



United States Department of the Interior

BUREAU OF RECLAMATION
Mid-Pacific Region
Northern California Area Office
16349 Shasta Dam Boulevard
Shasta Lake, CA 96019-8400

IN REPLY REFER TO:

NC-100
ENV-7.00

AUG 22 2016

SWR 2016



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NAT'L MARINE FISHERIES SVS
SACRAMENTO, CA

BDC H 1000

Ms. Maria Rea
Assistant Regional Administrator
California Central Valley Area Office
National Marine Fisheries Service
650 Capitol Mall, Suite 5-100
Sacramento, CA 95814

Subject: Final Sacramento River Temperature Management Plan per Reasonable and Prudent Alternative (RPA) Action I.2.4 of the National Marine Fisheries Service (NMFS)

Dear Ms. Rea:

By letter dated July 5, 2016, the Bureau of Reclamation submitted a Final Sacramento River Temperature Management Plan (2016 Plan) to the State Water Resources Control Board (SWRCB) pursuant to the requirements of SWRCB Order WR 90-5. The 2016 Plan was submitted after many weeks of analysis and discussion with the National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), and SWRCB staff. Order WR 90-5 requires Reclamation to prepare a management plan that "ensures the CVP operations do not result in redd dewatering, stranding, or temperature impacts to winter-run Chinook salmon or indirect impacts to other salmonids in the Sacramento or Trinity River basins." By letter dated July 8, 2016, the SWRCB approved the 2016 Plan. This approval was based on the June 28, 2016, concurrence letter issued by NMFS indicating that the Final 2016 Plan is consistent with the requirements of 2009 NMFS Biological Opinion (BiOp). In addition, the concurrence letter identified specific expectations regarding monitoring and real-time operations that Reclamation must comply with per the requirements of Order WR 90-5. The 2016 Plan is available at:

http://www.westcoast.fisheries.noaa.gov/publications/Central_Valley/Water%20Operations/bureau_of_reclamation_s_sacramento_river_temperature_management_plan_-_june_27__2016.pdf,

According to Attachment "C" of the approved 2016 Plan, the end of September (EOS) projected storages of the Shasta and Trinity River Divisions of the CVP would be approximately 2.6 million acre-feet (MAF) and 900 thousand acre-feet (TAF), respectively. These storage volumes are considerably greater than the prior two years. The 2016 Plan included the prospective need for a flow augmentation action from Trinity Reservoir in the amount of approximately 35 TAF that would be discharged during August and September.

The 2016 Lower Klamath River Late-Summer Flow Augmentation (Proposed Action) consists of the potential release of up to 84 TAF of water from Lewiston Dam to avert a fish die-off in the lower Klamath River during August and September of 2016. This volume is greater than provided in the Draft EA (up to 65 TAF) for public review because of unforeseen and continued dry hydrologic conditions in the Klamath River basin. The 84 TAF volume is comprised of three flow components that could be implemented in a progressive fashion, if needed, to reduce the incidence and severity of an *Ich* disease outbreak that could lead to a substantial adult salmon die-off. These include a Preventive Base flow (40 TAF) as a primary flow augmentation response, a Preventive Pulse flow (10 TAF) as a secondary augmentation response, and an Emergency Flow (34 TAF) as a tertiary augmentation response. The volume of each are determined from the need to meet certain flow requirements in the lower Klamath River over certain periods of time (See the Draft Environmental Assessment [EA] for greater detail). In 2015, the same flow components, but with different volumes, were used and only the Preventive Base and Preventive Pulse flow components occurred. As in past years, real-time environmental and biological monitoring would be used to inform the decision on implementation of each component.

The Proposed Action would not change diversions from the Trinity Basin to the Sacramento River Basin. However, implementation of any or all components of the Proposed Action would result in colder release temperatures to outflow areas of Lewiston Reservoir, including the Carr Tunnel, serving as the diversion point to the Sacramento River Basin, and the Lewiston Dam release to the Trinity River and outflow to serve Trinity River Hatchery that eventually flows to the Trinity River below Lewiston Dam. The mechanism by which water temperatures are reduced while implementing any components of the Proposed Action is a reduction in transit time of the larger flow through Lewiston Reservoir which decreases heating potential during the summer months and results in colder releases to these outflow areas. Review of modeling results indicates the average reduction in water temperatures from August 15 to September 28 is 0.1 °F through the Clear Creek Tunnel (Figure 1), and less than 0.01° F changes to temperatures at both Keswick Dam (Figure 2) and releases to Clear Creek from Whiskeytown Dam (Figure 3). In conclusion, the temperature modeling analysis shows that the water temperatures are no greater than those identified in the approved 2016 Plan.

Reclamation also reviewed the effects of the Proposed Action to Southern Oregon /Northern California (SONCC) Coho salmon in the Trinity River. Again, the modeling studies indicate on average a 0.05 °F temperature reduction to the water temperatures from Lewiston Dam over the period of August 15 to September 28 (Figure 4) for the reasons provided above. In addition, the temperature of releases from Lewiston Dam will be suitable to meet downstream temperature objectives in the Trinity River as they are estimated to be less than 53 F with flows that are greater than 450 cfs (U.S. Fish and Wildlife Service and Hoopa Valley Tribe 1999). As a result, the resulting temperatures would be protective of the Coho salmon juveniles that may be present.

Further modifications or refinements of the Proposed Action could occur based on real time data obtained between now and the date of implementation. As in most years, Reclamation and the Department of Water Resources (DWR) intend to continue to refine operations of the Central

Valley Project (CVP) and State Water Project (SWP) as hydrological and biological information becomes available in coordination with Federal and state resources agencies. If further refinements or modifications are necessary which may change the effects to listed species, Reclamation will seek consultation from NMFS to address those potential effects.

Reclamation requests concurrence from NMFS that the effects of the Proposed Action as described above are within the effects evaluated for the RPA Action I.2.4.C in 2009 NMFS BiOp and the 2016 Plan and will neither result in exceedance of incidental take in the 2009 NMFS BiOp, nor jeopardize the continued existence of listed species or destroy or adversely modify their designated critical habitats. As determined in the EA, Reclamation has not identified any adverse effects to essential fish habitat; therefore consultation regarding the Magnuson-Stevens Act (MSA) for the Sacramento River species is not needed. As to the Coho salmon for the Trinity Basin, the MSA will be conducted as part of the ongoing consultation on the Coho salmon.

We look forward to working with you and your staff as we navigate through another water year and appreciate your willingness to work with us on this matter.

Sincerely,



Donald P. Bader
Acting Area Manager

Enclosures: 5

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Reference:

USFWS and Hoopa Valley Tribe. 1999. Trinity River Flow Evaluation Report, Final Report to the Secretary of the Interior, Washington DC. 308 pp + Appendixes.

Table 1. Central Valley Project Forecast, August 16, 2016.

CVP Operations 90% Exceedance

Storages

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

		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	
Trinity		1151	1042	931	917	906	909	938	1020	1122	1236	1155	1044	945
	Elev.	2260	2247	2246	2244	2245	2248	2257	2268	2280	2272	2260	2249	
Whiskeytown		238	238	230	206	206	206	206	206	238	238	238	238	
	Elev.	1209	1207	1199	1199	1199	1199	1199	1199	1209	1209	1209	1209	
Shasta		3544	3076	2677	2411	2336	2328	2380	2714	3168	3414	3376	3156	2773
	Elev.	1011	993	1004	976	975	978	995	1015	1025	1024	1015	997	
Folsom		485	359	345	288	254	239	274	366	530	734	836	689	464
	Elev.	397	395	385	379	376	382	398	420	443	453	438	412	
New Melones		583	532	486	476	493	511	527	544	577	584	617	594	530
	Elev.	864	862	852	856	860	863	867	873	875	881	877	864	
San Luis		40	13	80	251	421	591	751	825	866	792	684	638	582
	Elev.	366	361	384	404	429	463	480	483	463	433	407	387	
Total		5259	4749	4549	4616	4783	5075	5675	6469	6997	6907	6359	5532	

State End of the Month Reservoir Storage (TAF)

		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	
Oroville		2334	1800	2082	1539	1386	1291	1441	1693	1974	2257	2288	2092	1758
	Elev.	763	750	735	717	705	724	752	780	806	809	791	759	
San Luis		155	270	168	150	135	183	358	457	451	307	127	-62	-159
Total San Luis (TAF)		195	282	248	401	556	773	1109	1282	1317	1099	810	577	423

Monthly River Releases (TAF/cfs)

		Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Trinity	TAF	46	54	23	18	18	18	17	18	32	258	126	48
	cfs	756	900	373	300	300	300	300	300	540	4,189	2,120	783
Clear Creek	TAF	5	9	14	10	11	11	10	11	13	13	9	7
	cfs	85	160	225	175	175	175	175	175	218	216	160	120
Sacramento	TAF	645	565	492	327	338	338	180	200	253	430	535	645
	cfs	10500	9500	8000	5500	5500	5500	3250	3250	4250	7000	9000	10500
American	TAF	203	89	93	74	77	77	69	77	79	137	244	308
	cfs	3301	1500	1507	1250	1250	1250	1250	1250	1325	2233	4102	5004
Stanislaus	TAF	12	12	35	12	12	13	12	12	27	25	15	15
	cfs	200	200	577	200	200	213	214	200	460	400	250	250
Feather	TAF	479	164	120	104	108	108	97	108	89	154	208	277
	cfs	7800	2750	1950	1750	1750	1750	1750	1750	1500	2500	3500	4500

Trinity Diversions (TAF)

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Carr PP	66	62	0	14	19	6	5	11	30	7	64	67
Spring Crk. PP	60	60	12	5	12	3	7	28	8	5	60	60

Delta Summary (TAF)

	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul
Tracy	165	272	272	250	225	190	120	140	48	49	140	152
USBR Banks	0	0	0	0	0	0	0	0	0	0	0	0
Contra Costa	12.7	14.0	16.8	18.4	18.3	14.0	14.0	12.7	12.7	12.7	9.8	11.1
Total USBR	178	286	299	268	243	204	134	153	60	62	150	163
State Export	414	163	244	197	225	190	120	140	42	43	75	165
Total Export	592	449	543	465	468	394	254	293	102	105	225	328
COA Balance	-19	60	137	95	95	95	95	95	40	21	0	0

Old/Middle River Std.												
Old/Middle R. calc.	-7,721	-6,070	-6,697	-6,055	-5,905	-4,968	-3,530	-3,537	-1,310	-1,351	-3,168	-4,375

Computed DOI	5401	4656	4994	4505	8166	13486	12805	16641	9497	10850	7094	6507
Excess Outflow	0	0	0	0	3660	7483	1405	5238	0	0	0	0
% Export/Inflow	49%	48%	56%	58%	47%	33%	26%	21%	12%	10%	26%	32%
% Export/Inflow std.	65%	65%	65%	65%	65%	65%	45%	35%	35%	35%	35%	65%

Hydrology

	Trinity	Shasta	Folsom	New Melones
Water Year Inflow (TAF)	1431	5,275	2,570	953
Year to Date - Forecasted % of mean	118%	95%	94%	90%

CVP actual operations do not follow any forecasted operation or outlook; actual operations are based on real-time conditions.
 CVP operational forecasts or outlooks represent general system-wide dynamics and do not necessarily address specific watershed/inbuary details.
 CVP releases or export values represent monthly averages.
 CVP Operations are updated monthly as new hydrology information is made available December through May.

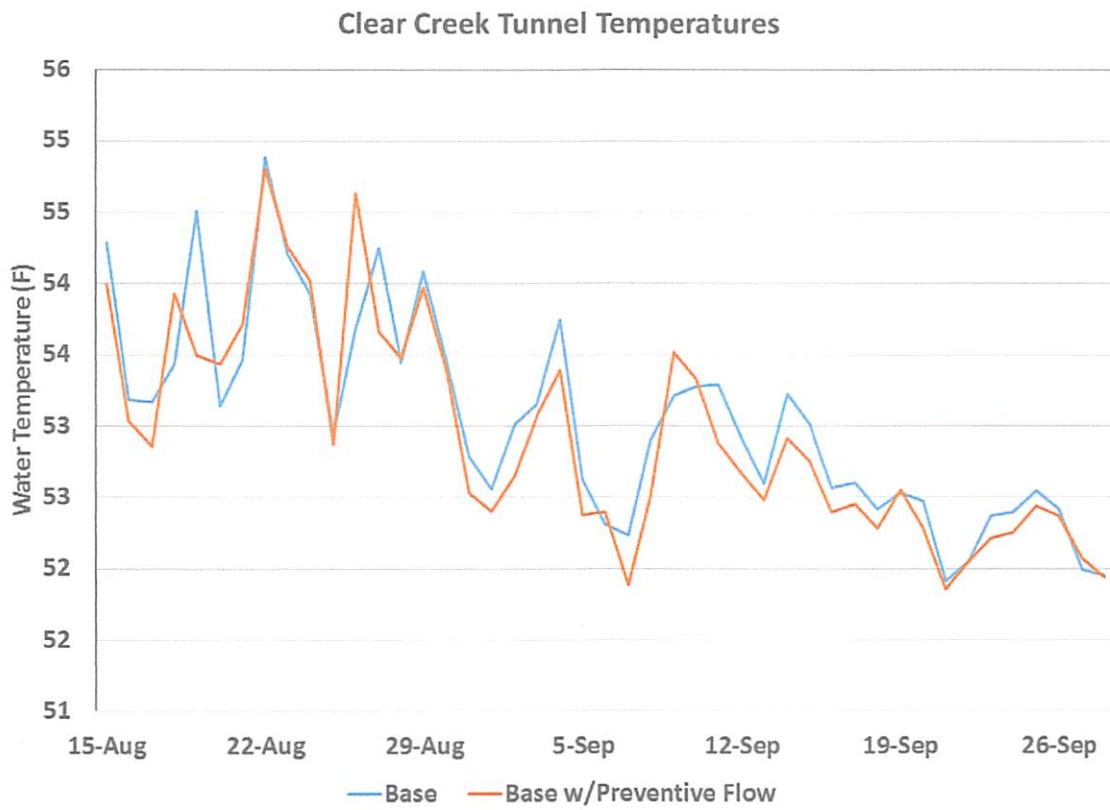


Figure 1. Water Temperatures of water diverted through Clear Creek Tunnel for a No Action (Base) and the Proposed Action (implementing the Preventive Base and Preventive Pulse). August 5 Model results.

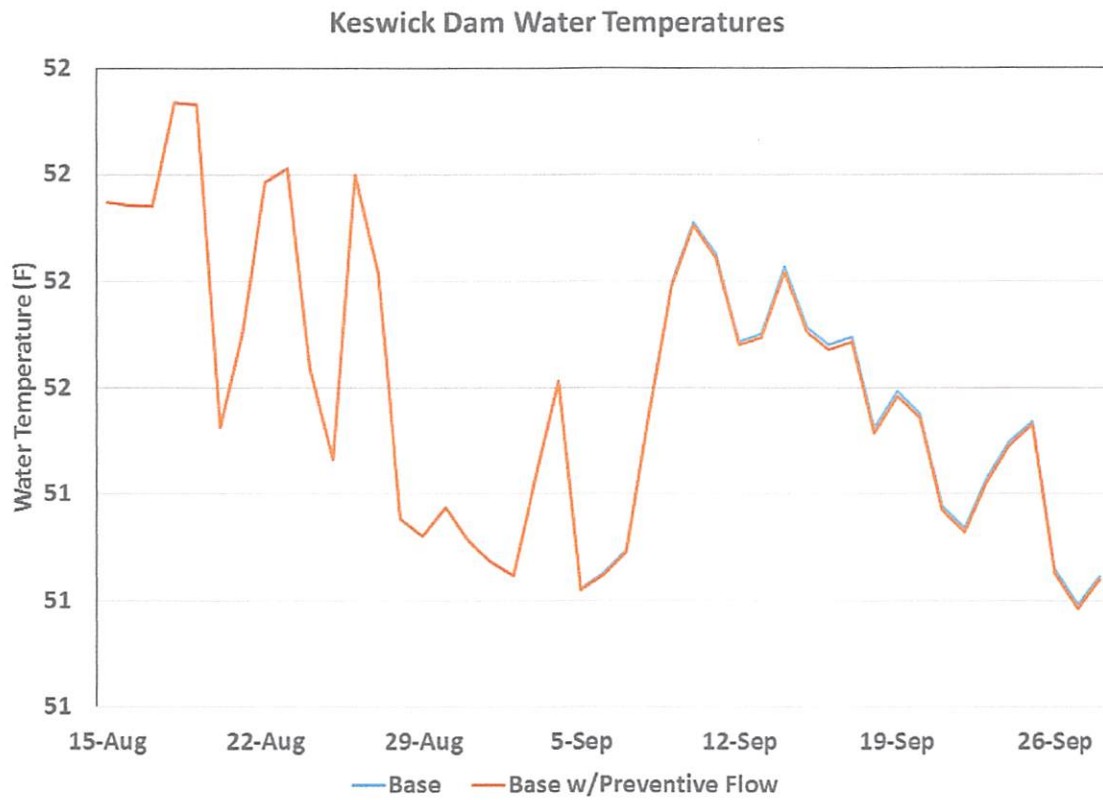


Figure 2. Water Temperatures from Keswick Dam on the Sacramento River for a No Action (Base) and the Proposed Action (implementing the Preventive Base and Preventive Pulse). August 5 Model results.

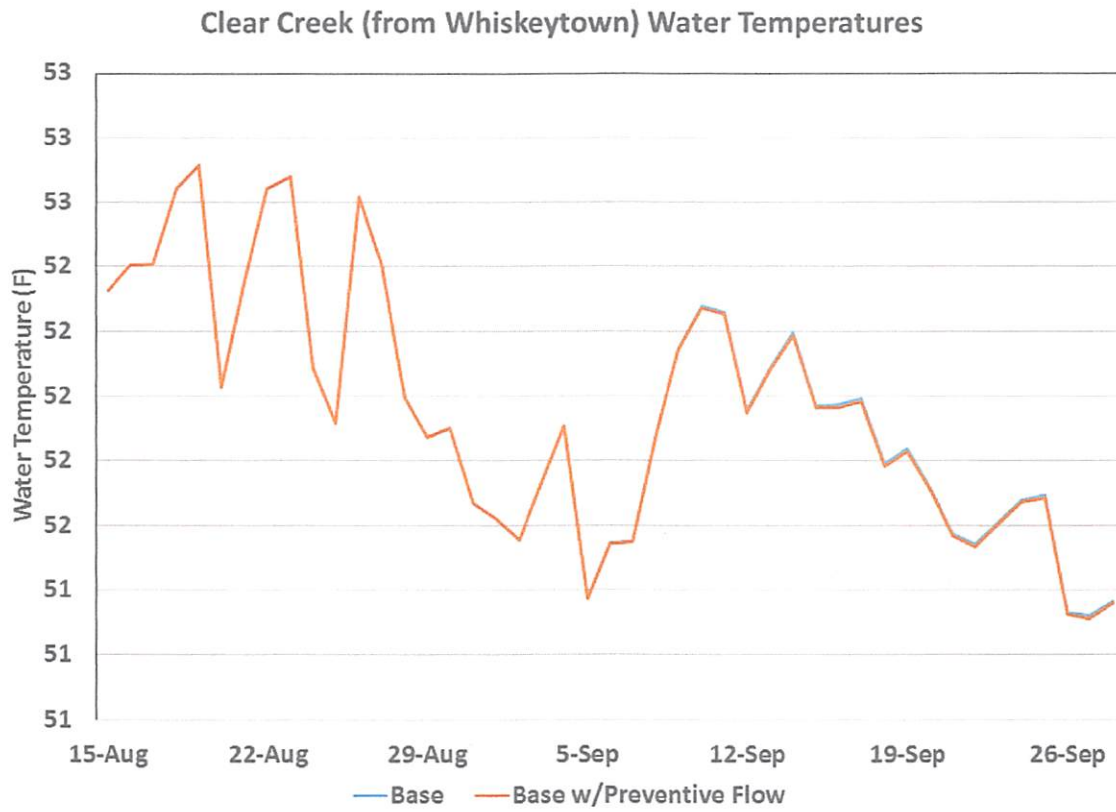


Figure 3. Water Temperatures from Whiskeytown Dam to Clear Creek for a No Action (Base) and the Proposed Action (implementing the Preventive Base and Preventive Pulse). August 5 Model results.

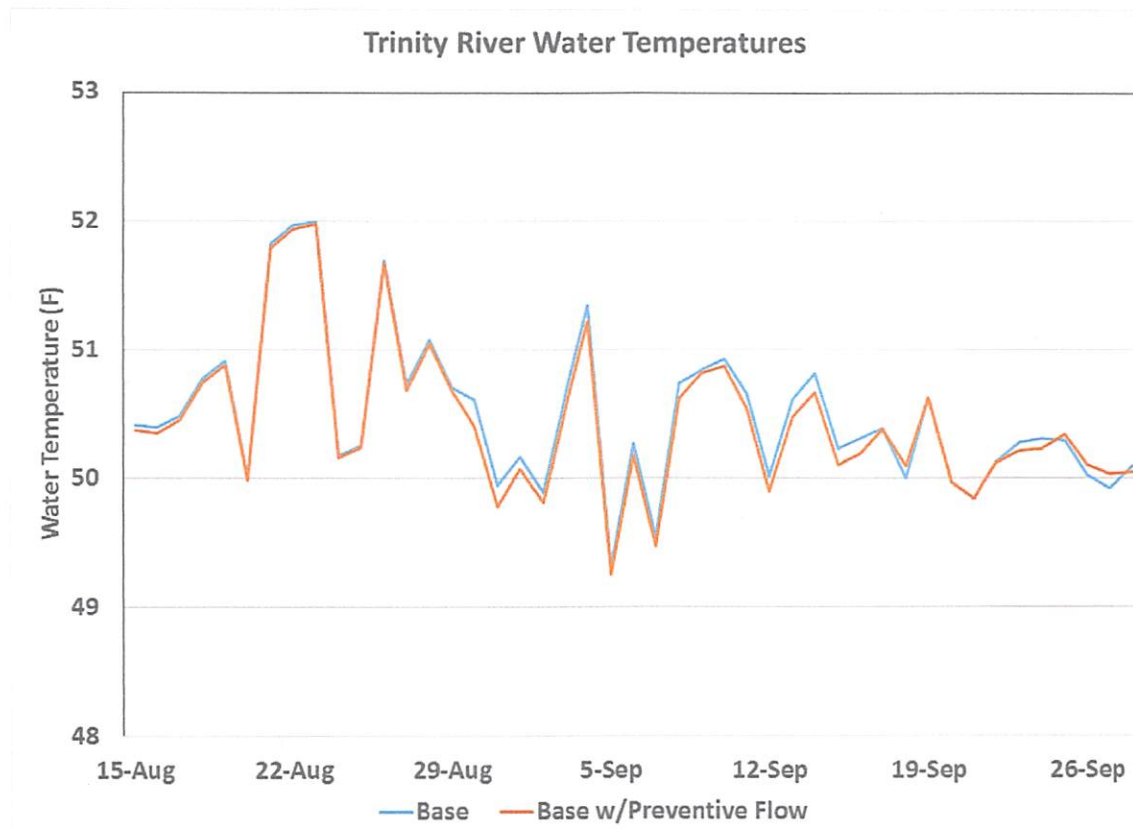


Figure 4. Water Temperatures from Lewiston Dam to the Trinity River for a No Action (Base) and the Proposed Action (implementing the Preventive Base and Preventive Pulse). August 5 Model results.