ATTACHMENT #3

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THE ROLE OF COLD WATER CARRYOVER STORAGE IN MEETING TRINITY RIVER RESTORATION PROGRAM FISHERY RESTORATION GOALS

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The role of cold water storage in Trinity Reservoir is critical to meeting TRRP fishery restoration goals. Extensive modeling was performed in the Trinity River Mainstem Fishery Restoration EIS on how each alternative considered would meet State, Tribal and Trinity River Flow Evaluation temperature objectives to protect and restore all critical life stages for Trinity River salmon and steelhead fisheries through maintaining satisfactory temperatures. The Flow Evaluation Alternative, with only 47% of the water, scored the best of all alternatives considered for temperature compliance, even better than the Maximum Flow Alternative that used all of the water released down the river.

In addition to evaluation of which alternative would meet Trinity River temperature objectives, the EIS also evaluated the effects of low carryover storage (low volume of water in Trinity Reservoir before winter) on meeting downstream temperature objectives. Through modeling, as well as real experience during periods of low storage (1977 and the drought of 1987-1992), the EIS determined that powerplant bypasses would be necessary when storage is below 1 million AF. It was also determined that storage should not go below 600,000 AF, or perhaps under the most dire circumstances with full powerplant bypasses and reconsultation with NMFS, carryover storage could go to 400,000 AF.

There are several problems with meeting downstream temperature compliance objectives during periods of low reservoir storage and low runoff (drought), including:

1. Trinity Reservoir refill potential is extremely low, especially compared to other CVP reservoirs. For instance, at 50% capacity, the chance of Trinity Lake refilling during the subsequent year is only 15%, while for Shasta it is 35%, and for Folsom, it is 60%. Therefore, once Trinity Reservoir is drained, it could take many years to refill it.
2. Lewiston Reservoir heats up releases from Trinity Dam prior to release to the river. The more water released from Trinity Dam, the colder it stays through

Lewiston Reservoir. Releases from Trinity Dam of approximately 1,800 cfs are required to keep the Trinity River cold at Lewiston Dam in summer. Because minimum summer releases to the river are 450 cfs release, there must be at least 1,350 cfs of water exported to the Sacramento River during the summer. In the event that there is extremely low Trinity Reservoir storage, there will likely be times when inadequate water availability will reduce Trinity Dam releases below 1,800 cfs, and resulting releases to the Trinity River will be too warm.

3. While the Trinity River Division of the CVP is supposed to be operated for the benefit of the Trinity River fishery and to meet the Trinity River Restoration ROD, it is also fully integrated into the entire CVP. Therefore, decisions are not just made on behalf of the Trinity River, but rather CVP water and power supplies.
4. Neither the Trinity River Restoration ROD, nor the CVP Operations Criteria and Plan (CVP OCAP), nor the proposed Klamath Settlement have taken into account the need for additional cold water from Trinity Reservoir during an extreme drought and/or reduction in Klamath River instream flows. An unplanned cold water release from Trinity Dam to abate or prevent another Klamath fish kill in late summer or fall would further deplete Trinity Reservoir cold water carryover storage. There is also no incentive for the TMC/TRRP to defer spring fishery flows to reserve a supply of cold water for late summer/fall conditions in the Lower Klamath River, as those flows would be lost if not used.
5. Modeling has demonstrated that with Trinity Reservoir storage at or below 900,000 AF, there is so little chance of refilling (let alone needing Safety of Dams releases) the subsequent year that there is no risk of long-term loss to CVP Firm Yield (via Safety of Dams releases) by maintaining a minimum storage of 900,000 AF. In other words, if the reservoir is left at 900,000 AF at the end of the water year, as opposed to 400,000 AF, there is no long term loss to the system from spills or Safety of Dams releases- the 500,000 AF difference is pretty much assured to be there for next year's water supplies.
6. The Trinity River Restoration ROD does not allow carryover of fishery flow water from one year to the next. In the event that low carryover storage is combined with a 'barely Wet" or "barely Extremely Wet" water year type (just at the lower cusp of a wetter water year), it is possible that the large fishery releases, combined with large contractual water deliveries, would cause a "temperature emergency" whereby little to no cold water pool would remain for the fall/spring chinook spawning and incubation period (or for amelioration of adverse conditions in the Lower Klamath River or the Sacramento River). The California Department of Fish and Game expressed this concern in their comments on the Trinity EIS by stating as follows:

"We believe there are opportunities to improve the operation of the Shasta-Trinity unit of the CVP to ameliorate the effects of the preferred alternative on Winter-run chinook in the Sacramento River, improve condition in the Trinity River, and reduce water supply impacts. The opportunities for Department of Interior to consider are in the specific areas of the allocation of Trinity Project water for Iron Mountain Mine waste mobilization, bypassing Trinity Powerhouse to release cold water, minor reductions in

the instream flow of the Sacramento River during the wet season (to improve temperature control in the dry season), ***and in allocating in stream flow on the Trinity River using a sliding scale that replaces the five water year types (to more closely match the natural hydrology and thus save water).*** *We believe that cumulatively these four opportunities represent well over 100,000 acre feet per year of water."* (Note: There was no detail provided on a sliding scale to replace the 5 water year types.)

The basic problem is that the Trinity EIS was modeled, and the Trinity ROD was predicated, on a reduction in exports to the CVP commensurate with the increased instream flow releases down the Trinity River. The ROD's promise to reduce Trinity River exports to the Sacramento River is shown below (ROD page 20):

> *"Since full operation of the TRD began in 1964, an average of 74% of the basin's inflow to the TRD (about 988,000 af) has been exported annually. In some years, approximately 90% of the annual inflow was diverted to the Sacramento basin. In recent years (1985-1997), annual exports have decreased to an average of 732,400 af; under the No Action alternative they were assumed to average 870,000 af. Currently, releases to the Trinity River are not less than 340,000 af annually. Under the Preferred Alternative, the TRD would be operated to release additional water to the Trinity River, and the timing of exports to the Central Valley would be shifted to later in the summer to help meet Trinity River instream temperature requirements. The Preferred Alternative would, on average, increase releases to the Trinity River by 75% above No Action levels.* ***Long-term average water exports to the Central Valley would be 630,000 acre feet, or a reduction compared to the No Action alternative of approximately 240,000 acre feet (28 percent).*** *Dry-period annual exports would be reduced by 160,000 acre feet (30 percent) compared to average dry period exports under the No Action alternative (see Table 3-3 in the DEIS)."*

It appears based on water operations in 2007, as well as plans modeled in the *Draft EIS/EIR for the South Delta Improvement Program* (SDIP) that this promise to reduce CVP contractual export deliveries is not being complied with. Shasta-Trinity reservoir storage was taken to the lowest level in 15 years after only one year of drought following several normal or wet years. Shasta Reservoir was drawn down to its lowest level since 1992, which followed 6 years of drought. The low carryover storage into this year has caused the Trinity PUD to allow imposition of a drought surcharge if it is a dry year. Modeling for the SDIP used carryover storage in violation of the Trinity ROD (250,000/500,000 AF vs. 400,000/600,000 AF) and NMFS Biological opinion for the Trinity ROD.

Solutions

The most obvious solution is to limit Trinity River water exports and correspondingly reduce CVP water contract deliveries in order to maintain higher Trinity Reservoir (and

Shasta) cold water carryover storage. However, given that decisions regarding water contract deliveries are beyond the capability of the Trinity River Restoration Program, there is little, if any flexibility to avoid a temperature crisis during such a future scenario.

However, the CVP OCAP and associated Biological Opinions are being rewritten, and are under the jurisdiction of the federal court in Fresno. There is the option through the revised CVP OCAP and associated Biological Opinions, to rewrite rules for carryover storage requirements (possibly including a reservation of water for emergencies on the Lower Klamath), a limitation on water delivery amounts, as well as the possibility of being able to carry over Trinity ROD flows from one year to the next. The TAMWG, TMC and TRRP staff might consider this as a rare opportunity to fine tune the ROD through compliance with the Endangered Species Act. Of course, this would require full cooperation from all trustee, tribal and resource agencies, such as the California Department of Fish and Game, the National Marine Fisheries Service and the U.S. Fish and Wildlife Service, as well as modeling expertise to investigate different options.

Another option could include a sliding scale of water year types, as suggested by the California Department of Fish and Game.