adjustment Mechanism (PCAM). The PCAM is used to do an after-the-fact true up of PP&L’s actual Net Power Costs (NPC) to the TAM costs that are based on year-head forecasts. Thus for this year, PAC’s 2022 PCAM is the mechanism that is used to true up the 2022 TAM forecasted NPC to 2022 actual NPC. KWUA has elected not to intervene in the PCAM case.

Litigation Update. *United States v. Klamath Drainage District.* On August 17, 2023, Magistrate Judge Clarke heard oral arguments in the federal government’s lawsuit against Klamath Drainage District (KDD). In that case, the government argues that KDD has been unlawfully diverting out of (contract) priority with its North Canal diversions in recent years.

Buchanan v. OWRD. This case stems from the Oregon Water Resources Department’s (OWRD) regulation of diversions in order to provide more water in Upper Klamath Lake in response to a tribal call for the Upper Klamath Lake water right determined in the ACFOD. The petitioners filed a lawsuit in state court challenging the OWRD curtailment orders. Under Oregon law, the filing of such a case causes an automatic stay of the OWRD orders. However, OWRD government removed the case to federal court. On August 9, Magistrate Judge Clarke upheld the OWRD decision to lift the stay.

This case has implications for how OWRD will enforce the tribal Upper Klamath Lake water right in the future; other similar cases, filed by other water users, will also have implications.

Under the “stipulated agreement” regarding the Klamath Tribes Upper Klamath Lake claim, at the present time, that determined water right cannot be relied upon to call out water rights having a priority earlier than August 9, 1908. The judgment issued in the KBA will not include the stipulated agreement. However, Klamath Project parties will have the opportunity to present an evidentiary case regarding the claims prior to a judgment being issued.

Operations Report. The August 2023 Operations Committee report by Committee Chair Gene Souza focused on the situation created by the unprecedented minimum Upper Klamath Lake elevation of 4139.2 feet adopted in Reclamation’s 2023 Klamath Project Operations Plan. See related story on page 1. Gene provided good context for the discussion with data on Upper Klamath Lake inflows, which have been underperforming through the summer.

Gene also displayed and discussed his analysis of where things would stand if the Project Supply for 2023 had been 285,000 acre-feet, as provided in the IOP, and the status of monitoring at the fish evaluation station at A Canal.

District and Third Party Restoration Discussions. The board had an open discussion regarding recent restoration initiatives and planning inside the Project. There is consensus that it is important that there be as much transparency as possible related to activities that individual districts are engaged in with third parties that may have consequences for others in the Project. It is having a special board meeting with Cal-Or Wetlands on August 16.

Horsefly Irrigation District reported that is working on off-stream storage in HID and Langell Valley.



As a preliminary note, it must be acknowledged that various private, public, and tribal entities have been evaluating, planning, and preparing for dam removal for more than a decade. The entity established to be responsible for dam removal, the Klamath River Renewal Corporation (KRRC) has hired some of the nation’s most experienced engineers and related contractors. Their removal plans have been subject to a lengthy, in-depth review by the Federal Energy Regulatory Commission (FERC) and an independent board of consultants. The project is subject to insurance, bonding, and indemnification coverage. The purpose of this article is not to suggest any deficiencies with or need to alter the KRRC’s current plans, but rather to point out the simultaneous opportunities that will exist for Klamath Project operations.

Construction Logistics

Dam removal is already underway. KRRC has breached and largely removed Copco 2, the smallest of the four dams. The three remaining dams, Iron Gate, Copco, and J.C. Boyle are scheduled to be removed in 2024.

The first step to removing the remaining dams is to dewater them. The two downstream dams, Iron Gate and Copco, impound significant amounts of water compared to J.C. Boyle. The total storage capacity behind Iron Gate and Copco is over 105,000 acre-feet (AF) of water, compared to just under 3,500 AF stored behind J.C. Boyle. More than 90 percent of this water is “dead storage” in the sense that is below the normal outlet works, meaning that dam modifications and special operations are required to dewater the dam sites.

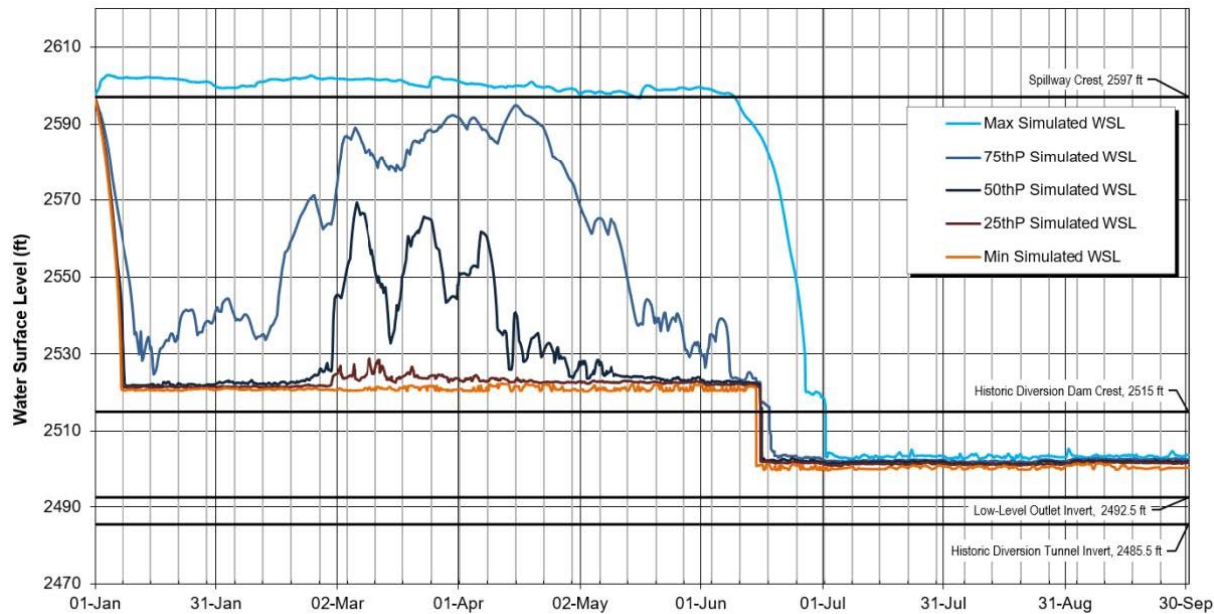
At Copco Dam, these modifications include the ongoing drilling of a 10-foot by 10-foot, D-shaped tunnel underneath one of the spillway bays, in order to provide a low-level outlet from the reservoir. A 10-foot-thick concrete plug is being left at the head of the tunnel. Next January the dewatering process will begin with the “precision blasting” of this plug, causing a surge of water that is expected to blow any remaining debris out of the tunnel. The tunnel is designed to drain both water and sediment from the bottom of the reservoir, at an initial flow rate of approximately 4,000 cubic feet per second (cfs).

Downstream and in close coordination with these operations, KRRC’s contractors will open the concrete gate on the existing

low-level outlet tunnel at Iron Gate Dam, which has never been fully opened. KRRC plans to open the outlet control gate to its maximum operating height of 57 inches, allowing upwards of 4,000 cfs to flow through the horseshoe-shaped, 15-foot-wide-by-16-foot-tall tunnel.

When these low-level outlets are opened, water levels behind the dams will immediately begin to drop. Water levels at Copco are expected to drop 45 feet within the first six days. At Iron Gate, the anticipated decline will be even faster – over 120 feet in the first ten days. Essentially all the stored water behind both dams – over 100,000 AF – is expected to be released to the lower Klamath River before the end of January. For context, the average discharge from Iron Gate Dam in January over the last quarter century is only about 90,000 AF, meaning that the entire river flow could conceivably be provided out of stored water being released from Copco and Iron Gate and still remain above the recent average flow.

Similar but uniquely challenging dewatering operations will simultaneously be occurring at J.C. Boyle Dam. For at least a two-week period in January the reservoir will have to be maintained at lower water levels, so that workers can access and blow stoplogs off two existing diversion culverts located under the dam’s spillway. KRRC expects that sustained



Copco Reservoir Drawdown Simulated Water Surface Levels

inflows to the reservoir of 400 cfs will be necessary during this time for crews to be able to work safely. Releases from Upper

Klamath Lake and Keno Dam will need to be reduced or minimized accordingly. Storage levels in Upper Klamath Lake should accordingly be expected to increase faster than normal during this period.

Following the initial dewatering process will be a period of significant uncertainty between February and June, where

hydrology will largely determine what happens with respect to water levels behind Copco and Iron Gate dams and what work can be done. As the KRRC's plans state:

The low-level outlet tunnel [at Copco I] functions as an uncontrolled hydraulic structure and drawdown rates and the overall drawdown period will depend on the reservoir inflow rates during the drawdown period. Partial reservoir refilling can occur due to large inflow events that exceed low-level outlet tunnel capacity.

In fact, partial refilling of both reservoirs is expected to occur after the initial drawdown. Large fluctuations in water levels are likely during this time period. According to the KRRC's model, in nearly one-third of all years, the reservoirs behind Iron Gate and Copco would be expected to completely refill to their spillway crests at some point after January.

Subject to upstream hydrology, a key step in the drawdown process is to lower water levels behind Copco below an elevation of 2,530 feet (74 feet below the dam's normal operating level), in order to begin opening the diversion tunnel originally used to

route river flows around the site during the dam's construction. KRRC needs sustained inflows to the reservoir of approximately 600 cfs in order to maintain water levels below that elevation. To accommodate that flow, releases out of Keno Dam (and Link River Dam) will need to be limited to around 350 cfs. KRRC's model indicates that in half of all years, such flows occur by June 1. Under drier conditions, they could be observed as early as May 1.

To open the historical diversion tunnel at Copco is no small feat. The current plan involves lowering an excavator and other equipment down the dam's left abutment to the tunnel intake using an anchoring system. If inflows exceed 2,200 cfs for a sustained period, the reservoir to begin to refill and equipment will have to be hastily removed. Once equipment is in place, the inlet structure has to be excavated, before the existing concrete plug in the tunnel can be drilled and blasted from the downstream side. When the plug is blasted, capacity through the historical diversion tunnel will be limited to 1,775 cfs but combined with releases through the new low-level outlet tunnel, the initial downstream flow is projected to be upwards of 5,675 cfs. As water levels subsequently drop, further excavation will occur to lower the intake another 13 feet, at which time flow through the new low-level outlet will

cease and transition to the historical diversion tunnel. This whole process is expected to take three weeks.

Not until the diversion tunnel is fully opened can actual dam removal begin. With the full flow established through the diversion tunnel, water levels in the reservoir are expected to drop below 2,515 feet, exposing the historical cofferdam used to dewater the dam site. Under a free-flowing state, the diversion tunnel provides a flow capacity of 4,200 cfs, which is expected to be able to handle inflows during the period when dam removal will occur. Opening the diversion tunnel in May would leave KRRC with approximately seven months to remove Copco, compared to five months if opened in July.

Demolition and removal of Copco encompasses the dam, the powerhouse and the related hydroelectric infrastructure. The 80-foot-high concrete dam will be demolished from the top down, with rubble being dumped down the downstream face, where it can then be hauled out to a disposal site. The final step will involve constructing a river channel for volitional fish passage through the concrete foundation of the former dam and the upstream reservoir.



Iron Gate Pano Photo by P9

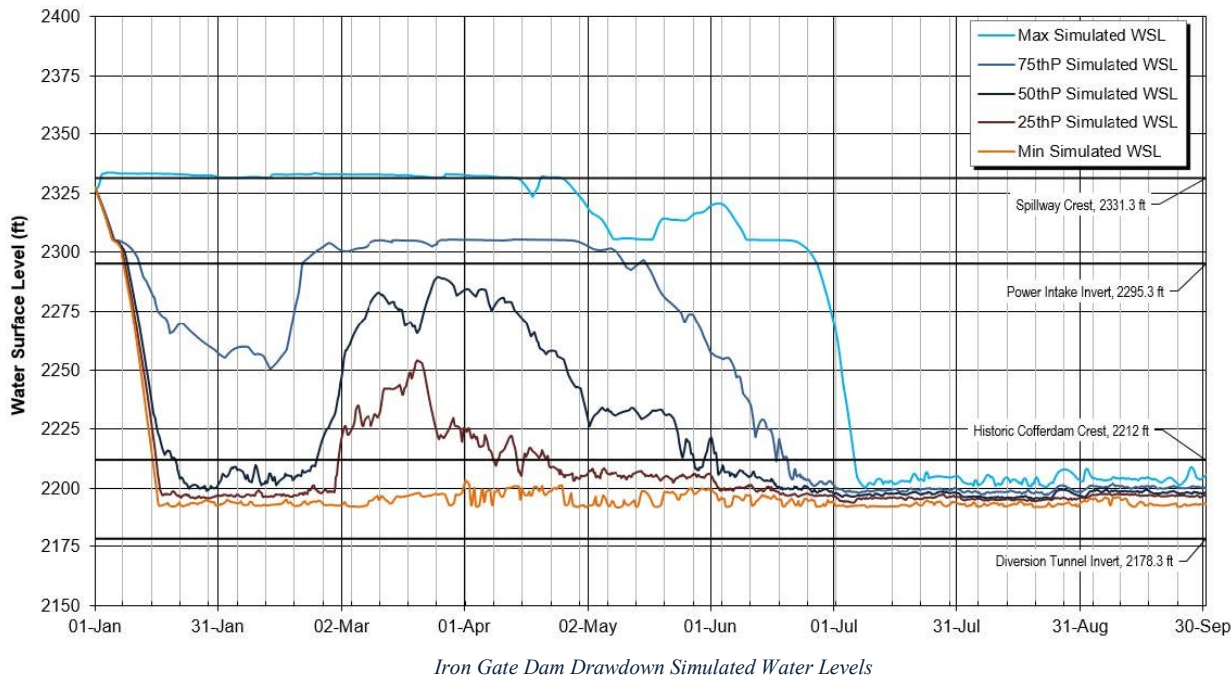
Iron Gate Dam is an earthen embankment structure. Altogether removing Iron Gate Dam requires hauling away almost a million cubic yards of material. However, the embankment can only be removed as fast as water levels behind the dam recede. As the dam is lowered, sufficient freeboard (three feet) must be maintained to prevent the dam from being overtopped during a potential flood event. A cofferdam will gradually be moved down the dam's upstream face as the embankment is removed and reservoir levels will allow. The removal process culminates with a "final breach" where the remaining water behind the dam is released. The KRRC expects to occur in late September or early October, when flows in the Klamath River are normally at their lowest. Here again, KRRC will need flows out of Keno Dam and Link River Dam to be reduced, to around 600 cfs, to accommodate this work.

Part of the reason for this timing is to avoid potential downstream flooding and risk to the public. The volume of water behind the dam is expected to be less than 500 acre-feet, nonetheless, the final breach could result in a temporary downstream surge of water of up to 7,000 cfs. KRRC expects the work removing the embankment to be completed in November.

Implications for Water Management

What does this all mean for water management in the Upper Klamath Basin, particularly with respect to stored water in Upper Klamath Lake? As noted above, there are times when we can reasonably expect releases from Upper Klamath Lake to be reduced in order to accommodate the construction logistics associated with dam removal. This action should result in an increase in the lake's water surface and storage levels. The magnitude of such effects will be dependent on hydrology but, for example, in January, will be directly observable.

Beyond the base operations where conditions remain reasonably dry like the last four years, there is a broader implication for water management in the Upper Klamath



Basin. Specifically, flood conditions in the Klamath River at any point and for any duration from January through October of 2024 will complicate and pose some level of risk for the removal of Copco, Iron Gate, and J.C. Boyle dams. For some context on the potential magnitude of high flows, note the peak discharge at Iron Gate Dam is computed to be 74,400 cfs. What exact complications and level of risk would depend on a number of factors, but without question, flood conditions are to be avoided from an engineering and project management standpoint.

The KRRC's plans incorporate daily minimum flows downstream of Iron Gate that are consistent with the National Marine Fisheries Service's 2019 Biological Opinion to Klamath Project operations. Minimum flows, however, won't

be the issue of concern during dam removal. The focus will be on avoiding flood conditions at any time during the work.

KRRC's flow management plan is based on hydrology during the time period of 1980 to 2016. While this time period includes a range of dry and wet years, it is unquestionably a drier period in the Klamath Basin's recent history. More importantly, while that time period does include some years with well-above average inflows, notably 1983 (154%), 1984 (154%), 1998 (128%), and 1999 (137%), it does not include the extremes observed over the last roughly 100 years. Those three years pale in comparison to years like 1956 (193%), 1958 (179%), and 1966 (186%), where the difference in inflows is up to a half-million acre-feet. It is unclear whether KRRC's plans could accommodate the flows that would result from such conditions.

What the winter has in stock for the Klamath Basin remains extremely uncertain; however, the National Weather Service recently forecast a better than average likelihood of a strong El Niño this coming winter. According to meteorologists, "strong" or "very strong" El Niño conditions have been observed eight times in the last seventy years, which have

almost all been marked by extremes. In half those year there was in excess of 125 percent of the long-term historical average inflow to Upper Klamath Lake, including the previously mentioned 1958, 1966, and 1983. In the other half of years, inflows were below average, led notably by 1992, the lowest year on record (46%). Therefore, history would show that we are in for an either extremely wet winter or an extremely dry one. For their part, the Farmers' Almanac is predicting an

"unusually snowy" winter for the Pacific Northwest. "Should an El Niño materialize, it could direct the subtropical jet stream into California, translating into copious amounts of rain and snow across the entire Southwest."

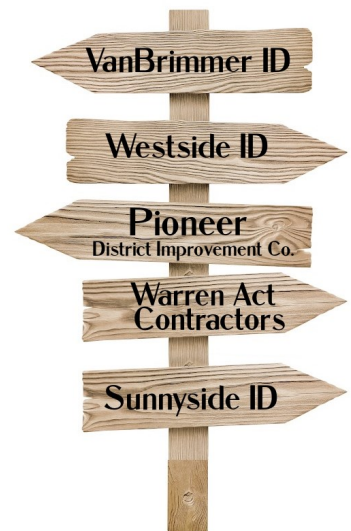
Going into this winter, an additional level of risk is posed by the Bureau of Reclamation's attempt to manage stored water in Upper Klamath Lake differently this year than it has in the recent period of record. Specifically, in the analysis KRRC presented to the FERC, it assumed certain outflows from Upper Klamath Lake based on the assumption that the lake would be operated to a minimum water surface elevation of 4,138.0 feet. Reclamation has instead this year, for the first time ever, tried to prescribe a minimum lake level of 4,139.2

feet. The difference between those two elevations equates to over 83,000 acre-feet of stored water. There is no question that maintaining a higher Upper Klamath Lake elevation this fall will increase the risk of potential flood conditions during dam removal. For context, 83,000 acre-feet constitutes more water than KRRC is planning to release from Iron Gate Dam all next May.

Acting on Opportunities

KRRC and its contractors have their hands tied with respect to modifying their plans to accommodate special operations. Their construction schedule and engineering constraints will as a practical matter simply dictate. There are also the sideboards in which the Klamath Project must operate, in terms of river flows and lake levels for ESA-listed species. But within those sideboards, any operations should be on the table from now through 2024 that materially limit the risk for dam removal. That is in everyone's best interest, not just the KRRC's. There is a necessary step of ensuring such operations are consistent with the assumptions made in U.S. Fish and Wildlife and the National Marine Fisheries Service's applicable biological opinions for the operation of the Klamath Project, but in light of the dam removal activities, the practical reality is that flows and lake levels will necessarily deviate from the modeled flows for those opinions.

It is in everyone's interest to identify opportunities for water management actions that will benefit the Basin, define the parameters for those actions ahead of time, and communicate the potential actions to set clear expectations among the stakeholder community. Reclamation is responsible for ESA compliance associated with both water levels in Upper Klamath Lake and instream flows in the Klamath River and will be responsible for providing direction to the KRRC. Developing a consensus proposal for Reclamation's consideration and action is a crucial next step. With a common understanding of the logistics associated with dam removal, close coordination and improved communication, water users, tribes, and other



Irrigation Districts displayed are KWUA member districts