RECLAMATION

Managing Water in the West

Draft Environmental Assessment

2013 Lower Klamath River Late Summer Flow Augmentation from Lewiston Dam

EA-13-07-NCAO

U.S. Department of the Interior
Bureau of Reclamation
Mid-Pacific Region

July 2013

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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Section 1 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). Flows in the lower Klamath averaged about 2,000 cubic feet per second (cfs) during September 2002.

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-eight thousand acre-feet (TAF) of supplemental water was 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.

For 2012, the estimated ocean abundance (preharvest) of fall-run Chinook salmon was 1.6 million (PFMC 2012), and the preseason river run-size estimate for fall run was 381,000 adults. The preliminary postseason river run size estimate was 302,108 adults. 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 developed recommendations for actions aimed at preventing any fish die-off and provided associated recommendations for preventative actions. About 39 TAF of Trinity Reservoir water was released to augment flows in the lower Klamath River. As in 2003 and 2004, general observations were that implementation of the sustained higher releases during August and September in 2012 coincided with no significant disease or adult mortalities.

The 2013 preharvest forecast for the ocean abundance of Klamath Basin fall-run Chinook salmon is 727,600 and the estimated escapement of fall-run to the Klamath Basin is approximately 272,000 (PFMC 2013). Fish biologists who work in the basin are again concerned that dry hydrologic conditions in the basin,

and the above average expected run size, could be conducive to a disease problem similar to the one experienced in 2002.

Need for the Proposal

The purpose of implementing the Proposed Action is to augment lower Klamath River flows to reduce the likelihood, and potentially reduce the severity, of any fish die-off in 2013. 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 Klamath Basin anadromous fish communities and the many user groups that rely upon the fishery. Reductions in the Klamath and Trinity River fish populations would affect tribal fishery harvest opportunities, ocean harvest levels, recreational fishing, as well as public perception and recovery mandates. Loss of 3 year-old fish and a potential loss of 4 year-old fish from the a given brood year can affect the population structure and may impede recovery goals as identified in the Trinity River Division (TRD) 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.

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

The TRD Central Valley Project Act of 1955 (P.L.84-386) provides the principal authorization for implementing the Proposed Action. Specifically, Section 2 of the Act limits the integration of the Trinity River Division with the rest of the Central Valley Project and gives precedence to in-basin needs, including that "the Secretary is authorized and directed to adopt appropriate measures to insure preservation and propagation of fish and wildlife…"

Scope

Implementation of the Proposed Action would be limited to late summer 2013. The area of potential affect includes the Trinity River from Lewiston Dam to the confluence with the Klamath River and the Klamath to the Klamath River estuary near Klamath, California. Additionally, the affected environment includes the Sacramento River Basin as transbasin diversions from Lewiston Reservoir to the Sacramento River Basin occur routinely through the summer.

Resources Eliminated from Further Analysis

Reclamation analyzed the affected environment of the Proposed Action and the 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.

There would be no impacts to cultural resources under the No Action Alternative as conditions would remain the same as existing conditions. The Proposed Action involves the release of flows from Lewiston Dam on the Trinity River to augment flows in the lower Klamath River. This action would use existing infrastructure and no new construction or ground disturbance would occur as part of the Proposed Action. 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).

Indian Sacred Sites

Reclamation is required by Executive Order 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.

There would be no impacts to Indian sacred sites under the No Action Alternative as conditions would remain the same as existing conditions. Similarly, 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.

There would be no impacts to flood plains under the No Action Alternative as conditions would remain the same as existing conditions. 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

There would be no impacts to land use under the No Action Alternative as conditions would remain the same as existing conditions. 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.

There would be no impacts to air quality under the No Action Alternative as conditions would remain the same as existing conditions. The Proposed Action would have no predictable impacts to air quality above that of the No Action Alternative.

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

Section 2 Alternatives Including the Proposed Action

This 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 [Service] et al. 2000). Flow releases at Iron Gate Dam on the Klamath River would be consistent with the 2013 National Marine Fisheries Service (NMFS) and Service's biological opinion addressing operation of Reclamation's Klamath Project, about 900 cfs in August and about 1,000 cfs in September. In addition, Reclamation is expected to provide a short-term increase in Lewiston Dam releases to provide for the Hoopa Valley Tribe's Boat Dance Ceremony (Ceremony) as is customary in odd numbered years. In 2013, the Ceremony will occur on August 27th, necessitating the peak flow of 2,650 cfs from Lewiston to occur one day prior to the event to account for travel time from the dam to the ceremonial site. Flow adjustments (also called ramping rates) from the base flow of 450 cfs to the peak and down from the peak to 450 cfs will follow contemporary approved rates of change to minimize public and environmental concerns. In total, the implementation of the ceremonial flow, above the base flow of 450 cfs, will result in a 5-day span of increased flow accounting for approximately 11,000 AF.

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 2,060 cfs in the second half of August and about 2,080 cfs in September under the No Action Alternative (not including the Ceremony pulse flow from Lewiston Dam).

Diversion of water from the Trinity River Basin to the Sacramento River Basin would continue as scheduled; currently transferring 157 TAF in August 2013 is planned and 92 TAF in September.

Proposed Action

Reclamation would operate Trinity and Lewiston Reservoirs to target a minimum flow of 2,800 cfs in the lower Klamath River (USGS Station KNK) between

August 15 and September 21, 2013, hereafter referred to as the Action Period. Flow augmentation would use up to 62,000 AF of Trinity water. However, augmentation of flow would be subject to the following environmental and biological conditions, which are to be informed by active monitoring programs that can alter the timing and duration of flow augmentation. Details of the conditions follow:

1) Flow augmentation to meet the 2,800 cfs target at KNK would commence within the Action Period when the abundance of adult fall-run salmon present in the lower Klamath River, as identified through harvest monitoring activities, suggests a good proportion of the run has entered the lower Klamath River. This condition could result in commencing flow augmentation on August 15th or later but would not interfere with timing or magnitude of the scheduled Hoopa Valley Tribe's Ceremony flows scheduled to occur in late August (See Figure 1).

2) Flow augmentation to meet the 2,800 cfs target at KNK would continue through September 21, and possibly through September 30 if average daily water temperatures are projected to be above 23 °C at KNK, or the presence of observed fish behavior of concern. Daily evaluations would be made to determine whether augmentation flows would continue and for how long between September 21 and 30.

3) Monitoring would also 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 2013. For example, the Yurok Tribe will sample adult Chinook salmon and thoroughly examine them for signs of Ich infection. In the very unlikely case that a threshold number of examined adults are infected with Ich, as confirmed by the 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 5,600 cfs). Up to approximately 39 TAF would be needed to implement the Proposed Action emergency response. This is designed to increase the water turnover 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.

4) Ramping rates from Lewiston Dam would follow contemporary approved rates of change to minimize public and other environmental concerns.

Given the current tributary accretion forecast, up to 62 TAF of supplemental water would be needed to implement the Proposed Action (not including the Ceremony pulse flow volume and assuming water temperatures remain below 23 °C). The resulting hydrograph at the KNK gage is presented in Figure 1.

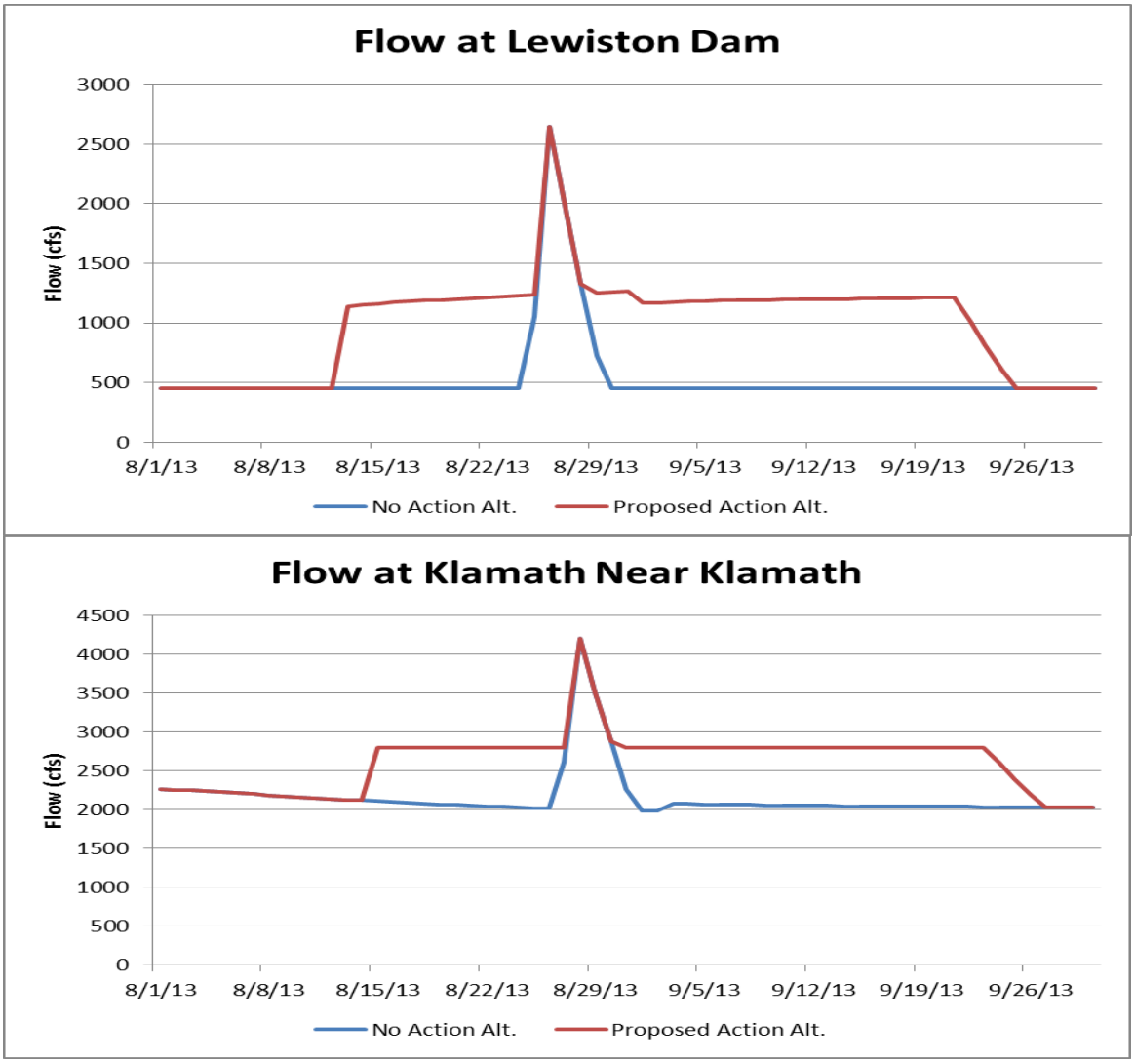

Figure 1. Approximate hydrograph for Lewiston Dam releases to result in the No Action Alternative and Proposed Action preventative flow targets in the lower Klamath River (U.S. Geological Survey Site #11530500: Klamath River near Klamath, California) during the 2013 fall-run Chinook salmon migration period.

Alternatives Considered But Eliminated From Further Consideration

The TRRP's Flow Work Group, Fall Flow Subgroup, detailed in their 2012 recommendations 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. Accordingly, the Subgroup 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.

The 2013 water supply conditions in the upper Klamath Basin and in the Trinity River Basin have deteriorated throughout the year. After planning for the Klamath River flows below Iron Gate Dam, and Upper Klamath Lake elevation management, consistent with the NMFS and Service's biological opinion addressing operation of Reclamation's Klamath Project, 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.

Section 3 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

TRD

Trinity Reservoir is the primary water storage facility in the TRD of the CVP (Figure 2). At capacity, it stores 2.448 million acre-feet (MAF), and receives an average annual inflow volume of about 1.2 MAF. Water released from Trinity Reservoir flows to Lewiston Reservoir, a reregulating reservoir, formed by Lewiston Dam. From Lewiston Reservoir, water can be diverted for use in the Sacramento River Basin via the Clear Creek Tunnel, or pass through Lewiston Dam to flow 112 miles to the Klamath River, which then flows approximately 43

miles before entering the Pacific Ocean. The Trinity River Hatchery, located at the base of Lewiston Dam, also diverts a small quantity of water in support of fish hatchery operations.

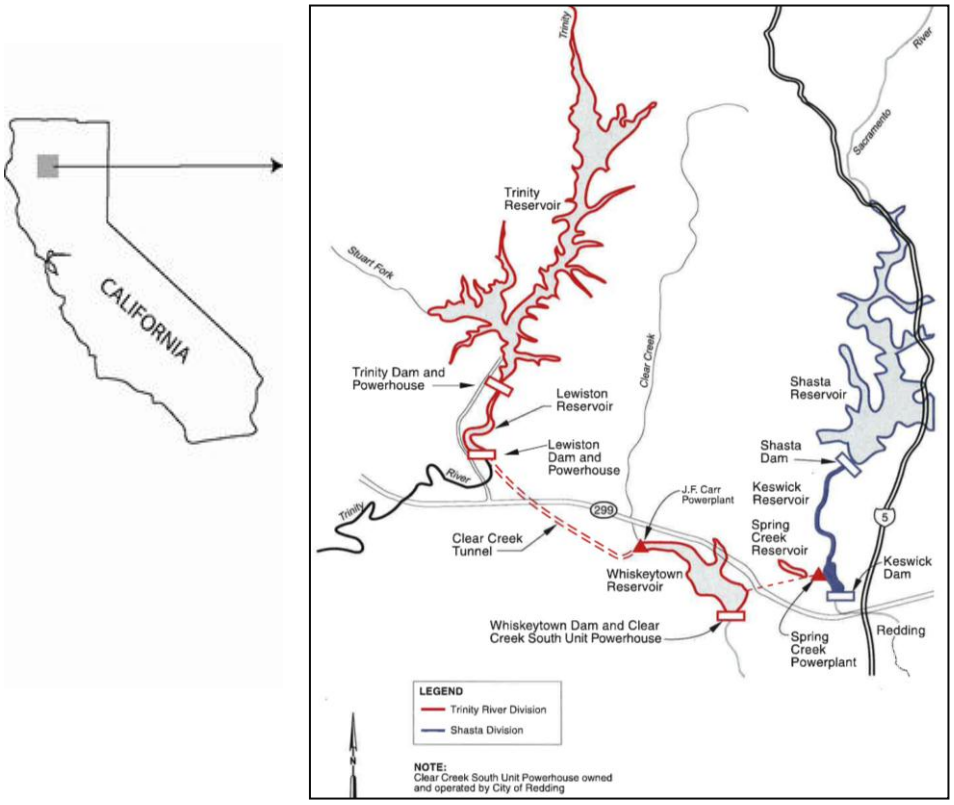

Figure 2. TRD of the Central Valley Project.

Water flowing through the 10.7-mile Clear Creek Tunnel enters the Judge Francis Carr Powerhouse and in to Whiskeytown Reservoir, which also serves as a reregulating reservoir. Water stored in this reservoir is released through Whiskeytown Dam where it serves to meet environmental requirements in Clear Creek, to generate hydropower by Redding Electric Utility, and provide water for downstream irrigation, municipal and industrial (M&I) needs. Alternatively, water from Whiskeytown Reservoir can also be diverted through Spring Creek Tunnel to Spring Creek Powerplant to Spring Creek and then into Keswick Reservoir. In Keswick Reservoir, Trinity River water is combined with Shasta Reservoir water and discharged through the Keswick Powerplant to the Sacramento River (Figure 2).

Coldwater Resources

Trinity Reservoir storage is important for providing the cold water needs of the Trinity River, and Clear Creek and Sacramento River in the Sacramento River Basin. These needs include meeting certain temperature requirements in both systems, which rely to a certain degree on transbasin diversions to continually reduce the time for warming of both Lewiston and Whiskeytown Reservoirs to

assure suitably cold water remain available for release to each of these waterways. The TRFMR EIS/EIR conducted assessments of the impact of projected temporal use of Trinity Reservoir storage by both basins with a condition of end of September carryover storage at 600 TAF to conclude that compliance with water temperature objectives could be met a high percentage of the time, but only by withdrawing water from Trinity Reservoir through the auxiliary outlet (~100' lower), which bypasses the power house.

The TRFMR EIS also reviewed historic accounts when the auxiliary outlet works was used to meet cold water resource needs (TRFMR EIS, Appendix A, page 427). In this review, the auxiliary outlet was used in 1991, 1992, and 1994 when storage was at 852 TAF, 1,008 TAF, and 1,200 TAF, respectively. In 2009, the need to use the auxiliary outlet occurred in the early fall. During this time, Trinity Reservoir storage was approximately 925 TAF.

In 2013, the September through November forecast storage volumes are 1,362, 1,243, and 1,221 TAF (Appendix A). Historically, temperatures concerns are ameliorated by November as ambient conditions typically result in mixing of the reservoir.

Hydropower Generation

The TRD has the capacity to generate substantial hydroelectric power because of the large number of powerplants in which this water travels by gravity. In addition to generating power at Trinity and Lewiston Dams in the Trinity Basin, hydropower is also generated at Judge Francis Carr, Spring Creek, and Keswick Powerplants. In total, operations of the TRD alone can account for as much as 30 percent of the total power generation capability of the CVP (TREIS 2000).

Power generation at Trinity Dam is dependent upon storage elevation as well as downstream needs for cold water (see above section). When the storage gets low enough to entrain water of an unsuitable temperature into the power house, Reclamation must switch to use of the auxiliary outlet.

Trinity River and Lower Klamath River

In addition to generating hydropower at Trinity and Lewiston Reservoirs, Trinity Reservoir water is important for meeting a variety of other needs in the Trinity and Klamath River. In the Trinity River, water is used year-round as prescribed by the TRMF EIS/EIR Record of Decision, as part of the mandates of the Trinity River Restoration Program (TRRP). Releases from the deep portions of the reservoir assure release of suitably cold water throughout the year in support of TRRP goals. Other in-basin uses include supplementing Lewiston Dam releases in the late summer in odd years to support the ceremonial needs of the Hoopa Valley Tribe, which typically requires up to 11,000 AF to achieve the necessary flow levels in the lower Trinity River in support of the event. Another more contemporary in-basin need of this water includes occasionally augmenting flows in the lower Klamath River in certain years (i.e. 2003, 2004, and 2012) where risk of a potential die-off of adult salmon could occur during late summer.

Supplemental flows used during these years were proactive scheduled quantities that ranged up to 39,000 AF. The Trinity River Division is also operated to achieve the temperature objectives included in the North Coast Regional Water Quality Control Board, January 2007, Water Quality Control Plan for the North Coast Region.

Sacramento River Basin

In addition to generating hydropower at several powerplants, Trinity Reservoir water released from Keswick Dam is used to support environmental, irrigation, M&I needs of the Sacramento River Valley, extending through the Sacramento – San Joaquin Delta. Relative to environmental conditions, the cold water that is diverted via the Clear Creek Tunnel is important for meeting the water temperature requirements in Clear Creek, assisting in meeting the water temperature requirements in the mainstem Sacramento River below Keswick Dam, and managing the cold water pool behind Shasta Dam. The period of greatest need in the Sacramento River Basin occurs during the warmer months when irrigation and M&I demands are highest and water temperatures concerns of the mainstem Sacramento River exist for several fish species listed under the Endangered Species Act.

In 2013, the Shasta Reservoir September through November forecast storage volumes are 1,718, 1,681, and 1,639 TAF (Appendix A). Historically, temperatures concerns are ameliorated by November as ambient conditions typically result in mixing of the reservoir.

Environmental Consequences

No Action

Under the No Action Alternative, the flow released from Lewiston Dam into the Trinity River in August and September 2013 would be maintained at 450 cfs, consistent with the flows described in the TRMFR EIS/EIR, in addition to a short term pulse flow (2,650 cfs) from Lewiston Dam to support a 1-day ceremonial need of the Hoopa Valley Tribe (see Figure 1). These flows are consistent with the existing condition; therefore, there would be no new effects to cold water resources, hydropower generation, or water resources for use in the Klamath River or Sacramento River Basins.

Proposed Action

Using the June 28, 2013, tributary accretion forecast (90% exceedance), and assuming Iron Gate Dam releases of 900 cfs and 1,000 cfs in August and September, respectively, the forecasted KNK flows would be below 2,800 cfs before August 15 and supplemental releases would be needed from Lewiston Reservoir to achieve the target flow of 2,800 cfs at KNK as previously described.

Under the Proposed Action the cold water of Trinity Reservoir would be reduced by up to 62 TAF in 2013, but would not result in significant affects to the cold water resource needs for the immediate year. This is because the end of water year 2013 storage volume in Trinity Reservoir is projected to be 1.362 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. A loss of about 62 TAF of cold water pool could result in an increase in water temperatures at Lewiston Dam of a few tenths of a degree Fahrenheit when the flow augmentation releases are completed.

In 2014, the reduction in storage of up to 62 TAF due to implementation of augmentation flows may influence the cold water 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 a relatively minor reduction in available cold water resources that may be accountable to this action.

Implementation of the Proposed Action will not adversely affect power generation in 2013, 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 2014, some portion of the water that is released through Lewiston Dam to implement the Proposed Action in 2013 may not be available for later release through the Clear Creek Tunnel, Carr Powerplant, the Spring Creek Tunnel and Powerplant and the powerplant at Keswick Dam in 2014. 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 2014, Shasta Reservoir operations, etc. In very general terms, if 62 TAF were released to the Trinity River to implement the preventative flows under the Proposed Action, future foregone generation could be a maximum of about 75,330 megawatt hours. However, power generation opportunities are subject to many restrictions and uncertainties unrelated to the Proposed Action.

In 2013, recreational activities in Trinity Lake are not likely to change to any great extent due to the Proposed Action. In the current year, boat ramp access to the lake is expected to remain the same as the No Action Alternative. In contrast, there is a small chance that some boat ramps might not be useable due to a reduced water elevation in the lake during the latter part of summer 2014. 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), and recreational fishing. Flows up about 1,200 cfs from Lewiston Dam needed to augment the lower Klamath River flow to 2,800 cfs 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.

Providing up to 62 TAF of supplemental water in the lower Klamath River as a preventative measure in the late summer in 2013 would not affect water supply allocations managed as part of the CVP in 2013, or water operations within the Central Valley. Water allocations for irrigation and M&I deliveries have already been determined for 2013, and the supplemental water would not affect the projected volume of water to be exported to the Sacramento River Basin in 2013. The extent that the release of up to 62 TAF affects the 2014 water supply and water allocations will depend on the water year 2014 hydrology and operational objectives.

Without implementation of the Proposed Action, Trinity Reservoir storage is forecasted to be approximately 1.362 MAF (90 percent exceedance value) at the beginning of water year 2014, which is lower than the historical average of about 1.66 MAF. Given the planned operation of Trinity Reservoir, Carr Powerplant, and Lewiston Reservoir, storage in Trinity Reservoir is forecasted to be 1.987 MAF at the end of April 2014 (50 percent exceedance). The approximate 62 TAF for preventative use in supplementing the lower Klamath River flows in late summer is about 4.5 percent of the forecasted volume present in Trinity Reservoir at the beginning of water year 2014 and about 3 percent of the 50 percent exceedance forecasted volume by the end of April 2014. 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. Safety-of-dam releases occurred in December 2012 into the new calendar year.

If Trinity Reservoir fills during 2014, there would be no effects to water resources available for all potential purposes. In contrast, if Trinity Reservoir does not fill in 2014, 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.

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 TRD 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 2014 may exacerbate system-wide supply conditions in the future. However, any such effects would be very minor.

Biological Resources

Affected Environment

Trinity River and Lower Klamath River

Several anadromous fish species use the lower Klamath River and the Trinity River to complete their lifecycles. The life stages of species of interest for this EA include both Federally-listed coho salmon (*Oncorhynchus kisutch)* as well as some non-listed fish, including the North American green sturgeon (*Acipenser medirostris*), spring- and fall-run Chinook salmon (*O. tshawytscha),* which have tribal, recreational and commercial value. One or more life stages of each of these species are present in the area of influence of the Proposed Action Alternative. The Pacific eulachon, while listed as threatened under the ESA, is not evaluated further because no life stages of this species would be present in freshwater during the period of effect from the Proposed Action. Greater detail on life history timing of considered species follows.

Coho Salmon

Coho salmon populations in the Klamath River Basin are severely reduced from historical levels and are listed as Federally threatened, part of the Southern Oregon/Northern California Coasts Evolutionarily Significant Unit. Life history timing for coho salmon in the Klamath River are provided in Table 1.

Table 1. Life-history timing of coho salmon in the Klamath River Basin downstream of Iron Gate Dam. Peak activity is indicated in black. (Table, and associated references, are from Stillwater Sciences, 2009)

Life stage (citations)	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec	
Incubation																								
Emergence[1,2,3]																								
Rearing[4]																								
Juvenile redistribution[5]																								
Juvenile outmigration[6, 7, 8 9, 10]																								
Adult migration[9]																								
Spawning[9, 11]																								

[1] CDFG (2000, unpubl. data, as cited in NRC 2004); [2] CDFG (2001, unpubl. data, as cited in NRC 2004); [3] CDFG (2002, unpubl. data, as cited in NRC 2004); [4] Sandercock (1991); [5] T. Soto, Fisheries Biologist, Yurok Tribe, pers. comm., August 2008; [6] Scheiff et al. (2001); [7] Chesney and Yokel (2003); [8] T. Shaw (USFWS, unpubl. data, 2002, as cited in NRC (2004); [9] NRC (2004); [10] Wallace (2004); [11] Maurer (2002)

Green Sturgeon

Green sturgeon in the Klamath River Basin are included in the Pacific-Northern Distinct Population Segment (DPS), which also includes coastal spawning

populations from the Eel River north to the Klamath and Rogue rivers. While not listed formally under the ESA as threatened or endangered, they are presently designated as a Species of Concern (NMFS 2006). Life-history timing for the various life stages in freshwater are provided in Table 2.

Table 2. Life-history timing of green sturgeon in the Klamath River Basin downstream of Iron Gate Dam. Peak activity is indicated in black (Table, and associated references, are from Stillwater Sciences, 2009)

Life stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Incubation/emergence[1]												
Rearing[1, 2, 3]												
Juvenile outmigration[4, 5, 6, 7, 8]												
Adult migration[1, 2, 9, 10, 11, 12, 13]												
Spawning[2, 3, 4, 13]												
Post-spawning adult holding[13]												

[1] CALFED ERP (2007), [2] NRC (2004), [3] FERC (2006), [4] Emmett et al. (1991, as cited in CALFED ERP 2007), [5] CH2M Hill (1985), [6] Hardy and Addley (2001), [7] Scheiff et al. (2001), [8] Belchik (2005, as cited in CALFED ERP 2007), [9] KRBFTF (1991), [10] Moyle (2002), [11] PacifiCorp (2004), [12] Van Eenennaam et al. (2006), [13] Benson et al. (2007)

Chinook Salmon

Chinook salmon of the Klamath River Basin are comprised of two runs or races, the spring-run that immigrates during the spring and early summer, and the fall-run that immigrates in the late summer and early fall. Adults of each race use similar habitat areas in the basin, largely separated by timing of use. Adult fall-run immigration into the Klamath River estuary and lower Klamath River can be subjected to environmental stressors that can result in premature mortality, as was documented in 2002. Greater details on life-history timing of the spring- and fall-run are provided in Tables 3 and 4.

Table 3. Life-history timing of spring-run Chinook salmon in the Klamath River Basin downstream of Iron Gate Dam. Peak activity is indicated in black. (Table, and associated references, are from Stillwater Sciences, 2009)

Life stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Type I												
Incubation[1]												
Emergence[1, 2]												
Rearing												
Juvenile outmigration[1]												
Adult migration in mainstem1[1,3,11]												
Adult entrance into tributaries[1,11]												
Spawning[7, 8]												
Type II												
Rearing												
Juvenile outmigration[1, 9, 10, 11]												
Type III												
Rearing												
Juvenile outmigration[1, 10, 11]												

[1] Olson (1996); [2] West 1991; [3] Tuss et al. (1990, as cited in Olson 1996), [4] NAS (2004, as cited in FERC 2006); [5] Barnhart (1994); [6] NRC (2004); [7] Dean (1995a); [8] Sartori 2006a; [9] Sullivan (1989), [10] Dean (1994); [11] Dean (1995)

Table 4. Life-history timing of fall-run Chinook salmon in the Klamath River Basin downstream of Iron Gate Dam. Peak activity is indicated in black. (Table, and associated references, are from Stillwater Sciences, 2009)

Life stage	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Type I												
Incubation	■	■	■	■	■	■	■	■	■	■	■	■
Emergence[1]			■	■	■	■						
Rearing					■	■	■	■	■	■	■	
Juvenile outmigration[2,3,4,5]						■	■	■	■	■	■	
Adult migration[6, 7,8]								■	■	■		
Spawning[9,10,11,12]										■	■	
Type II												
Rearing				■	■	■	■	■	■	■	■	
Juvenile outmigration[2, 13]									■	■	■	
Type III												
Rearing	■	■	■	■	■	■	■	■	■	■	■	■
Juvenile outmigration[2, 13]			■	■	■	■						

[1] USGS (1998, as cited in NRC 2004); [2] Scheiff et al. (2001); [3]Chesney 2000; [4]Chesney and Yokel 2003; [5]Voight and Gale 1998); [6]NAS (2004, as cited in FERC 2006); [7] USGS (1998, as cited in NRC 2004); [8]Strange (2007); [9] Shaw et al. (1997); [10] Magneson (2006); [11] Lau (CDFG, pers. comm., 1996, as cited in Shaw et al. 1997); [12] Hampton (2002); [13] Wallace 2004

Other Wildlife

Several species of amphibians, reptiles, and birds utilize the riparian corridor of the Trinity River as well as the lower Klamath River system.

Central Valley

Several anadromous fish species of special concern use the waterways in which Trinity River water is used in the Sacramento River Valley. Species of potential concern include the following Federally-listed species: Central Valley steelhead (*O. mykiss*), spring- and winter-run Chinook salmon, and the Southern DPS population of North American green sturgeon (*Acipenser medirostris*).

Environmental Consequences

No Action Alternative

Trinity River and Lower Klamath River

Flows in the lower Klamath River during the late summer would be reflective of flows from Iron Gate Dam releases consistent with the 2013 NMFS and Service's biological opinion on operation of Reclamation's Klamath Project, releases from Lewiston Dam, and accretions of flow from tributaries between the dams to the lower Klamath River. Under the No Action Alternative, Lewiston Dam flows would remain the same as prescribed in the TRMFR EIS/EIR, in addition to a 1-day peak release of 2,650 cfs to accommodate the Hoopa Valley Tribe's Ceremony in late August (see Figure 1). The TRMFR flow prescription of 450 cfs during August and September would result in no effect to the biota of the river system as it would be similar to the existing condition. In contrast, the Ceremonial flow, which Reclamation also considers an existing condition, would

increase flow and reduce water temperatures of the lower Klamath River during a typical time of high abundance of holding fall-run salmon in the lower Klamath River. Resultant water temperatures of the lower Trinity River would be expected to be reduced by as much as 4 C, as what occurred during the Ceremony in late August 2009 (Scheiff and Zedonis 2009). Corresponding water temperature reductions of the Klamath River immediately below the confluence would likely be 2 C with a notable, but reduced influence, extending to the estuary (Scheiff and Zedonis 2009). Additionally, the associated ramping rates for flow changes in support of the Ceremonial flows at Lewiston Dam would remain consistent with historical patterns determined to be safe for the biota of the Trinity River or the lower Klamath River. Impacts to many of the species along the river would not be expected to be adversely affected by the Ceremony flow because most, if not all, of these species are likely advanced in development beyond the early life stages that could be more vulnerable to a change in flow/river stage during this time of the year. For example, there would no longer be yellow-legged frog egg masses on the river margins nor ground nesting birds. A potential beneficial influence of the Ceremony flow is that it may provide a stimulus for adult green sturgeon holding in the lower Trinity River and Klamath River below the confluence of the Trinity River to emigrate to the Pacific Ocean allowing improved survival.

Because the projected minimum flow of the lower Klamath River is substantially lower than what has been observed in the recent past, and the relatively large run-size projection for fall Chinook salmon, there is an increased risk for a fish die-off in the lower Klamath River in 2013, relative to the Proposed Action. While the temporary increase in flow attributable to the Ceremony flow could provide temporary relief for stressful environmental conditions in the lower Klamath River, the duration of influence of the pulse would likely only last between 5 and 7 days, which would not be long enough to cover the entire time period of concern, or mid-August to mid-September. 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.

Sacramento River Basin

The quantity and quality (i.e. water temperature) of flow would also remain suitable for transbasin diversions to Whiskeytown Reservoir, representing the source water for Clear Creek and Spring Creek diversions to Keswick Reservoir. As a consequence there would be no effect to the biota of the Sacramento River Basin. The water temperature compliance point in the mainstem Sacramento would be retained at the existing compliance point (currently Airport Road Bridge).

Proposed Action

Trinity River and Lower Klamath River

Under the Proposed Action, the susceptibility of returning adult fall Chinook salmon to diseases that led to the 2002 fish die-off would decrease in the lower

Klamath River during the late summer in 2013. The Proposed Action would be expected to decrease water temperatures in the lower Klamath River during the period of flow augmentation, and in turn, Chinook salmon may experience less physiological stress and vulnerability to disease. In 2003, 2004, and 2012 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, given the inherent uncertainties regarding events of this nature, combined with the predicted large fish-run size, it is not possible to predict with absolute certainty that the Proposed Action will preclude a fish die-off in 2013, nor is it possible to accurately quantify the reduced disease risk attributed to the increased flows. There may also be an increase in water temperatures in the Trinity River just subsequent to the Proposed Action. This could be as high as one-half a degree Fahrenheit at Lewiston Dam. The timing of an increase in release temperature could coincide with a period when river temperatures are typically near the Basin Plan Objectives at Douglas City and the confluence of the North Fork Trinity River.

Sacramento River Basin

Implementation of the Proposed Action would not affect the quantity and quality (i.e. water temperature) of flow and would also remain suitable for transbasin diversions to Whiskeytown Reservoir in 2013. As a consequence, the influence of the Proposed Action would be similar to the No Action Alternative and there would be no substantial effects to the biota of the Sacramento River Basin in 2013.

Trinity and Shasta Reservoirs are operated in a coordinated fashion. Depending on the details of future operations, and the fill pattern at both reservoirs, the Proposed Action may reduce the available cold water resources used to meet temperature objectives in the Sacramento River in 2014. Changes to the ability to achieve temperature objectives would be expected to be minor, as would the associated affects to ESA-listed salmon and steelhead.

Cumulative Impacts

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

Global Climate

Climate change refers to significant change in measures of climate (e.g. temperature, precipitation, or wind) lasting for decades or longer and is considered a cumulative impact. Many environmental changes can contribute to climate change (changes in sun's intensity, changes in ocean circulation, deforestation, urbanization, burning fossil fuels, etc.) (EPA 2010). Gases that trap heat in the atmosphere are often called greenhouse gases (GHG). Some GHG, such as CO_2, occur natural and are emitted to the atmosphere through natural

processes and human activities. Between 1990 and 2009, CO_2 was the primary GHG (approximately 85 percent) produced in the U.S. due to the combustion of fossil fuels such as coal, natural gas, oil and gasoline to power cars, factories, utilities and appliances. The added gases, primarily CO_2 and CH_4, are enhancing the natural greenhouse effect and likely contributing to an increase in global average temperature and related climate change.

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 GHG emissions. CARB is further directed to set a GHG emission limit, based on 1990 levels, to be achieved by 2020. In addition, the EPA has issued regulatory actions under the Federal Clean Air Act as well as other statutory authorities to address climate change issues.

Environmental Consequences

No Action Alternative

Under the No Action Alternative, hydropower electricity generation would occur as normal at the TRD. The amount and timing would vary according to available opportunities and other water release and delivery commitments. CVP power customers would not have to change their power purchase patterns and sources more so than the status quo conditions. Additional hydrocarbon-generated electricity would not have to be purchased in lieu of sustainable sourced power more so than the status quo conditions. Therefore, there would be no additional affects to GHG emissions.

Proposed Action

While no GHG emissions would be generated by as a direct result of implementation of the Proposed Action, there may be some broader scale or theoretical effects to GHG emission levels associated with the Proposed Action.

If 62 TAF of water is released from Trinity and Lewiston Reservoirs to augment flows in the lower Klamath River, some of that volume of water may have been exported from the Trinity River at some unknown time in the future, depending on fill patterns for Trinity Reservoir and other operational decisions. In that case, hydroelectric power would have been generated at the J.F. Carr Powerplant, the Spring Creek Powerplant, and likely the Keswick Powerplant. The power generated by this volume of water would have been available for purchase by the CVP "preference" power customers as available. CVP preference power customers share the CVP energy production that is in excess of Reclamation's water pumping needs. At any given time, CVP power customers may have to purchase power when available CVP power is not sufficient for their demands. This non-CVP power may be hydrocarbon generated. Assuming 62 TAF of water is used for flow augmentation, a maximum of 75,330 megawatt hours of power generation may be foregone at some time in the future. Assuming that power customers would have to replace all of that power with hydrocarbon generated

power, an estimated additional 53,149 metric tons of CO_2 equivalent would be emitted. The timing and distribution of the potential additional CO_2 equivalent is unknown.

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 EA 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 2013, 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, 2004 and 2012, 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, it is likely that 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 effects 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 2014 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 2013, 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 2014, 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 Clear Creek Tunnel, Carr Powerplant, the Spring Creek Tunnel and Powerplant and the powerplant at Keswick Dam in 2014. 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 2014, Shasta Reservoir operations, etc. In very general terms, if 62 TAF were released to the Trinity River to implement the preventative flows under the Proposed Action, future foregone generation could be a maximum of about 75,330 megawatt hours. However, power generation opportunities are subject to many restrictions and uncertainties unrelated to the Proposed Action. Also, power production patterns are generally driven by water delivery decisions. Whether power in excess of Reclamation's water pumping needs is available at a given time, and whether power available for CVP power customers is sufficient for their demands is difficult to predict. CVP power customers may have to buy power from alternative sources when CVP power would have otherwise been generated using the water that was used to implement 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.

Section 4 Consultation and Coordination

Public Review Period

Reclamation previously provided several updates on the potential to release additional flows to augment flows in the lower Klamath River in late summer 2013 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.

Reclamation intends to provide the public with an opportunity to comment on the Draft Finding of No Significant Impact and Draft EA from July 17, 2013 to the close of business on July 31, 2013.

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 Service. Therefore, there is no need to consult with the Service pursuant to the ESA.

NMFS representatives were intimately involved in development of the recommendations that formed the basis of the Proposed Action. The group that developed the 2012 flow augmentation recommendations also considered any affects to threatened coho salmon associated with implementation, 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, 2013 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. 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.

Section 6 References

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Section 7 List of Acronyms and Abbreviations

cfs	cubic feet per second
CVP	Central Valley Project
DPS	distinct population segment
EA	Environmental Assessment
EIS	Environmental Impact Statement
EIR	Environmental Impact Report
ESA	Endangered Species Act
ITA	Indian Trust Asset
KNK	Klamath Near Klamath
MAF	million acre-feet
National Register	National Register of Historic Places
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
PMFC	Pacific Fishery Management Council
Reclamation	Bureau of Reclamation
Service	U.S. Fish and Wildlife
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 A. June 2013 Storage forecasts at the 90 percent probability of exceedance level

Storages

Federal End of the Month Storage/Elevation (TAF/Feet)

		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Trinity	2004	1867	1660	1479	1362	1243	1221	1214	1193	1225	1290	1355	1283
	Elev.	2332	2316	2301	2291	2280	2278	2278	2275	2279	2285	2291	2284
Whiskeytown	239	238	238	238	230	230	225	206	206	206	206	238	238
	Elev.	1209	1209	1209	1207	1207	1205	1199	1199	1199	1199	1209	1209
Shasta	3363	2826	2285	1888	1718	1681	1639	1702	1850	1983	2202	2417	2039
	Elev.	1000	973	951	940	938	935	939	948	956	969	980	960
Folsom	734	641	462	346	300	274	253	241	250	303	387	542	651
	Elev.	433	412	395	387	382	378	376	378	388	401	422	434
New Melones	1334	1218	1101	988	904	876	878	882	886	896	901	808	699
	Elev.	971	956	941	929	925	925	925	926	927	928	914	896
San Luis	465	206	86	60	134	235	348	487	624	601	530	423	245
	Elev.	384	355	354	366	375	395	427	451	447	442	420	380
Total		6996	5832	4999	4648	4539	4565	4732	5008	5213	5515	5783	5155

State End of the Month Reservoir Storage (TAF)

Oroville	2812	2513	2048	1583	1380	1286	1187	1138	1192	1322	1521	1666	1498
	Elev.	827	787	740	716	704	691	684	692	709	733	749	730
San Luis	320	197	131	150	144	100	132	268	362	344	361	271	126
Total San Luis (TAF)	785	404	217	211	278	336	480	755	986	945	891	694	371

Monthly River Releases (TAF/cfs)

Trinity	TAF	47	28	28	27	23	18	18	18	17	18	32	180
	cfs	783	450	450	450	373	300	300	300	300	300	540	2,924
Clear Creek	TAF	9	7	5	9	12	13	12	12	11	12	12	12
	cfs	150	120	85	150	200	225	200	200	200	200	200	200
Sacramento	TAF	803	845	667	387	323	280	215	200	250	307	238	738
	cfs	13500	13750	10850	6500	5250	4700	3500	3250	4500	5000	4000	12000
American	TAF	133	213	151	76	62	61	64	52	49	88	48	61
	cfs	2242	3458	2459	1276	1007	1020	1049	850	874	1430	800	1000
Stanislaus	TAF	30	21	19	12	39	12	12	14	12	17	89	72
	cfs	512	347	302	200	635	200	200	220	220	281	1495	1167
Feather	TAF	164	307	338	193	77	74	77	77	69	77	74	184
	cfs	2750	5000	5500	3250	1250	1250	1250	1250	1250	1250	1250	3000

Trinity Diversions (TAF)

	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Carr PP	111	188	157	92	101	17	9	35	5	3	39	36
Spring Crk. PP	105	180	150	90	90	10	20	30	5	10	10	30

Delta Summary (TAF)

		Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May
Tracy		50	220	258	258	230	170	175	175	47	60	45	50
USBR Banks		0	9	9	9	0	0	0	0	0	0	0	0
Contra Costa		6.4	12.9	13.6	14.4	15	16.4	17.2	9.2	7	7	6.4	6.4
Total USBR		56	242	281	281	245	186	192	184	54	67	51	57
State Export		131	252	334	182	163	184	225	175	65	103	45	54
Total Export		187	494	615	463	408	370	417	359	119	170	96	110
COA Balance		-7	0	0	-7	-8	-8	-8	-8	-8	-8	-8	-8
Old/Middle River Std.													
Old/Middle R. calc.		-2,551	-6,379	-7,948	-6,241	-4,895	-4,825	-5,265	-4,529	-1,574	-1,963	-714	-914
Computed DOI		7346	4994	3497	3009	4002	4505	4506	7304	11400	11403	9581	14706
Excess Outflow		0	0	0	0	0	0	0	2798	0	0	84	7597
% Export/Inflow		21%	46%	61%	61%	60%	57%	64%	45%	15%	17%	11%	9%
% Export/Inflow std.		35%	65%	65%	65%	65%	65%	65%	65%	45%	35%	35%	35%

Hydrology

	Clair Engle		Shasta		Folsom		New Melones	
Water Year Inflow (TAF)	817		3,855		1,639		552	
Year to Date + Forecasted % of mean	68%		70%		60%		52%	

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