United States Department of the Interior

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Memorandum

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From: Alan C. Heck, Jr.
Klamath Basin Area Office

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Date: 2025.09.10 11:10:09 -07'00'

Subject: Environmental Compliance Review for Klamath Project Adaptive Management in 2025

This memorandum provides an environmental compliance evaluation regarding the Bureau of Reclamation's intent to adaptively manage the 2025 Klamath Project operational activities to account for conditions encountered or forecasted for the water year. As of June 1, the projected conditions did not fully materialize, and Upper Klamath Lake (UKL) elevation were trending below earlier projections. Above average temperatures and reduced precipitation created additional demands on the system, which reduced the End Of Season (EOS) elevation projection for UKL. However, operational activities remain consistent with the 2024 Biological Opinions (BiOps).

PROPOSED ACTION

The Bureau of Reclamation (Reclamation) proposes to fully satisfy Klamath Project irrigation demand using the following sources as permitted under the 2024 BiOps:

1. Deferred Project Supply (DPS)
2. Unused Refuge Supply originating from Lost River system and UKL return flows
3. Stored UKL Water
4. Modeled outputs from the Klamath Release Model (KRM)

Adaptive management and continued coordination with relevant agencies will guide withdrawals as UKL elevations are adjusted.

BACKGROUND

Beginning February 27th, 2025, Klamath Basin Area Office (KBAO) began reporting water supply calculations in the weekly Real Time Operations (RTO) presentations provided to the regulating agencies and stakeholders. In the February 27th presentation, KBAO reported a projected DPS on April 1st of 48 TAF, unused refuge supply of 43 TAF, and modeled KRM outputs of 248 TAF, which would have made 340 TAF available for agricultural use. KBAO continued providing weekly updates to all stakeholders and on April 3rd, 2025, at the start of the irrigation season, the RTO slide presentation showed 27 TAF of DPS, 43 TAF of unused refuge supply and 277 TAF in modeled KRM outputs, which would have made 347 TAF available to the project for agricultural use. On April 9th, KBAO provided initial water availability letters to the services, irrigators, and tribes indicating that anticipated project demands would be met, "based on current hydrology and historical use patterns." On April 15th, KBAO published its 2025 operations plan for operations during the water year. It detailed anticipated project demand as 330 TAF.

UKL was considered "full" at 4143.11' elevation with favorable forecast models. UKL peaked at 4143.22' elevation on 3 May and forecasts were continually updated to reflect actual weather patterns. On 15 May, the National Weather Service issued a seasonal forecast calling for below average rainfall chances and above average temperatures for the period of June 1 to September 1. This was further confirmed with the release of the Natural Resources Conservation Service forecast on 1 June that incorporated this data and lowered forecasted inflow volumes to UKL. KBAO staff did a statistical analysis of actual project performance against modeled outputs and developed a calculated adjustment to the model outputs for the remainder of the water year. In the professional opinion of the KBAO staff, 10 TAF of additional irrigation demand and a 5% increase in evapotranspiration (ET) is expected over the June 1st to September 1st timeframe and was factored into EOS elevation calculations for UKL. Throughout the irrigation season, the Klamath Project has followed the KRM formulas found in the 2024 BiOps. These formulas include moving the Endangered Species Act compliance measurement point from Iron Gate to Keno Dam after PacifiCorp removed its four lower hydropower dams in 2024, accounting for a new bathymetry of UKL after reconnecting Agency Barnes in January 2025, and efforts to better estimate net inflow to UKL based on developing hydrologic conditions.

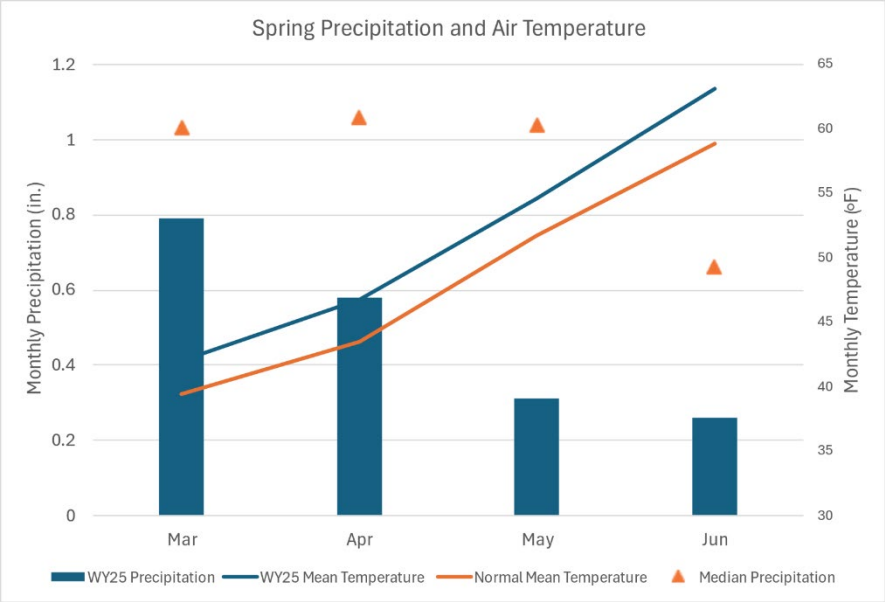

Figure 1: Mean temperature and total precipitation recorded from NOAA's Klamath Falls Airport meteorological station from March -June. POR (1991-2020) medians represented in orange and WY2025 represented in blue. Mean temperature and total precipitation were below normal from March through June this spring

ENVIRONMENTAL COMPLIANCE

River Flows

After adoption of the 2024 BiOp, Keno Dam release targets during 2025 – computed daily using the Normalized Wetness Index, UKL Status, and Operations Index – have been fully met. As a result, the Flexible Flow Account (FFA) reached maximum volume of 35 TAF by February 9, 2025. In coordination with the Fish and Wildlife and National Marine Fisheries Services, it was determined that the full volume of the FFA would be released from February 28 to March 8, coinciding with a high natural runoff event to create a pulse or flushing flow.

Following the flushing flow, from March 9 to July 31, the average targeted Keno releases per the BiOp have been 1,900 cfs and the actual average release has been 2,057 cfs. A total of about 587,504 AF was released versus a target of 542,624 AF, an increase of 44,880 AF above modeled output. The extra volume was mainly due to flood control releases. During the spring/summer season, in accordance with BiOp guidelines, Keno releases have slowly decreased to near baseflows. This operational alignment not only satisfies BiOp requirements but also supports regional fisheries and riparian health objectives by mimicking natural hydrologic patterns more effectively than previous years.

UKL Elevations

In 2025, the UKL elevation was above 4,143.0' from April 1 through May 19 and remained above 4142.0' through June 21. These elevations created spawning conditions that exceeded the minimum condition parameters established by the BiOp

There is no EOS lower elevation limit specified in the U.S. Fish and Wildlife Service 2024 BiOp. The lowest elevation modeled at the end of September in the 2024 BiOp was 4,137.23 feet. From the BiOp, "The Proposed Action is likely to result in UKL elevation higher than 4,137.23 ft. at the end of September in over 95 percent of years and should provide more preferred habitat for adult suckers."

The expected inflows for 2025 based on the June 1 forecast as specified in the 2024 BiOp is 130 TAF from June 1 – September 30 and assuming 38 TAF of additional volume is released from UKL, the September 30, 2025 EOS UKL elevation projection, based on the inflow forecasts from earlier in the season is 4139.08 feet. Inflows based on measurements to date are lagging and are estimated as 96 TAF. Assuming 38 TAF of additional volume is released from UKL, the current EOS projection based on actual measurements is 4138.77 feet. Relevant to the U.S. Fish and Wildlife Service BiOp, both of these EOS elevations are well within the analysis for the Period of Review (POR). Relevant to the National Marine Fisheries Service BiOp, Reclamation has been and will continue to meet all applicable Klamath River flows for the close of Water Year (WY) 2025 and anticipated for WY 2026. The National Marine Fisheries Service (NMFS) BiOp also states that "... NMFS understands that any deviations from the formulaic approach via the proposed adaptive management process would only be used to minimize adverse effects to Southern Oregon/Northen California Coast (SONCC) coho salmon and its critical habitat." Reclamation is not aware of any outstanding needs in WY 2025 to service SONCC coho salmon or its critical habitat to which the water can be applied.

Project Allocation

Due to an abnormally dry and hot spring, irrigation district managers and Klamath Basin Area Office staff estimate that through a combination of increased ET and agricultural needs, Project demand could reach 340 TAF this year. To meet this increased demand, Reclamation explored alternative sources of water that could be used to augment Project supply, such as Lost River flows, return flows from Agriculture, or additional water from UKL.

As modeled in the Klamath Basin Planning Model (KBPM), on June 1st, 2025, Project Supply from UKL was calculated as 302 TAF of water available for Project irrigation from all sources.

Flows from the Lost River will largely depend on precipitation as summer baseflows are minimal and are largely diverted for east side irrigation. Agricultural return flows pumped back to the Klamath River continue to accumulate DPS. Lost River flows and agricultural return flows are not expected to satisfy the additional demand. Therefore, some or all of the 38 TAF will be released from UKL. Even if the entire 38 TAF comes from UKL, the EOS UKL elevations are still well within the effects analyzed in the KBPM as explained below.

CONCLUSION

To meet the full 330 TAF Klamath Project demand in 2025, the Bureau will utilize UKL supply, DPS, and refuge allocations within BiOp guidance. UKL elevations and habitat parameters remain within acceptable bounds, though below early-season projections. At the beginning of September, demands is lower than expected and full demand is now expected to be near the original estimate of 330 TAF. However, KBAO will continue to enact adaptive management measures as conditions may shift.

Ongoing coordination with the U.S. Fish and Wildlife Service and National Marine Fisheries Service continues to ensure BiOp compliance and safeguard listed species