

RECLAMATION

Managing Water in the West

Final Environmental Assessment 2012 Lower Klamath River Late Summer Flow Augmentation

EA-NC-12-05



U.S. Department of the Interior
Bureau of Reclamation

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Mission Statements

The mission of the Department of the Interior is to protect and provide access to our Nation's natural and cultural heritage and honor our trust responsibilities to Indian Tribes and our commitments to island communities.

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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Introduction

Background

In September, 2002, a substantial number of returning adult fall-run Chinook salmon died prematurely in the lower Klamath River. Federal, Tribal, and State biologists studying the die-off concluded that: (1) pathogens *Ichthyophthirius multifiliis* (Ich) and *Flavobacterium columnare* (Columnaris) were the primary causes of death to fish; and (2) warm water temperatures, low water velocities and volumes, high fish density, and long fish residence times likely contributed to the disease outbreaks and subsequent mortalities (Guillen 2003; Belchik et al. 2004; Turek et al. 2004).

Outbreaks of Ich occur when conditions are favorable for rapid multiplication of the parasite, such as warm water, high fish densities, and stressed fish. The adult phase of this parasite is called a trophozoite, and resides and feeds on the skin and gills of the infected fish. Cysts break off the fish, find substrate (the bottom of the river), and multiply into thousands of free swimming bodies called tomites. The free swimming tomites then seek out a new host, grow to full size, and the cycle repeats itself. Larger, sexually mature fish, such as those that died in the 2002 fish die-off, are more susceptible to Ich and development and growth of the life stages of this parasite are highly dependent on temperature; growth is accelerated with increased temperatures. Relatively higher river flows generally result in increased water volumes, velocities, and turnover rates in a given river reach. Flows in the lower Klamath River were about 2,500 cubic feet per second (cfs) during the first half of August 2002, then decreased to about 2,000 cfs by September. Flows averaged about 2,000 cubic feet per second (cfs) during September.

In 2003 and 2004, predictions of relatively large runs of fall-run Chinook salmon to the Klamath River Basin and drier than normal hydrologic conditions prompted Reclamation to arrange for late-summer flow augmentation to increase water volumes and velocities in the lower Klamath River to reduce the probability of a disease outbreak in those years. Thirty three thousand acre feet (TAF) of supplemental water were released from Trinity Reservoir in 2003, and 36 TAF in 2004. While documentation of the effectiveness of these events is limited, general observations were that implementation of the sustained higher releases from August to early September in each year coincided with no significant disease or adult mortalities.

Based on the estimated number of 2 year-old fish in the 2011 Klamath Basin fall Chinook salmon run, the 2012 ocean abundance (pre-harvest) of fall-run was

estimated to be 1.6 million (PMFC 2012a). After considering estimated ocean harvest and other mortality, an early estimate of the in-river run of adult fall-run Chinook salmon was approximately 352,000. Later, the in-river run size was estimated at 381,000 (PFMC 2012b). This run size would be the largest on record since records were kept beginning in 1978, and more than three times the 1978-2011 average of just over 100,000. Because of the expected extremely large run size, and the relatively dry conditions in the upper Klamath Basin and associated expected flows in the Klamath River during the late summer, fish biologists who work in the basin were concerned that conditions could be conducive to a fish die-off similar to that in 2002. Consequently, a subgroup of the Trinity River Restoration Program's (TRRP) Flow Work Group convened several times to develop recommendations to monitor the in-river Chinook salmon run, establish thresholds for actions aimed at preventing any fish die-off, and provide associated recommendations for preventative actions.

Need for the Proposal

The purpose of implementing the Proposed Action is to increase lower Klamath River flows to reduce the likelihood, and potentially reduce the severity, of any fish die-off in 2012. Agency reports regarding the 2002 die-off identified crowded holding conditions for pre-spawn adults, warm water temperatures, and presence of disease pathogens (i.e., Ich and Columnaris) as the likely major factors contributing to the adult mortalities.

The biological consequences of large-scale fish die-offs could substantially impact present efforts to restore the native Trinity River anadromous fish community and the fishery. Reductions in the Klamath and Trinity River fish populations affect Tribal fishery harvest opportunities, ocean harvest levels, recreational fishing, as well as public perception and recovery mandates. Loss of 3 year-old and 4 year-old fish could affect the population structure, and may impede recovery goals as identified in the Trinity River Division Central Valley Project Act of 1955 (P.L. 84-386), and the Central Valley Project Improvement Act of 1992 (P.L. 102-575), for naturally produced fall run Chinook salmon.

By way of further background, in a March 5, 2003 court hearing, Judge Oliver Wanger directed the Department of the Interior to determine what actions would be necessary to "assure against the risk of fish losses that occurred late in the [2002] season" (U.S. District Court 2003a). Judge Wanger subsequently issued a ruling on April 4, 2003, allowing the Bureau of Reclamation to use an additional 50 TAF from the Trinity River Division of the Central Valley Project "at its reasonable discretion" to prevent a recurrence of the September 2002 fish die-off (U.S. District Court 2003b). Projected flow conditions and a forecasted record fall-run Chinook salmon escapement to the lower Klamath River in 2012 present similar conditions to those experienced during the die-off in 2002. Therefore, Reclamation is considering implementing the Proposed Action as a preventative

means to minimize any substantive disease outbreaks and the likelihood of another fish die-off in 2012.

Reclamation's Legal and Statutory Authorities and Jurisdiction Relevant to the Proposed Federal Action

The Trinity River Division Central Valley Project Act of 1955 (P.L.84-386) provides the principle authorization for implementing the Proposed Action. Specifically, section 2 of the Act states that “the Secretary is authorized and directed to adopt appropriate measures to insure preservation and propagation of fish and wildlife...” (emphasis added).

Scope

Implementation of the Proposed Action would be limited to late summer 2012 flow releases from storage in the Trinity River Basin; the affected environment would include the Trinity River and Klamath River from Lewiston Dam downstream to the Klamath River estuary near Klamath, California. Additionally, the affected environment could include the Sacramento River basin as transbasin diversions from Trinity River basin to the Sacramento River basin occur annually.

Resources Eliminated from Further Analysis

Reclamation analyzed the affected environment of the Proposed Action and No Action Alternative and has determined that there is no potential for direct, indirect, or cumulative effects to the following resources:

- **Cultural Resources:** Reclamation uses the National Historic Preservation Act of 1966 (16 U.S.C. 470) Section 106 process to consider the effect to historic properties relating to a federal action or “undertaking” as outlined in the Section 106 implementing regulations at 36 CFR §800. The Proposed Action involves the release of flows from Lewiston Dam on the Trinity River to augment flows in the lower Klamath River. The release of flows from Lewiston Dam would be within the normal release flow range and water levels along the Trinity River, and would not exceed the historic range of flows in the Trinity River. As a result, Reclamation has determined that the proposed action has no potential to cause effects to cultural resources eligible for inclusion in or listing on the National Register pursuant to 36 CFR §800.3(a)(1). Based on this finding, Reclamation eliminated cultural resources evaluation from further analysis in this document.
- **Indian Sacred Sites:** Reclamation is required by EO 13007, to the extent practicable permitted by law, and not clearly inconsistent with essential

agency functions, to: (1) accommodate access to, and ceremonial use of, Indian sacred sites by Indian religious practitioners; and (2) avoid adversely affecting the physical integrity of such sacred sites. When appropriate, Reclamation shall, to the greatest extent possible, maintain the confidentiality of sacred sites.

The Proposed Action would not inhibit access to or ceremonial use of an Indian Sacred Site, nor would the Proposed Action adversely affect the physical integrity of such sacred sites.

- Floodplains, Wetlands and Waterways: Executive Order 11988 requires Federal agencies to prepare floodplain assessments for actions located within or affecting flood plains, and similarly, Executive Order 11990 places similar requirements for actions in wetlands.

The Proposed Action does not involve construction, dredging or other modification of regulated water features. No permits under the Clean Water Act [CWA] (33 U.S.C. 1251) would be needed. Further, the Proposed Action only includes providing controlled reservoir releases that are within the normal operational envelope.

- Land Use: Under the Proposed Action, there would be no changes in land use due to implementation of the Proposed Action. The proposed water releases from Lewiston Dam are within the historic range of flows addressed in the Trinity River Mainstem Fishery Restoration Environmental Impact Statement/Environmental Impact Report (TRMFR EIS/EIR; U.S. Fish and Wildlife Service et al. 2000). In addition, the magnitude and timing of the target flows in the lower Klamath River are well within the range of historic flows resulting from rainstorms, etc. Therefore, no changes in land use near the rivers will be required as a consequence of the Proposed Action.
- Air Quality: Section 176 (C) of the Clean Air Act [CAA] (42 U.S.C. 7506 (C)) requires any entity of the federal government that engages in, supports, or in any way provides financial support for, licenses or permits, or approves any activity to demonstrate that the action conforms to the applicable State Implementation Plan (SIP) required under Section 110 (a) of the Federal CAA (42 U.S.C. 7401 [a]) before the action is otherwise approved.

The Proposed Action would have no impacts to air quality.

- In 2006, the State of California issued the California Global Warming Solutions Act of 2006, widely known as Assembly Bill 32, which requires California Air Resources Board (CARB) to develop and enforce regulations for the reporting and verification of statewide Greenhouse Gas (GHG) emissions. CARB is further directed to set a GHG emission limit, based on 1990 levels, to be achieved by 2020. In addition, the Environmental

Protection Agency has issued regulatory actions under the Federal Clean Air Act as well as other statutory authorities to address climate change issues (EPA 2011c).

There would be no GHG generated by the Proposed Action. Accordingly, the activities under the Proposed Action would result in no impacts to global climate change.

As there would be no impact to the resources listed above resulting from the Proposed Action or the No Action alternative, they will not be considered further.

Resources Requiring Further Analysis

This EA will analyze the affected environment of the Proposed Action and No Action Alternative in order to determine the potential direct, indirect, and cumulative effects to the following resources:

- Water Resources
- Biological Resources
- Indian Trusts Assets
- Environmental Justice
- Socioeconomic Resources

Alternatives Including the Proposed Action

This Environmental Assessment (EA) considers two possible actions: the No Action Alternative and the Proposed Action. The No Action Alternative reflects future conditions without the Proposed Action and serves as a basis of comparison for determining potential effects to the human environment.

No Action Alternative

Under the No Action Alternative, late-summer releases from Lewiston Dam would remain at 450 cfs, as prescribed in the Record of Decision for the TRMFR EIS/EIR (U.S. Fish and Wildlife Service et al. 2000). Flow releases at Iron Gate Dam on the Klamath River would be consistent with the 2010 National Marine Fisheries Service (NMFS) biological opinion addressing operation of Reclamation's Klamath Project, about 1,030 cfs. In addition, Reclamation would also direct an increase in Iron Gate Dam releases to provide water for the Yurok Tribe's Boat Dance Ceremony (Ceremony) as is customary in even numbered

years. In 2012, the Ceremony will require Iron Gate Dam releases to increase from base flows to a peak of approximately 1,600 cfs for one day on August 31 for the Ceremony on September 2, with the goal of meeting a target flow of 2,300 cfs approximately 130 miles downstream of Iron Gate Dam at the Orleans gage. Following the Ceremony, Iron Gate Dam releases would be decreased at an appropriate rate down to base flow for the season.

Under the No Action Alternative the estimated flows in the lower Klamath River (U.S. Geological Survey Site #11530500; Klamath near Klamath gage [KNK]), and scheduled releases from Lewiston Dam are shown in Figure 1. Forecasted flows at the KNK gage would average about 2,800 cfs in the second half of August and about 2,660 cfs in September under the No Action Alternative.

Proposed Action

Reclamation would operate Lewiston Reservoir to target a minimum flow in the lower Klamath River at KNK of 3,200 cfs from August 15, 2012, to September 21, 2012, followed by a decrease in flow at an appropriate rate back to the normal base flow for the season assuming that daily average water temperatures are below 23° C; otherwise flows would be decreased by September 30. The 3,200 cfs flow magnitude was identified as the approximate August and September average flows during those years (since 1978) when the fall Chinook salmon run in the Klamath River was greater than the 2002 run size.

Within the time frame when the supplemental flow would occur, flows from Lewiston Reservoir would be adjusted to coincide with a planned pulse flow release from Iron Gate Dam on the Klamath River for the Yurok Tribe's Ceremony on September 2. The Klamath River pulse is designed to provide a one-day, 2,300 cfs flow at the Orleans gage, and the Lewiston Reservoir releases would be adjusted and timed to result in a peak flow target of 4,400 cfs at the KNK gage. The purpose of this pulse flow in the lower Klamath River would be to further increase the water velocity and turnover rates in the parts of the river where adult salmon are holding. Given the tributary accretion forecast, up to 48 TAF of supplemental water would be needed to implement these Proposed Action preventative flows. The resulting hydrograph at the KNK gage is presented in Figure 1.

The preventative flows that would be provided to augment the flows in the lower Klamath River in late summer are expected to prevent a disease-related fish die off in 2012, and conditions will be carefully monitored during this time. In August and September there would be a number of monitoring activities implemented before and during the action to assess environmental and biological conditions in the lower Klamath River. Assessments would be used to gain knowledge regarding the ecological consequences of the actions while also informing management whether additional actions may be required to thwart a fish die-off in 2012. For example, the Yurok Tribe will sample adult Chinook

salmon and thoroughly examine them for signs of Ich infection. If a threshold number of examined adults are infected with Ich, as confirmed by the U.S. Fish and Wildlife Service's California-Nevada Fish Health Center, an immediate emergency flow release from Lewiston Reservoir would be initiated to further disrupt the life cycle of the pathogen in an attempt to prevent a catastrophic disease outbreak. Specifically, Lewiston Reservoir would be operated to double the current flow on the lower Klamath River at the KNK gage for a 7 day period (up to a maximum flow of 6,400 cfs). Up to approximately 44 TAF would be needed to implement the Proposed Action emergency response. This is designed to increase the water turn-over rate in areas where adult fish are holding, more effectively flush the infectious life form of Ich downstream into the estuary where they cannot survive, and make it more difficult for additional fish to be infected.

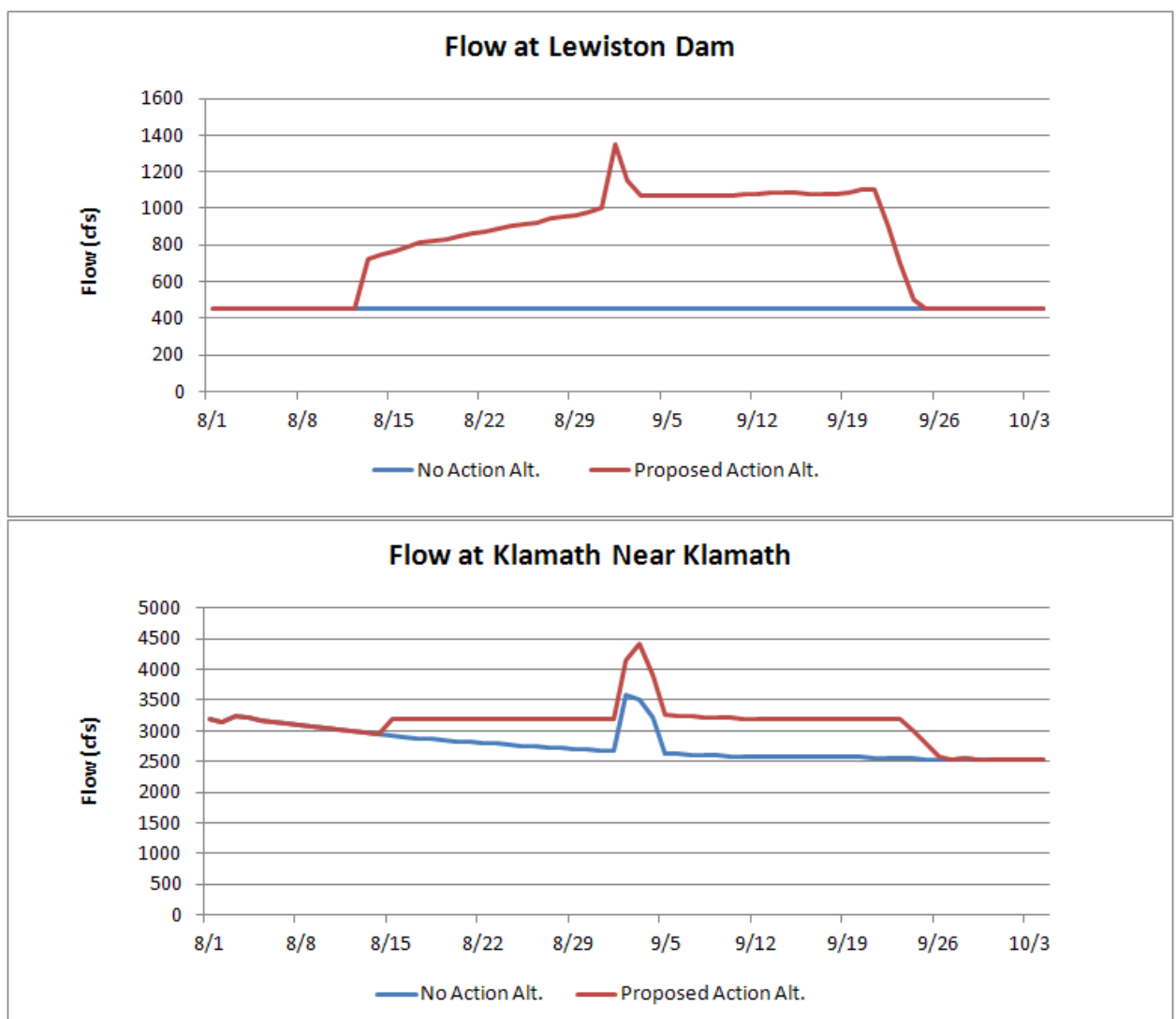


Figure 1. Approximate hydrograph for Lewiston Dam releases to result in the No Action Alternative and Proposed Action preventative flow targets in the lower

Klamath River (U.S. Geological Survey Site #11530500: Klamath River near Klamath, California) during the 2012 fall-run Chinook salmon migration period.

Alternatives Considered But Eliminated From Further Consideration

The TRRP's Flow Work Subgroup described the primary reason that supplemental flows would decrease the likelihood of an epizootic event in the lower Klamath River during the late summer. In summary, the expectation is that increased water volumes and velocities in the lower river would dilute the infective stages of Ich and reduce the overall density of adult fall-run Chinook salmon. While the Subgroup did discuss the relative effects of different water sources for flow augmentation, they did not recommend a specific source for the supplemental water (i.e., storage in the upper Klamath River Basin vs. the upper Trinity River). Reclamation considered the potential alternative sources of supplemental water for the lower Klamath River in the late summer, and the associated implications.

While the available water supplies in the Trinity River Basin increased dramatically during the spring of 2012, the water supply in the upper Klamath River did not improve nearly as much. After planning for the Klamath River flows below Iron Gate Dam consistent with the NMFS biological opinion addressing operation of Reclamation's Klamath Project, providing for the Upper Klamath Lake elevation regime consistent with the U.S Fish and Wildlife Service's biological opinion addressing endangered suckers, and providing for limited irrigation water delivery, Reclamation determined that in practical terms, supplemental water for late summer lower Klamath River flows is not available from the upper Klamath River.

Affected Environment and Environmental Consequences

This section identifies the potentially affected environment and the environmental consequences associated with the Proposed Action and the No Action Alternative, in addition to environmental trends and conditions that currently exist.

Water Resources

Reclamation stores water for several purposes in Trinity and Shasta Reservoirs. These facilities and other Central Valley Project (CVP) facilities are operated in a coordinated fashion to satisfy a number of geographically diverse flood control

and environmental requirements, as well as provide water to satisfy water delivery and water rights responsibilities and to generate hydroelectric power.

Affected Environment

Trinity Reservoir is the primary water storage facility in the Trinity River Division of the CVP. Total storage capacity is 2.448 million acre feet (MAF), and the average annual inflow volume into the Reservoir is about 1.2 MAF. Of the available water stored in Trinity Reservoir, the water lower in the reservoir (the hypolimnion) is relatively cold when the reservoir is annually stratified. Cold water in Trinity and other reservoirs is an important resource to support downstream water temperature control efforts in the Trinity River, Sacramento River, and Clear Creek (tributary to the Sacramento River). A reregulation reservoir is formed by Lewiston Dam downstream of Trinity Dam. At Lewiston Dam, water is either released into the Trinity River or exported to the Sacramento River Basin via the Clear Creek tunnel. Downstream of the Clear Creek tunnel the water helps meet the multi-purpose objectives of the CVP stretching from Shasta Reservoir through the Sacramento – San Joaquin Delta down to the San Joaquin Valley.

Environmental Consequences

No Action

Under the No Action Alternative, the flow released into the Trinity River in August and September 2012 would be consistent with the flows described in the TRMFR EIS/EIR. No supplemental flows would be provided in the lower Klamath River in the late summer, and there would be no effects to water resources.

Proposed Action

Providing approximately 48 TAF of supplemental water in the lower Klamath River as a preventative measure in the late summer in 2012 would not affect water supply allocations managed as part of the Central Valley Project (CVP) in 2012, or water operations within the Central Valley. Water allocations for irrigation and municipal and industrial deliveries have already been determined for 2012, and the supplemental water would not affect the projected volume of water to be exported to the Sacramento River Basin in 2012. Additionally, with the exception of the Proposed Action augmentation, flows in the Trinity River would not be affected.

Without implementation of the Proposed Action, Trinity Reservoir storage is forecasted to be approximately 1.835 MAF (50% exceedance value) at the beginning of water year 2013, which is higher than the historical average of about 1.66 MAF. Given the planned operation of Trinity Reservoir, Carr power plant, and Lewiston Reservoir, storage in Trinity Reservoir is forecasted to be 2.012 MAF at the end of June 2013 (50% exceedance). The approximate 48 TAF for preventative use in supplementing the lower Klamath River flows in late summer 2012 is less than 3 percent of the forecasted volume present in Trinity Reservoir

at the beginning of water year 2013, and about 2 percent of the 50% exceedance forecasted volume by the end of June 2013. Forecasting filling of Trinity Reservoir in April is complicated by the possibility of safety-of-dam releases that can occur from November through March as a result of above normal precipitation patterns that could occur.

In the unlikely event that the emergency flow portion of the Proposed Action is implemented, up to 44 TAF of water in addition to the preventative supplemental flows would be released into the Trinity River. Release of this water would occur if there is evidence of an imminent disease outbreak as in 2002. As with the water volume necessary to implement the preventative supplemental flows, the volume necessary to implement the emergency flow augmentation may not be available for other purposes after 2012. Again, this is not possible to accurately predict due to the uncertainties associated with filling Trinity Reservoir in 2013.

If Trinity Reservoir fills during 2013, there would be no effects to water resources available for all potential purposes in 2013. In contrast, if Trinity Reservoir does not fill in 2013, some water volume, up to the amount released for supplemental Klamath River flows, may not be available for other potential purposes. However, this represents a small proportion of the water made available for various purposes annually, on average, from the CVP. For example, 92 TAF, the approximate volume needed to implement the preventative flows and the unlikely emergency flows, is less than 4 percent of the total CVP water service contract volumes, and less than 1 percent of the total CVP contracted volume.

Under the Proposed Action the coldwater of Trinity Reservoir would be reduced by up to 92 TAF in 2012, if both the preventative and unlikely emergency flows are implemented. This reduction would occur in 2012 but would not result in significant affects to the coldwater resource needs for the immediate year. This is because the end of water year 2012 storage volume in Trinity Reservoir is projected to be 1.835 MAF, which is well above the storage threshold of approximately 1 MAF where temperature of water released through the penstocks may be a concern for downstream use.

In 2013, the reduction in storage of up to 92 TAF due to implementation of both the preventative and unlikely emergency flows may influence the coldwater resource but is dependent upon whether the reservoir would fill. In the event the reservoir spills, or substantial safety-of-dams releases occur, there could be no effect. Otherwise, there could be some relatively minor reduction in available cold water resources that may be accountable to this action.

In 2012, recreational activities in Trinity Lake are not likely to change to any great extent due to the Proposed Action. If the preventative flows portion of the Proposed Action were implemented, the water surface elevation of Trinity Reservoir would be decreased by up to 3.5 feet relative to no action. In the unlikely event that the emergency flows portion of the Proposed Action were

implemented, the reservoir elevation would be decreased by up to an additional 3 feet. Boat ramp access to the lake is expected to remain the same as the No Action alternative. There is a small chance that some boat ramps might not be useable due to a reduced water elevation in the lake during the later part of summer of 2013 as a consequence of implementing the Proposed Action. As previously mentioned, however, the complexities and uncertainties of accurately predicting water surface elevations that far in the future are tied to variable and unpredictable precipitation patterns and therefore preclude Reclamation from providing meaningful estimates.

The significant recreational activities in the Trinity River that may be influenced by the Proposed Action include: pleasure rafting and fishing (boating), both recreational and subsistence fishing. The unlikely implementation of the emergency response provision of the Proposed Action could increase flow magnitudes up to 4,200 cfs from Lewiston Dam. This increase, although only occurring for a period of a few days, would limit recreational fishing opportunities during this time. Before and after the peak, which would only be used on an emergency basis, flows up to 1,200 cfs from Lewiston Dam would be expected to continue to provide bank and boat-based fishing as well as boating opportunities along the entire river. In addition, the greater quantity of water in the lower river would afford greater power boat access to a larger section of the Klamath River thereby expanding fishing opportunities for many.

Cumulative Impacts

There are no anticipated substantial cumulative impacts on Trinity Basin water resources related to the Proposed Action. Although there are a number of relatively small scale water diversions downstream of Lewiston Dam, no additional impacts are expected to occur compared with recent past years.

The Trinity River Division of the CVP is operated in coordination with all the other CVP and State Water Project facilities. Due to varying future water supply conditions within this large geographic area, it is not possible to meaningfully evaluate how a potential slightly lower Trinity Reservoir storage in 2013 may exacerbate system-wide supply conditions in the future. However, any such effects would be minor.

Biological Resources

Affected Environment

A variety of fish, wildlife, and plant species occur within the riparian corridor and in the Trinity River below Lewiston Dam and the in lower Klamath River. These biological resources, and the effects of various river flows, were previously described in the TRMFR EIS/EIR. The Proposed Action flow magnitudes are within the range of flows considered in the TRMFR EIS/EIR, and the preventative flows are within the range of historical flow magnitudes and timing. The primary target species expected to benefit from the Proposed Action is

Chinook salmon, while other fish, amphibians, reptiles, birds, and mammal species are not likely to be adversely affected. Therefore, the following section addressing the Environmental Consequences of the No Action Alternative and the Proposed Action will focus exclusively on Chinook salmon.

Environmental Consequences

No Action

Under the No Action Alternative, flows in the Trinity River would be within the range described in the TRMFR EIS/EIR, and the effects to the biological resources have been discussed and considered in that document. Flows in the lower Klamath River during the late summer would result from Iron Gate Dam releases consistent with the 2010 NMFS biological opinion on operation of Reclamation's Klamath Project, Klamath and Trinity River tributary accretion flow, and releases from Lewiston Dam.

As previously discussed, there is concern about the vulnerability of the expected large fall Chinook salmon in-river run in 2012 to disease, as was experienced in 2002, under implementation of the No Action Alternative. A fish die-off of the magnitude experienced in 2002 has obvious effects to the returning fish run, but also can affect the age class structure of salmon populations for a number of years.

Proposed Action

Under the Proposed Action, the susceptibility of returning adult fall Chinook salmon to diseases that led to the 2002 fish die-off would likely decrease in the lower Klamath River during the late summer in 2012. This expectation is due to increases in lower Klamath River water volumes, velocities, and turnover rates under the Proposed Action that would further inhibit the spread of Ich. While it is possible that water temperatures could be slightly decreased due to additional Trinity River flow contributions (see Zedonis 2004, 2005), the primary concept is that physically making it more difficult for the Ich life cycle to be completed will decrease disease risk. In 2003 and 2004 supplemental flows were implemented, and general observations were that the sustained higher releases from mid-August to mid-September in each year coincided with no significant disease or adult mortalities. Further, no unusual adult fish mortalities in the Klamath River upstream of the confluence of the Trinity were observed in these years. However, given the inherent uncertainties regarding events of this nature, combined with the predicted very large fish run size, it is not possible to predict with absolute certainty that the Proposed Action will preclude a fish die-off in 2012, nor is it possible to accurately quantify the reduce of disease risk attributed to the increased flows.

Cumulative Impacts

No addition cumulative impacts to biological resources beyond those described in the TRMFR EIS/EIR are anticipated.

Indian Trust Assets

Indian trust assets (ITA) are legal interests in assets that are held in trust by the United States Government for federally recognized Indian tribes or individuals. The trust relationship usually stems from a treaty, executive order, or act of Congress. The Secretary of the Interior is the trustee for the United States on behalf of federally recognized Indian tribes. Trust assets may include lands, minerals, and natural resources, as well as hunting, fishing, and water rights. In some cases, ITA may be located off trust land.

Affected Environment

Indian trust assets were described and considered in the TRMFR EIS/EIR and the associated Record of Decision. Specifically relevant to the No Action Alternative and the Proposed Action considered in this Environmental Assessment are the tribal trust fisheries in the Klamath and Trinity Rivers.

Environmental Consequences

No Action

Under the No Action Alternative, any affects to ITA have been previously described in the TRMFR EIS/EIR. As previously mentioned, the inherent uncertainties of events of this nature make it difficult to accurately quantify the risk of an epizootic outbreak to the large run of returning fall Chinook salmon associated with implementation of the No Action Alternative. However, if a large scale fish die-off similar to 2002 were to occur in late summer 2012, regardless of apparent causes, it would be devastating for the tribal trust fisheries in the Klamath and Trinity Rivers.

Proposed Action

Under the Proposed Action, it is expected that the risk of disease vulnerability to the large returning run of fall Chinook salmon to the lower Klamath River in the late summer would be decreased, relative to the No Action Alternative. In turn, the risk to the tribal trust fishery would be expected to decrease. In 2003 and 2004 supplemental flows were implemented, and general observations were that the sustained higher releases from mid-August to mid-September in each year coincided with no significant disease or adult mortalities. However, as previously mentioned, the expected decrease in risk associated with the Proposed Action cannot be accurately quantified.

Cumulative Impacts

Cumulative effects to ITA from future activities are somewhat speculative. Activities of Executive Branch federal agencies that may affect ITA are carefully scrutinized regarding their affects to these assets. State and local activities that are undertaken on non-federal land are subject to associated limitations, and the resulting affects to ITA would be speculative.

Environmental Justice

Executive Order 12898 (February 11, 1994) mandates Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and lower-income populations.

Affected Environment

The Trinity and Klamath Rivers flow through rural areas. Additionally, these rivers both run through the Hoopa Valley Tribe and Yurok Tribe Reservations. Generally speaking, the Reservations' populations are generally lower-income and traditionally rely on salmon and steelhead as an important part of their subsistence.

Environmental Consequences

No Action

As previously mentioned, it is not currently possible to accurately quantify the risk of disease susceptibility to returning fall Chinook salmon in the lower Klamath River in the late summer under implementation of the No Action Alternative. However, if a large-scale fish die-off were to occur, as in 2002, it would be devastating to the Tribes and local communities.

Proposed Action

Under the Proposed Action, the large run of fall Chinook salmon returning to the lower Klamath River in the late summer would be less susceptible to a disease outbreak similar to that which ultimately caused the 2002 fish die-off. In turn, the risk to the Tribal fisheries and the associated environmental justice would be reduced. However, as previously mentioned, this expected decrease in risk cannot be accurately quantified at this time.

Cumulative Impacts

Cumulative effects of future activities on minority and low income populations are speculative. Federal agency actions are subject to scrutiny regarding their affects to these populations. However, State and local activities on non-federal lands are not necessarily subject to the same analyses. Therefore, it is speculative to determine the effects of future, non-federal activities on minority and low income populations.

Socioeconomic Resources

Affected Environment

The most potentially affected socioeconomic resources that may be affected by the No Action or Proposed Action are the commercial, recreational, and Tribal salmon and steelhead fisheries on Klamath Basin stocks and the associated

economic activities. Also, water from Trinity Reservoir is exported to the Central Valley for consumptive use, and hydroelectric power is generated.

Environmental Consequences

No Action

Under the No Action Alternative, socioeconomic resources may be similar to those that were described in the TRMFR EIS/EIR. If a fish die-off does occur in the lower Klamath River in the late summer, Tribal fisheries would likely be devastated and any fishery-related socioeconomic resources would be affected also. However, as previously mentioned, it is not possible to currently quantify the risk of fish disease susceptibility associated with the No Action Alternative.

Proposed Action

Under the Proposed Action, there would be a reduced risk of disease susceptibility to the large run of fall Chinook salmon returning to the Klamath River in the late summer. In turn, there may be less potential for adverse affects to fisheries-related socioeconomic resources. As previously mentioned, it is not currently possible to accurately quantify the expected decrease in disease susceptibility for fall Chinook salmon returning to the lower Klamath River in the late summer associated with the Proposed Action.

Depending in part on whether Trinity Reservoir completely fills in water year 2013 after the Proposed Action would be implemented, there is a possibility that some of the water volume from Trinity Reservoir used to implement the Proposed Action may not be available for other uses in the future. It would be speculative to estimate the amount of water that may be unavailable in the future. However, the amount of water needed for the preventative flows in the lower Klamath River is a small proportion of the total CVP water deliveries. Since the CVP facilities are operated in a coordinated fashion, and annual water allocations to contractors are determined by supply conditions throughout the system, it is unlikely that any allocations to individual contractors would be reduced in the future due to implementation of the Proposed Action.

Implementation of the Proposed Action will not adversely affect power generation in 2012, with the exception of a small loss of potential power generation at Trinity Dam. The expected schedule for water delivery to the Clear Creek tunnel has already been developed, and the Proposed Action would not affect these exports.

If Trinity Reservoir does not fill in water year 2013, some portion of the water that is released through Lewiston Dam to implement the Proposed Action may not be available for later release through the Lewiston power plant, Clear Creek tunnel, Carr power plant, the Spring Creek tunnel and power plant and the power plant at Keswick Dam in 2013. In turn, this may result in decreased power generation. However, this would be complex to determine and quantify, depending on the particular refill patterns at Trinity Reservoir, whether safety-of-dams releases occur at Trinity Dam in 2013, Shasta Reservoir operations, etc. In

very general terms, if 92 TAF were released to the Trinity River to implement the preventative and unlikely emergency flows under the Proposed Action, future foregone generation could be a maximum of about 110,400 megawatt hours worth in excess of \$5 million. However, power generation opportunities are subject to many restrictions and uncertainties unrelated to the Proposed Action.

Reclamation intends to assess any effects of the Proposed Action in future years in terms of water supply and power generation, and seek to identify and implement mitigation opportunities, as appropriate consistent with Reclamation authorities and available resources.

Cumulative Impacts

Cumulative impacts of future activities on socioeconomic resources are speculative. Federal agency actions are subject to scrutiny regarding their affects to these resources. State and local activities on non-federal lands are not necessarily subject to the same analyses. So it is not possible to meaningfully determine the effects of future, non-federal activities on socioeconomic resources.

Consultation and Coordination

Public Review

Reclamation previously provided several updates on the potential to release additional flows to augment flows in the lower Klamath River in late summer 2012 to the Trinity River Management Council (TMC), and the Trinity Adaptive Management Working Group (TAMWG; a Federal Advisory Committee Act-chartered committee). These groups were established by the TRMFR Record of Decision and provide a wide spectrum of local and regional representation with regard to fishery restoration topics. Specifically, in two public meetings on June 11, 2012, and June 20, 2012, Reclamation provided updates on the planning to potentially providing additional protection for the large returning Chinook salmon run in 2012. Reclamation also provided the recommendation document from the TRRP Flow Subgroup to both the TMC and TAMWG by June 11, 2012.

Reclamation announced in a July 17, 2012, press release that the draft EA and FONSI was available for review and requested comments from the public until July 27, 2012. Twenty three email comments were received that supported the Proposed Action as described in the draft EA. One hundred fifty six email comments supported the Proposed Action described in the draft EA, and also advocated for additional augmentation water to be provided from storage in the upper Klamath Basin. Reclamation also received a number of letters with more specific comments on the draft documents. Those comments are summarized in Appendix Two, along with responses to general categories of comments received.

Endangered Species Act (16 U.S.C. § 1531 et seq.)

Section 7 of the Endangered Species Act (ESA) requires Federal agencies, in consultation with the Secretary of the Interior and/or Commerce, to ensure that their actions do not jeopardize the continued existence of endangered or threatened species, or result in the destruction or adverse modification of the critical habitat of these species.

The Proposed Action would not affect any federally-listed threatened or endangered species under the jurisdiction of the U.S. Fish and Wildlife Service (Service). Therefore, there is no need to consult with the Service pursuant to the ESA.

In 2003, NOAA's National Marine Fisheries Service (NMFS) concurred with Reclamation's determination that providing supplemental flows to improve environmental conditions in the lower Klamath River was not likely to adversely affect threatened Southern Oregon/Northern California Coast coho salmon. The preventative flow magnitudes included in the Proposed Action are estimated to be less than those provided during flow augmentation in 2003. Additionally, the timing of the flow augmentation proposed in 2012 is similar to flow augmentation implemented in 2003. A NMFS biologist was intimately involved in development of the interagency, intergovernmental recommendations that formed the basis of the Proposed Action. The group also considered any effects to threatened coho salmon associated with implementation of the Proposed Action, and concluded that there may be some minor benefits related to additional available rearing habitat during this time period.

If the Proposed Action is implemented, 2012 CVP operations will still be in accordance with the NMFS 2009 biological opinion addressing the coordinated operation of the CVP and the State Water Project with respect to threatened and endangered fish in the Sacramento River. As previously stated, use of water for supplemental flows in the lower Klamath River may result in some of that water not being available for other uses in subsequent years. Some examples of potential effects to the Sacramento River Division facilities are less end of September Shasta Reservoir storage and more dependence on cold water resources from Shasta Reservoir to meet mainstem Sacramento River water temperature targets. However, there are many variables that preclude a meaningful, specific description of such effects to water availability, including the future fill schedules at Trinity Reservoir and Shasta Reservoirs, future meteorology, future CVP water allocations, water conveyance restrictions, etc. If implementation of the Proposed Action results in substantive changes to CVP operations in subsequent years that may adversely affect listed salmon and steelhead species, Reclamation will consult with NMFS as appropriate.

California Water Code (§ 1435 et seq.)

Reclamation intends to submit a Temporary Urgency Change Petition pursuant to Water Code § 1435 to add the lower Trinity and Klamath Rivers to the place of use associated with the Trinity River Division water rights permits.

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Appendix One - List of Acronyms and Abbreviations

cfs	Cubic feet per second
CVP	Central Valley Project
EA	Environmental Assessment
EIS	Environmental Impact Statement
EIR	Environmental Impact Report
ESA	Endangered Species Act
ITA	Indian Trust Asset
MAF	Million acre feet
National Register	National Register of Historic Places
NHPA	National Historic Preservation Act
Reclamation	Bureau of Reclamation
TAF	Thousand acre feet
TAMWG	Trinity Adaptive Management Work Group
TMC	Trinity Management Council
TRD	Trinity River Division
TRMFR	Trinity River Mainstem Fishery Restoration
TRRP	Trinity River Restoration Program

Appendix Two – Response to Comments

The draft EA and FONSI were made available for public review on Reclamation’s Mid-Pacific Region web site following a July 17, 2012, press release. Comments received were considered in developing the final EA and FONSI. A summary of commenters who provided detailed comments are shown in Table 1. Responses to general categories of comments received are shown in Table 2.

Table 1. List of commenters who provided detailed comments on the 2012 Lower Klamath River Late Summer Flow Augmentation Proposal.

Commenter	Individual or Signatory	Agency/Affiliation
1	Leonard E. Masten Jr.	Hoopa Valley Tribal Council
2	Grace Bennet	Siskiyou County Board of Supervisors
3	Barry Tippin	Redding Electric Utility
4	Paul Hauser	Trinity Public Utilities District
5	Felice Pace	Public
6	Tom Stokely	California Water Impact Network
7	Les Martin	Public
8	Garwin Yip	NOAA’s National Marine Fisheries Service
9	Tim Hemstreet	PacifiCorp Energy
10	Virginia Bass	Humboldt County Board of Supervisors
11	Kelli Gant	Trinity Lake Revitalization Alliance
12	James Smith	Public
13	Brent ten Pas	Northern California Power Agency

Table 2. Response to general categories of comments received.

Commenter	Comment	Response
1,5	Supplemental flow releases should begin August 1 through the fall Chinook migration period.	The majority of biologists that developed the preventative flow augmentation regime believe the August 15 through September 21 period would encompass nearly all of the fall-run Chinook salmon migration period.
1,5	All Trinity River Division water used for flow augmentation should be accounted for in a way that assigns any future risk of shortage to water allocated	Reclamation has no plans to change water allocations to the Trinity River that are described in the ROD.

Commenter	Comment	Response
	for diversion to the Central Valley, not to the releases allocated to the Trinity River.	
1,5	The assessment should evaluate potential flow augmentation in additional years beyond 2012.	Reclamation agrees that future years should be evaluated, but this will not be done in this Environmental Assessment.
1,5,10	The assessment should confirm the validity of the Humboldt County contract and the authority to use water under that contract for supplemental flows and other beneficial in-stream uses as well as consumptive uses.	The Commissioner of Reclamation and other Department of the Interior officials continue to discuss this issue; beyond the scope of this analysis.
3,4	Value of the hydroelectric energy generation due to flow augmentation should be fully accounted for.	The Environmental Assessment includes a “worst case scenario” regarding the amount of foregone generation, and the expected value of that generation provided by commenter has been added.
4,13	Environmental impacts of CVP power customers replacing lost energy with natural gas fired generation has negative environmental attributes.	While it is possible that there will be foregone generation due to the flow augmentation, it is difficult and speculative to meaningfully quantify any changes in environmental attributes
2, 9	Reclamation and NMFS must ensure that the Trinity River water releases do not result in fish moving into the Klamath River and its tributaries when temperature and flow conditions are marginal.	Augmentation with Trinity River water could result in slightly lower water temperatures in the lower Klamath River. However, the biologists do not expect returning fish to migrate into the Klamath River prematurely. Rather, the flow augmentation is designed to improve environmental conditions and reduce the likelihood of disease transmission. Finally, no apparent difficulties were noted during the 2003 and 2004 flow augmentation actions that utilized Trinity River Basin water.
1,2,5,9,12	Why is water not being released from storage in the upper Klamath River Basin to	Water supply conditions in the upper Klamath River Basin and environmental considerations

Commenter	Comment	Response
	augment flows in the lower Klamath River?	resulted in little additional water being available from the upper basin. Water supply conditions in the Trinity River Basin are better. Also, as noted above, flow augmentation actions in 2003 and 2004 did not appear to have adverse impacts to fish.
6,10	Supports the Proposed Action and FONSI	Comment noted.
7	Does not support the Proposed Action, based on “[Reclamation] tried this in 2002, with very bad results.”	Flow augmentation similar to the Proposed Action did not occur in 2002.
8,13	EA should include examples of post-2012 potential impacts of the Proposed Action on environmental conditions in the mainstem Sacramento River.	The EA does state that some volume of water used to implement the Proposed Action may not be available for other uses beyond 2012. More specific examples provided by the commenter have been added to the final EA.
9	EA should indicate that factors controlling fish disease prevalence in the Klamath River are complex, and should better explain the mechanisms involved.	Additional discussion of the Ich life cycle has been added to the final EA.
10	Request that public advisories be issued to the area media in order to inform downstream residents and recreationalists of river conditions.	Reclamation and others will take steps to inform the public of river flows during this period.
11	The EA does not contain references to published, defensible scientific studies or data showing that the proposed flow augmentation is needed.	Reclamation is not aware of any such specific studies mentioned. The post-2002 analyses of the fish die-off that are referenced in the EA do provide relevant analyses and some general recommendations.
11,12	The drop in Trinity Reservoir elevation due to the 2012 Proposed Action will likely make many boat ramps unusable.	Based on forecasted conditions and planned operation of the Trinity River Division, Reclamation does not anticipate any changes to boat ramp usability

Commenter	Comment	Response
		in 2012 due to the Proposed Action.
13	There is no discussion about reimbursing other project purposes for these actions.	The EA states that Reclamation intends to assess any effects of the Proposed Action in future years in terms of water supply and power generation, and seek to identify and implement mitigation opportunities, as appropriate consistent with Reclamation authorities and available resources.