

# RECLAMATION

*Managing Water in the West*

## Record of Decision

# Long-Term Plan to Protect Adult Salmon in the Lower Klamath River Final Environmental Impact Statement

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**U.S. Department of the Interior  
Record of Decision  
Long-Term Plan to Protect Adult Salmon in the Lower Klamath River  
Final Environmental Impact Statement  
April 2017**

## **1. Summary**

In September 2002, an unforeseen and unprecedented fish die-off occurred during a two-week period in the lower Klamath River. A subsequent U.S. Fish and Wildlife Service (Service) report indicated that of the approximately 34,000 anadromous salmonids estimated to have perished during this event, nearly all (98.4 percent) were adult salmonids. The two fish disease pathogens leading to the die-off were identified as *Ichthyophthirius multifiliis* (Ich) and *Flavobacter columnare* (Columnaris). High fish densities—due to the relatively large run size (approximately 170,000 adult Chinook salmon), low flows, and relatively high water temperatures—were identified as causative factors for the rapid spread of disease. Since the large-scale die-off of 2002, heightened concern over a disease outbreak and related large-scale adult salmon mortalities re-emerged, due to forecasted and observed fisheries and hydrologic conditions during 2003, 2004, 2012, 2013, 2014, 2015, and 2016. In response to this concern, Reclamation provided augmentation flows during these years.

In response to the need for augmentation flows in the past several years, and to the potential need for flows in future years, Reclamation prepared a Draft Long-Term Plan for Protecting Late-Summer Adult Salmon in the Lower Klamath River (LTP). The initial Draft LTP was provided to key stakeholders for review on December 31, 2014. Following the review and considering comments, the LTP was revised and provided to the public on April 17, 2015.

The scoping process for the Long-Term Plan environmental planning process was initiated in July 2015 and included a series of open houses/meetings designed to provide background information and provide an opportunity for members of the public and tribes to discuss the National Environmental Policy Act (NEPA) process with project representatives. As part of the scoping process, agencies and tribes were invited to participate as cooperating agencies on the Environmental Impact Statement (EIS). The cooperating agencies for this EIS are the Hoopa Valley Tribe, Karuk Tribe, Klamath Tribes, Yurok Tribe, U.S. Fish and Wildlife Service (Service), National Marine Fisheries Service (NMFS), Bureau of Indian Affairs, California Department of Fish and Wildlife, Humboldt County, and the San Luis and Delta-Mendota Water Authority.

The U.S. Department of the Interior (DOI), Bureau of Reclamation (Reclamation), prepared a Final EIS to evaluate and disclose potential environmental effects associated with implementing the LTP. This Record of Decision (ROD) documents Reclamation's decision to implement the LTP as described in Alternative 1. The Final EIS and ROD were prepared in accordance with NEPA, the Council on Environmental Quality's NEPA implementing regulations at 40 CFR 1500-1508, and the DOI regulations at 43 CFR Part 46.

Reclamation's Notice of Availability of the LTP Final EIS was published in the Federal Register on January 27, 2017 by the United States Environmental Protection Agency. Additionally, a press release was issued on January 27, 2017 and postcards noticing the availability of the Final EIS were mailed to: the general public; cooperating agencies; California State Assembly and Senate; Oregon State Assembly and Senate; California and Oregon United States Representatives and Senators; County elected officials within the project area (Modoc, Shasta, Trinity, Klamath, Humboldt, Siskiyou Counties); federally recognized Native American Tribes in the project area; City of Redding; irrigation districts and water users in California and Oregon; non-government officials; and other interested parties. Written comments were received from two individual citizens, and the Environmental Protection Agency (EPA). Comments from two of the individuals consisted of personal commentary unrelated to the alternatives or analysis in the EIS. The EPA stated that they do not have any comments to provide on the Final EIS. After examination of the three written comments, Reclamation has concluded there were no substantive issues raised on the Final EIS.

## 2. Decision

Reclamation has selected the Proposed Action (Alternative 1), which is to provide supplemental flows from mid-August to late September, from Lewiston Dam to prevent a disease outbreak in the lower Klamath River in years when the flow in the lower Klamath River is projected to be less than 2,800 cubic feet per second (cfs). Supplemental flows would come from water stored in Trinity Reservoir. The Proposed Action is comprised of three different flow augmentation components to be implemented as needed in a phased approach, based on environmental and biological conditions. The three components include: (1) a preventive base-flow release that targets increasing the base flow of the lower Klamath River to 2,800 cfs from mid-August to late September to improve environmental conditions; (2) a preventive pulse flow to be used as a secondary measure to alleviate continued poor environmental conditions and signs of Ich infection in the lower Klamath River; and (3) a contingency volume, to be used on an emergency basis as a tertiary treatment to avoid a significant die-off of adult salmon when the first two components of the Proposed Action are not successful at meeting their intended objectives. An adaptive management approach that incorporates real-time environmental and biological monitoring would be used to determine if and when to implement any or all of these three flow augmentation components. This decision is authorized by Section 2 of the 1955 Trinity River Division Act.<sup>1</sup>

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<sup>1</sup> In the Final EIS, the primary statutory authority for the proposed action was identified as Section 2 of the 1955 Act which provides for specific limitations on the integration of the Trinity River Division with the rest of the Central Valley Project (CVP) and gives precedence to in-basin needs including that "the Secretary is authorized and directed to adopt appropriate measures to insure the preservation and propagation of fish and wildlife" (Proviso 1) and that "not less than 50,000 acre-feet shall be released annually from the Trinity Reservoir and made available to Humboldt County and downstream users" (Proviso 2). For the actions implemented in 2012, 2013, and 2014, Reclamation identified Proviso 1 as the primary authority for flow releases. On October 1, 2014, the U.S. District Court for the Eastern District of California ruled that Proviso 1 did not provide authority for releases made in 2012, 2013, and 2014. Reclamation identified both Proviso 1 and 2 as the primary authority for the flow releases in 2015 and 2016. On February 21, 2017, the Ninth Circuit Court of Appeals reversed the District Court's order regarding Proviso 1, holding that Proviso 1 provided authority for the flow releases. Additional discussion of both Proviso 1 and 2 are included in the Statutory Appendix to the EIS.

### **3. Alternatives Considered in the Final EIS**

#### **No Action Alternative**

The No Action Alternative represents future conditions without implementation of the proposed action, and the resulting environmental effects from taking no action. Under the No Action Alternative, Reclamation would not implement flow augmentation actions to supplement flows in the lower Klamath River when there is a threat of disease outbreak and fish die-off.

The No Action Alternative assumes continued implementation of existing projects, plans, ecosystem restoration projects (e.g. Trinity River Restoration Program), land or resource management plans, water supply management and wastewater facilities, flood management facilities, and recreational facilities. The No Action Alternative assumes future conditions such as climate change and sea-level rise, the development of lands in accordance with general plans in areas served by CVP water supplies, and continued operation of the CVP to the year 2030. The No Action Alternative also includes PacifiCorp operating their Klamath Hydroelectric Project under the current annual license, with the dams remaining in place.

#### **Proposed Action (Alternative 1)**

The Proposed Action (Alternative 1) includes supplemental flows from Lewiston Dam to prevent a disease outbreak in the lower Klamath River in years when the flow in the lower Klamath River is projected to be less than 2,800 cubic feet per second (cfs). The water for supplemental flows would come from water stored in Trinity Reservoir. This decision is authorized by Section 2 of the 1955 Trinity River Division Act.

The Proposed Action is comprised of three flow augmentation components to be implemented as needed in a phased approach, based on environmental and biological conditions. The three components include: (1) a preventive base-flow release that targets increasing the base flow of the lower Klamath River to 2,800 cfs from mid-August to late September to improve environmental conditions; (2) a one day preventive pulse flow (targeting 5,000 cfs in the lower Klamath River) to be used as a secondary measure to alleviate continued poor environmental conditions and signs of Ich infection in the lower Klamath River; and (3) a five-day emergency pulse flow (targeting 5,000 cfs in the lower Klamath River) to be used on an emergency basis as a tertiary treatment, to avoid a significant die-off of adult salmon when the first two components of the Proposed Action are not successful at meeting their intended objectives.

An adaptive management approach that incorporates real-time environmental and biological monitoring would be used to determine if and when to implement any or all of these three flow augmentation components. Reclamation would implement these flow augmentation components in coordination with federal, state, and tribal resource specialists, including fisheries biologists or pathologists (i.e., Long-Term Plan to Protect Adult Salmon in the Lower Klamath River Technical Team).

The 2,800 cfs target flow release of the preventive base flow augmentation, and the 5,000 cfs target flow of the preventive pulse flow and emergency pulse flow augmentations are flow levels

used as planning estimates. They may be adjusted if real-time observations or changes in understanding of the infection mechanics suggest these flow levels are more than that required to prevent a fish die off. Additionally, flow augmentation criteria may evolve over time based on monitoring and research of environmental and biological conditions. Adaptively managing the flow criteria over time will allow Reclamation to refine the flow volume needed to meet the purpose, thus minimizing potential adverse effects to water supply and cold water pool resources.

**Trinity River ROD Flow Rescheduling Alternative (Alternative 2)**

This alternative includes supplemental flows from Lewiston Dam, to prevent a disease outbreak in the lower Klamath River, in years when the river’s flow is projected to be less than 2,800 cfs. Supplemental flow would come sequentially from water stored in Trinity Reservoir, primarily through modifying the pattern of releases (i.e., rescheduling) for Trinity River ROD flow. If rescheduling of Trinity River ROD flow is insufficient to meet flow augmentation requirements, water would be released pursuant to authority provided in Proviso 1 of the 1955 Trinity River Division Act. The supplemental flow would involve the same three components described for the Proposed Action, including preventive base flow augmentation, preventive pulse flow, and emergency pulse flow augmentation.

Under Alternative 2, Trinity River ROD flow releases would be reduced in earlier months to reserve a portion of the total release volume, to meet the estimated need for supplemental flow later in the season. Table 1 identifies the volume of water, based on the Trinity River ROD year type, to be rescheduled for release in August and September for flow augmentation.

**Table 1. Alternative 2 rescheduled water volume by water year type**

Water Year Classification	Total Trinity Reservoir Inflow for Water Year Classification <sup>1</sup> (acre-feet)	Total Volume of Trinity River ROD Flows <sup>1</sup> (acre-feet)	Volume Rescheduled for Alternative 2 <sup>2</sup> (acre-feet)
Extremely Wet	>=2,000,000	815,000	3,228
Wet	1,350,000-1,999,999	701,000	7,593
Normal	1,025,000-1,349,999	647,000	10,536
Dry	650,000-1,024,999	453,000	23,476
Critically Dry	<650,000	369,000	33,261

**Notes:**

<sup>1</sup> As described in the *2000 Final Trinity Mainstem Fishery Restoration Environmental Impact Statement/Report*

<sup>2</sup> Volumes reflect average estimated preventive base flow augmentation by year type based upon CalSim inputs

## **Other Alternatives**

Other alternatives were suggested during scoping for the Draft EIS. Pages 2-11 through 2-14 of the Draft EIS described 3 categories of alternatives that were considered and eliminated from further detailed analysis in the EIS. This included construction of new water treatment and storage facilities, which were eliminated because they would not be implementable by August 2017. Other alternatives that were not carried forward include: acquiring water from willing sellers; reoperation of Klamath Hydroelectric Project; reoperation of Klamath River tributary facilities; altering flow requirements under the 2013 Klamath Project Biological Opinion; modifying Reclamation's Safety of Dams storage; restricting commercial and recreational fishing; and implementing additional water quality standards for agricultural return flow in the Klamath River.

Additionally, during preparation of the EIS, some stakeholders expressed interest in a more comprehensive solution that would more broadly address the health of the Klamath River system. In making this decision to implement the Proposed Action, Reclamation understands that additional alternatives may become viable if circumstances change significantly in the Klamath River basin. For instance, in the event efforts move forward with the proposal to remove dams on the main stem Klamath River, water quality may be improved, and obviate the need for supplemental flows from the Trinity River, or additional sources of water originating in the Klamath River basin may become viable sources for this action. In this case, Reclamation would collaborate with stakeholders on more holistic approaches to ensuring the health of the Klamath River system.

Reclamation reviewed each of these concepts, and determined that they would not meet the purpose and need for the project, they would not alleviate one or more of the significant effects associated with the Proposed Action, or they were not implementable in a reasonable amount of time.

## **4. Environmentally Preferable Alternative**

As provided in 43 CFR 46.30, the environmentally preferable alternative is the alternative required by 40 CFR 1505.2(b) to be identified in a ROD, that causes the least damage to the biological and physical environment and best protects, preserves, and enhances historical, cultural, and natural resources.

Based on the environmental analysis in the Draft EIS, Alternative 2 has been identified as the environmentally preferable alternative because it would achieve the Proposed Action's objective of preventing an Ich outbreak with the least impacts to water supply and listed fish species in the Sacramento River system. Though both alternatives have similar environmental effects, the main differences between the alternatives are the effects on CVP water deliveries, temperature effects in the Trinity and Sacramento Rivers, and the effects to hydropower generation. In general, in some drier years, Alternative 1 would reduce CVP water deliveries by up to 24 TAF, while Alternative 2 would reduce those same deliveries by about 6 TAF. Both alternatives could lead to water temperature changes in the mainstem of the Trinity River, with Alternative 1 having effects primarily in July through December while Alternative 2 would have effects on water

temperature in April through July. Compared to Alternative 2, Alternative 1 would also have greater effects on water temperatures in the Sacramento River, which could affect various life stages for Chinook salmon in critical years. (See Draft EIS, Executive Summary, Table ES-3, Comparison of Environmental Effects of Alternatives 1 and 2)

Although Alternative 2 has been identified as the environmentally preferable alternative, it was not selected for implementation because restoration efforts set forth in the Trinity River ROD are specifically provided for restoring the mainstem of the Trinity River, especially the 40 miles immediately below the Lewiston Dam, to a “healthy” alluvial river, mimicking the natural hydrograph, albeit on a smaller scale. The Trinity River Flow Evaluation Report recommendations that were the basis of the preferred alternative for the Trinity River Mainstem Fishery Restoration FEIS/EIR and subsequent adoption of the Trinity River ROD, are well defined. The flow volumes of each water year type are minimums established to meet specific flow-related objectives during each water year type, with May through mid-July representing the time period when flows differ between year types to meet specific objectives and when the greatest magnitude flows of the year are scheduled. Outside of these months, the flows from Lewiston Dam are consistent between water year types and represent a base flow to meet minimum habitat needs of the river below Lewiston. These flow releases were designed not only to provide water of sufficient quantity and quality (*e.g.* temperature) for appropriate salmonid habitat and passage while in the river, but also to flush fine sediments and provide other geomorphic benefits that – combined with mechanical river restoration and other recommendations – would restore the river without seeking to keep *all* Trinity River water supplies within the watershed. It would not be consistent with the purposes of the Trinity River ROD flows for Reclamation to reduce the amount of water scheduled to be released under the Trinity River ROD earlier in the year for a late summer flow augmentation release. Additionally, although adaptive management may in the future allow for certain substantial within-year alterations to the Trinity River ROD’s flow schedule based on Trinity River Restoration Program (Program) results and objectives, DOI has concluded that such changes to the annual hydrographs should not occur prior to full implementation of the Program. The Program adopted by the Trinity River ROD has yet to be fully implemented, thus, at this stage in the implementation of the Trinity River ROD, it would not be prudent for the flow releases set forth in the Trinity River ROD to be reduced at other times of year in order to provide for the late summer flow augmentation releases. Further, changes to the Trinity River ROD flow schedule would require agreement to modify these flows between the implementing agencies identified in the Trinity River ROD.

## 5. Basis for Decision

During the public scoping period to solicit public input and guide alternative development, Reclamation developed four criteria to effectively address the Purpose and Need statement to screen potential alternatives: The four criteria are as follows:

- **Effective:** Addresses more than one of the significant contributing factors to *Ichthyophthirius multifiliis* (Ich) epizootic events: (1) crowded holding conditions for pre-spawn adults, (2) warm water temperatures, and (3) presence of disease pathogens.



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- **Substantial Risk Reduction:** Capability of meaningfully and substantially reducing the likelihood, and potentially reducing the severity of any Ich epizootic event that could lead to an associated fish die-off.
- **Immediate Implementability:** Actions may be needed as early as August 2017, therefore alternatives need to be able to be implemented immediately. Further, the term proposed for this Environmental Impact Statement (EIS) is 2017 through 2030. This period is relatively short, and measures need to be able to provide measurable benefit within this time period.
- **Consistent with Laws and Regulations:** Consistent with Federal Reclamation law; other Federal laws; State of California and Oregon laws, water rights, permits, and licenses.

Public input was considered by Reclamation in developing alternatives to be examined in detail in the Draft EIS. After consideration of the comments received, Reclamation has determined that the Proposed Action best addresses the need for action which is to increase lower Klamath River flows to reduce the likelihood, and potentially reduce the severity, of any fish die-off in future years due to crowded holding conditions for pre-spawn adults, warm water temperatures, and the presence of disease pathogens. The Proposed Action can be implemented by August 2017, and is within Reclamation's authority to implement without requiring additional authority. Moreover, implementation of the Proposed Action will not result in adjustments to the Trinity River ROD designated flow volumes associated with the annual flow schedule approved by the Trinity Management Council.

In addition to the statutory and trust responsibilities of the DOI regarding the Klamath River fishery, Reclamation considered effects to resources such as Biological Fisheries Resources, Hydropower Resources, Surface Water Supply and Management (e.g. CVP Deliveries), Tribal Trust Resources, and Surface Water Quality (Executive Summary, Table ES-3 Comparison of Alternatives, Draft EIS). Under Alternative 1, there are no substantial adverse effects to tribal trust resources related to water supply, fisheries resources, or terrestrial biological resources. Also, essential to making this decision, in 2016 Reclamation asked experts to evaluate the scientific basis and appropriateness of the documents relied upon to create flow augmentation criteria. The peer reviewers are from various state universities and staff from the U.S. Geological Survey and are recognized technical experts in fish ecology and habitat, water resource planning, and fish pathogens. The panel was asked two questions: are the implementation criteria supported by the science, and have the assumptions and uncertainties associated with utilizing the flow criteria been appropriately characterized? Overall, reviewers indicated the flow augmentation program to be reasonable given the local circumstances in the lower Klamath River, even if not fully supported in the literature. All reviewers recommended continued monitoring and application of an adaptive management approach, especially in light of the

number of years since 2002 where flow augmentation has been used, noting that additional data collection would allow for refinement of criteria. A report summarizing the panel's recommendations was prepared by Reclamation in October 2016.

## 6. Environmental Commitments and Monitoring

Monitoring and research efforts will include both essential monitoring actions (e.g., monitoring required to measure the flow augmentation component triggers, such as Ich infestation level) as well as additional monitoring and research actions, to inform potential refinement of flow augmentation trigger criteria. This will result in improved performance and is intended to assess effects of flow augmentation actions on Trinity River and lower Klamath River ecosystems.

The following required essential monitoring actions provide a basis to determine whether the specific criteria have been triggered for the three flow augmentation components. These essential monitoring actions would be performed annually. Through funding, Reclamation is committed to managing the monitoring actions associated with flow augmentation and the environmental effects to resources.

- *Flow and Water Temperature* Real-time flow and water temperature data would be obtained from existing U.S. Geological Survey (USGS) stream gages along the Klamath and Trinity Rivers.
- *Fish Density, Including Estuary Counts* Various methods would be utilized to determine fish densities, including estuary counts and other methods identified by the LTP Technical Team. The Yurok Tribe would collect harvest and catch effort data for the estuary. Estimates of fall-run Chinook salmon adult abundance in the estuary will be made based on weekly or more frequent harvest quantity data and the fishing efforts of the Yurok Tribe.
- *Fish Health Monitoring (Ich)* Monitoring and assessment of salmon and steelhead for the presence of Ich would be conducted along the lower Klamath River during the late-summer and fall months (July through October).

As part of Alternative 1, additional monitoring and research actions would be conducted to further scientific understanding of causative factors of Ich infection and outbreak in the lower Klamath River and the ecological impacts of management actions taken to minimize Ich. Based on the concept of adaptive management, and utilizing additional scientific information on the causative factors, Reclamation in coordination with the LTP Technical Team, may refine trigger criteria of the three flow components (i.e., preventive base flow augmentation, preventive pulse flows, and emergency pulse flow augmentation) to further reduce the likelihood—and potentially the severity—of any Ich epizootic event. Tables 2-2 and 2-3 (pages 2-8 through 2-9) of the Draft EIS identifies additional monitoring and forecasting actions that may be conducted as part of Alternative 1.

Section 7 of the ESA requires federal agencies to ensure that their activities do not jeopardize the continued existence of listed endangered or threatened species or adversely modify those

species' critical habitats. When federal agencies propose actions which may adversely affect a listed species, agencies must consult with either the Service or NMFS. Consistent with these responsibilities, Reclamation consulted with NMFS on the potential effects of the Proposed Action on listed fish species. NMFS concluded consultation with the issuance of a programmatic biological opinion which includes stipulations for annual reinitiating of consultation as well as annual assessment, coordination, monitoring, and reporting. The biological opinion provided a determination that the project would not jeopardize the existence of any listed fish species, while the annual consultation process is expected to culminate in an individual biological opinion that will include an incidental take statement. Reclamation will implement the proposed action consistent with the Biological Opinion.

NMFS also concluded that aspects of the proposed action would adversely affect Essential Fish Habitat (EFH) for Chinook salmon through changes in water temperature and flows in the upper Sacramento River between Keswick Dam and Red Bluff Diversion Dam. To minimize these effects, NMFS recommends that Reclamation fund studies to determine how the conceptual model of a Chinook salmon fish kill has changed over time, and refine the understanding of factors leading to a fish kill in the lower Klamath River. Reclamation intends to fully implement these EFH conservation recommendations to protect designated EFH for Pacific Coast salmon by implementing the studies and monitoring described above in this section.