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**PACIFIC COAST FEDERATION
of FISHERMEN'S ASSOCIATIONS**



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Northwest Regional Director
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In Memoriam:
Nathaniel S. Bingham
Harold C. Christensen
William F. "Zeke" Grader, Jr.

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Ernest Conant
Regional Director
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2800 Cottage Way
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Email: econant@usbr.gov

15 May 2022
Via Email

Scott Rumsey, Ph.D.
Acting Regional Administrator
NOAA Fisheries
West Coast Region
Email: scott.rumsey@noaa.gov

**RE: Sixty-Day Notice of Intent to Sue for Violations of the Endangered Species Act
Regarding the Operation of the Trinity River Division of the Central Valley Project
on Threatened Species**

Dear Director Conant and Regional Administrator Rumsey:

This letter serves as the formal 60-day Notice of Intent to Sue the U.S. Bureau of Reclamation ("BOR") from the Pacific Coast Federation of Fishermen's Associations (PCFFA) and its sister organization, Institute for Fisheries Resources (IFR), for violations of Section 7 and 9 of the Endangered Species Act ("ESA") as set forth below. This letter also constitutes formal 60-day notice of our intent to initiate litigation under the citizen suit provision of the ESA.

These violations arise from BOR's continuing failure to comply with the ESA's prohibition against "take" of ESA-listed species that applies to them, and its failure to reinstate

Ernest Conant, BOR
Re: 60-Day Notice of Intent to Sue
15 May 2022

ESA consultation in accordance with requirements imposed by the October 12, 2000, “Biological Opinion for the Trinity River Mainstem Fishery Restoration EIS and Its Effects on Southern Oregon/Northern California Coast Coho Salmon, Sacramento River Winter-run Chinook Salmon, Central Valley Spring-run Chinook Salmon and Central Valley Steelhead.”

Additionally, the BOR’s Final “Sacramento River Temperature Management Plan for Water Year 2022” dated May 2, 2022, if implemented as presented, will devastate the fishery resources of the Trinity River, negating years of restoration efforts and ignoring legal commitments of Public Law 84-386 and Water Right Order 90-5.¹

We are writing to request that immediate action be taken to reinitiate consultation with NMFS as required by the Endangered Species Act, specifically for the Trinity River Division of the Central Valley Project. We are also requesting that proper temperature management plans be developed and implemented specifically for the Trinity River Basin for the protection of threatened and endangered fish species abiding there.

I. BACKGROUND

The construction and operation of the Trinity River Division (“TRD”) of the Central Valley Project (“CVP”) was authorized on August 12, 1955 (P.L. 84-386). Section two of P.L. 84-386 directed the Secretary of the Interior to “adopt appropriate measures to insure the preservation and propagation of fish and wildlife.”² Following the completion of the TRD, diversion of up to 90% of the flows to the Central Valley led to significant riverine habitat degradation and 80-90% declines in salmon and steelhead populations. Although significant restoration actions were later implemented, these actions were generally ineffective in restoring the salmon and steelhead populations to pre-dam levels as called for by Public Law 98-541.

On December 19, 2000, the Secretary of the Interior signed a Record of Decision (“ROD”) that established the Trinity River Restoration Program to restore the fishery resources of the Trinity River.³ A key component of the restoration program is the management of flow from the TRD of the CVP, operated by the BOR. The quantity and quality of water releases from the TRD into the Trinity River greatly affect the fishery resources of the Trinity River and the lower Klamath River. The Biological Opinion (“BiOP”) issued by the National Marine Fisheries Service (“NMFS”) on October 12, 2000,⁴ providing ESA coverage for the implementation of the restoration program established under the ROD, including the operation of the TRD. Aside from Central Valley ESA listed aquatic species, only the Southern Oregon/Northern California Coast Coho Salmon were considered in this BiOP.

¹ For details, see Attachment 1, April 27, 2022, e-mail from Justin Ly, NOAA Fisheries North Coast Branch Chief to Eileen Sobek, Executive Officer of the California State Water Resources Control Board.

² P.L. 84-386 § 2

³ See U.S. Department of the Interior. “Record of Decision for the Trinity River Mainstem Fishery Restoration EIS,” (2000), accessed at www.trrp.net/library/document/?id=227

⁴ National Marine Fisheries Service (NMFS). “Biological opinion for the Trinity River mainstem fishery restoration EIS and its effects on southern Oregon / northern California coast coho salmon, Sacramento River winter-run chinook salmon, central valley spring-run chinook salmon, and central valley steelhead. National Marine Fisheries Service, Southwest Region, Long Beach, California.” (2000) Accessed at www.trrp.net/library/document?id=1240.

As stated in “Section IX. Reinitiation Notice” of the BiOP:

As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the actions has been retained (or is authorized by law) and if: (1) **the amount or extent of incidental take is exceeded**; (2) **new information reveals effects of agency actions that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion**; or (4) **a new species is listed or critical habitat designated that may be affected by the action**. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.⁵

Water Right Order 90-5 contains a provision that is intended to protect from harm Trinity River fishery resources from operations of the TRD for temperature control on the Sacramento River.⁶ These protections are stated as adult salmonid temperature requirements of 56° F at specific locations during the salmon spawning periods starting September 15.

The Water Quality Control Plan for the North Coast Region (“North Coast Basin Plan”) also contains an additional temperature objective for the Trinity River to protect state threatened Spring Chinook that may be holding prior to spawning.⁷ See below:

Table 1. Trinity River Water Temperature Objectives for Adult Salmonid Holding and Spawning

Trinity River Water Temperature Objectives for Adult Salmonid Holding and Spawning ¹		
River Reach	Daily Average Not To Exceed	Period
Lewiston to Douglas City Bridge	60° F	July 1-Sept 15
Lewiston to Douglas City Bridge ²	56° F	Sept 15 – Oct 1
Lewiston to North Fork Confluence ²	56° F	Oct 1- Dec 31

1. North Coast Regional Water Quality Control Board (1991) and approved by the U.S. EPA in 1992 as Clean Water Act standards.
2. Included in Water Right Order 90-5 as water permit condition for operations related to Sacramento River temperature control.

⁵*Id.* (emphasis added).

⁶ State Water Resources Control Board, “WR Order 90-5,” pages 61, 62, accessed at: www.waterboards.ca.gov/waterrights/board_decisions/adopted_orders/orders/1990/wro90-05.pdf

⁷ See North Coast Basin Plan, Table 3-1b, page 3-13, accessed at: www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/180710/BPChapter3WaterQualityObjectives.pdf

The EPA's 1992 approval of the Trinity River Basin Plan temperature objectives and Interim Action Plan identifies that BOR is required to meet these temperature objectives and also that diversions to the CVP are "controllable factors."⁸

II. ESA VIOLATIONS BY THE BIOLOGICAL OPINION

A. Prohibitive Take of Threatened Southern Oregon/Northern California Coast (SONCC) Coho Salmon (*Oncorhynchus kisutch*) (ESA Section 9)

Except as provided in the statute, section 9 of the ESA makes it unlawful for any person to "take" a federally-listed endangered fish species within the United States.⁹ The ESA defines "take" to mean "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct."¹⁰ "Harm" is defined in Department of Commerce regulations as "an act which actually kills or injures fish or wildlife," including "significant habitat modification or degradation which actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including, breeding, spawning, rearing, migrating, feeding, or sheltering."¹¹ Further, the Supreme Court has concluded that the "harm" may be direct or indirect and need not be purposeful.¹² ESA section 4(d) allows NMFS to customize prohibitions and regulate activities to specifically provide for the conservation of threatened species, including the Southern Oregon/Northern California Coast.¹³ This applies particularly to "take," which as noted above can include any act that kills or injures the threatened species, and may also include habitat modification.

In the fall and early winter of 2021, operations of the TRD caused a "take" of Southern Oregon/Northern California Coast (SONCC) Coho Salmon at Trinity River Hatchery and presumably in the upper mainstem Trinity River due to increased water temperatures resulting from TRD operations.¹⁴ Trinity River Hatchery Coho Salmon eggs, which are part of the SONCC Evolutionary Significant Unit, experienced excessive mortality (up to 75%) due to high water temperatures from water that was released from the TRD as a result of previous operations, especially trans-basin operations that exhausted the cold water in Trinity Lake. These water temperature increases resulted in significant habitat modification, which may also constitute "harm" since it actually resulted in the death or injury to wildlife.¹⁵ While no direct estimate of egg mortality of Coho Salmon eggs in the Trinity River below Lewiston Dam exists, it is logical as well as consistent with the best available science that naturally spawning Coho Salmon eggs

⁸ See 1992 Approval by the United States Environmental Protection Agency of Trinity River Water Quality Objectives, accessed at: www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PCFFA&I_GFR/part2/pcffa_97.pdf

⁹ 16 U.S.C. 1538(a)(1)(B).

¹⁰ 16 U.S.C. 1532(19).

¹¹ 50 C.F.R. 222.102.

¹² *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. 687,704 (1995).

¹³ 50 CFR 223.203. See also NOAA, "Protective Regulations for Threatened Species Under the Endangered Species Act: Section 4(d)." (2020) <https://www.fisheries.noaa.gov/national/endangered-species-conservation/protective-regulations-threatened-species-under-endangered>

¹⁴ See Attachment 1, Attachment 2.

¹⁵ *Babbitt v. Sweet Home Chapter of Communities for a Great Oregon*, 515 U.S. at 708.

that also were exposed to these higher water temperatures experienced higher mortality.¹⁶ In addition to the unauthorized “take” of threatened SONCC Coho Salmon in 2021, it is likely that there will be unauthorized “take” of SONCC Coho salmon in the Trinity River in 2022 under the Final Sacramento Water Temperature Plan (See Section III), for similar reasons.

B. Failure to Reinitiate Consultation When New Species Were Listed (ESA Section 7)

Section 7 of the ESA states that federal agencies must “utilize their authorities in furtherance of the purposes” of the ESA and carry out “programs for the conservation of endangered species and threatened species.”¹⁷ Agency action must not “jeopardize” the continued existence of a listed species or adversely modify its critical habitat.¹⁸ In order to effectively achieve these ESA goals, agencies must consult with the delegated agency whenever their actions “may affect” a listed species.¹⁹

1. Southern Resident Killer Whale (*Orcinus orca*)

The Southern Resident Killer Whale distinct population segment (“DPS”) was listed as threatened under the ESA on February 16, 2006.²⁰ However, the BOR **did not** reinitiate ESA consultation as required by the BiOP concerning its impacts on this newly-listed species. The operation of the TRD directly affects the Killer Whale’s primary food source, which is Chinook salmon.

Operation of the TRD affects the Trinity spring-run Chinook Salmon, which is listed as threatened under the California ESA (“CESA”), and Trinity fall-run Chinook Salmon. Klamath Basin fall-run Chinook Salmon, composed of both Klamath and Trinity sub-stocks, are managed as a single stock for fishery management purposes, have not met their minimum natural spawning escapement goal in six of the last seven years and they are not expected to meet the minimum natural spawning escapement in 2022. Poor water temperature conditions experienced in the Trinity River during the 2021 spawning period likely compromised Trinity River Chinook Salmon production as it did Coho salmon production.

NMFS has clearly stated that 2022 CVP operations as currently planned will not be protective of Trinity River Coho salmon.²¹ The current CVP operations and water conditions have clearly impacted Trinity River Chinook salmon production and thus will negatively impact the primary food source of the threatened Killer Whales, putting them in jeopardy -- and therefore further consultation is required to determine the full impacts.

2. Pacific Eulachon (*Thaleichthys pacificus*)

¹⁶See Attachment 1.

¹⁷ 16 U.S.C. § 1536(a)(1).

¹⁸ Id. at § 1536(a)(2).

¹⁹ 50 C.F.R. § 402.14(a); see 16 U.S.C. § 1536(a)(2).

²⁰ 70 FR 69903.

²¹ See Attachment 1.

The Southern DPS of Pacific Eulachon was listed as threatened under the federal ESA on May 17, 2010.²² The BOR **did not** reinitiate ESA consultation as required by the BiOP. The Southern DPS of Pacific Eulachon occurs in rivers from the Mad River in California, to the Skeena River in British Columbia, Canada. Critical habitat for the Pacific Eulachon was designated on December 19, 2011, including the lower 17.2 miles of the Klamath River.²³ During certain times of the year, flows from the TRD can affect the quantity and quality of water in the lower Klamath River which is critical habitat for the Eulachon. The possibility that the TRD “may affect” the Eulachon populations is enough to warrant reinitiation of consultation to ensure that the actions being taken are not placing this threatened species in jeopardy by changing the quality and quantity of water in the Klamath River and taking away its critical habitat.

III. FINAL SACRAMENTO RIVER TEMPERATURE MANAGEMENT PLAN FOR WATER YEAR 2022

The Final Sacramento River Temperature Management Plan for Water Year 2022 (“Temperature Management Plan”) will devastate the fishery resources of the Trinity River and the Tribal and non-tribal fisheries that depend upon them.²⁴ As presented, the end of month storage in Trinity Reservoir will be 589 thousand acre-feet (“TAF”) at the end of July, 505 TAF at the end of August, 423 TAF at the end of September and 394 TAF at the end of October (see Table 2). The end of September minimum carryover storage identified in the Trinity ROD is 600 TAF.²⁵ The end-of-September Trinity Reservoir carry-over storage of less than 750 TAF has been established as potentially problematic for meeting the thermal needs for anadromous salmonids in the Trinity River.²⁶ More recently, NOAA Fisheries staff identified carry-over storage of less than 1.2 million acre-feet to be “problematic” in meeting required temperatures.²⁷

While BOR failed to provide any downstream temperature modeling for the Trinity River in their Temperature Management Plan, it is obvious that having reservoir levels of less than 600 TAF in Trinity Reservoir in July, then going below, will provide unsuitable release water temperatures for anadromous salmonids in the Trinity River in violation of Section 2 of P.L. 84-386 and Water Right Order 90-5. The Temperature Management Plan identified October release temperatures to be 58.6° F at Lewiston, forty miles upstream of the 90-5 60° F compliance point at the North Fork Trinity confluence (see Table 3). The continued diversions into water year 2023 (see Table 4) and extremely low reservoir levels will most likely cause a “take” of SONCC Coho Salmon in the Trinity River and Trinity River Hatchery as occurred in 2021 due to increased water temperatures in their critical habitat.

²² 75 F.R. 13012

²³ 76 F.R. 65323

²⁴ See “Sacramento River Temperature Management Plan For Water Year 2022.”

www.waterboards.ca.gov/waterrights/water_issues/programs/drought/sacramento_river/docs/2022-sac-tmp-final.pdf

²⁵ See U.S. Department of the Interior. “Record of Decision for the Trinity River Mainstem Fishery Restoration EIS” (2000) accessed at www.trrp.net/library/document/?id=227

²⁶ See Deas, M.L. “Trinity River Carryover Analysis” (1998), accessed at www.trrp.net/library/document/?id=2341; See Bender, M.D. “Bureau of Reclamation, Technical Service Center Technical Memorandum” (2012) 86-68220-12-06, accessed at www.trrp.net/library/document/?id=1813

²⁷ See Attachment 1.

Table 2. End of Month CVP Reservoir Storage, U.S. Bureau of Reclamation Final Sacramento River Temperature Management Plan for Water Year 2022. May 2, 2022.

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

		Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Trinity	807	756	693	646	589	505	423	394	372	356	360	393	459
	Elev.	2225	2216	2209	2200	2186	2170	2164	2159	2155	2156	2164	2177
Whiskeytown	213	238	238	238	238	238	238	206	206	206	206	206	206
	Elev.	1209	1209	1209	1209	1209	1209	1199	1199	1199	1199	1199	1199
Shasta	1735	1746	1646	1523	1382	1238	1135	1132	1117	1106	1229	1432	1759
	Elev.	942	935	927	917	906	897	897	896	895	905	921	943
Folsom	584	670	669	556	366	302	298	274	254	243	272	345	293
	Elev.	436	436	423	398	388	387	382	379	377	382	395	386
New Melones	935	908	831	753	690	638	611	569	572	574	580	578	574
	Elev.	929	918	905	894	885	880	872	872	873	874	873	873
San Luis	333	332	300	231	142	110	87	31	73	130	332	328	311
	Elev.	445	438	422	403	391	383	369	379	399	436	432	430
Total		4651	4376	3947	3407	3031	2792	2606	2594	2614	2980	3281	3602

Table 3. Estimated Trinity Dam and Lewiston Dam Release Temperatures for 2022 from U.S. Bureau of Reclamation Final Temperature Management Plan, May 2, 2022.

Month	Trinity	Lewiston
May	47.3	50.2
June	48.2	53.4
July	48.9	53.8
August	50.6	55.0
September	54.3	56.7
October	57.4	58.6
November	54.6	53.8

Table 4. Trinity Diversions, U.S. Bureau of Reclamation Final Sacramento River Temperature Management Plan for Water Year 2022. May 2, 2022.

Trinity Diversions (TAF)

	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
Carr PP	38	16	25	30	31	30	10	10	10	10	5	3
Spring Crk. PP	10	10	15	20	20	20	30	0	0	5	5	10

Klamath-Trinity fall Chinook Salmon support dependent Tribal and non-tribal fisheries within the Klamath-Trinity Basin and along the Pacific Coast from the Washington/Oregon border to Monterey Bay, California. Yet Klamath-Trinity fall Chinook Salmon have not met their minimum natural spawning escapement target in 6 or the last 7 years and are not projected to meet the minimum target in 2022. The harvest of Tribal, in-river recreational, ocean commercial and ocean recreational salmon seasons have been severely constrained due to the persistent low abundance of Klamath-Trinity fall Chinook salmon. If reservoir levels and water release temperatures as depicted in the Temperature Management Plan are implemented, it can be expected that migrating, holding, and spawning Chinook Salmon will experience high mortality in the Trinity River and probably in the lower Klamath River. This loss of production from the Trinity River will impact ocean and in-river fisheries in 2025 through 2027.

The current Temperature Management Plan is going to impact the fishery resources of the Trinity River, specifically spring Chinook salmon (CESA threatened), fall Chinook salmon (not ESA listed but severely depleted and a major food source for SRKW orcas which are ESA-

listed), and Coho salmon (ESA and CESA threatened). This Plan will: (1) impact future dependent Tribal and non-Tribal fisheries; (2) violate the “do no harm” clause of the 1955 Trinity Act (Section 2 of P.L. 84-386), the ESA, and Water Right Order 90-5; (3) compromise the efforts of the Trinity River Restoration Program and the hundreds of millions of dollars that have been invested in restoring the salmonid fishery resources of the Trinity River.

IV. A SEPARATE TRINITY RIVER BIOLOGICAL OPINION IS NEEDED

The TRD, while integrated into the CVP, has always had specific protections embodied in the 1955 Trinity River Act. Section 2 of P.L. 84-386 directed the Secretary of the Interior to “adopt appropriate measures to insure the preservation and propagation of fish and wildlife.” According to a 1993 Interior Solicitor’s Opinion, the Tribal Trust Doctrine dictates that with the federally reserved fishing rights of the Hoopa Valley and Yurok Tribes, there are property rights associated with the flows of the Trinity River.²⁸ These rights date back more than 10,000 years, making them senior to any water rights obtained by the BOR for the CVP.

The Central Valley Project Improvement Act, P.L. 102-575 (CVPIA) also acknowledged the difference between the Trinity River²⁹ and Central Valley³⁰ streams by having separate fishery restoration goals for each basin. The primacy of the waters of the Trinity River for use in the Trinity River Basin is explained in a 1979 opinion by Interior Solicitor Leo Krulitz on the water contract and drought shortage provisions with the Grasslands Water District:

...in authorizing the Trinity River Division in 1955, Congress specifically provided that in-basin flows (in excess of a statutorily prescribed minimum) determined by the Secretary to meet in-basin needs take precedence over needs to be served by out of basin diversions.³¹

Neither the 2009 nor the 2019 CVP BiOps included the Trinity River and SONCC Coho salmon, supporting our belief that there should now be a separate consultation. It is therefore appropriate for BOR to initiate a reinitiation of consultation for the Trinity River *that is separate from the current Reinitiation of Consultation for the entire CVP*.

V. REQUEST FOR RELIEF

As evidenced from the lack of representation of the Trinity River and SONCC in the BiOp, reinitiation of consultation with NMFS as required by the ESA specifically for the TRD of the CVP is needed. Additionally, there are several emergency actions that should be taken to prevent any further harm and rectify the issues discussed above. These are listed below:

²⁸ See 1993 Solicitor’s Opinion on Tribal Fishing Rights, Page B13. Accessed at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PC_FFA&IGFR/part2/pcffa_94.pdf

²⁹ CVPIA Section 3406(B)(23).

³⁰ CVPIA Section 3406(B)(1).

³¹ See Memorandum from Interior Solicitor to Assistant Secretary Land and Water Resources, regarding proposed contract with Grasslands Water District, 12/7/1979, Page B-13, accessed at https://www.waterboards.ca.gov/waterrights/water_issues/programs/bay_delta/california_waterfix/exhibits/docs/PC_FFA&IGFR/part2/pcffa_96.pdf

- A. Cease all trans-basin diversions from the Trinity Basin except for those absolutely necessary to meet Trinity River water temperature objectives. Utilizing diversions to meet Trinity water temperature objectives should be a last resort.
- B. Conduct temperature modeling specifically for the Trinity River so the effects of the 2022 Temperature Management Plan on the Trinity River can be comprehensively evaluated.
- C. Develop a Cold-Water Pool Management Plan for Trinity and Lewiston Reservoirs for water year 2022 to meet Trinity River water temperature objectives; considering using power bypass, drawing down Lewiston Reservoir, and reducing restoration releases to increase cold water pool, etc.
- D. Develop a sub-component of the Trinity Plan that includes how the water needs necessary to meet the 2017 Record of Decision for the Long-Term Plan to Protect Adult Salmon in the Lower Klamath River³² will be met in 2022.
- E. Once ambient air conditions are sufficient to cool water temperatures to meet water temperature objectives, all trans-basin diversions should cease in order to start building up the storage in Trinity Reservoir.
- F. Develop a multi-year cold-water pool management plan for the TRD so that the needs of the Trinity River and the obligations of the Secretary of the Interior can be met into the future.

VII. CONCLUSION

There is deep concern for the health of the Trinity River Basin and the aquatic species that depend on healthy water quality and appropriate water temperatures. We are eager to have these violations and concerns addressed and request that they be addressed at the earliest possible date. If no action is taken within the 60 days after notice of this letter, we will pursue the appropriate legal claims to resolve the issues discussed above.

Sincerely,



Glen H. Spain, J.D.
NW Regional Director and
General Legal Counsel
Pacific Coast Federation of Fishermen's Associations (PCFFA)
and the Institute for Fisheries Resources (IFR)

³² See <https://www.trrp.net/library/document/?id=2465>

Ernest Conant, BOR
Re: 60-Day Notice of Intent to Sue
15 May 2022

cc: Deb Haaland, Secretary of Interior, US Dept. of the Interior,
1849 C Street NW, Washington, DC 20240
Gina Raimondo, Secretary of Commerce (TheSec@doc.gov)
Camille Calimlim Touton, Commissioner of Reclamation (mtouton@usbr.gov)
Janet Coit, NOAA Fisheries Assistant Administrator (janet.coit@noaa.gov)
Congressman Jared Huffman, c/o John Driscoll (john.driscoll@mail.house.gov)
and Logan Ferree (Logan.Ferree@mail.house.gov)
Bryan Newland, US Dept. of Interior (bryan_newland@ios.doi.gov)
Scott Bergstrom, Solicitor's Office, US Dept. of Interior (scott.bergstrom@sol.doi.gov)

Trinity 60-day Notice (05-15-22)

Ernest Conant, BOR
Re: 60-Day Notice of Intent to Sue
15 May 2022

ATTACHMENT 1

E-mail from Justin Ly, NOAA Fisheries to Eileen Sobeck, Executive Officer State Water Resources Control Board, April 27, 2022. Re: Subject: Comments on Reclamation's draft Sac River Temperature Management Plan

ATTACHMENT 1

From: **Justin Ly - NOAA Federal** <justin.ly@noaa.gov>
Date: Wed, Apr 27, 2022 at 12:14 PM
Subject: Comments on Reclamation's draft Sac River Temperature Management Plan
To: <Eileen.Sobeck@waterboards.ca.gov>
Cc: <bay-delta@waterboards.ca.gov>, <Diane.Riddle@waterboards.ca.gov>, Garwin Yip - NOAA Federal <garwin.yip@noaa.gov>, Seth Naman <seth.naman@noaa.gov>, Roman Pittman - NOAA Federal <roman.pittman@noaa.gov>, Howard Brown - NOAA Federal <howard.brown@noaa.gov>

Dear Ms. Sobeck,

Reclamation provided a draft Sacramento River Temperature Management Plan (Draft TMP) in April 2022 to regulatory agencies as part of its water right requirement under Water Order 90-05 (WRO 90-5), as well as the requirements under RPM 1.a. of the 2019 National Marine Fisheries Service (NMFS) Biological Opinion, and the Interim Operations Plan, ordered by the US District Court on March 14, 2022. NMFS provides the following comments to the State Water Resources Control Board (Board) as part of Reclamation's requirement under water order 90-05 for your consideration in approving a final Temperature Management Plan for this year, as well as in development of new water temperature requirements on the Trinity River in the future. NMFS understands Reclamation is faced with exceptional water management challenges in this third year of critically dry water yield in the Trinity and Sacramento river basins. Our comments address operational considerations and Trinity Reservoir cold water pool management that will reduce the amount and extent of incidental take of threatened Southern Oregon/Northern California Coasts coho salmon:

In the first four weeks of spawning in November of 2021, approximately 75% of coho salmon eggs at Trinity River Hatchery (TRH) perished (Clifford 2022; Figure 1). Because water temperatures in the Trinity River were similar to that of TRH, a similar proportion of ESA listed wild SONCC coho salmon eggs likely perished. This occurred because low Trinity Reservoir storage resulted in high water temperatures released from Lewiston Dam which continued to climb in temperature until finally peaking in November, as the water released from Trinity Reservoir remained unseasonably warm.

Water temperatures in the Trinity River are known to be problematic when Trinity Reservoir reaches storages less than 1.2 MAF (million acre feet), as the main outlet begins to entrain warmer waters in the water column (Asarian et al. in prep). Projected Trinity Reservoir end-of-September (EOS) storage in 2022 will be less than 500 TAF (thousand acre feet), which is at least 250 TAF less than 2021 (EOS 750 TAF). In addition, Reclamation's draft plan includes the diversion of 91 TAF after October 1 2022 (Attachment 1 in the draft TMP). Complete loss of cold water less than 50°F may occur, and mortality of coho salmon could be even greater than 2021 this coming fall.

While Reclamation's Draft TMP for Water Year 2022 outlines several goals for the Sacramento River as it relates to compliance with WRO 90-5, the Draft TMP makes no mention of meeting the water temperature objectives in the Trinity River in order to comply with WRO 90-5. Reclamation's draft plan results in a Lewiston release temperature of 56.9°F in October from Lewiston Dam (Attachment 2 in the plan), which would exceed the Board's 56°F degree objective even without any downstream warming at both Douglas City and above the North Fork Trinity River (Figure 2).

WRO 90-5 states that "Permittee shall not operate its Trinity River Division for water temperature control on the Sacramento River in such a manner as to adversely affect salmonid spawning and egg incubation in the Trinity River...." Please note that Reclamation is already using the Trinity River for water temperature control on the Sacramento, despite the model results indicating it will not meet the 90-05 criteria for the Trinity River.

Therefore, we provide the following recommendations:

- We ask that the Board ensure the protection of the limited Trinity Reservoir cold water pool for salmon spawning success this fall, as provided in WRO 90-5.
- We recommend the Board require Reclamation to significantly curtail all diversions to the Central Valley until at which time in water year 2023, it can be determined that the Trinity Reservoir will recover to a projected EOS storage of at least 1.2 MAF in 2023.
- We recommend that the auxiliary outlet for Trinity Reservoir be used only following coordination with Trinity River basin stakeholder, managers, and Tribes. Unless significant impacts to Trinity River adult Chinook salmon are expected or observed in September and October of 2022, the auxiliary outlet should only be used after November 1 to reduce take of ESA listed coho salmon adults and eggs.
- WRO 90-5's water temperature criteria for 56°F at the Douglas City Bridge between Sept 15 and Oct 1 and at the confluence of the North Fork Trinity River between Oct 1 and Dec 31 are not sufficiently cold to prevent mortality of Chinook salmon and coho salmon eggs in the Trinity River. Therefore, NMFS recommends Reclamation meet water temperatures of 53.5°F (12°C) daily max and 50°F (10°C) daily average, or less after November 1.
- Finally, we recommend that the Board begin work to condition Reclamation's water right permit to include new water temperature requirements for the protection of all adult salmonids and their embryo on the Trinity River, including ESA listed SONCC coho salmon.

Thank you.

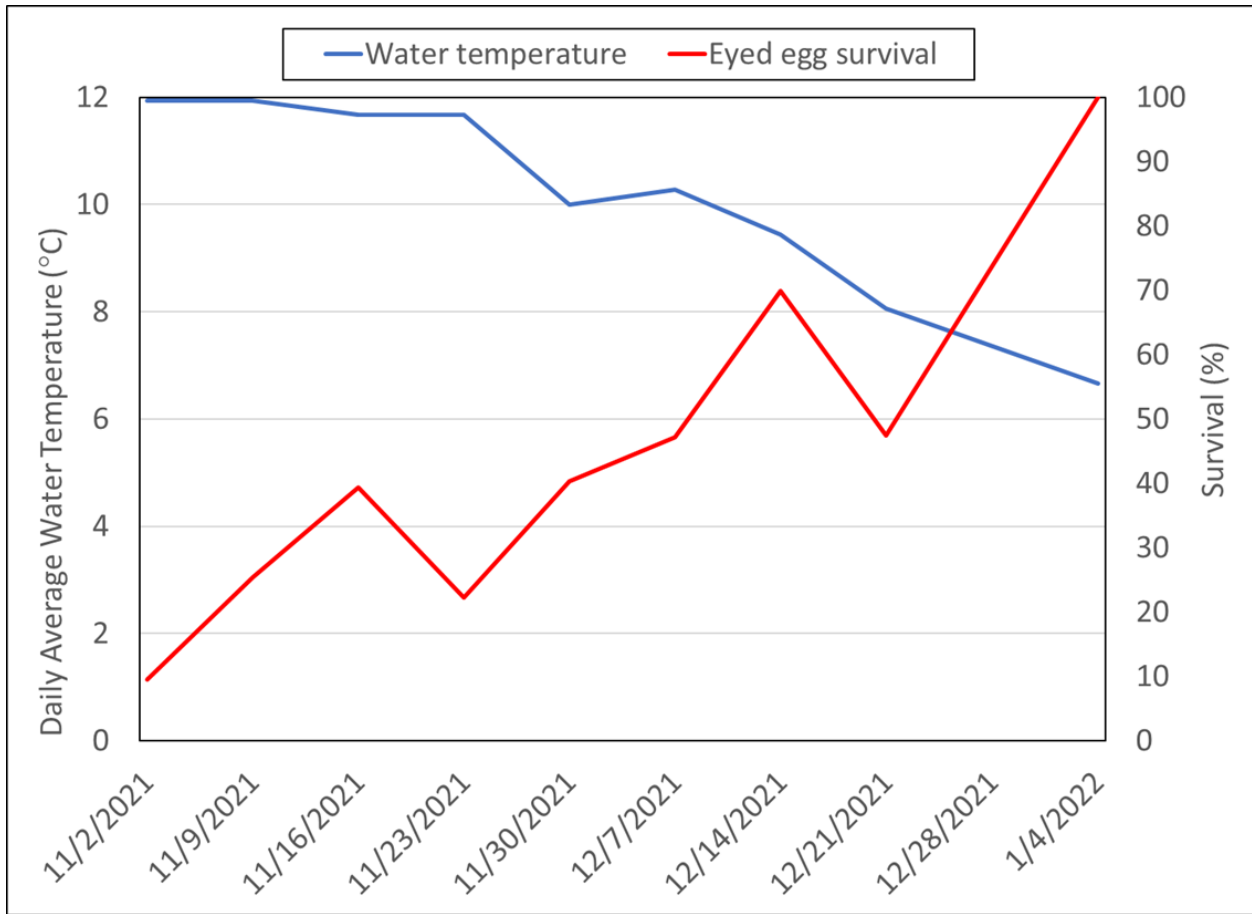


Figure 1. Coho salmon egg survival and Trinity River Hatchery water temperatures, 2021 (Clifford 2022)

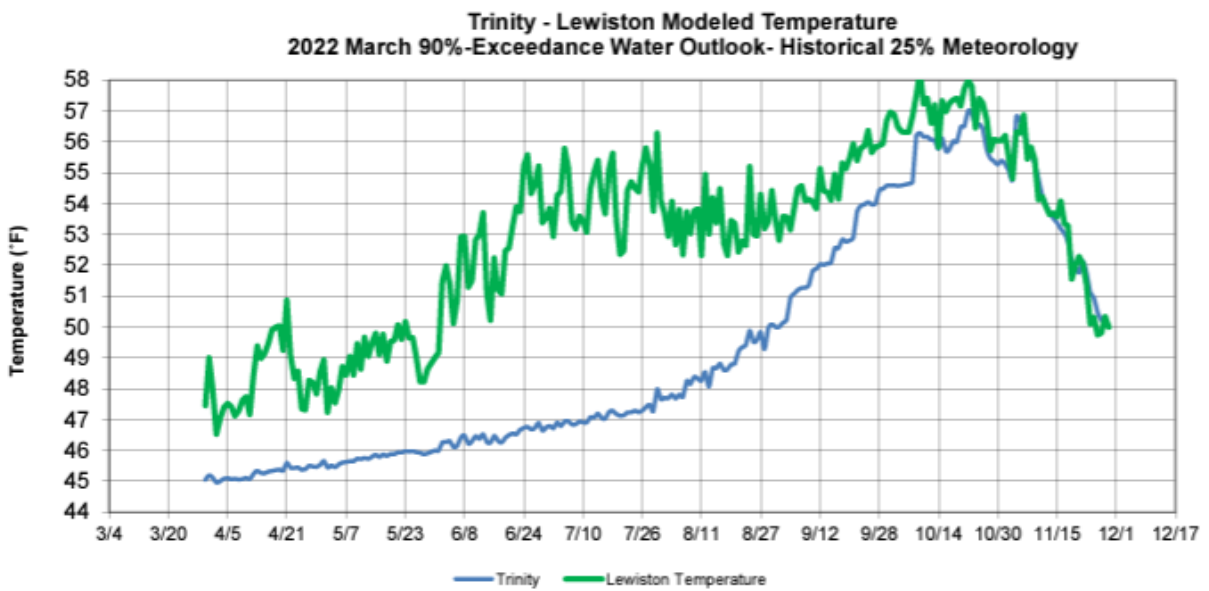


Figure 2. Projected Trinity River water temperatures at Lewiston (Reclamation 2022).

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Asarian, J.E., K. De Juilio, D. Gaeuman, S. Naman, and T. Buxton. In prep. Synthesizing 87 years of scientific inquiry into Trinity River water temperatures. Prepared for the Yurok Tribe Fisheries Program and Trinity River Restoration Program by Riverbend Sciences with assistance from the Yurok Tribe Fisheries Program, NOAA Fisheries, and U.S. Bureau of Reclamation.

Bureau of Reclamation. 2022. Draft Sacramento River Temperature Management Plan for Water Year 2022. April 6.

Clifford, M. 2022. Memo to Eric Jones regarding water temperature and coho salmon egg survival at Trinity River Hatchery in Brood Year 2021-2022. Northern Region Fisheries. CDFW. April 21

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Justin Ly

North Coast Branch Supervisor, West Coast Region

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NOAA
FISHERIES

Ernest Conant, BOR
Re: 60-Day Notice of Intent to Sue
15 May 2022

ATTACHMENT 2

Letter From Yurok Tribe and Hoopa Valley Tribe to David Palumbo and Janet Coit, March 25, 2022. Re: Emergency Interim Actions to Protect Tribal Trust Assets of the Trinity River and the Initiation of Consultation on the Trinity River Division of the Central Valley Project under the Endangered Species Act.



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March 25th, 2022

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Re: Emergency Interim Actions to Protect Tribal Trust Assets of the Trinity River and the Initiation of Consultation on the Trinity River Division of the Central Valley Project under the Endangered Species Act

Mr. Palumbo and Ms. Coit:

The Hupa and Yurok have relied upon the fisheries of the Trinity River since time immemorial to nourish our environment, people, and culture. In more recent times we have cooperated with the federal government to restore the river and its' fisheries from the damage done by the implementation of the Trinity River Division (TRD) of the Central Valley Project (CVP), so that once again the river can support healthy runs of fish that our culture depends upon. However, reckless over allocation and diversion of water resources continue to degrade habitat conditions needed to support migrating, holding, and spawning salmon, as well as their incubating eggs. In the face of these trying conditions we remain committed to being full and active partners in the restoration of the Trinity River.

Reclamation lacks coverage for take from operation of the TRD for listed Southern Oregon and Northern California Coastal (SONCC) Coho Salmon under the Endangered Species Act (ESA). SONCC Coho Salmon are severely imperiled and low abundance restricts harvest opportunity for tribal and non-tribal fisheries, partially due to take caused by operation of the TRD. The National Marine Fisheries Service 2000 Biological opinion for the Trinity River mainstem fishery restoration EIS (NMFS, 2000) sets the limit on take of SONCC Coho at zero but take has occurred due to low storage conditions in Trinity Reservoir causing release of water insufficiently cold to protect spawning and incubation in the Fall of 2021 (Attachment 1). In addition, the 2000 BiOp reached a no-jeopardy and no adverse modification of critical habitat conclusions based on expected improved habitat conditions and survival of Coho

freshwater life stages, but Coho habitat conditions and Coho populations have declined precipitously as a result of TRD operations (Attachment 1). There is also a complete lack of analysis and disclosure of impacts of the TRD on two additional species listed since the year 2000 (Southern Resident - Killer Whale; Southern Distinct Population Segment – Eulachon), one of which supports a traditional tribal fishery held in trust by the federal government and the other which relies on the same fish that support tribal people. We are encouraged that Reclamation intends to reconsult with NOAA Fisheries under the ESA to rectify the unlawful, and irresponsible operation of the TRD and to analyze and disclose the impacts to the environment, listed species, and the fisheries that the federal government holds in trust for the Hoopa Valley and Yurok Tribes.

EMERGENCY INTERIM ACTIONS

Further, there is an immediate need for interim emergency measures to protect ESA listed SONCC Coho Salmon from foreseeable and excessive take due to limited inflow and cold-water resources. Because the amount of take allowed by the 2000 BiOp has been exceeded and will continue to be exceeded under current TRD operations, Reclamation has lost incidental take coverage and is liable for take that occurs. To avoid and minimize take, further harm to SONCC Coho Salmon, and comply with the 1955 Act (PL 84-386) authorizing the TRD, Reclamation should implement emergency measures during the reinitiated consultation.

Current protections offered by state and federal regulation are not adequate, as warm water in Trinity River Hatchery from October through December of 2021 contributed to losses of gravid adults, eggs, and embryos of listed SONCC Coho Salmon. These same water temperature conditions existed in natural spawning areas below Lewiston Dam and almost certainly resulted in undocumented losses of naturally spawning fish and their progeny (Attachment 1). Existing temperature targets on the Trinity River were developed for Chinook Salmon on the Sacramento River in the early 1990's. More recent research has shown that Coho Salmon require colder water during reproduction (Carter, 2006). Reclamation's operation forecasts for this water year predict even lower storage and higher release temperatures during spawning than were observed in 2021. Reclamation must take every action possible to provide for the preservation and propagation of Trinity River fish and wildlife by curtailing trans-basin diversion and by bypassing power production. Reduction of trans-basin water deliveries from the TRD must occur immediately if cold-water reserves are to be maintained to meet the habitat conditions required by SONCC Coho salmon reproduction in the Trinity River.

The TRD of the CVP was authorized by the 1955 Trinity River Act (1955 Act) for the purpose of diverting water from the Klamath River Basin to the Sacramento River Basin, provided that "appropriate measures to insure preservation and propagation of fish and wildlife" be taken (Provision 1). However, management measures continue to fall tragically short of meeting legal requirements of Provision 1. The ecosystem collapse caused by the TRD resulted in the Trinity River Basin Fish and Wildlife Management Act of 1984, mandating recovery of fisheries resources held in trust by the federal government, which was determined to be "unlawfully long overdue" by the 9th Circuit Court of Appeals in 2004. The diversion of surplus water is conditional upon the fulfillment of Provision 1. Interim actions prior to the completion of a new biological opinion not only have to meet the ESA's no jeopardy standard for listed species but are required to meet the higher bar of the original authorizing act. Reclamation must ensure needs of the Trinity River are met prior to any other use of Trinity River water, such as filling of Whiskeytown Reservoir for recreation, conveyance of water to the Sacramento Basin, or hydropower production.

We ask that you analyze and implement accordingly the following emergency measures in a timely manner to help mitigate foreseeable and imminent impacts of the TRD to the preservation and propagation of fish and wildlife resources of the Trinity River:

- 1) Do not use Trinity River water for the purpose of filling Whiskeytown Reservoir in advance of the diversion season;
- 2) Curtail trans-basin diversion to the maximum extent possible while keeping Trinity River releases suitably cold to support fish and wildlife;
- 3) Bypass power as needed to provide cold water to the Trinity River;
- 4) Adhere to colder temperature requirements of Coho Salmon during reproduction (Nov 1 - Dec 31; Attachment 1)

REINITIATED CONSULTATION

The unique authorization of the TRD by the 1955 Act, and the Provisions of that act, require that in-basin needs are prioritized before Trinity River water can be exported for other purposes (reaffirmed by Solicitor of Interior Tompkins December 23, 2014, opinion). Moreover, DOI Solicitors Krulitz (December 7, 1979) - **Memorandum from Solicitor to the Assistant Secretary, Land and Water Resources** concluded that fishery flows for “in-basin needs take precedence over needs to be served by out-of-basin diversion” of Trinity River water to the Central Valley. Id at 3. The scoping notice of intent (NOI) includes in the purpose and need meeting the requirements of the Reclamation Act “and other federal law.” The 1955 Act constitutes such a law and contains requirements that must be met by the proposed ESA action and preferred alternative under the National Environmental Policy Act (NEPA). The NOI acknowledges that the proposed action must protect Indian trust assets in the Trinity River. Accordingly, the proposed action for the ESA consultation and preferred alternative under NEPA must ensure in-basin fish and wildlife needs are met before any water is identified as surplus and available for out-of-basin diversions.

To meet these requirements of the diversion, the pending re-consultation on operations of the TRD must remain separate and be completed prior to that of the larger CVP. This will ensure that environmental impacts of reservoir management and water quality and quantity of river releases in the Trinity River Basin can be considered independent of the impacts in the Sacramento River. The resulting ‘surplus’ Trinity River water, after all in-basin needs are satisfied, can then be considered for possible trans basin diversion inputs to the evaluation of environmental impacts of the larger CVP to the Sacramento River system and its ESA listed species. No impacts in the Sacramento Basin should be attributed to any lack of diversions from the Trinity River, as no water is made available by the authorizing congressional act unless it is surplus to the in-basin needs of the Trinity.

We ask that you require the following during development of proposed action and preparation of a Biological Assessment of the TRD and any resulting proposed and final action and assessment under the NEPA:

- 1) Compliance with California Water Rights Order 90-5 and new colder Coho Salmon specific temperature targets at release from Lewiston Dam during spawning and incubation;

- 2) Multi-year drought, and climate change must be explicitly addressed through protective storage measures and any proposed action reduces risk of impacts to Trinity River;
- 3) Water volumes for the preservation and propagation of fish and wildlife, by water year type, released to Trinity River meet or exceed those established under the 2000 Trinity River ROD and are to be managed throughout each year for the benefit of Trinity River fisheries by implementing science based adaptive management administered by the Trinity River Restoration Program and Trinity Management Council;
- 4) Compliance with Provision 2 of the 1955 Act acknowledging and accounting for the right of downstream users on the Trinity River to no less than 50,000 acre-feet of water volume stored in Trinity Reservoir annually (in addition to Provision 1 volume);
- 5) Inclusion of a long-term plan to replace, upgrade, or remove infrastructure identified to pose a risk to preservation, propagation, or recovery of fish and wildlife of the Trinity River or inhibit implementation of adaptive management;
- 6) Coordinate management of the Trinity River (including water quality of dam release) with management of the Klamath Basin, while surplus water volume for other uses, including hydropower production and water to be diverted, is formally coordinated with the CVP;
- 7) Both the Hoopa Valley and Yurok Tribe, who hold federally reserved fishing rights, be granted Co-lead status for environmental documents on the Trinity River Division.

While we understand the complex situation that Reclamation and regulatory agencies are in regarding competing interests between two basins connected by this water project, these are the exact reasons that the provisions were included in the authorizing 1955 Act and further documented in the contemporaneous discussion that occurred in Congress (USHOR, 1955). We ask that you take extraordinary measures to use the existing capabilities of the TRD to save our federally reserved trust fisheries resources during this trying water year, as well as the next two water years that will proceed before completion of reinitiated consultation. We look forward to working with the agencies tasked with determining and regulating future operations of the TRD and ensuring the mandated recovery of the productivity of Trinity River fisheries, which is vital to meet the cultural, ceremonial, subsistence, and economic needs of the Hoopa Valley and Yurok Tribes. Please consider these as scoping comments for the notification of intent for development of a new EIS for Long-term Operation of the CVP and State Water Project. Because Reclamation will be making operational decisions beginning in April that could foreclose needed emergency measures, we ask that you respond to our request for emergency measures for this water year by April 8th, 2022.

Sincerely,



Joseph L. James, Chairman,
Yurok Tribe



Joe Davis, Chairman,
Hoopa Valley Tribe

CC:

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Jared Huffman, U.S. Congressman – CA 2nd District

REFERENCES:

Carter K, 2006. The Effects of Temperature on Steelhead Trout, Coho Salmon, and Chinook Salmon Biology and Function by Life Stage. Implications for Klamath Basin TMDLs. California Regional Water Quality Control Board, North Coast Region. 27 pp.

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USHOR (U.S. House of Representatives). 1955. 84th Congress, 1st Session, Report No. 602. ct Authorizing the Secretary on the Interior to construct, operate, and maintain the Trinity River Division, Central Valley Project, California, under federal reclamation laws. Report

Attachment 1

Poor Survival during Incubation of Trinity Coho Salmon Eggs in 2021

Status of Coho Salmon

Trinity River Coho salmon are part of the Southern Oregon Northern California Coastal (SONCC) Coho salmon Evolutionarily Significant Unit (ESU) that was listed under the federal Endangered Species Act (ESA) in 1997. Coho salmon populations within this ESU are extremely depressed, with the Trinity River populations being no exception. In fact, an ad hoc group formed by the Pacific Fisheries Management Council (PFMC) to assess the risk of extinction for some of the 39 SONCC Coho salmon populations determined that the aggregate of Trinity River populations (Upper Trinity, Lower Trinity, and South Fork Trinity Rivers) have a 64% risk of going extinct over the next 20 years, even if there are no harvest impacts upon these populations¹.

The abundance of Trinity Coho salmon has continued to decline since their listing under the ESA. For example, the average abundance of natural origin (not from a hatchery) Coho salmon adults from 2000 to 2009 was 2,008 fish, whereas the average abundance from 2010 to 2019 was 1,065 (Table 1) adult Coho; a decline of 47%. What is even more alarming is the decline in recent years, given the average abundance of natural origin spawners from 2010 to 2014 was 1,593 adults, however this average dropped to 185 adults for the years 2015, 2017, and 2019 (adequate data not available for 2016 and 2018); a decline of 88% during the recent five-year period. While abundance estimates that include hatchery fish show a similar decline (Table 1), they need to be considered with caution, given that production of Coho smolts at Trinity River Hatchery was reduced from 500,000 to 300,000 in 2015.

Further Decline from Warm Late-fall Incubation Temperatures in 2021

Coho Spawned at Trinity River Hatchery

The decline of Trinity River Coho salmon was exacerbated during 2021, when incubating eggs were subjected to excessively warm water temperatures during the late fall/winter. This was reflected in the low survival of incubating Coho salmon eggs at Trinity River Hatchery (TRH) during the 2021/2022 spawning season (Table 2²). Coho salmon eggs during 2021 at Trinity River Hatchery (TRH) were often exposed to average daily water temperatures of approximately 12°C, (Table 2) well above the 6 - 10 °C range necessary for optimal survival of incubating Coho salmon eggs (USEPA 2001 in Carter 2006 and WDOE 2002 in Carter 2006³). As can be seen in Table 2, temperatures for spawning and subsequent incubation, at TRH were often near 12 °C. According to Kevin Kwak, CDFW Fisheries Veterinarian, warm water temperatures are thought to be the primary reason for the low survival of Coho salmon eggs at TRH during the winter of 2021/2022. As is evident in Figure 1, there was an inverse correlation between temperatures at the time of spawning and survival from the “green” to “eyed” egg stages, with survival at the warmer temperatures being extremely low, ranging from 9.5% to 39%.

¹ Pacific Fishery Management Council Southern Oregon/Northern California Coast Coho Salmon: Fishery Harvest Control Rule Risk Assessment, Draft Final Report, November 2021. 156 pp.

² Data obtained from Mark Clifford, Senior Environmental Scientist, California Department of Fish and Wildlife.

³ Carter K, 2006. The Effects of Temperature on Steelhead Trout, Coho Salmon, and Chinook Salmon Biology and Function by Life Stage. Implications for Klamath Basin TMDLs. California Regional Water Quality Control Board, North Coast Region. 27 pp.

Table 1. Escapement data for adult SONCC Coho salmon (natural and hatchery origin) to natural spawning grounds and at Trinity River Hatchery, 2000 – 2019. 2016 and 2018 were excluded in analysis due to inadequate data to estimate the natural origin component of the escapement.

Return Year	Trinity Natural Origin Adults in Wild ¹	Trinity Hatchery Origin Adults in Wild ¹	Trinity Total Adults in Wild ¹	Trinity Hatchery ⁴
2000	288	6,297	6,585	3,461
2001	2,945	15,770	18,715	9,755
2002	372	7,440	7,812	6,495
2003	3,264	10,991	14,255	10,396
2004	7,830	15,287	23,117	9,906
2005	1,728	9,974	11,702	16,624
2006	1,416	7,454	8,870	9,839
2007	940	1,612	2,552	2,653
2008	861	2,204	3,065	4,539
2009	438	1,718	2,156	2,477
2010	624	2,146	2,770	3,899
2011	991	2,403	3,394	1,924
2012	1,577	6,335	7,912	7,357
2013	3,948	8,935	12,883	6,204
2014	823	6,405	7,228	2,971
2015	459	166	625	3,059
2016			635	482
2017	34	107	141	270
2018	1	502	503	556
2019	63	358	421	643
Avg. 2000 - 2009	2,008	7,875	9,883	7,615
Avg 2010 - 2019 (2018 excluded due to small sample size)	1,065	3,357	4,001	2,979
Avg. 2010 - 2014	1,593	5,245	6,837	4,471
Avg. 2015 - 2019 (2018 excluded due to small sample size)	185	210	396	1,324

⁴ CDFW, 2021. Annual Report Trinity River Basin Salmon and Steelhead Monitoring Project: Chinook and Coho Salmon and Fall-Run Steelhead Run-Size Estimates Using Mark-Recapture Methods 2020-21

Table 2. Temperatures at time of spawning, and survival of Coho salmon eggs at Trinity River Hatchery from “green” to “eyed” stages, 2021/2022⁵.

Egg Lot	Spawn Date	Avg Daily Water Temp (°C) at TRH	Green Eggs Kept	Eyed Eggs that Survived	% "Eyed" Egg Survival
1	11/2/2021	11.9	30,366	2,882	9.5%
2	11/9/2021	11.9	75,188	19,133	25.4%
3	11/16/2021	11.7	103,369	40,687	39.4%
4	11/23/2021	11.7	121,153	26,938	22.2%
5	11/30/2021	10.0	192,785	77,818	40.4%
6	12/7/2021	10.3	170,373	80,298	47.1%
7	12/14/2021	9.4	101,713	71,159	70.0%
8	12/21/2021	8.1	11,245	5,328	47.4%
9	1/4/2022	6.7	2,860	2,860	100.0%

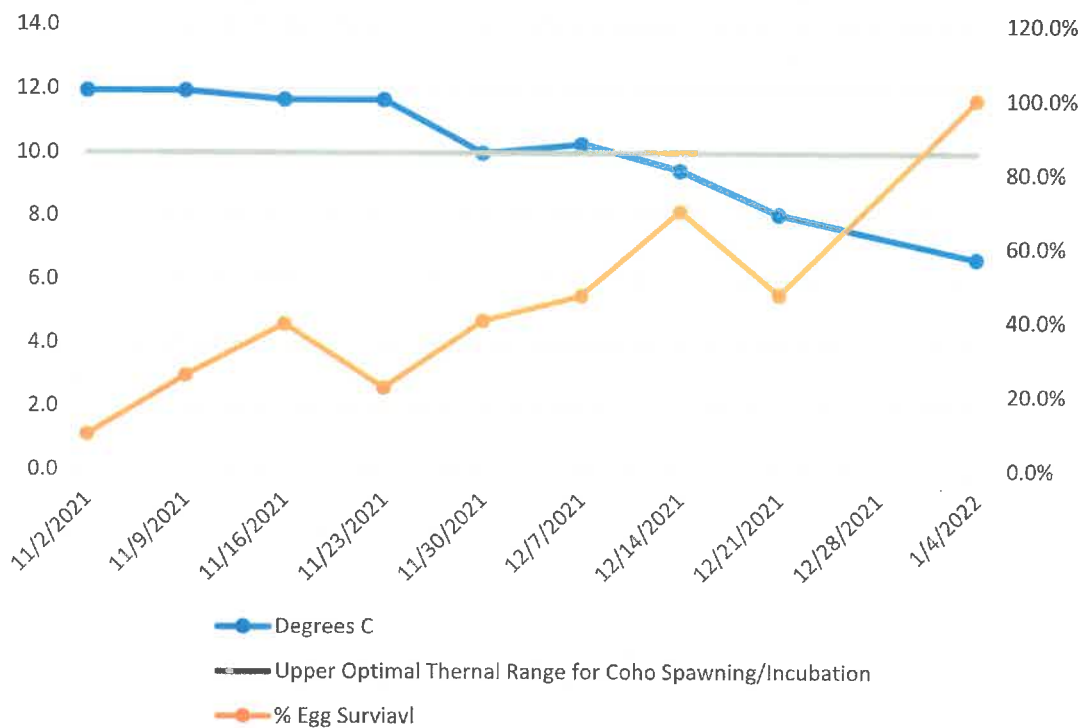


Figure 1. Survival of Coho salmon eggs relative to average daily water temperature at time of spawning, 2021/2022, and upper end of optimal temperature range for spawning/incubating Coho salmon eggs.

⁵ Data obtained from Mark Clifford, Hatchery Senior Environmental Scientist, California Department of Fish and Wildlife staff, February 2022.

Coho Spawned in Natural Areas

Warm water temperature was a problem in the Upper Trinity River as well (Figure 2) during late-fall 2021, indicating that survival of Coho salmon eggs naturally spawned/incubated in the Upper Trinity River was also low. This is a substantial concern given the large numbers of Coho salmon that typically spawn in the mainstem Trinity River, especially in the upper 40 miles of the Trinity River (Table 3). Furthermore, the upper two miles of the Trinity River (near Lewiston, where Figure 2 temperatures were measured) during some years contains the highest densities of naturally spawned Coho salmon of the Trinity River, as documented in 2008 (Sinnen et al, 2010 as cited in NMFS 2017⁶).

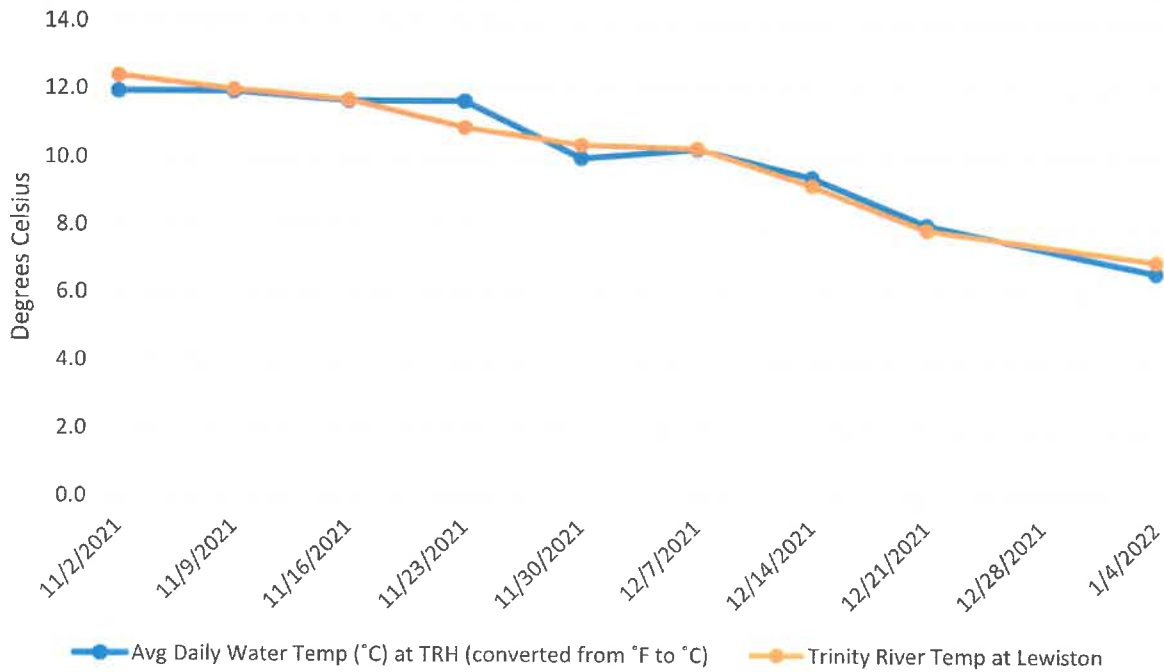


Figure 2. Daily average water temperatures at TRH and in the Trinity River near Lewiston CA, November 2, 2021 to January 4, 2022. Dots represent dates fish were spawned at TRH.

Table 2. Estimated number of Coho salmon redds in the mainstem Trinity River and mainstem Trinity River upstream of the North Fork Trinity River⁶.

Year	Estimated Mainstem Coho Redds	Estimated Mainstem Coho Redds Upstream of North Fork	Percent of Total Redds Upstream of North Fork
2002	662	658	99%
2003	106	106	100%
2004	1,320	1,305	99%
2005	935	927	99%
2006	639	634	99%
2007	141	131	93%
2008	444	442	100%
2009	133	129	97%
2010	545	544	100%
2011	126	115	91%
2012	273	266	97%
2013	1,018	985	97%
2014	473	441	93%
2015	40	39	98%

Sources: Chamberlain et al. 2012a; Chamberlain et al. 2012b; Chamberlain et al. 2015a; Chamberlain et al. 2015b; Chamberlain et al. 2015c; Rupert et al. 2015.

Low Reservoir Levels in Late Fall 2021 Created Warm River Temperatures

During the late fall of 2021, Trinity Reservoir was managed to low storage levels (677,712 of storage on November 2), resulting in warm water temperatures being released to the Trinity River. As noted in Kamman (1999⁷): “During dry periods, when Trinity reservoir levels get too low, warmer surface waters are drawn into the Trinity dam powerhouse intake, resulting in relatively warm water releases to Lewiston Lake. In turn, these warm temperatures are propagated through Lewiston Lake to the river.” Studies have been conducted to determine the appropriate end-of-year Trinity reservoir levels so that river releases are cool enough to meet the biological needs of fish in the Trinity River. According to Bender (2012⁸), a cursory sensitivity analysis indicated that end-of-September carryover storage of less than 750,000 acre-feet is potentially thermally problematic for cold water fish in the Trinity River. According to Deas (1998⁹): “In general, elevated water temperature at the power/main intake elevation was an issue for carry-over storage of 750,000 AF. Only under certain circumstances was temperature a

⁶ NMFS 2017. *Hatchery and Genetics Management Plan for Trinity River Hatchery Coho Salmon*. 117 pp.

⁷ Kamman 1999. *Temperature Analysis of Proposed Trinity River Fish and Wildlife Restoration Flow Alternatives Using the Better Model*.

⁸ Bendor M.D., 2012. Bureau of Reclamation, Technical Service Center, Technical Memorandum 86-68220-12-06.

⁹ Deas, M.L., 1998. Trinity Reservoir Carryover Analysis.

concern at 1,250,000 AF, and there were no temperature concerns for carry-over storage of 1,750,100 AF.”

As noted in a recent study (Asarian et al. in preparation¹⁰): “The relationship between reservoir storage and water temperature at the elevation of the main outlet appears to be non-linear, with an inflection point around 1,250,000 AF where temperatures rise increasingly steeply as reservoir storage drops beyond this level (see Figure 3)”.

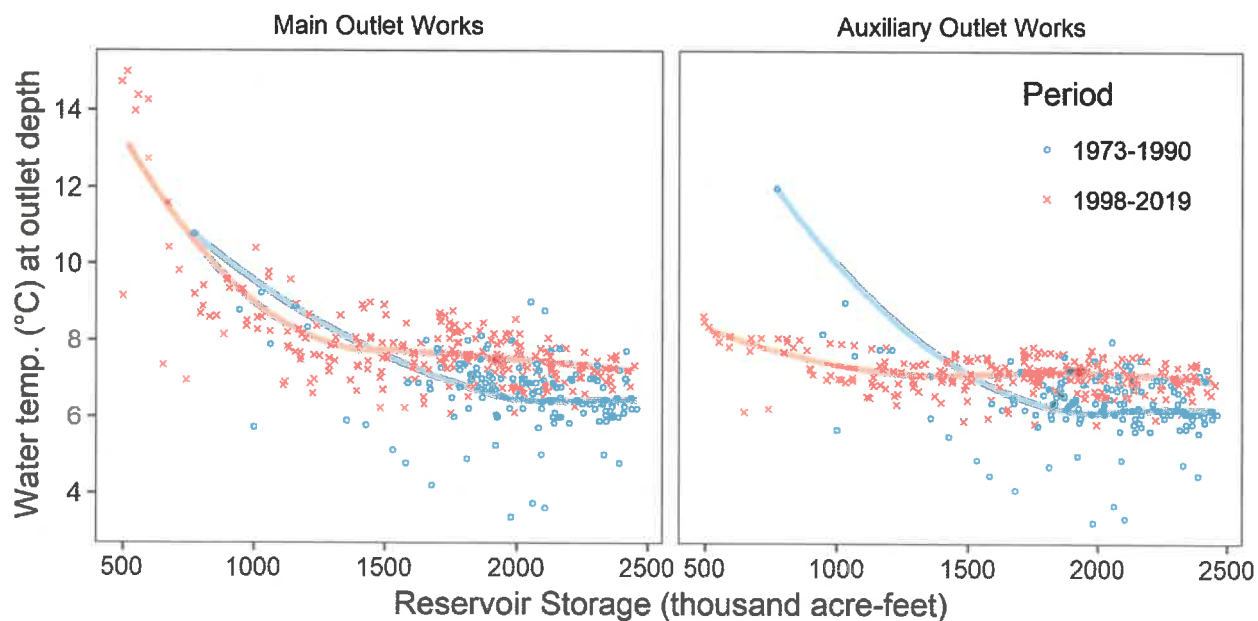


Figure 3 (taken from Asarian et al, in preparation). Comparison of the 1972–1990 and 1998–2019 time periods for the relationship of Trinity Reservoir storage volume to water temperatures at elevations of main outlet (2114 ft) and auxiliary outlet (2000 ft) for all months (January–December) in 38 years from 1972–2019, excluding years without data. Data extracted from reservoir profiles measured by USBR (2020). At low reservoir storage, a few high temperature values cause the blue trend line for 1973–1990 be higher than red trend line for the 1998–2019, but this an artifact of particular conditions that occurred in 1977 and not representative of the overall period³. Lines are LOESS (LOcally Estimated Scatterplot Smoothing) smoothers. Concept for figure adapted from Barajas (2016).

During 2021, when warm water temperatures resulted in low survival of Coho salmon (November 2 – December 14 – see Figure 1), storage in Trinity reservoir ranged from 677,712 AF to 707,699 AF; well below levels recommended to protect cool Trinity River temperature releases. While other factors, such as withdrawal rates and temperature of winter inflow, can affect the relationship between release temperatures and the amount of water stored in Trinity Reservoir, Trinity Reservoir carryover storage (amount of water stored at the end of the water year – September 30) is a primary driver of the temperature of water released to the Trinity River.

¹⁰ Asarian J.E., K. De Julio, D. Gaeuman, S. Naman, and T. Buxton in preparation/review. Synthesizing 87 years of scientific inquiry into Trinity River water temperatures. 225 pp.

New Temperature Targets to Prevent Take of SONCC Coho Salmon Adults, Eggs, and Embryos

For the Trinity River to support SONCC Coho salmon reproduction, management measures need to be implemented that result in temperatures conducive to the survival of Coho salmon eggs. Such measures include maintaining adequate reservoir storage levels (well above 750,000 AF and likely near 1.25 million AF), potential use of the auxiliary outlet to access colder water (Deas 1998⁹, Kamman 1999⁷), and potentially other measures to improve capabilities of TRD infrastructure to control temperature of release independent from storage and operations in Lewiston Reservoir, including those identified by Bender (2012⁸). Additionally, a new Coho salmon specific temperature threshold of 10 °C or less³ for releases from Lewiston Reservoir to the Trinity River should be adhered to starting November 1st and extending to December 31st annually.