BUREAU OF RECLAMATION

Cachuma Order WR-2019-0148 Term 27 Annual Compliance Report for Water Year 2020

Cachuma Project, California
Interior Region 10 – California Great Basin

U.S. Department of the Interior

December 2020

Mission Statements

The Department of the Interior (DOI) conserves and manages the Nation's natural resources and cultural heritage for the benefit and enjoyment of the American people, provides scientific and other information about natural resources and natural hazards to address societal challenges and create opportunities for the American people, and honors the Nation's trust responsibilities or special commitments to American Indians, Alaska Natives, and affiliated island communities to help them prosper.

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.

Contents

Page

Introduction

On September 17, 2019 the State Water Resources Control Board (State Water Board) adopted Order WR-2019-0148 (Order) amending permits 11308 and 11310 (Applications 11331 and 11332) held by the United States Department of Interior, Bureau of Reclamation (Reclamation) for the Cachuma Project in Santa Barbara, California.

Term 27 of the Order requires Reclamation to *"submit a report and all supporting data by December 31 of each year that documents right holder's[1] compliance with all permit terms for the previous water year ending September 30. To document compliance with term 15, right holder shall submit annually to the Deputy Director the document produced in accordance with paragraph (1) of the term and condition that implements Reasonable and Prudent Measure No. 11 of the 2000 Biological Opinion."*

In accordance with Term 27 of the Order, Reclamation provides the following report for Water Year 2020 (October 1, 2019 through September 30, 2020). Italicized text is direct language from the Order. Reclamation's response to terms of the Order are in regular font.

Term 1

This term states, *"The authorized purpose of use under Permits 11308 and 11310 shall be: Irrigation, Municipal, Domestic, Industrial, Salinity Control, Incidental Recreation, Stockwatering, and Fish and Wildlife Conservation."*

Term is noted. Reclamation is operating the Cachuma Project pursuant to the authorized purpose of use described under the Order.

Term 2

This term states, *"The authorized place of use under Permits 11308 and 11310 shall be:*

The Santa Ynez River including Lake Cachuma and tributaries (including Hilton Creek) for Fish and Wildlife Conservation. All lands included within existing boundaries (205,376 acres) including the areas of service within the political boundaries of the Cachuma Member Units: the Carpinteria Valley Water District, the City of Santa Barbara, the Goleta Water District, the Montecito Water District, and the Santa Ynez River Water Conservation District, Improvement District No. 1, and a net irrigable acres of 40,250 acres within a gross area of 205,376 acres, as shown on maps filed with the State Water Board. Recreational use at Cachuma Reservoir."

Term is noted. Reclamation is operating the Cachuma Project pursuant to the authorized place of use as described under the Order.

[1] The term "Right Holder" from the Order refers to the Bureau of Reclamation.

Term 3

This term states, *"Permits 11308 and 11310 shall be amended to include mandatory permit terms A through Q. Mandatory permit term E shall replace existing permit terms 3 and 11, and mandatory permit term O shall replace existing permit term 4 of Permits 11308 and 11310."*

Term is noted.

Term 4

This term states, *"Standard permit terms 5F and 5R shall replace existing permit terms 1 and 2 respectively of Permits 11308 and 11310."*

Term is noted.

Term 5

This term states, *"For the protection of downstream rights, existing permit terms 5 and 6 of Permits 11308 and 11310, as modified by Order WR 73-37 and amended by Order WR 89-18, shall be amended in accordance with the technical amendments proposed by the parties to a settlement agreement dated December 17, 2002, and agreed to by right holder, and attached to and incorporated herein by reference (Appendix 2). All other sections, paragraphs or subparagraphs of existing permit terms 5 and 6 of Permits 11308 and 11310, as modified by Order WR 73-37 and amended by Order WR 89-18, not specifically amended by the December 17, 2002 agreement or this Order are intended to and shall remain in full force and effect."*

Term is noted.

Term 6

This term states, *"Existing permit term 7 of Permits 11308 and 11310, as modified by Order WR 73-37 and amended by Order WR 89-18, shall be amended to read as follows:*

> *The State Water Board reserves authority to make any amendments to Permits 11308 and 11310, as may be required concerning proper and adequate releases of water for downstream use, and recharge of groundwater, in satisfaction of downstream rights, based on any changes to the December 17, 2002 settlement agreement between the Cachuma Conservation Release Board; the Santa Ynez River Water Conservation District, Improvement District No. 1; the Santa Ynez River Water Conservation District; and the City of Lompoc, following notice and opportunity for hearing."*

Term is noted.

Term 7

This term states, *"Existing Permit terms 9, 10, 12, and 13 of Permits 11308 and 11310, shall remain unchanged."*

Term is noted.

Term 8

This term states, *"Right holder is on notice that when the State Water Board determines that any person is violating, or threatening to violate, any term or condition of a right, the State Water Board may issue an order to that person to cease and desist from that violation. (Wat. Code, § 1831.) Civil liability may be imposed administratively by the State Water Board pursuant to Wat. Code, § 1055, or may be imposed by the superior court. The Attorney General, upon the request of the board, shall petition the superior court to impose, assess, and recover those sums. (Wat. Code, § 1846.)"*

Term is noted.

Term 9

This term states, *"Right holder shall comply with the measuring and monitoring requirements as specified in the terms of this right or any reporting requirements by statute, order, policy, regulation, decision, judgment or probationary designation. The more stringent requirement shall control in each instance where there is a conflict or inconsistency between the requirements. Right holder shall comply with the measuring and monitoring requirements of chapter 2.8, title 23, California Code of Regulations."*

Reclamation provides annual permittee reports for Water Right ID A011331, Permit Number 011308, and Water Right ID A011332, Permit Number 011310 to the State Water Board by April 1st of the following year.

Term 10

This term states, *"Right holder shall measure the amount of water beneficially used under this right using devices and/or methods satisfactory to the Deputy Director. In order to demonstrate compliance with the beneficial use monitoring requirements of this right, right holder shall provide evidence that the devices and/or methods are functioning properly, in a manner satisfactory to the Deputy Director, within thirty days of first use of the device or method, with the reports required by chapter 2.7, title 23, California Code of Regulations, and whenever requested by the Division of Water Rights."*

Reclamation provides annual permittee reports for Water Right ID A011331, Permit Number 011308, and Water Right ID A011332, Permit Number 011310 to the State Water Board by April 1st of the following year.

Term 11

This term states, *"Right holder shall comply with the reporting requirements of chapter 2.7, title 23, California Code of Regulations. Right holder shall promptly submit any reports, data, or other information that may reasonably be required by the State Water Board, including but not limited to documentation of water diversion and beneficial use under this right."*

Reclamation provides annual permittee reports for Water Right ID A011331, Permit Number 011308, and Water Right ID A011332, Permit Number 011310 to the State Water Board by April 1st of the following year.

Term 12

This term states, *"Urban water suppliers must comply with the Urban Water Management Planning Act (Wat. Code, § 10610 et seq.) An "urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. This term will be implemented in conjunction with term 34."*

Reclamation notes that certain defined Urban water suppliers are required to comply with the Urban Water Management Planning Act. See Reclamation's response regarding Term 34.

Term 13

This term states, *"Agricultural water users and suppliers must comply with the Agricultural Water Management Planning Act (Act) (Water Code, § 10800 et seq.). Agricultural water users applying for a permit from the State Water Board are required to develop and implement water conservation plans in accordance with the Act. An "agricultural water supplier" means a supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. An agricultural water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers."*

Reclamation notes that certain defined Agricultural water suppliers are required to comply with the Agricultural Water Management Planning Act.

Term 14

This term states that *"No water shall be diverted or used under this right for commercial and applicable personal medical use cannabis cultivation unless the water right holder is in compliance with all applicable conditions, including the numeric and narrative instream flow requirements, of the current version of the State Water Board's Cannabis Cultivation Policy – Principles and Guidelines for Cannabis Cultivation."*

Cannabis is considered a Schedule I controlled substance under the Controlled Substance Act of 1970, as amended; as such, Reclamation does not allow federal water to be used for cannabis cultivation.

Term 15

This term states, *"Except as otherwise provided in this term and in term 16 below, right holder shall operate and maintain the Cachuma Project and implement conservation measures including but not limited to those described in Revised Section 3 (Proposed Project) of the Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River, June 2000, taking into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion, and right holder shall comply with all of the Reasonable and Prudent Measures 5 and 7 through 13, set forth at page 68, and the Terms and Conditions, set forth at pages 70–78, in the National Marine Fisheries Service's (NMFS) Biological Opinion: U.S. Bureau of Reclamation operation and maintenance of the Cachuma Project on the Lower Santa Ynez River in Santa Barbara County, California, September 2000 (2000 Biological Opinion). Right holder shall notify the State Water Board's Executive Director (Executive Director) within 30 days of the issuance of a new Biological Opinion. To prevent any conflicting requirements upon issuance of any new Biological Opinion, the Executive Director may modify this term upon request of right holder after receiving the approval of NMFS. Any modification to this term shall be made in accordance with section 780 of title 23 of the California Code of Regulations."*

As noted in the Term 18 Plan submitted to the State Water Board on December 17, 2019, Reclamation has and will continue to comply with terms and conditions of the 2000 Biological Opinion issued by the National Marine Fisheries Service (NMFS) for the Cachuma Project.

Reclamation is in re-consultation with NMFS on the Operation and Maintenance of the Cachuma Project. A Biological Assessment was submitted to NMFS on December 18, 2020. Reclamation will notify the State Water Board's Executive Director within 30 days of the issuance of a new Biological Opinion.

Term 15(a)

This term states, *"For the protection of fish and other public trust resources in the Santa Ynez River below Bradbury Dam, right holder shall release or bypass water to maintain the following Mainstem Rearing instream flows in the Santa Ynez River, as set forth below, at all times.*

Table 1 Flows
Mainstem Rearing Flows

Reservoir Spill (af)[a]	*Lake Storage (af)*[b]	*Flow (cfs) Requirements at:*		
		Highway 154	*Alisal Road*	*Stilling Basin & Long Pool*
≥20,000	*N/A*	*10*	*1.5*[c]	-
< 20,000	*≥ 120,000*	*5*	*1.5*[d]	-
	≥30,000 and <120,000	*2.5*	*1.5*[d]	-
	<30,000	-	-	*30 af/mo*[e]

NA - not applicable

[a] *Reservoir spill is calculated cumulatively over the course of the water year (FEIR, Vol. IV, Appendix F, Draft Technical Memorandum No. 5, p. 6), which begins October 1 (FEIR, Vol. IV, Appendix F, Draft Technical Memorandum No. 5, p. 8).*

[b] *Lake storage is measured on the first day of each month. (FEIR, Vol. IV, Appendix E, Technical Memorandum No. 1, p. 5.)*

[c] *The specified flow applies only when Oncorhynchus mykiss are present.*

[d] *The specified flow applies only if there was reservoir spill greater than or equal to 20,000 af in the prior water year and Oncorhynchus mykiss are present in the Alisal Reach.*

[e] *When there is less than 30,000 af of total water stored in the reservoir, regardless of origin, right holder shall provide periodic releases of 30 af per month to refresh the Stilling Basin and Long Pool directly downstream of the dam to provide for Oncorhynchus mykiss rearing in these areas. Less than 30 af per month may be released upon determination by the fishery agencies and the State Water Board that less water is necessary to refresh the Stilling Basin and Long Pool directly downstream of the dam for Oncorhynchus mykiss in these areas."*

As shown in Figure 1, water storage in Lake Cachuma was greater than 120,000 acre-feet throughout the entire year. Pursuant to Table 1 of the Order, required flows between October 1, 2019 through September 30, 2020 were 5 cubic feet per second at Highway 154. No flows were required at Alisal Road since Lake Cachuma did not spill in Water Year 2019.

Figure 1. Lake Cachuma Operations Water Year 2020 Summary.

Month	End of Month Storage	Monthly Totals													
		Change in Storage	Rainfall		Evaporation		CCWA Inflow	Releases						Computed Inflow
								Park	S. Coast	Hilton	WR 89-18	Outlet	Spillway	
	acre-feet	*acre-feet*	*inches*	*acre-feet*	*inches*	*acre-feet*	*acre-feet*	*acre-feet*	*acre-feet*	*acre-feet*	*acre-feet*	*acre-feet*	*acre-feet*	*acre-feet*
EOM	Storage	Change	Rain_in	Rain_af	Evap_in	Evap_af	CCWA	Park	Tecolote	Hilton	WR8918	Outlet	Spillway	Comp_In
Sep 2019	144,474.7													
Oct 2019	141,460.7	(3,014.0)	-	-	6.080	945.8	-	1.8	1,609.3	160.6	-	234.6	-	(61.9)
Nov 2019	139,540.1	(1,920.5)	1.5	309.9	3.370	496.7	-	1.7	1,264.5	193.5	-	202.0	-	236.3
Dec 2019	139,884.8	344.7	7.2	1,467.0	1.930	259.7	-	1.2	468.2	201.5	-	191.0	-	1,459.0
Jan 2020	139,198.8	(686.1)	0.5	97.9	2.130	282.2	175.6	1.2	538.2	201.7	-	191.0	-	352.2
Feb 2020	137,666.7	(1,532.1)	0.1	12.2	3.250	506.8	3.9	1.4	1,112.0	189.5	-	178.0	-	451.6
Mar 2020	142,851.9	5,185.2	8.1	1,649.2	3.110	481.8	58.0	0.9	722.4	250.0	-	177.0	-	6,751.2
Apr 2020	156,800.4	13,948.6	3.6	757.4	4.660	816.3	34.5	0.8	974.5	272.5	-	1,634.0	-	17,608.6
May 2020	154,484.7	(2,315.7)	0.1	15.5	8.180	1,467.4	52.5	0.9	1,556.3	289.3	-	804.0	-	1,749.6
Jun 2020	151,493.7	(2,991.0)	-	-	8.520	1,526.1	145.8	2.3	1,682.2	278.8	-	318.0	-	670.5
Jul 2020	147,954.5	(3,539.2)	-	-	9.260	1,614.3	277.9	2.9	1,969.8	309.7	-	343.0	-	422.6
Aug 2020	143,999.8	(3,954.7)	-	-	9.100	1,554.6	90.2	-	2,116.6	360.4	-	317.0	-	303.8
Sep 2020	135,569.7	(8,430.1)	-	-	6.870	1,062.0	21.8	-	1,929.6	338.7	5,522.0	-	-	400.3
Total		**(8,904.9)**	**21.0**	**4,309.1**	**66.460**	**11,013.7**	**860.2**	**15.0**	**15,943.5**	**3,046.2**	**5,522.0**	**4,589.6**	**-**	**30,343.8**
Minimum	135,569.7	(8,430.1)	-	-	1.9	259.7	-	-	468.2	160.6	-	-	-	(61.9)
Average	144,260.0	(742.1)	1.8	359.1	5.5	917.8	71.7	1.2	1,328.6	253.9	460.2	382.5	-	2,528.6
Maximum	156,800.4	13,948.6	8.1	1,649.2	9.3	1,614.3	277.9	2.9	2,116.6	360.4	5,522.0	1,634.0	-	17,608.6

As shown in Attachment A, Reclamation made daily releases from Bradbury Dam through the Hilton Creek Watering System and the Dam's River Outlet works to meet the 5 cfs target flow at Highway 154 pursuant to Table 1.

As noted previously, there is no feasible and reliable way to get a direct measurement of flows at Highway 154; therefore, Reclamation used an alternate site downstream of the Highway 154 bridge to measure flows and confirm releases made from the Dam were meeting target flow requirements as described in the Term 18 Plan provided to the State Water Board.

As shown in Figure 2, measured flows at Refugio Road (River Mile 3.88), approximately 1 mile downstream of Highway 154, confirmed that releases made at Bradbury Dam were meeting or exceeding target flows below Highway 154. It should be noted that measurements at Refugio Road were discontinued after August 25, 2020 due to safety concerns as a result of higher flows in the Santa Ynez River due to releases to comply with Water Rights Order 89-18 as requested by the Santa Ynez River Water Conservation District.

As shown in the September 2020 Daily Operations Report (Attachment A), Water Rights Releases were initially started at 120 acre-feet (60.5 cfs) and continued through the end of the 2020 Water Year. All of the 89-18 Water Rights releases were significantly greater than releases previously made from Bradbury Dam and shown to meet target flows at Highway 154 (Figure 2). As shown in Figure 3, flows at the Solvang gage (#11128500), more than seven miles downstream of Highway 154, was zero before the start of 89-18 Water Rights Releases. Flows at this location ramped up to approximately 130 cfs before dropping slowly and leveling out to approximately 50 cfs through the end of the Water Year.

Figure 2. Lower Santa Ynez River Measured Flows at Refugio Road.

Date	Total Release at Bradbury Dam (AF)[1]	Total Release at Bradbury Dam (cfs)[2]	Refugio Road (cfs)
5/27/2020	18.3	9.23	5.78
6/25/2020	20.3	10.23	5
7/22/2020	22.3	11.24	6.4
7/23/2020	20.7	10.44	6.2
8/24/2020	21.6	10.89	6.01
8/25/2020	22.6	11.39	5.4

[1]Sum of River Outlet Works and Hilton Creek Watering System releases from Daily Operations Reports.
[2]Conversion from acre-feet (AF) to cubic feet per second (cfs).
[3]Field measurements taken by Reclamation hydrotechnicians at River Mile 3.88 near the eastern end of Refugio Road approximately 1 mile below the Highway 154 target at River Mile 2.98.

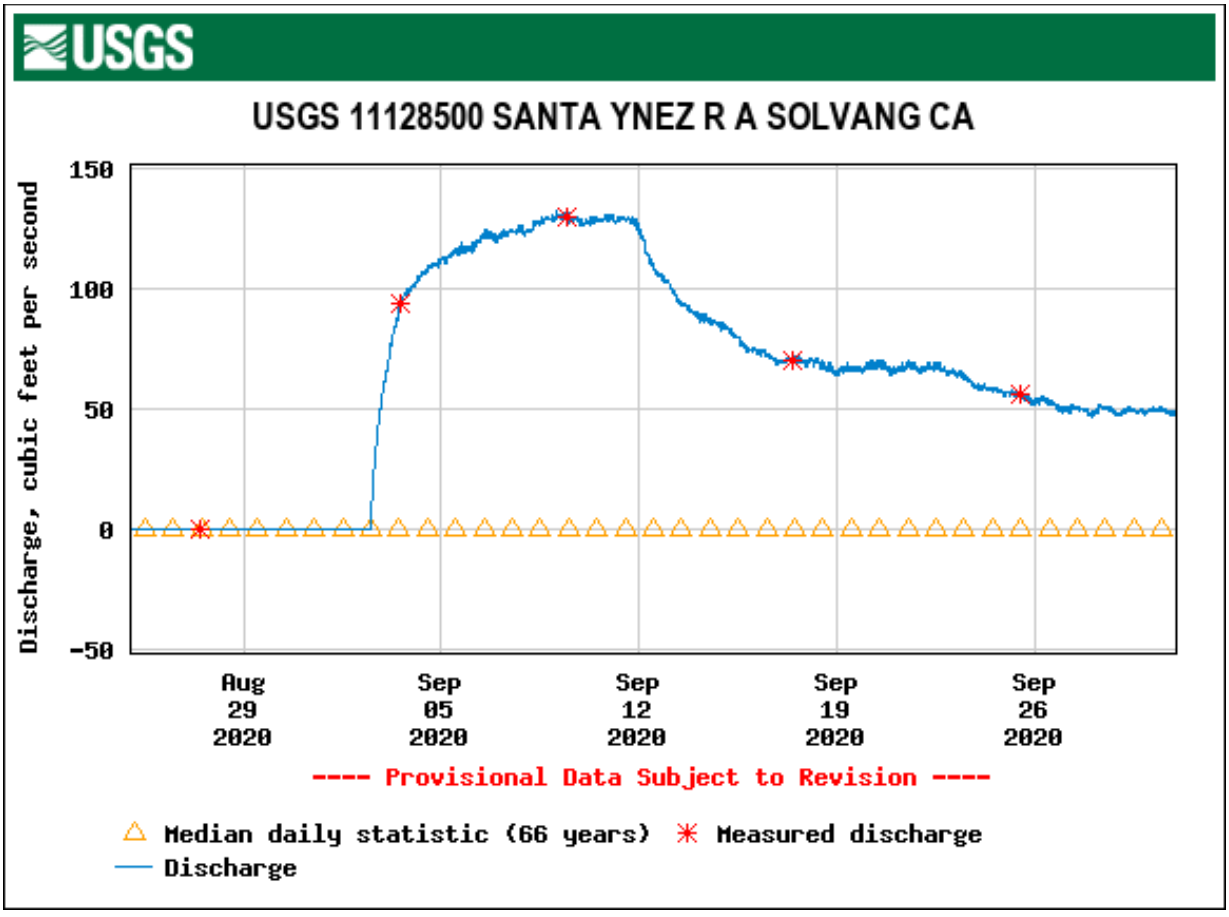

Figure 3. Lower Santa Ynez River Flows at USGS 11128500 (Solvang) from August 25, 2020 through September 30, 2020

Term 15(b)

This term states, *"Notwithstanding the foregoing, right holder is not required to implement any of the tributary passage impediment and barrier fixes described in Revised Section 3 (Proposed Project) of the Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River, June 2000."*

Term noted.

Term 15(c)

This term states, *"Right holder shall proceed with rescue efforts within a period necessary to prevent steelhead mortality following any flow interruption of the Hilton Creek Watering System. Right holder shall post all flow interruptions of the Hilton Creek Watering System and rescue efforts on a publicly accessible website."*

Term 15(c) was not applicable as no flow interruptions of the Hilton Creek Watering System occurred in Water Year 2020.

Term 16

This term states, *"Right holder shall release or bypass water to meet the Table 2 Flows, set forth below, at all times during Wet and Above Normal water year types."*

Term noted. Cumulative inflow throughout Water Year 2020 never reached 33,707 acre-feet; therefore, Table 2 flows were not triggered.

Term 16(a)

This term states, *"For purposes of this term, water year types shall be classified in accordance with the following index:*

Cachuma Reservoir Inflow Index for Water Year Classification

Water Year Classification (Oct. 1-Sep. 30)	*Index (Cachuma Reservoir Inflow) (af)*
Wet	*> 117,842*
Above Normal	*≤ 117,842 > 33,707*
Below Normal	*≤ 33,707 > 15,366*
Dry	*≤ 15,366 > 4,550*
Critical	*≤ 4,550*

Term noted. Reclamation is using the index provided in the Water Order to determine year type.

Term 16(b)

This term states, *"Table 2 Flows are triggered when the cumulative Cachuma inflow (beginning October 1 of each year) of 33,707 af is first reached during a water year. Cumulative Cachuma inflow starts at zero at the beginning of every water year.*

Table 2 Flows
(Wet and Above Normal Water Year Types)

*Minimum Flow Requirement**	*Period of Flow*	*Purpose of Flow*
48 cfs	*02/15 to 04/14*	*Spawning*
20 cfs	*04/15 to 06/01*	*Incubation and Rearing*
25 cfs	*06/02 to 06/09*	*Emigration*
Ramp to 10 cfs by 06/30		
10 cfs	*06/30 to 10/01*	*Rearing and Resident Fish Maintenance*
5 cfs	*10/01 to 02/15*	*Resident Fish*

**The above flows shall be maintained at both San Lucas and Alisal bridges. These flows may be met with both natural stream flow and releases from Bradbury Dam."*

As shown in Figure 1, cumulative inflow throughout Water Year 2020 never reached 33,707 acre-feet; therefore, Table 2 flows were not triggered.

Term 16(c)

This term states, *"During any given water year, Table 2 Flows may be reduced or terminated for a period not to exceed the remainder of the water year if CDFW or NMFS determines that the flows are likely to harm the fishery. Right holder shall temporarily reduce or stop releases to meet the Table 2 Flows if and as directed by the Director of CDFW or the Assistant Regional Administrator for Protected Resources in the Southwest Region of the NMFS. Within three business days of receiving direction from CDFW or NMFS to temporarily reduce or stop releases to meet the Table 2 Flows, right holder shall notify the Executive Director and provide all relevant supporting information. The Executive Director may disapprove the direction to reduce or terminate the flows if the Executive Director disagrees with the determination that Table 2 Flows would harm the fishery, after which the Executive Director will confer with NMFS and CDFW. Right holder shall make available on a publicly accessible website the determination by CDFW and NMFS that flows will be modified, including information regarding the reason the flows are likely to harm the steelhead, any new regimes that are implemented, and the expected duration of the modification. In exercising authority under this paragraph, the Executive Director shall not reduce any water releases other than releases to meet Table 2 Flow requirements."*

Term 16(c) was not applicable as Table 2 flows were not triggered in Water Year 2020.

Term 16(d)

This term states, *"Right holder shall implement a change to the schedule of the Table 2 Flows as directed by CDFW or NMFS, if CDFW or NMFS, right holder, and the Member Units have agreed to an accounting method that ensures that the change will not cause a greater water supply impact than the impact that would occur if water were released to meet the Table 2 Flows in accordance with the existing schedule. Within five business days of reaching an agreement that allows for the Table 2 Flow schedule to be changed, right holder shall notify and submit the agreement to the Executive Director, who may disapprove any changes to the schedule. Any change to the schedule of Table 2 Flows shall comply with the requirements of the California Environmental Quality Act Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000–15387)."*

Term 16(d) was not applicable as Table 2 flows were not triggered in Water Year 2020.

Term 16(e)

This term states, *"If CDFW or NMFS directs a change to the schedule of Table 2 Flows pursuant to paragraph (16b) above, but right holder and the Member Units do not agree to the change consistent with paragraph (16d),*

CDFW or NMFS may request the Executive Director to require the change, and the Executive Director may require right holder to implement the change, provided that the Executive Director determines that the change will not cause a greater water supply impact than the impact that would occur if water were released in order to meet the Table 2 Flows in accordance with the existing schedule."

Term 16(e) was not applicable as Table 2 flows were not triggered in Water Year 2020.

Term 16(f)

This term states, *"Within one year of the adoption of this Order, right holder shall confer with the Member Units to analyze reducing the safe yield of the Cachuma Project to prevent the loss of beneficial uses of the project during severe shortages. In determining the project's safe yield, right holder and Member Units shall consider the increased flow requirements (Table 2 Flows) in wet and above normal water years, past multi-year droughts, and the potential for more frequent and severe periods of drought in the future. Consideration shall also be given to revision of the assumptions used in prior determinations of the "operational yield" of the project. Within 18 months of the adoption of this Order, right holder shall advise the Executive Director in writing of any current or planned reduction to the Cachuma Project's safe yield."*

Pursuant to Term 16(f), Reclamation is coordinating with the County of Santa Barbara and the Member Units regarding potential changes to the safe yield of the Cachuma Project. Discussions and analysis are ongoing to prevent the loss of beneficial uses during severe shortages. At present, there are no current or planned reductions to the Cachuma Project's safe and operational yield. Reclamation will notify the Executive Director of the State Water Board in writing of any changes to the safe yield.

Term 17

This term states, *"For all draft and final plans, studies, and reports required by this Order, right holder shall consult with CDFW and NMFS. Consultation shall include, but need not be limited to, the following:*

> *(1) Within 30-business days of adoption of this Order, right holder shall contact and schedule ongoing and regular consultation meetings with CDFW and NMFS. Right holder, NMFS, and CDFW shall develop and identify study and plan components during their consultation meetings.*
>
> *(2) Upon completion of any study plan component, whether draft or final, right holder shall transmit the components to CDFW and NMFS.*
>
> *(3) Right holder shall provide CDFW and NMFS with at least 30-business days to comment on the documents prior to submittal to the Deputy Director. This 30-business day comment period shall apply to all draft, final, or revised submissions to the Deputy Director.*
>
> *(4) Right holder shall include any comments submitted by CDFW or NMFS in any submission to the Deputy Director, shall explain how the comments were addressed, and shall explain right holder's reasons for not incorporating changes based on comments from CDFW or NMFS, if applicable.*
>
> *(5) In addition to the regular ongoing meetings, right holder shall hold an annual meeting with CDFW and NMFS during each year that studies described in this Order are being conducted. The annual meeting will be held in July, unless a different date is mutually agreed upon in writing. At the annual meeting, right holder*

must present data collected in the previous year and report progress on each study identified in the approved study plan and compliance with this Order."

Pursuant to Term 17(1), Reclamation contacted NMFS and CDFW to set up an initial consultation meeting that was held on October 24, 2019. A follow-up meeting was held in December 2019. Reclamation continues to coordinate with NMFS and CDFW to schedule recurring/regular meetings as needed.

Pursuant to Term 17(2) and 17(3), Reclamation has submitted draft plans for Term 18 and Term 20 to NMFS and CDFW for the requisite minimum 30-working day review period.

Pursuant to Term 17(4), Reclamation submitted the Term 18 and Term 20 plans to the State Water Board with NMFS' and CDFW's comments and explained how they were addressed including reasons for not incorporating any proposed changes.

Pursuant to Term 17(5), Reclamation will schedule the required annual meeting with NMFS and CDFW in years that studies described in the Order are being conducted. As Reclamation is awaiting a response from the State Water Board on the Term 20 Plan, no studies are planned to begin at this time.

Term 18

This term states, *"Within 90 days from the date of this Order, right holder shall submit to the Deputy Director for approval, a plan, describing the measures in place or that will be implemented to ensure compliance with terms 15 and 16. If the plan includes future measures, a schedule for implementation of those measures must also be provided. The Deputy Director may direct right holder to make any changes to the plan reasonably necessary to ensure compliance."*

Pursuant to Term 18, Reclamation submitted a Term 18 Plan to NMFS and CDFW on October 30, 2019 for the requisite minimum 30-working day review period. NMFS and CDFW provided comments on December 11 and December 12, 2019, respectively, leaving Reclamation with five calendar days to complete the Plan and address comments before the Order's December 17, 2019 required submittal to the State Water Board.

Reclamation submitted the Term 18 Plan to the State Water Board along with NMFS' and CDFW's comments on December 17, 2019. However, as Reclamation did not have adequate time to complete the Plan in its entirety, Reclamation provided a supplement to the plan on January 29, 2020. The supplement provided Reclamation's written responses to the comments provided by NMFS and CDFW. On June 4, 2020, Reclamation received a letter dated May 26, 2020 from the State Water Board requesting additional information. Reclamation met with the State Water Board regarding their letter and based on feedback from the State Water Board, Reclamation provided a revised plan on August 7, 2020. Discussions between Reclamation and the State Water Board on the Term 18 Plan are ongoing.

Term 19

This term states, *"Right holder shall conduct a study that evaluates the effectiveness of the Table 2 Flows at protecting public trust resources as evaluated over five Wet or Above Normal water year types. Right holder shall complete, submit, and post a report on the results of the study within a year after the conclusion of the fifth Wet or Above Normal water year unless the Executive Director approves a time extension. This study shall be conducted in a manner that provides comparable data to the current monitoring data required by term 26. At a minimum the study must evaluate:*

> *(1) The effects of Table 2 flows on steelhead in the river and quantification of the amount of additional habitat provided, including habitat below the Alisal Reach;*
>
> *(2) The quality and suitability of the additional habitat, considering temperature, dissolved oxygen, and substrate;*
>
> *(3) Any detrimental effects, demonstrated by clear, scientific evidence, to steelhead in the river caused by the additional flows, such as reduced cold water refugia;*
>
> *(4) Whether benefits to the steelhead fishery could be maximized through an alternative flow schedule with equivalent or reduced water supply impacts; and*
>
> *(5) The extent to which the Table 2 Flows can be conjunctively used to satisfy downstream water rights and whether any adjustments to the "above Narrows" account or the "below Narrows" account are warranted to minimize the effects of release or bypass flow requirements on Cachuma Project yield. In performing this analysis, right holder shall confer with interested parties regarding any adjustments to the above Narrows account and/or the below Narrows account."*

Reclamation is developing a plan to conduct a study pursuant to Term 19 that would provide comparable data to current monitoring required by Term 26.

Term 20

This term states, *"Right holder shall develop a plan for conducting the studies in term 24 and any other studies that may be necessary to determine the measures necessary to protect the public trust resources of the Santa Ynez River and keep the steelhead fishery in the Santa Ynez River in good condition at the individual, population, and community level. Submittal of the plan for approval by the Deputy Direction is due within 6 months of the date of this Order unless the Deputy Director provides for an extension of this timeframe. The study plan shall identify the proposed deadlines for completing: each of the individual studies, including the sequencing of the studies; draft reports of the findings of the studies for review and comment by CDFW and NMFS; and the final reports of the results. The study plan shall also include a description of the appropriate metrics to be used to evaluate to what extent a given measure will restore steelhead to good condition."*

Pursuant to Term 20, Reclamation developed a plan for conducting the studies identified in Term 24. The Term 20 Plan was submitted to NMFS and CDFW for the minimum 30-working day review period on January 23, 2020. NMFS provided comments on March 2, 2020 and CDFW provided comments on March 6, 2020.

Reclamation submitted the plan along with the comments to the State Water Board on March 17, 2020. As noted in the submittal, Reclamation did not provide specific responses to the comments as they were similar and predominantly focused on the content and development of the various Term 24 studies rather than addressing the plan for the Term 24 studies required under Term 20. Consequently, very minimal edits to the plan were warranted. Reclamation did revise the section titled Term 24(b)(l) and the draft proposal to use the instream flow incremental method (IFlM) to conduct studies based on feedback provided by NMFS and CDFW.

Reclamation is awaiting a response from the State Water Board regarding the Term 20 Plan.

Term 21

This term states, *"Right holder shall conduct the studies pursuant to the approved study plan described in term 20, including any changes directed by the Deputy Director, including phasing, refinement, or augmentation of studies. The Deputy Director may also require updates and revisions to the study plan on a periodic or as-needed basis as studies are completed or new information becomes available. To the extent possible, studies shall be conducted concurrently and in coordination with any other studies that right holder may be conducting or planning to conduct. Upon written agreement by CDFW and NMFS, the Deputy Director may determine that existing studies fulfill applicable study requirements of this condition."*

Reclamation submitted the Term 20 Plan on March 17, 2020 and is awaiting a response from the State Water Board.

Term 22

This term states, *"After completing each study, right holder shall submit a report to the Deputy Director, CDFW, and NMFS that describes the study and its results and post the report on a publicly accessible website. Right holder shall also develop and submit a final report within a year after completion that summarizes all of the findings of the above reports and identifies specific measures that could be implemented to achieve good condition of the steelhead population in the Santa Ynez River. Unless the Deputy Director approves a time extension, right holder shall submit the summary report one year after the final study report is submitted."*

Reclamation submitted the Term 20 Plan on March 17, 2020 and is awaiting a response from the State Water Board.

Term 23

This term states, *"Right holder shall evaluate the following in each study required in term 24:*

(1) The extent to which the measure could benefit steelhead and other public trust resources;

(2) The technical and regulatory feasibility of the measure;

(3) The costs of the measure;

(4) Any potential impacts of the measure, including potential impacts to water quality, fishery resources, water supplies; and

(5) Any other study-specific criteria indicated below."

Pursuant to Term 23, the evaluation of the above criteria was included in the Term 20 Plan submitted to the State Water Board on March 17, 2020.

Term 24

This term states, *"Right holder shall, at a minimum, conduct the following studies to evaluate measures that may be necessary to keep the steelhead fishery in the Santa Ynez River below Bradbury Dam in good condition at the individual, population, and community level and shall be informed by current scientific information on southern California steelhead recovery, including NMFS' 2012 Final Southern California Steelhead Recovery Plan:"*

See specific responses below.

Term 24(a)

This term states, *"Study and evaluate options for providing steelhead passage of adults and smolts around Bradbury Dam including: fish ladders, locks, elevators, and trap-and-truck operations, including associated collection facilities. The study shall also include, but shall not be limited to, an evaluation of reservoir outlet works, collectors, transport methods, and upstream and downstream release sites. Unless the Deputy Director provides for a variation, the study shall conform to the Santa Ynez River Fish Passage Feasibility Analysis submitted by NMFS (on February 16, 2004) and CDFW (on February 17, 2004) during this proceeding. Right holder shall complete and submit a report on the results of the study to the Deputy Director, CDFW, and NMFS within 24 months from the date of this Order."*

Reclamation previously responded to the State Water Board regarding this issue. Refer to Reclamation's September 16, 2019 letter which is hereby incorporated by reference.

Term 24(b)

This term states, *"Conduct an instream flow study to determine conditions necessary to keep the steelhead in the Santa Ynez River watershed in good condition at the individual, population, and community levels. This study shall include analyses of both flow and non-flow measures that could improve the quantity and quality of steelhead habitat. At a minimum, the study must:*

(1) Evaluate the flow conditions necessary to protect each stage of the steelhead life cycle and maintain the abundance, productivity, genetic and life history diversity, and spatial structure of the population, including an evaluation of the needed frequency, duration, timing, and rate of change of flows for the protection of steelhead and other native species;

(2) Assess the flow conditions necessary to ensure hydrologic connectivity and opportunities for movement between the habitats needed by each stage of the steelhead life cycle, including tributary access, and appropriate channel morphology and sediment transfer that will provide sufficient habitat to keep steelhead in good condition;

(3) Assess potential instream or streamside habitat restoration measures and the potential effects on quantity and quality of steelhead habitat in relation to flow;

(4) Evaluate water quality issues that may impact steelhead including but not limited to elevated temperatures, low dissolved oxygen, and sediment transport and potential measures to address these issues;

(5) Evaluate operational changes to Bradbury Dam that could improve steelhead conditions; and

(6) Evaluate whether the timing of releases made pursuant to Water Rights Order 89-18 should be revised."

On March 17, 2020, Reclamation submitted the Term 20 Plan that addresses the studies identified in this term. Reclamation is awaiting a response from the State Water Board.

Term 24(c)

This term states, *"Study and evaluate the effects of predation, particularly by piscivorous (fish-eating) fish, and nonnative species on steelhead in the Santa Ynez River, and measures that could be implemented to reduce the impacts of those species on steelhead in the river. The study shall specifically evaluate the effects of flows, including but not limited to Table 2 Flows, on supporting habitat conditions that reduce predation and the proliferation of nonnative species, as well as reasonable measures to prevent the introduction or reintroduction of invasive species. In addition, the study shall determine the effects of beaver dams on passage opportunities and distribution of steelhead and measures that could be implemented to reduce any impacts on steelhead in the river from beavers."*

On March 17, 2020, Reclamation submitted the Term 20 Plan that addresses the studies identified in this term. Reclamation is awaiting a response from the State Water Board.

Term 25

This term states, *"Right holder shall use either a gauge or methodology satisfactory to CDFW and NMFS and approved by the Deputy Director to maintain a continuous record of the daily instream flows in the Santa Ynez River at Highway 154 and at Alisal Road, or other sites that the Deputy Director deems suitable, sufficient to document compliance with the terms of this permit. The Deputy Director may require revisions to the methodology or frequency of recording upon a showing of good cause and written agreement from CDFW and NMFS. Unless the Deputy Director approves a variation, right holder shall make instream flow records available daily on a publicly accessible website on as close to a real-time basis as feasible."*

Continuous daily releases at Bradbury Dam are measured by Reclamation and posted to https://www.usbr.gov/mp/cvo/vungvari/cchdop.pdf.

Continuous daily instream flows at Alisal Road (Gage #11128500) are measured by USGS and posted to https://waterdata.usgs.gov/ca/nwis/uv/?site_no=11128500&PARAmeter_cd=00065,00060.

As noted under Term 15, there is no feasible and reliable way to get a direct measurement of daily instream flows at Highway 154 Bridge due to the braided nature of the stream and property access issues. Discussions with the State Water Board regarding compliance with flow requirements at this location are ongoing.

Term 26

This term states, *"Right holder shall implement the monitoring program described in the 2000 Revised Biological Assessment, taking into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion, with consideration of other existing monitoring programs including the California Coastal Salmonid Monitoring Plan. The Deputy Director may amend the monitoring requirements to require additional monitoring or refine existing requirements."*

Pursuant to Term 26, Reclamation is implementing the monitoring program developed for the 2000 Biological Opinion. Reclamation does not have section 7 ESA coverage to implement changes outside the 2000 Biological Opinion's monitoring program. Reclamation is currently undergoing re-consultation with NMFS on the Cachuma Project. Once a new Biological Opinion is issued, Reclamation will implement the monitoring plan developed pursuant to the re-consultation. As stated under Term 15, Reclamation will notify the State Water Board's Executive Director within 30 days of the issuance of a new Biological Opinion.

Term 27

This term states, *"Right holder shall submit a report and all supporting data by December 31 of each year that documents right holder's compliance with all permit terms for the previous water year ending September 30. To document compliance with term 15, right holder shall submit annually to the Deputy Director the document produced in accordance with paragraph (1) of the term and condition that implements Reasonable and Prudent Measure No. 11 of the 2000 Biological Opinion. These reports and all supporting data shall be submitted to the Division of Water Rights in a format designated by the Deputy Director and shall be made readily available on a publicly accessible website. The Deputy Director may amend reporting requirements to determine compliance with all permit terms."*

Pursuant to Term 27, Reclamation has prepared and submitted this report. Based on conversations with State Water Board staff, Reclamation understands that the Deputy Director will not be designating the format for the report and supporting data. As this report and its supporting data will be posted to Reclamation's website, it has been made accessible pursuant to 508 compliance requirements under the Rehabilitation Act of 1973 (29 U.S.C. § 794 (d)).

Pursuant to RPM 11 of the 2000 Biological Opinion, final snorkel monitoring for a given water year is not completed until the fall after the end of the Water Year. As such, the annual monitoring report required under RPM 11 is not completed until after the snorkels are completed. For Water Year 2020, due to water rights releases continuing into November 2020, fall snorkel surveys were completed at the end of November. The RPM 11 Annual Monitoring Report was finalized and submitted to NMFS on December 31, 2020. A copy of the Annual Monitoring Report is included as Attachment B.

Due to concerns with complying with Term 17's requirements, Reclamation requested that the timeline for providing the Term 27 Annual Report be extended in order to provide enough time to submit to NMFS and CDFW prior to finalizing and submitting to the State Water Board. On December 16, 2020, Reclamation received notice that the Deputy Director approved an extension until March 31, 2021. Reclamation anticipates that this will be an ongoing issue in the future when 89-18 Water Rights Releases continue into the late fall. For those years, Reclamation would suggest

that similar extensions be granted to provide enough time for the RPM 11 Annual Monitoring Report to be completed so it can be included as an attachment to the Term 27 Annual Report.

Term 28

This term states, *"The State Water Board reserves authority to modify the terms of this permit as set forth below to the extent necessary and appropriate to implement Water Code section 100 and the public trust doctrine:"*

Term noted.

Term 28(a)

This term states, *"The Executive Director may adjust the Table 2 Flows required by term 16 of this permit."*

Term is noted. It should further be noted that any change to Table 2 flows would require a reassessment of the Cachuma Project safe and operational yield required under Term 16(f).

Term 28(b)

This term states, *"The State Water Board may require right holder to implement any measures to restore or improve fish passage, control predators and nonnative species, or to improve habitat that may be necessary to keep steelhead in good condition. Any subsequent determination concerning the flows or other measures necessary to protect public trust uses and keep fish in good condition should be made with the benefit of the study of the effects of the Table 2 Flows and the results of the studies required by term 24 and any other information available at the time, and shall be made in accordance with section 780 of title 23 of the California Code of Regulations. Right holder shall implement any changes to flow requirements or other required measures in accordance with any time schedule established by the State Water Board once right holder has obtained any necessary regulatory approvals."*

Term noted.

Term 28(c)

This term states, *"Upon a showing of good cause by right holder, NMFS, and CDFW, the Executive Director may authorize right holder to implement measures that can achieve and keep steelhead in the Santa Ynez River in good condition instead of meeting some or all of the Table 2 Flows. Prior to implementation, right holder shall obtain NMFS's and CDFW's approvals of final project designs."*

Term noted.

Term 29

This term states, *"The State Water Board reserves continuing authority to modify this order for conformity with any future Biological Opinion that may be issued regarding the Santa Ynez River steelhead fishery or any modification to the 2000 Biological Opinion."*

Term noted.

Term 30

This term states, *"If right holder anticipates a violation of any of these terms or conditions or if a violation has occurred, right holder shall provide immediate written notification to the Deputy Director and shall make these notifications readily available on a publicly accessible website."*

Term noted.

Term 31

This term states, *"The Executive Director and Deputy Director shall comply with the California Environmental Quality Act Guidelines (California Code of Regulations, Title 14, Division 6, Chapter 3, Sections 15000-15387) when exercising delegated authority under this Order."*

Term noted.

Term 32

This term states, *"Nothing in this Order shall be construed to modify or authorize modification of United States Bureau of Reclamation's independent obligations under the federal Endangered Species Act (16 U.S.C. §§ 1531-1544)."*

Term noted.

Term 33

This term states, *"Right holder shall implement an Oak Woodland Restoration Plan that will achieve a 2:1 replacement ratio of the oak trees 20 years after the first Cachuma surcharge event."*

Pursuant to the 2004 Record of Decision for the Lower Santa Ynez River Fish Management Plan and Cachuma Project Biological Opinion for Southern Steelhead Trout Environmental Impact Statement/Environmental Impact Report (EIS/EIR), Reclamation committed to implementing the long-term oak tree restoration program at Cachuma Lake County Park. As part of this plan, oak trees would be replaced at a ratio to ensure a final 2:1 replacement ratio is met at the end of 20 years.

Term 34

This term states, *"Right holder shall work diligently to revise its April 14, 1996 contract with Santa Barbara County Water Agency to the extent necessary to require the Member Units (the City of Santa Barbara; Goleta Water District; Montecito Water District; Carpinteria Valley Water District; and the Santa Ynez River Water Conservation District, Improvement District No. 1) to implement the water demand management measures identified as part of the urban water shortage contingency analyses contained in their urban water management plans. To the extent authorized by law, right holder shall require the Member Units to implement the measures in accordance with*

the Member Units' urban water management plans, as they may be amended. Right holder shall submit annual status reports to the Deputy Director describing efforts to negotiate a new contract with Santa Barbara County Water Agency. In the event that right holder does not succeed in revising its contract with Santa Barbara County Water Agency in conformity with this term by December 31, 2020, the Board reserves continuing authority to amend Permits 11308 and 11310 (Applications 11331 and 11332) to achieve water use reductions comparable to the Member Units' water demand management measures and delegates that authority to the Deputy Director."

Reclamation previously responded to the State Water Board regarding this issue. Refer to Reclamation's December 9, 2016 letter which is hereby incorporated by reference.

Term 35

This term states, *"Right holder shall submit annual status reports to the Deputy Director describing efforts to make new water supplies and conserved water available to the Member Units. The report shall include, but need not be limited to, right holder's and the Member Units' activities. The report shall include, but need not be limited to, an update on the operational status and capacity of the City of Santa Barbara's desalination plant and the operational status of any other desalination, recycled water, transfers, demand management, reservoir surcharging, or other new sources of supply for the Member Units that may be proposed in the future. Nothing in this Order shall be construed as an approval or endorsement of any water supply project or source of supply. The Deputy Director may modify this term's water conservation reporting requirements for consistency with water conservation reporting requirements adopted pursuant to a regulation or informational order issued pursuant to section 10609.28 of the Water Code."*

Reclamation is not making any new or conserved water supplies available to the Member Units. However, Reclamation does provide funding opportunities through competitive water conservation grant programs. For Water Year 2020 the following cost-share grants were awarded to those in the Santa Barbara County area:

- $1,499,000 to the City of Santa Barbara for their Advanced Metering Infrastructure Project Phase 2 Project through the Water SMART Grants: Water and Energy Efficiency Grants program. The project would install advanced metering infrastructure (AMI) equipment and implement a data management system, along with a customer portal that will support 27,000 primarily residential water meters that were installed in a previous phase of this overall AMI project. By providing real-time water use data about leaks and abnormal use patterns, the project is expected to result in annual water savings of 631 acre-feet and will better prepare the City for extended drought conditions. The water conserved will offset groundwater pumping and reduce the Recipient's dependence on water imported through the State Water Project.

In addition, Reclamation requires water conservation pursuant to Article 20(a) of the Master Water Service Contract. Specifically:

> 20. (a) The parties acknowledge that, as of the date of execution of this contract, the Contractor and each of the Cachuma Member Units that is obligated to do so have developed and are implementing water conservation plans (i) which contain definite water conservation goals, appropriate economically feasible water conservation measures, and a time schedule for meeting the water conservation goals, and (ii) which meet or exceed (A) the requirements of Federal law, and (B) the criteria

> contained in the April 30, 1993 document entitled "U.S. Bureau of Reclamation, Mid-Pacific Region Criteria for Evaluating Water Conservation Plans."

Further, the Member Units address their own respective conservation efforts pursuant to their State-required Urban and Agricultural water management plans. Reclamation does not receive this information.

Attachment A:
Water Year 2020 Lake Cachuma Daily Operations

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

OCTOBER 2019 — LAKE CACHUMA DAILY OPERATIONS

RUN DATE: November 1, 2019

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	735.64	144,475											
1	735.59	144,349	-126	-33.9	0.0	.0	49.8	5.2	7.3	.0	29.8	.190	.00
2	735.55	144,249	-100	-17.8	0.0	.0	48.3	5.2	8.3	.0	20.4	.130	.00
3	735.51	144,150	-99	0.3	0.0	.0	50.8	5.2	7.3	.0	36.0	.230	.00
4	735.47	144,050	-100	-16.8	0.0	.0	48.7	5.2	7.4	.0	21.9	.140	.00
5	735.43	143,950	-100	-5.0	0.0	.0	49.4	5.2	7.5	.0	32.9	.210	.00
6	735.40	143,875	-75	16.4	0.0	.0	48.3	5.2	8.2	.0	29.7	.190	.00
7	735.37	143,800	-75	25.2	0.0	.0	48.6	5.2	7.3	.0	39.1	.250	.00
8	735.33	143,700	-100	-3.0	0.0	.0	48.6	5.2	7.3	.0	35.9	.230	.00
9	735.30	143,625	-75	24.0	0.0	.0	49.7	5.2	8.2	.0	35.9	.230	.00
10	735.25	143,501	-124	-49.6	0.0	.0	52.6	5.1	7.3	.0	9.4	.060	.00
11	735.22	143,426	-75	39.2	0.0	.0	58.0	5.2	7.3	.0	43.7	.280	.00
12	735.18	143,326	-100	5.5	0.0	.0	58.7	5.2	7.3	.0	34.3	.220	.00
13	735.13	143,201	-125	-17.2	0.0	.0	58.5	5.2	8.3	.0	35.8	.230	.00
14	735.09	143,076	-125	-23.6	0.0	.0	57.8	5.2	7.3	.0	31.1	.200	.00
15	735.05	143,002	-74	26.7	0.0	.0	58.7	5.1	7.3	.0	29.6	.190	.00
16	735.02	142,927	-75	18.6	0.0	.0	56.9	5.1	8.3	.0	23.3	.150	.00
17	734.97	142,802	-125	-27.8	0.0	.0	64.6	5.1	7.3	.0	20.2	.130	.00
18	734.92	142,677	-125	-9.9	0.0	.0	71.6	5.1	7.3	.0	31.1	.200	.00
19	734.87	142,552	-125		0.0	.0	82.1	5.1	7.3	.0	29.5	.190	.00
20	734.82	142,428	-124	-35.8	0.0	.0	31.4	5.1	8.3	.0	43.4	.280	.00
21	734.78	142,328	-100	9.1	0.0	.0	61.0	5.1	7.3	.0	35.7	.230	.00
22	734.75	142,253	-75	19.1	0.0	.0	53.8	5.1	7.3	.0	27.9	.180	.00
23	734.72	142,178	-75	0.6	0.0	.0	39.0	5.1	8.3	.0	23.2	.150	.00
24	734.68	142,078	-100	-18.4	0.0	.0	39.7	5.1	7.4	.0	29.4	.190	.00
25	734.65	142,003	-75	32.3	0.0	.0	40.7	5.1	7.3	.0	54.2	.350	.00
26	734.62	141,928	-75	16.9	0.0	.0	39.2	5.1	7.4	.0	40.2	.260	.00
27	734.58	141,830	-98	-18.6	0.0	.0	40.6	5.1	7.4	.0	26.3	.170	.00
28	734.55	141,756	-74	0.9	0.0	.0	40.1	5.1	8.1	.0	21.6	.140	.00
29	734.51	141,658	-98	-9.3	0.0	.0	53.1	5.1	7.3	.0	23.2	.150	.00
30	734.47	141,559	-99	-15.5	0.0	.0	53.0	5.1	8.4	.0	17.0	.110	.00
31	734.43	141,461	-98	5.2	0.0	.0	56.6	6.3	6.3	.0	34.0	.220	.00
TOTAL (AF)			**-3,014**	**-62.2**	**0.0**	**.0**	**1,609.9**	**160.6**	**234.6**	**.0**	**945.7**	**6.080**	**.00**
(AVG)		**142,893**											

COMMENTS:
* COMPUTED INFLOW IS THE SUM OF CHANGE IN STORAGE, RELEASES, AND EVAPORATION MINUS PRECIP ON THE RESERVOIR SURFACE AND CCWA INFLOW.
DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

NOVEMBER 2019 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: December 1, 2019

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	734.43	141,461											
1	734.39	141,362	-99	-19.9	0.0	.0	44.8	6.6	7.0	.0	20.7	.140	.00
2	734.36	141,288	-74	3.9	0.0	.0	39.1	6.6	7.0	.0	25.2	.170	.00
3	734.33	141,214	-74	9.2	0.0	.0	40.3	6.8	8.0	.0	28.1	.190	.00
4	734.29	141,116	-98	-19.6	0.0	.0	39.8	6.5	7.0	.0	25.1	.170	.00
5	734.26	141,042	-74	-3.8	0.0	.0	39.0	6.5	7.0	.0	17.7	.120	.00
6	734.21	140,919	-123	-31.7	0.0	.0	58.6	6.5	7.0	.0	19.2	.130	.00
7	734.18	140,845	-74	21.5	0.0	.0	73.1	6.5	7.0	.0	8.9	.060	.00
8	734.14	140,747	-98	-20.8	0.0	.0	47.5	6.5	7.0	.0	16.2	.110	.00
9	734.13	140,722	-25	52.0	0.0	.0	46.8	6.5	6.0	.0	17.7	.120	.00
10	734.08	140,574	-148	-65.2	0.0	.0	45.7	6.5	7.0	.0	23.6	.160	.00
11	734.05	140,525	-49	22.5	0.0	.0	46.3	6.4	7.0	.0	11.8	.080	.00
12	734.03	140,476	-49	23.6	0.0	.0	44.5	6.4	7.0	.0	14.7	.100	.00
13	734.00	140,402	-74	1.6	0.0	.0	44.5	6.4	7.0	.0	17.7	.120	.00
14	733.98	140,353	-49	19.1	0.0	.0	42.9	6.4	7.0	.0	11.8	.080	.00
15	733.95	140,279	-74	-10.1	0.0	.0	41.7	6.4	7.0	.0	8.8	.060	.00
16	733.92	140,205	-74	-5.9	0.0	.0	42.9	6.4	7.0	.0	11.8	.080	.00
17	733.91	140,180	-25	35.1	0.0	.0	36.9	6.4	8.0	.0	8.8	.060	.00
18	733.89	140,131	-49	32.5	0.0	.0	29.8	6.4	7.0	.0	38.3	.260	.00
19	733.84	140,008	-123	-60.1	0.0	.0	28.9	6.4	7.0	.0	20.6	.140	.00
20	733.83	139,983	-25	22.6	0.0	10.2	29.7	6.4	7.0	.0	14.7	.100	.05
21	733.79	139,885	-98	-37.5	0.0	.0	42.2	6.4	6.0	.0	5.9	.040	.00
22	733.77	139,836	-49	32.8	0.0	.0	48.8	6.4	6.0	.0	20.6	.140	.00
23	733.73	139,737	-99	-26.0	0.0	.0	45.9	6.4	6.0	.0	14.7	.100	.00
24	733.71	139,688	-49	30.2	0.0	.0	47.7	6.4	6.0	.0	19.1	.130	.00
25	733.67	139,589	-99	-21.8	0.0	.0	49.1	6.4	7.0	.0	14.7	.100	.00
26	733.63	139,491	-98	-13.2	0.0	.0	47.5	6.4	6.0	.0	24.9	.170	.00
27	733.67	139,589	+98	14.5	0.0	144.8	37.2	6.4	6.0	.0	11.7	.080	.71
28	733.67	139,589	+0	-64.1	0.0	114.2	28.9	6.4	6.0	.0	8.8	.060	.56
29	733.67	139,589	+0	6.1	0.0	40.8	27.2	6.4	6.0	.0	7.3	.050	.20
30	733.65	139,540	-49	-2.0	0.0	.0	27.3	6.4	6.0	.0	7.3	.050	.00
TOTAL (AF)			**-1,921**	**-74.5**	**0.0**	**310.0**	**1,264.6**	**193.5**	**202.0**	**.0**	**496.4**	**3.370**	**1.52**
(AVG)		**140,297**											

COMMENTS:
* COMPUTED INFLOW IS THE SUM OF CHANGE IN STORAGE, RELEASES, AND EVAPORATION MINUS PRECIP ON THE RESERVOIR SURFACE AND CCWA INFLOW.
DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

DECEMBER 2019 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: January 1, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	733.65	139,540											
1	733.69	139,639	+99	-13.5	0.0	155.0	27.3	6.5	6.0	.0	2.7	.020	.76
2	733.66	139,565	-74	-10.2	0.0	.0	27.4	6.5	7.0	.0	22.9	.170	.00
3	733.64	139,516	-49	-27.9	0.0	12.2	15.4	6.5	6.0	.0	5.4	.040	.06
4	733.73	139,737	+221	56.7	0.0	193.8	11.6	6.5	6.0	.0	5.4	.040	.95
5	733.72	139,712	-25	-18.6	0.0	36.7	11.7	6.5	6.0	.0	18.9	.140	.18
6	733.70	139,663	-49	-16.6	0.0	.0	11.8	6.5	6.0	.0	8.1	.060	.00
7	733.70	139,663	+0	26.9	0.0	4.1	11.8	6.5	6.0	.0	6.7	.050	.02
8	733.71	139,688	+25	12.5	0.0	38.8	11.5	6.5	7.0	.0	1.3	.010	.19
9	733.72	139,712	+24	-18.7	0.0	71.4	12.2	6.5	6.0	.0	4.0	.030	.35
10	733.70	139,663	-49	-18.4	0.0	.0	11.4	6.5	6.0	.0	6.7	.050	.00
11	733.69	139,639	-24	5.5	0.0	.0	11.6	6.5	6.0	.0	5.4	.040	.00
12	733.68	139,614	-25	3.4	0.0	4.1	11.9	6.5	6.0	.0	8.1	.060	.02
13	733.68	139,614	+0	29.6	0.0	.0	11.7	6.5	6.0	.0	5.4	.040	.00
14	733.66	139,565	-49	-18.4	0.0	.0	11.7	6.5	7.0	.0	5.4	.040	.00
15	733.62	139,466	-99	-58.8	0.0	.0	11.6	6.5	6.0	.0	16.1	.120	.00
16	733.61	139,442	-24	11.1	0.0	.0	11.8	6.5	6.0	.0	10.8	.080	.00
17	733.59	139,393	-49	-15.5	0.0	.0	11.6	6.5	6.0	.0	9.4	.070	.00
18	733.58	139,369	-24	13.8	0.0	.0	11.9	6.5	6.0	.0	13.4	.100	.00
19	733.57	139,345	-24	6.9	0.0	.0	11.7	6.5	6.0	.0	6.7	.050	.00
20	733.55	139,296	-49	-13.3	0.0	.0	11.5	6.5	7.0	.0	10.7	.080	.00
21	733.56	139,320	+24	56.3	0.0	.0	11.7	6.5	6.0	.0	8.1	.060	.00
22	733.54	139,272	-48	0.3	0.0	.0	11.6	6.5	6.0	.0	24.2	.180	.00
23	733.66	139,565	+293	-81.5	0.0	401.6	11.9	6.5	6.0	.0	2.7	.020	1.97
24	733.69	139,639	+74	21.8	0.0	89.7	19.6	6.5	6.0	.0	5.4	.040	.44
25	733.68	139,614	-25	17.7	0.0	.0	20.8	6.5	6.0	.0	9.4	.070	.00
26	733.82	139,959	+345	30.0	0.0	357.5	20.9	6.5	7.0	.0	8.1	.060	1.75
27	733.82	139,959	+0	43.2	0.0	.0	19.9	6.5	6.0	.0	10.8	.080	.00
28	733.80	139,909	-50	-11.6	0.0	.0	21.9	6.5	6.0	.0	4.0	.030	.00
29	733.80	139,909	+0	38.9	0.0	.0	19.7	6.5	6.0	.0	6.7	.050	.00
30	733.80	139,909	+0	-65.0	0.0	102.1	20.6	6.5	6.0	.0	4.0	.030	.50
31	733.79	139,885	-24	11.9	0.0	.0	20.7	6.5	6.0	.0	2.7	.020	.00
TOTAL (AF)			**+345**	**-1.5**	**0.0**	**1,467.0**	**468.4**	**201.5**	**191.0**	**.0**	**259.6**	**1.930**	**7.19**
(AVG)		**139,621**											

COMMENTS:
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DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

JANUARY 2020 — LAKE CACHUMA DAILY OPERATIONS

RUN DATE: February 1, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	733.79	139,885											
1	733.77	139,836	-49	-2.5	0.0	.0	21.0	6.6	7.0	.0	11.9	.090	.00
2	733.75	139,786	-50	-3.0	0.0	.0	21.2	6.5	6.0	.0	13.3	.100	.00
3	733.74	139,762	-24	23.6	0.0	.0	20.5	6.5	6.0	.0	14.6	.110	.00
4	733.74	139,762	+0	16.7	26.7	.0	21.5	6.6	6.0	.0	9.3	.070	.00
5	733.74	139,762	+0	2.4	35.8	.0	20.4	6.5	6.0	.0	5.3	.040	.00
6	733.73	139,737	-25	3.5	18.4	.0	21.1	6.5	6.0	.0	13.3	.100	.00
7	733.73	139,737	+0	35.0	6.8	.0	17.4	6.5	6.0	.0	11.9	.090	.00
8	733.72	139,712	-25	-0.6	11.2	.0	12.8	6.5	7.0	.0	9.3	.070	.00
9	733.71	139,688	-24	8.3	0.2	.0	9.4	6.5	6.0	.0	10.6	.080	.00
10	733.69	139,639	-49	-16.0	0.0	2.0	11.9	6.5	6.0	.0	10.6	.080	.01
11	733.69	139,639	+0	46.0	0.0	.0	12.3	6.5	6.0	.0	21.2	.160	.00
12	733.67	139,589	-50	-18.7	0.0	.0	12.2	6.5	6.0	.0	6.6	.050	.00
13	733.67	139,589	+0	31.2	0.0	.0	12.1	6.5	6.0	.0	6.6	.050	.00
14	733.65	139,540	-49	-13.9	0.0	.0	12.3	6.5	7.0	.0	9.3	.070	.00
15	733.64	139,516	-24	-0.6	5.3	.0	12.2	6.5	6.0	.0	4.0	.030	.00
16	733.63	139,491	-25	2.1	5.9	.0	12.6	6.5	6.0	.0	7.9	.060	.00
17	733.66	139,565	+74	21.2	1.7	87.7	12.2	6.5	6.0	.0	11.9	.090	.43
18	733.65	139,540	-25	23.0	0.0	.0	17.0	6.5	6.0	.0	18.5	.140	.00
19	733.64	139,516	-24	16.4	0.0	.0	18.6	6.5	6.0	.0	9.3	.070	.00
20	733.64	139,516	+0	37.3	0.0	.0	18.2	6.5	6.0	.0	6.6	.050	.00
21	733.63	139,491	-25	-0.1	0.0	8.2	18.3	6.5	7.0	.0	1.3	.010	.04
22	733.62	139,466	-25	13.3	5.7	.0	18.3	6.5	6.0	.0	13.2	.100	.00
23	733.61	139,442	-24	8.6	5.9	.0	18.1	6.5	6.0	.0	7.9	.060	.00
24	733.60	139,418	-24	19.8	0.0	.0	20.7	6.5	6.0	.0	10.6	.080	.00
25	733.59	139,393	-25	21.0	0.0	.0	21.6	6.5	6.0	.0	11.9	.090	.00
26	733.59	139,393	+0	39.4	0.0	.0	21.6	6.5	6.0	.0	5.3	.040	.00
27	733.58	139,369	-24	19.0	0.0	.0	19.9	6.5	6.0	.0	10.6	.080	.00
28	733.55	139,296	-73	-31.4	8.8	.0	21.0	6.5	7.0	.0	15.9	.120	.00
29	733.53	139,247	-49	-9.5	8.4	.0	22.2	6.5	6.0	.0	13.2	.100	.00
30	733.52	139,223	-24	24.5	0.0	.0	20.1	6.5	6.0	.0	15.9	.120	.00
31	733.51	139,199	-24	18.2	0.0	.0	20.4	6.5	6.0	.0	9.3	.070	.00
TOTAL (AF)			**-686**	**334.2**	**140.8**	**97.9**	**539.1**	**201.7**	**191.0**	**.0**	**327.1**	**2.470**	**.48**
(AVG)		**139,544**											

COMMENTS:
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DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

FEBRUARY 2020 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: March 1, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	733.51	139,199											
1	733.50	139,174	-25	24.4	0.0	.0	21.2	6.5	6.0	.0	15.7	.100	.00
2	733.49	139,150	-24	24.4	0.0	.0	21.8	6.5	6.0	.0	14.1	.090	.00
3	733.45	139,053	-97	-43.0	0.0	.0	21.1	6.5	6.0	.0	20.4	.130	.00
4	733.42	138,980	-73	-8.0	0.0	.0	32.7	6.5	7.0	.0	18.8	.120	.00
5	733.40	138,931	-49	7.1	0.0	.0	38.9	6.5	6.0	.0	4.7	.030	.00
6	733.38	138,883	-48	20.7	0.0	.0	39.0	6.5	6.0	.0	17.2	.110	.00
7	733.36	138,834	-49	11.9	0.0	.0	39.0	6.5	6.0	.0	9.4	.060	.00
8	733.34	138,785	-49	16.0	0.0	.0	38.4	6.5	6.0	.0	14.1	.090	.00
9	733.33	138,761	-24	30.4	0.0	4.1	39.7	6.5	6.0	.0	6.3	.040	.02
10	733.31	138,712	-49	8.3	0.0	8.1	39.4	6.5	7.0	.0	12.5	.080	.04
11	733.29	138,664	-48	19.0	0.0	.0	38.9	6.5	6.0	.0	15.6	.100	.00
12	733.27	138,615	-49	6.4	0.0	.0	38.2	6.5	6.0	.0	4.7	.030	.00
13	733.24	138,542	-73	4.4	0.0	.0	38.4	6.5	6.0	.0	26.5	.170	.00
14	733.22	138,494	-48	19.6	0.0	.0	39.4	6.6	6.0	.0	15.6	.100	.00
15	733.20	138,445	-49	16.0	0.0	.0	40.0	6.5	6.0	.0	12.5	.080	.00
16	733.18	138,396	-49	21.0	0.0	.0	39.2	6.6	7.0	.0	17.2	.110	.00
17	733.16	138,348	-48	20.5	0.0	.0	37.2	6.6	6.0	.0	18.7	.120	.00
18	733.13	138,275	-73	-1.8	0.0	.0	40.0	6.5	6.0	.0	18.7	.120	.00
19	733.12	138,250	-25	45.7	0.0	.0	39.4	6.6	6.0	.0	18.7	.120	.00
20	733.10	138,202	-48	22.7	0.0	.0	38.4	6.6	7.0	.0	18.7	.120	.00
21	733.08	138,129	-73	-0.7	0.0	.0	39.5	6.5	6.0	.0	20.3	.130	.00
22	733.05	138,080	-49	33.4	0.0	.0	43.3	6.6	6.0	.0	26.5	.170	.00
23	733.02	138,007	-73	-6.4	0.0	.0	44.8	6.5	6.0	.0	9.3	.060	.00
24	732.99	137,934	-73	3.2	0.0	.0	43.4	6.6	6.0	.0	20.2	.130	.00
25	732.97	137,886	-48	42.6	0.0	.0	43.8	6.6	6.0	.0	34.2	.220	.00
26	732.95	137,837	-49	27.1	3.8	.0	44.0	6.6	6.0	.0	23.3	.150	.00
27	732.92	137,764	-73	2.8	0.0	.0	44.5	6.6	6.0	.0	18.7	.120	.00
28	732.90	137,715	-49	26.5	0.0	.0	44.3	6.5	6.0	.0	18.7	.120	.00
29	732.88	137,667	-48	44.4	0.0	.0	44.2	6.5	6.0	.0	35.7	.230	.00
TOTAL (AF)			**-1,532**	**438.6**	**3.8**	**12.2**	**1,112.1**	**189.5**	**178.0**	**.0**	**507.0**	**3.250**	**.06**
(AVG)		**138,431**											

COMMENTS:
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DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

MARCH 2020 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: April 6, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	732.88	137,667											
1	732.85	137,594	-73	4.3	0.0	.0	44.9	6.5	6.0	.0	19.9	.130	.00
2	732.83	137,545	-49	-9.0	0.0	32.3	44.5	6.5	6.0	.0	15.3	.100	.16
3	732.80	137,472	-73	9.6	0.0	.0	44.1	6.5	6.0	.0	26.0	.170	.00
4	732.77	137,399	-73	-7.5	0.0	.0	30.0	6.5	6.0	.0	23.0	.150	.00
5	732.76	137,375	-24	39.7	0.0	.0	30.2	8.1	7.0	.0	18.4	.120	.00
6	732.74	137,326	-49	14.7	0.0	.0	29.6	8.2	6.0	.0	19.9	.130	.00
7	732.73	137,302	-24	36.1	0.0	.0	30.6	8.2	6.0	.0	15.3	.100	.00
8	732.71	137,253	-49	10.5	0.0	2.0	29.3	7.8	6.0	.0	18.4	.120	.01
9	732.68	137,180	-73	-9.1	0.0	.0	29.8	8.2	6.0	.0	19.9	.130	.00
10	732.67	137,156	-24	25.4	0.0	.0	23.0	8.2	6.0	.0	12.2	.080	.00
11	732.89	137,691	+535	-48.2	5.8	615.6	22.5	8.2	6.0	.0	1.5	.010	3.05
12	732.93	137,788	+97	57.8	5.9	68.7	12.5	8.2	4.0	.0	10.7	.070	.34
13	732.94	137,813	+25	36.9	4.3	12.1	11.9	8.3	5.0	.0	3.1	.020	.06
14	732.94	137,813	+0	26.1	5.8	2.0	12.4	8.3	4.0	.0	9.2	.060	.01
15	732.94	137,813	+0	33.1	0.0	14.1	13.0	8.2	6.0	.0	20.0	.130	.07
16	733.05	138,080	+267	18.2	0.0	283.2	11.4	8.3	7.0	.0	7.7	.050	1.40
17	733.65	139,540	+1,460	1,117.8	0.0	371.0	11.4	8.3	6.0	.0	3.1	.020	1.82
18	733.78	139,860	+320	356.5	0.0	4.1	12.2	8.4	6.0	.0	14.0	.090	.02
19	733.83	139,983	+123	178.3	0.0	.0	20.8	8.3	6.0	.0	20.2	.130	.00
20	733.86	140,057	+74	111.4	0.0	.0	21.4	8.4	6.0	.0	1.6	.010	.00
21	733.91	140,180	+123	179.9	0.0	2.0	21.2	8.4	6.0	.0	23.3	.150	.01
22	733.96	140,303	+123	165.7	0.0	.0	22.1	8.4	6.0	.0	6.2	.040	.00
23	734.17	140,820	+517	322.4	0.0	238.0	20.2	8.4	7.0	.0	7.8	.050	1.16
24	734.45	141,510	+690	744.5	0.0	.0	21.3	8.4	6.0	.0	18.8	.120	.00
25	734.61	141,904	+394	427.9	5.9	.0	21.7	8.4	5.0	.0	4.7	.030	.00
26	734.71	142,153	+249	297.2	0.0	4.1	21.6	8.4	5.0	.0	17.3	.110	.02
27	734.78	142,328	+175	221.9	6.0	.0	21.6	8.4	4.0	.0	18.9	.120	.00
28	734.84	142,478	+150	202.9	6.0	.0	21.9	8.4	5.0	.0	23.6	.150	.00
29	734.89	142,602	+124	186.2	6.0	.0	21.7	8.4	5.0	.0	33.1	.210	.00
30	734.94	142,727	+125	179.6	6.0	.0	21.4	8.4	4.0	.0	26.8	.170	.00
31	734.99	142,852	+125	184.6	0.5	.0	22.6	8.4	7.0	.0	22.1	.140	.00
TOTAL (AF)			**+5,185**	**5,115.4**	**52.2**	**1,649.2**	**722.8**	**250.0**	**177.0**	**.0**	**482.0**	**3.110**	**8.13**
(AVG)		**139,352**											

COMMENTS:
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DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

APRIL 2020 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: May 1, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	734.99	142,852											
1	735.02	142,927	+75	149.0	0.0	.0	28.0	8.5	6.0	.0	31.5	.190	.00
2	735.04	142,977	+50	112.9	0.0	.0	33.5	8.5	6.0	.0	14.9	.090	.00
3	735.05	143,002	+25	106.7	0.0	.0	30.7	8.5	6.0	.0	36.5	.220	.00
4	735.08	143,052	+50	123.7	0.0	.0	32.6	8.5	6.0	.0	26.6	.160	.00
5	735.10	143,126	+74	157.6	0.0	.0	31.5	8.5	7.0	.0	36.6	.220	.00
6	735.81	144,905	+1,779	1,298.4	0.0	528.5	31.7	8.5	6.0	.0	1.7	.010	2.52
7	737.12	148,237	+3,332	3,375.3	0.0	10.7	20.6	8.6	6.0	.0	18.8	.110	.05
8	737.61	149,494	+1,257	1,309.5	0.0	77.4	22.2	8.8	92.0	.0	6.9	.040	.36
9	737.99	150,481	+987	1,099.9	0.0	73.4	20.6	8.8	112.0	.0	44.9	.260	.34
10	738.49	151,779	+1,298	1,372.0	5.9	63.0	20.6	9.1	101.0	.0	12.2	.070	.29
11	738.91	152,880	+1,101	1,233.4	0.4	.0	21.5	9.1	90.0	.0	12.2	.070	.00
12	739.21	153,669	+789	923.9	0.0	2.2	21.8	9.2	78.0	.0	28.1	.160	.01
13	739.45	154,301	+632	744.5	0.0	.0	20.5	9.2	67.0	.0	15.8	.090	.00
14	739.64	154,801	+500	605.2	0.0	.0	21.3	9.3	64.0	.0	10.6	.060	.00
15	739.80	155,228	+427	546.9	0.0	.0	21.5	9.3	59.0	.0	30.1	.170	.00
16	739.91	155,521	+293	415.9	0.0	2.2	21.4	9.3	59.0	.0	35.4	.200	.01
17	740.02	155,814	+293	412.0	0.0	.0	21.3	9.3	60.0	.0	28.4	.160	.00
18	740.10	156,027	+213	319.2	0.0	.0	22.9	9.3	58.0	.0	16.0	.090	.00
19	740.17	156,214	+187	289.5	0.0	.0	20.2	9.3	57.0	.0	16.0	.090	.00
20	740.25	156,427	+213	329.2	0.0	.0	21.7	9.3	55.0	.0	30.2	.170	.00
21	740.30	156,561	+134	240.7	0.0	.0	21.5	9.3	51.0	.0	24.9	.140	.00
22	740.36	156,720	+159	274.3	0.0	.0	21.9	9.4	43.0	.0	41.0	.230	.00
23	740.38	156,774	+54	167.5	0.0	.0	44.8	9.3	22.0	.0	37.4	.210	.00
24	740.44	156,934	+160	293.6	0.0	.0	47.1	9.4	20.0	.0	57.1	.320	.00
25	740.45	156,960	+26	149.3	0.0	.0	68.2	9.3	19.0	.0	26.8	.150	.00
26	740.43	156,907	-53	196.4	0.0	.0	72.0	9.3	111.0	.0	57.1	.320	.00
27	740.40	156,827	-80	158.7	0.0	.0	74.0	9.4	109.0	.0	46.3	.260	.00
28	740.40	156,827	+0	196.5	0.0	.0	46.1	9.4	100.0	.0	41.0	.230	.00
29	740.39	156,800	-27	142.1	12.2	.0	44.7	9.4	88.0	.0	39.2	.220	.00
30	740.39	156,800	+0	147.5	16.0	.0	47.8	9.4	76.0	.0	30.3	.170	.00
TOTAL (AF)			**+13,948**	**16,891.3**	**34.5**	**757.4**	**974.2**	**272.5**	**1,634.0**	**.0**	**854.5**	**4.880**	**3.58**
(AVG)		**152,632**											

COMMENTS:
* COMPUTED INFLOW IS THE SUM OF CHANGE IN STORAGE, RELEASES, AND EVAPORATION MINUS PRECIP ON THE RESERVOIR SURFACE AND CCWA INFLOW.
DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

MAY 2020 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: June 1, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	740.39	156,800											
1	740.37	156,747	-53	119.1	1.5	.0	45.4	9.3	63.0	.0	55.9	.310	.00
2	740.34	156,667	-80	94.8	0.0	.0	46.7	9.4	61.0	.0	57.7	.320	.00
3	740.31	156,587	-80	66.3	0.0	.0	45.6	9.3	59.0	.0	32.4	.180	.00
4	740.30	156,561	-26	135.2	0.0	.0	46.7	9.4	60.0	.0	45.1	.250	.00
5	740.27	156,481	-80	96.9	0.0	.0	62.5	9.4	60.0	.0	45.0	.250	.00
6	740.24	156,401	-80	105.3	0.0	.0	69.3	9.4	58.0	.0	48.6	.270	.00
7	740.21	156,321	-80	99.0	0.0	.0	63.9	9.3	59.0	.0	46.8	.260	.00
8	740.18	156,241	-80	89.9	0.0	.0	57.1	9.4	53.0	.0	50.4	.280	.00
9	740.15	156,161	-80	71.9	0.0	.0	49.3	9.4	50.0	.0	43.2	.240	.00
10	740.13	156,107	-54	94.5	0.0	.0	50.6	9.3	40.0	.0	48.6	.270	.00
11	740.10	156,027	-80	44.8	0.0	.0	50.4	9.3	22.0	.0	43.1	.240	.00
12	740.07	155,921	-106	3.7	0.0	.0	38.1	9.3	21.0	.0	41.3	.230	.00
13	740.05	155,894	-27	47.3	20.3	.0	37.3	9.4	12.0	.0	35.9	.200	.00
14	740.01	155,787	-107	-2.2	0.0	.0	50.3	9.4	11.0	.0	34.1	.190	.00
15	739.98	155,707	-80	45.3	0.0	.0	51.2	9.3	11.0	.0	53.8	.300	.00
16	739.95	155,627	-80	58.9	0.0	.0	52.1	9.4	11.0	.0	66.4	.370	.00
17	739.93	155,574	-53	59.8	0.0	.0	52.3	9.3	10.0	.0	41.2	.230	.00
18	739.91	155,521	-53	46.0	0.0	15.5	53.0	9.3	11.0	.0	41.2	.230	.07
19	739.87	155,414	-107	3.1	0.0	.0	51.4	9.3	10.0	.0	39.4	.220	.00
20	739.84	155,334	-80	46.5	0.0	.0	52.4	9.4	11.0	.0	53.7	.300	.00
21	739.81	155,254	-80	32.8	0.0	.0	52.3	9.3	10.0	.0	41.2	.230	.00
22	739.79	155,201	-53	64.6	0.0	.0	52.5	9.3	11.0	.0	44.8	.250	.00
23	739.76	155,121	-80	37.7	0.0	.0	51.9	9.3	10.0	.0	46.5	.260	.00
24	739.73	155,041	-80	34.0	0.0	.0	52.6	9.3	11.0	.0	41.1	.230	.00
25	739.70	154,961	-80	36.5	0.0	.0	43.6	9.3	10.0	.0	53.6	.300	.00
26	739.68	154,908	-53	62.6	0.0	.0	39.9	9.3	11.0	.0	55.4	.310	.00
27	739.66	154,854	-54	56.2	7.2	.0	38.3	9.3	9.0	.0	60.8	.340	.00
28	739.63	154,774	-80	41.1	7.5	.0	48.6	9.3	10.0	.0	60.7	.340	.00
29	739.60	154,695	-79	39.0	7.4	.0	49.0	9.3	10.0	.0	57.1	.320	.00
30	739.57	154,616	-79	9.3	7.4	.0	48.6	9.3	11.0	.0	26.8	.150	.00
31	739.52	154,485	-131	-4.5	1.1	.0	53.0	9.3	10.0	.0	55.3	.310	.00
TOTAL (AF)			**-2,315**	**1,735.4**	**52.4**	**15.5**	**1,555.9**	**289.3**	**806.0**	**.0**	**1,467.1**	**8.180**	**.07**
(AVG)		**155,645**											

COMMENTS:
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DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

JUNE 2020 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: July 1, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	739.52	154,485											
1	739.49	154,406	-79	15.8	0.0	.0	45.6	9.3	11.0	.0	28.9	.160	.00
2	739.46	154,327	-79	11.1	7.6	.0	47.7	9.3	10.0	.0	30.7	.170	.00
3	739.44	154,274	-53	59.2	0.0	.0	48.6	9.3	11.0	.0	43.3	.240	.00
4	739.40	154,169	-105	19.7	0.0	.0	48.5	9.3	11.0	.0	55.9	.310	.00
5	739.37	154,090	-79	43.5	0.0	.0	48.8	9.3	10.0	.0	54.4	.302	.00
6	739.33	153,985	-105	-9.5	0.0	.0	50.0	9.3	11.0	.0	25.2	.140	.00
7	739.28	153,853	-132	-17.5	0.0	.0	48.4	9.3	10.0	.0	46.8	.260	.00
8	739.22	153,695	-158	-25.7	0.0	.0	49.0	9.3	11.0	.0	63.0	.350	.00
9	739.19	153,590	-105	22.0	0.0	.0	50.2	9.3	10.0	.0	57.5	.320	.00
10	739.16	153,538	-52	62.5	0.0	.0	47.5	9.3	11.0	.0	46.7	.260	.00
11	739.12	153,432	-106	17.6	17.9	.0	68.3	9.3	10.0	.0	53.9	.300	.00
12	739.05	153,248	-184	-13.9	0.0	.0	69.0	9.3	11.0	.0	80.8	.450	.00
13	739.01	153,143	-105	39.5	0.0	.0	67.8	9.3	10.0	.0	57.4	.320	.00
14	738.97	153,038	-105	31.9	0.0	.0	68.2	9.3	11.0	.0	48.4	.270	.00
15	738.92	152,906	-132	-3.3	0.0	.0	54.7	9.3	11.0	.0	53.7	.300	.00
16	738.88	152,801	-105	14.9	2.1	.0	50.8	9.3	10.0	.0	51.9	.290	.00
17	738.85	152,722	-79	-4.0	32.9	.0	50.0	9.3	11.0	.0	37.6	.210	.00
18	738.81	152,617	-105	26.4	5.7	.0	51.6	9.3	10.0	.0	66.2	.370	.00
19	738.77	152,512	-105	20.1	7.3	.0	67.5	9.2	11.0	.0	44.7	.250	.00
20	738.73	152,406	-106	28.9	4.8	.0	72.2	9.3	10.0	.0	48.2	.270	.00
21	738.68	152,275	-131	22.1	0.2	.0	70.5	9.3	11.0	.0	62.5	.350	.00
22	738.64	152,170	-105	39.2	0.0	.0	73.1	9.3	10.0	.0	51.8	.290	.00
23	738.61	152,091	-79	46.9	0.0	.0	55.6	9.3	11.0	.0	50.0	.280	.00
24	738.57	151,987	-104	20.2	0.0	.0	55.0	9.3	10.0	.0	49.9	.280	.00
25	738.54	151,909	-78	51.6	0.0	.0	54.0	9.3	11.0	.0	55.3	.310	.00
26	738.51	151,831	-78	21.4	22.2	.0	55.1	9.2	11.0	.0	46.3	.260	.00
27	738.48	151,753	-78	33.9	14.5	.0	53.7	9.3	10.0	.0	53.4	.300	.00
28	738.45	151,675	-78	46.2	8.9	.0	54.0	9.3	11.0	.0	58.8	.330	.00
29	738.42	151,598	-77	32.0	8.5	.0	53.7	9.3	10.0	.0	44.5	.250	.00
30	738.38	151,494	-104	11.6	12.9	.0	53.0	9.3	11.0	.0	55.2	.310	.00
TOTAL (AF)			**-2,991**	**664.3**	**145.5**	**.0**	**1,682.1**	**278.8**	**317.0**	**.0**	**1,522.9**	**8.502**	**.00**
(AVG)		**152,918**											

COMMENTS:
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DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

JULY 2020 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: August 1, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	738.38	151,494											
1	738.35	151,416	-78	15.4	13.3	.0	54.0	9.3	10.0	.0	33.4	.190	.00
2	738.33	151,364	-52	30.3	30.7	.0	54.1	9.3	11.0	.0	38.6	.220	.00
3	738.30	151,286	-78	25.4	35.1	.0	54.2	9.3	10.0	.0	65.0	.370	.00
4	738.29	151,260	-26	62.8	36.0	.0	53.7	9.2	11.0	.0	50.9	.290	.00
5	738.25	151,156	-104	16.9	12.7	.0	54.6	9.3	10.0	.0	59.7	.340	.00
6	738.22	151,078	-78	52.3	12.7	.0	54.3	9.3	11.0	.0	68.4	.390	.00
7	738.17	150,948	-130	-21.9	12.7	.0	52.4	9.3	10.0	.0	49.1	.280	.00
8	738.12	150,818	-130	15.1	12.6	.0	86.6	9.3	11.0	.0	50.8	.290	.00
9	738.07	150,663	-155	-4.9	8.0	.0	87.0	9.3	11.0	.0	50.8	.290	.00
10	738.02	150,559	-104	36.6	8.0	.0	73.4	9.2	10.0	.0	56.0	.320	.00
11	737.98	150,455	-104	32.9	7.9	.0	66.5	9.3	13.0	.0	56.0	.320	.00
12	737.93	150,325	-130	13.8	8.0	.0	66.6	9.3	13.0	.0	62.9	.360	.00
13	737.88	150,195	-130	20.6	8.0	.0	66.4	9.3	13.0	.0	69.9	.400	.00
14	737.83	150,065	-130	4.0	6.4	.0	64.7	9.3	14.0	.0	52.4	.300	.00
15	737.78	149,935	-130	-5.9	5.3	.0	58.2	9.3	13.0	.0	48.9	.280	.00
16	737.73	149,806	-129	3.7	0.0	.0	63.4	9.2	13.0	.0	47.1	.270	.00
17	737.68	149,676	-130	6.4	0.0	.0	63.6	9.3	13.0	.0	50.5	.290	.00
18	737.63	149,546	-130	3.6	0.0	.0	64.4	9.2	13.0	.0	47.0	.270	.00
19	737.58	149,417	-129	13.8	0.0	.0	65.5	9.3	14.0	.0	54.0	.310	.00
20	737.53	149,289	-128	11.8	0.0	.0	65.4	9.2	13.0	.0	52.2	.300	.00
21	737.48	149,161	-128	17.7	0.0	.0	64.5	9.1	13.0	.0	59.1	.340	.00
22	737.43	149,032	-129	2.5	0.0	.0	64.0	9.3	13.0	.0	45.2	.260	.00
23	737.38	148,904	-128	-0.3	0.0	.0	60.1	11.7	9.0	.0	46.9	.270	.00
24	737.34	148,801	-103	22.3	0.0	.0	64.9	11.8	7.0	.0	41.6	.240	.00
25	737.29	148,673	-128	-3.0	7.8	.0	64.2	11.8	10.0	.0	46.8	.270	.00
26	737.24	148,545	-128	7.0	7.9	.0	64.7	11.8	11.0	.0	55.4	.320	.00
27	737.19	148,391	-154	-24.7	7.9	.0	62.5	11.8	11.0	.0	51.9	.300	.00
28	737.15	148,314	-77	37.0	7.9	.0	63.8	11.8	10.0	.0	36.3	.210	.00
29	737.10	148,185	-129	8.0	9.6	.0	64.3	11.8	10.0	.0	60.5	.350	.00
30	737.06	148,083	-102	28.5	9.7	.0	63.9	11.7	11.0	.0	53.6	.310	.00
31	737.01	147,954	-129	1.3	9.7	.0	63.8	11.7	11.0	.0	53.5	.310	.00
TOTAL (AF)			**-3,540**	**429.0**	**277.9**	**.0**	**1,969.7**	**309.8**	**353.0**	**.0**	**1,614.4**	**9.260**	**.00**
(AVG)		**149,784**											

COMMENTS:
* COMPUTED INFLOW IS THE SUM OF CHANGE IN STORAGE, RELEASES, AND EVAPORATION MINUS PRECIP ON THE RESERVOIR SURFACE AND CCWA INFLOW.
DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

AUGUST 2020 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: December 7, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	737.01	147,954											
1	736.96	147,826	-128	-4.8	9.7	.0	64.6	11.7	10.0	.0	46.6	.270	.00
2	736.91	147,698	-128	10.4	9.7	.0	65.0	11.7	11.0	.0	60.4	.350	.00
3	736.88	147,621	-77	59.7	9.7	.0	64.4	11.7	10.0	.0	60.3	.350	.00
4	736.82	147,467	-154	-19.1	9.7	.0	61.6	11.7	11.0	.0	60.3	.350	.00
5	736.77	147,339	-128	7.3	0.4	.0	65.8	11.7	10.0	.0	48.2	.280	.00
6	736.72	147,210	-129	1.8	0.0	.0	63.4	11.7	11.0	.0	44.7	.260	.00
7	736.67	147,082	-128	4.7	0.0	.0	62.9	11.7	10.0	.0	48.1	.280	.00
8	736.61	146,928	-154	-11.7	0.0	.0	80.1	11.7	11.0	.0	39.5	.230	.00
9	736.55	146,777	-151	-13.2	0.0	.0	79.1	11.7	11.0	.0	36.0	.210	.00
10	736.50	146,650	-127	30.0	0.0	.0	80.4	11.7	10.0	.0	54.9	.320	.00
11	736.44	146,498	-152	19.5	0.0	.0	82.1	11.6	11.0	.0	66.8	.390	.00
12	736.38	146,347	-151	-2.1	0.0	.0	81.1	11.6	10.0	.0	46.2	.270	.00
13	736.33	146,220	-127	33.0	0.0	.0	82.7	11.6	11.0	.0	54.7	.320	.00
14	736.29	146,119	-101	53.4	0.0	.0	81.5	11.6	10.0	.0	51.3	.300	.00
15	736.25	146,018	-101	57.3	0.0	.0	70.8	11.6	11.0	.0	64.9	.380	.00
16	736.19	145,841	-177	-28.3	0.0	.0	63.9	11.6	10.0	.0	63.2	.370	.00
17	736.15	145,765	-76	49.5	0.0	.0	63.6	11.6	11.0	.0	39.3	.230	.00
18	736.10	145,638	-127	32.5	0.0	.0	63.6	11.6	11.0	.0	73.3	.430	.00
19	736.06	145,537	-101	31.8	0.0	.0	65.2	11.6	10.0	.0	46.0	.270	.00
20	736.01	145,411	-126	27.4	0.0	.0	63.7	11.6	10.0	.0	68.1	.400	.00
21	735.94	145,234	-177	-23.2	0.0	.0	85.3	11.6	11.0	.0	45.9	.270	.00
22	735.89	145,107	-127	30.0	0.0	.0	88.5	11.6	11.0	.0	45.9	.270	.00
23	735.83	144,955	-152	14.1	0.0	.0	95.9	11.6	11.0	.0	47.6	.280	.00
24	735.79	144,854	-101	-0.7	0.0	.0	51.5	11.6	10.0	.0	27.2	.160	.00
25	735.74	144,728	-126	-4.5	0.0	.0	49.7	11.6	11.0	.0	49.2	.290	.00
26	735.71	144,652	-76	12.0	12.4	.0	31.4	11.5	10.0	.0	47.5	.280	.00
27	735.66	144,525	-127	0.8	12.5	.0	69.5	11.6	10.0	.0	49.2	.290	.00
28	735.61	144,399	-126	-20.1	12.5	.0	55.1	11.6	11.0	.0	40.7	.240	.00
29	735.55	144,249	-150	-33.9	12.5	.0	61.3	11.6	10.0	.0	45.7	.270	.00
30	735.51	144,150	-99	29.5	1.1	.0	61.3	11.6	11.0	.0	45.7	.270	.00
31	735.45	144,000	-150	-28.7	0.0	.0	61.6	11.5	11.0	.0	37.2	.220	.00
TOTAL (AF)			**-3,954**	**314.4**	**90.2**	**.0**	**2,116.6**	**360.4**	**327.0**	**.0**	**1,554.6**	**9.100**	**.00**
(AVG)		**145,898**											

COMMENTS:
* COMPUTED INFLOW IS THE SUM OF CHANGE IN STORAGE, RELEASES, AND EVAPORATION MINUS PRECIP ON THE RESERVOIR SURFACE AND CCWA INFLOW.
DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

UNITED STATES DEPARTMENT OF THE INTERIOR
U.S. BUREAU OF RECLAMATION-CACHUMA PROJECT-CALIFORNIA

SEPTEMBER 2020 **LAKE CACHUMA DAILY OPERATIONS** RUN DATE: October 1, 2020

DAY	ELEV	STORAGE ACRE-FEET IN LAKE	CHANGE	COMPUTED* INFLOW AF.	CCWA INFLOW AF.	PRECIP ON RES. SURF. AF.	RELEASE - AF. TUNNEL	HILTON CREEK	OUTLET	SPILLWAY	EVAP AF.	EVAP INCH	PRECIP INCHES
	735.45	144,000											
1	735.37	143,800	-200	17.4	0.0	.0	62.1	11.5	120.0	.0	23.8	.150	.00
2	735.20	143,376	-424	-44.0	0.0	.0	61.4	11.6	277.0	.0	30.0	.190	.00
3	735.04	142,977	-399	5.4	0.0	.0	60.9	11.5	280.0	.0	52.0	.330	.00
4	734.88	142,577	-400	14.1	0.0	.0	79.8	11.5	285.0	.0	37.8	.240	.00
5	734.72	142,178	-399	25.7	0.0	.0	86.4	11.5	286.0	.0	40.8	.260	.00
6	734.56	141,781	-397	54.1	0.0	.0	91.2	11.5	292.0	.0	56.4	.360	.00
7	734.41	141,411	-370	70.0	0.0	.0	90.7	11.4	280.0	.0	57.9	.370	.00
8	734.23	140,968	-443	7.0	0.0	.0	91.4	11.4	291.0	.0	56.2	.360	.00
9	734.07	140,550	-418	-9.2	0.0	.0	80.1	11.4	283.0	.0	34.3	.220	.00
10	733.90	140,156	-394	-7.4	0.0	.0	58.1	11.4	286.0	.0	31.1	.200	.00
11	733.75	139,786	-370	-9.1	0.0	.0	51.5	11.4	284.0	.0	14.0	.090	.00
12	733.62	139,466	-320	-10.5	0.0	.0	54.6	11.3	225.0	.0	18.6	.120	.00
13	733.52	139,223	-243	36.8	0.0	.0	54.2	11.3	188.0	.0	26.3	.170	.00
14	733.42	138,980	-243	16.7	0.0	.0	46.1	11.3	176.0	.0	26.3	.170	.00
15	733.32	138,737	-243	9.4	0.0	.0	47.7	11.3	161.0	.0	32.4	.210	.00
16	733.23	138,518	-219	33.2	0.0	.0	58.1	11.2	149.0	.0	33.9	.220	.00
17	733.13	138,275	-243	8.8	0.0	.0	57.6	11.3	146.0	.0	36.9	.240	.00
18	733.04	138,056	-219	29.0	0.0	.0	58.9	11.2	141.0	.0	36.9	.240	.00
19	732.95	137,837	-219	-15.2	0.0	.0	18.3	11.2	139.0	.0	35.3	.230	.00
20	732.85	137,594	-243	34.2	0.0	.0	104.5	11.2	140.0	.0	21.5	.140	.00
21	732.74	137,326	-268	5.5	0.0	.0	71.2	11.2	139.0	.0	52.1	.340	.00
22	732.64	137,083	-243	10.1	0.0	.0	68.3	11.2	140.0	.0	33.6	.220	.00
23	732.55	136,866	-217	7.0	0.0	.0	62.4	11.1	120.0	.0	30.5	.200	.00
24	732.48	136,698	-168	46.8	7.2	.0	59.2	11.1	109.0	.0	42.7	.280	.00
25	732.39	136,482	-216	-14.2	7.3	.0	59.9	11.1	103.0	.0	35.1	.230	.00
26	732.32	136,314	-168	19.7	7.3	.0	60.9	11.1	91.0	.0	32.0	.210	.00
27	732.24	136,122	-192	6.0	0.0	.0	60.3	11.2	93.0	.0	33.5	.220	.00
28	732.16	135,930	-192	5.8	0.0	.0	59.3	11.1	97.0	.0	30.4	.200	.00
29	732.09	135,738	-192	12.5	0.0	.0	60.0	11.1	100.0	.0	33.4	.220	.00
30	732.01	135,570	-168	35.2	0.0	.0	54.7	11.1	101.0	.0	36.4	.240	.00
TOTAL (AF)			**-8,430**	**400.8**	**21.8**	**.0**	**1,929.8**	**338.7**	**5,522.0**	**.0**	**1,062.1**	**6.870**	**.00**
(AVG)		**139,013**											

COMMENTS:
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DATA BASED ON 24-HOUR PERIOD ENDING 0800.
INDICATED OUTLETS RELEASE INCLUDE ANY LEAKAGE AROUND GATES.

Attachment B:
Water Year 2020 Annual Monitoring Report Pursuant to RPM 11 of the National Marine Fisheries Service 2000 Biological Opinion

WY2020 ANNUAL MONITORING REPORT

For:

THE BIOLOGICAL OPINION FOR THE OPERATION AND MAINTENANCE OF THE CACHUMA PROJECT ON THE SANTA YNEZ RIVER IN SANTA BARBARA COUNTY, CALIFORNIA

Prepared for:

U.S. DEPARTMENT OF THE INTERIOR, BUREAU OF RECLAMATION
SOUTH-CENTRAL CALIFORNIA AREA OFFICE

Prepared by:

CACHUMA OPERATION AND MAINTENANCE BOARD
FISHERIES DIVISION

DECEMBER 16, 2020

Annual Monitoring Report

1. Introduction

The Water Year 2020 (WY2020) Annual Monitoring Report (AMR) fulfills Reasonable and Prudent Measure (RPM) 11 of the September 2000 National Marine Fisheries Service (NMFS) Biological Opinion (2000 BiOp) (NMFS, 2000). The AMR provides *Oncorhynchus mykiss* (*O. mykiss*) monitoring results and water quality data gathered during the water year from October 1, 2019 to September 30, 2020.

The *O. mykiss* monitoring, data analyses, and report were prepared by the Cachuma Operation and Maintenance Board Fisheries Division (COMB-FD) in collaboration with United States Department of Interior, Bureau of Reclamation (Reclamation or USBR).

Monitoring focused on three areas of the Lower Santa Ynez River (LSYR) basin (Figure A):

1. Highway (Hwy) 154, Refugio, and Alisal reaches on the LSYR mainstem;
2. The Cadwell Reach on the LSYR mainstem; and
3. Hilton, Quiota, El Jaro, and Salsipuedes creeks.

Figure A: LSYR from Bradbury Dam and Lake Cachuma to the Pacific Ocean and tributary creeks and reaches of interest of the LSYR Fish Monitoring Program.

Efforts to monitor water quality and conduct redd surveys, migrant trapping, and snorkel surveys were modified since the issuance of the 2000 BiOp which was done during the previous water year. Program modifications reflect requests or requirements from Reclamation and NMFS in response to landowner access constraints, drought related conditions, or program adaptive management. Modifications in the WY2020 monitoring followed what was done in the previous water year.

The time period covered by this AMR is WY2020 (October 1, 2019 through September 30, 2020). However, in order to roughly encompass the life history stages of *O. mykiss* (i.e., migration, spawning, and rearing) during this period, COMB-FD has included fall snorkel surveys conducted in October or November (i.e., after the end of WY2020). The addition of these surveys are included to provide observations of *O. mykiss* survival through the WY2020 dry season consistent with previous AMRs submitted to NMFS. This report also incorporates historical context for reference of the water year type since WY2000.

The WY2020 AMR is organized by:

1. Hydrologic Conditions;
2. Water Quality;
3. Habitat Quality;
4. *O. mykiss* Migration;
5. Aging of O. mykiss Migrant Captures plus Mortalities
6. *O. mykiss* Reproduction and Rearing; and
7. Beaver Dam Abundance.

Report figures and tables are incorporated at the end of the document.

2. Monitoring Results

2.1. Hydrologic Conditions (Figures 1 - 4 and Tables 1 - 4)

WY2020 was an average year with a total of 21.03 inches of precipitation (rainfall) measured at Bradbury Dam; the long-term average, 1953–2020, is 19.91 inches. Following the California State Water Resources Control Board established criteria, WY2020 was classified as a below normal year with inflow to Lake Cachuma of 26,229 acre-feet (af). The majority of precipitation occurred in December, March and April. WY2020 was the 27th wettest year on record (the wettest year was in 1998 with 53.65 inches of precipitation and the driest year on record was in 2007 with 7.41 inches of precipitation at Bradbury Dam). The current and past hydrologic conditions from WY2001 through WY2020 are presented in Figures 1 through 4 and Tables 1 through 4. The greatest amount of precipitation of WY2020 occurred in association with the 3/11/20 storm (6.77 inches) and the second highest precipitation event occurred in association with the 4/6/20 storm (3.56 inches). The LSYR lagoon was breached on 4/7/20 and provided ocean connectivity for 177 consecutive days during the water year, 55 of those days were during the migration season (January through May). The lagoon remains open as of the date of this report but the river is not continuous.

WY2020 was the ninth year after a spill (WY2011). Reservoir storage remained greater than 30,000 af and 120,000 af through the water year with peak storage of 156,960 af on 4/25/20. The 2000 BiOp required target flows of at least 5 cubic feet per second (cfs) to the Hwy 154 Bridge were maintained throughout the water year. Target flows to Hilton Creek of a minimum of 2 cfs were also maintained through the water year from the Hilton Creek Watering System (HCWS) by gravity flow to the Upper Release Point (URP). None of Reclamation's alternative backup water delivery systems were needed

throughout the water year. State Project Water was delivered to Lake Cachuma through the CCWA by-pass pipeline and not through the Outlet Works and penstock. Hence, there was no discharge or mixing of State Project Water with downstream releases (Figure 4).

In Hilton Creek, there were two high streamflow events from the upper watershed on 12/25/19 and 4/6/20, the latter brought down a large quantity of streambed material from the Whittier Fire burn scar. The first event produced a steep storm hydrograph with a rapid increase followed by an equally rapid decrease in streamflow resulting in one *O. mykiss* mortality found in a high flow channel. During that April storm, stream sediments refilled most of the small and large pool habitats throughout the reaches on Reclamation property as well as continued to fill in the Long Pool. The amount of sediments moving downstream impacted water quality and habitat conditions for the Hilton Creek *O. mykiss* population. There were five *O. mykiss* mortalities found in association with the 4/6/20 stormflow event. Reports for these two stormflow events were produced and submitted to Reclamation who then provided them to NMFS.

There were two fish passage supplementation events (4/7/20 and 4/25/20). *O. mykiss* were observed moving downstream during both events. Reclamation provided a report to NMFS on 10/27/20.

There was a Water Rights (WR) 89-18 release in WY2020 that started on 8/31/20 and continued until 11/30/20. This was a Below Narrows Account release that discharged 10,478 af (SYRWCD) of water from Lake Cachuma to recharge downstream aquifers.

2.2. Water Quality (Figures 5 - 54 and Tables 5 - 6)

Stream water quality data (temperature and dissolved oxygen concentration) were collected for the LSYR mainstem below Bradbury Dam and its tributaries based on locations of historical observations of *O. mykiss* and locations identified in the monitoring plan (USBR, 2000). The instrument deployment schedule and the monitoring results for each habitat are provided in Figures 5 through 54 and Tables 5 through 6.

Water quality conditions across the LSYR basin during the dry season of WY2020 were improved compared to dry year conditions observed in WY2018, though considered suboptimal for supporting *O. mykiss* rearing towards the end of the fall due to drying stream conditions. The dry season retraction of aquatic habitats resulted in degraded water quality as the dry season progressed, as is typical. Most of the Refugio Reach, half of the Alisal Reach, and multiple sections of Reach 3 downstream of the Alisal Bridge were primarily dry, although isolated sections had surface flow. Many sub-reaches in the tributaries were also dry and drought-like conditions continued to affect streamflow particularly as we got into the fall. Rearing *O. mykiss* were observed during snorkel surveys in Hilton, Quiota, El Jaro, and Salsipuedes creeks where refugia (undercut banks, large boulders, and/or instream wood) and cooler water existed, particularly in the watered section of Hilton Creek on Reclamation property. Reaches developed higher temperatures with less favorable in-stream conditions in the LSYR mainstem during the dry season, likely favoring non-native fish over *O. mykiss*. In July, Reclamation after

discussion with NMFS modified releases from Lake Cachuma from the Outlet Works and through the HCWS to reduce water temperatures in support of the *O. mykiss* population downstream of the dam.

Lake Cachuma stratified over the warmer months of the year (April through October) and a mild lake turnover event occurred during November (Figure 54).

2.3. Habitat Quality (Figures 55 - 64)

Habitat quality was monitored within the LSYR Basin during WY2020 by photo documentation at long-standing photo point locations using digital cameras. The photo comparisons provided in Figures 55 through 64 documented the physical changes observed at reference locations from WY2005 to WY2020. Notably, riparian canopy vegetation continued to grow and mature in stream reaches with perennial and near perennial flow, particularly in the watered section of Hilton Creek.

2.4. *O. mykiss* Migration (Figures 65 - 73 and Tables 7 - 10)

Migrant trapping was conducted as proposed in the annual Migrant Trapping Plan that was submitted by COMB-FD to Reclamation and subsequently submitted to NMFS by Reclamation (COMB, 2020). Juvenile and adult take limits stipulated in the 2000 BiOp were not exceeded during WY2020. Results are presented in Figures 65 through 73 and Tables 7 through 10.

Average (normal) year conditions provided the potential for upstream and downstream fish migration, as well as access to and from the ocean; the lagoon bar breached on 4/7/20 and remained open for the rest of the water year that provided ocean connectivity for 177 consecutive days, 55 of those days was during the migration season. The upstream and downstream migrant traps were installed in Hilton Creek from 2/5/20 to 5/19/20, in Salsipuedes Creek from 3/24/20 to 5/15/20, and in the LSYR mainstem from 4/9/20 to 4/25/20 for a total of 104, 51, and 15 functional trap days, respectively. Traps were removed in Hilton Creek due to reaching the take limit, in Salsipuedes Creek due to low flow, and in the LSYR mainstem due to concerns of inhibiting passage during the second Passage Supplementation event.

The Hilton Creek trap captured 49 upstream and 90 downstream migrants, 32 of which were smolts moving down out of the system. In Salsipuedes Creek, only two upstream migrants and one downstream migrant were captured with no smolts observed. At the LSYR mainstem trap, five downstream migrating smolts were captured. A total of 105 juveniles and 42 adult *O. mykiss* were captured in the total migrant trapping effort which was below the 2000 BiOp incidental take limits. No anadromous adult *O. mykiss* were observed during migrant trapping or any snorkel surveys in all of the study areas of the LSYR watershed during WY2020.

The LSYR mainstem trap was operated during the first few weeks of the 2020 WR 89-18 release for 18 days with no *O. mykiss* captured. The release was ramped up over two days as requested by NMFS. Non-native warm water species were captured specifically bass,

sunfish, bluegill, catfish, and carp. Pursuant to 2000 BiOp RPM 6, a report will be provided to NMFS by Reclamation.

2.5. Aging of *O. mykiss* Migrant Captures plus Mortalities (Figure 74 and Table 11)
Scales were taken and analyzed on 67 of 147 total migrant captures at the three trap sites (Hilton Creek, LSYR Mainstem and Salsipuedes Creek) and four mortalities found over the reporting period. The minimum size for sampling was set at 120 mm and some fish could not be sampled or the scales were not representative enough to make a clear determination, hence why the number analyzed is less than the total number of captures. The scales from each fish were dried, placed on individual microscope slides, photographed, and analyzed by COMB-FD to make an age determination. The age range was from 0+ to 5 years old with an associated size range of 82 mm to 431 mm (Table 11). The majority of fish were 1+ in age (29 at 43%), with the second highest category of 3 (9 at 13%) and 3+ (9 at 13%) in age. Two examples of analyzed fish scales would be a 4 year old Hilton Creek upstream migrant resident *O. mykiss* at 417 mm and a 2+ year old LSYR mainstem downstream migrating smolt at 264 mm (Figure 74). Scale analysis is a valuable effort to better understand population dynamics.

2.6. *O. mykiss* Reproduction and Rearing (Figures 75 - 87 and Tables 12 - 20)
Redd (spawner) surveys were conducted within the LSYR basin from January through May. The results are presented in Tables 12 through 14. There were 34 *O. mykiss* redds identified as from resident fish as determined from their relative size and because no anadromous fish were observed throughout study area in 2020. Of the 34 redds, 24 were in Hilton Creek, one in Quiota Creek, and nine in Salsipuedes Creek. No redds were observed in the LSYR Hwy 154 Reach, Refugio Reach, and Alisal Reach, or in El Jaro Creek.

Three snorkel surveys were conducted in the LSYR mainstem (spring, summer, and fall) and two snorkel surveys its tributaries (spring and fall), each at the end of the season in reaches with sufficient water to hold fish and where water visibility was sufficient to observe fish while snorkeling. Snorkel survey results are presented in Figures 75 through 87 and Tables 15 through 20. There were 119 and 65 *O. mykiss* observed within the Hwy 154 Reach of the LSYR mainstem on Reclamation property in the spring and fall, respectively. Half of those fish were young of the year which suggested successful spawning within the Hwy 154 Reach. *O. mykiss* young of the year were observed in Hilton, Salsipuedes, and El Jaro creeks; the highest count, 598, of young of the year *O. mykiss*, was observed in Hilton Creek. Successful spawning is likely attributable to a normal year with good streamflow after a wet WY2019, elevated baseflows well into the spring due to late season rains, and available spawning gravels particularly in Hilton Creek despite impacts to water quality and habitat from the stormflow events described above.

Non-native, warm water fish species were observed in the Hwy 154 Reach (bass, sunfish, and carp), Refugio Reach (bass, sunfish, and carp), and Alisal Reach (bass, sunfish, and carp), of the LSYR mainstem. Non-native warm water species also were observed in lower Salsipuedes Creek (bass, sunfish, and carp) and in El Jaro Creek (sunfish) (Table

6). Co-occurrence of *O. mykiss* and non-native fish was documented in the Hwy 154 Reach just downstream of the Long Pool and the Refugio Reach in the LSYR mainstem, and in the lower reaches of Salsipuedes Creek (Reaches 1 - 4 and 5).

2.7. Beaver Abundance (Figure 88 and Table 21)

A total of 60 beaver dams were documented (58 dams in the LSYR mainstem and two dams in the tributaries) during the fall survey (Figure 88 and Table 21). This was an increase in the number of dams in both the LSYR and tributaries since WY2019 (45 dams in the LSYR mainstem and zero tributary dams). WY2019 was a wet year that provided opportunity for disbursement of beavers within the LSYR watershed that were documented in WY2020. Active dams appeared to be located within the wetted sections of the drainage.

3. References

NMFS (National Marine Fisheries Service). 2000. Endangered Species Act Section 7 Consultation, Biological Opinion, U.S. Bureau of Reclamation operation and maintenance of the Cachuma Project on the Santa Ynez River in Santa Barbara County, California. Issued, September 11, 2000. U.S. Department of Commerce, National Oceanic and Atmospheric Administration, Southwest Region, California Coastal Area Office, Long Beach, California.

USBR (U.S. Bureau of Reclamation). 2000. Revised Section 3 (Proposed Project) of the Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River. Prepared for the National Marine Fisheries Service. U.S. Bureau of Reclamation, Fresno, California.

COMB, 2020. WY2020 Migrant Trapping Plan. Prepared in collaboration with United States Bureau of Recalamation, Cachuma Operation and Maintenance Board (COMB), Fisheries Division.

Table 1: WY2000 to WY2020 rainfall (precipitation) at Bradbury Dam, reservoir conditions, passage supplementation, and water rights releases.

Water Year	Rainfall Bradbury* (in)	Year Type**	Spill	# of Spill Days	Reservoir Condition Storage (max) (af)	Reservoir Condition Elevation (max) (ft)	Passage Supplementation	Water Right Release
2000	21.50	Normal	Yes	26	192,948	750.83	No	Yes
2001	31.80	Wet	Yes	131	194,519	751.34	No	No
2002	8.80	Dry	No	0	173,308	744.99	No	Yes
2003	19.80	Normal	No	0	130,784	728.39	No	No
2004	10.60	Dry	No	0	115,342	721.47	No	Yes
2005	44.41	Wet	Yes	131	197,649	753.11	No	No
2006	24.50	Wet	Yes	54	197,775	753.15	Yes	No
2007	7.40	Dry	No	0	180,115	747.35	No	Yes
2008	22.59	Wet	Yes	53	196,365	752.70	No	No
2009	13.66	Dry	No	0	168,902	743.81	No	No
2010	23.92	Wet	No	0	178,075	747.05	Yes	Yes
2011	31.09	Wet	Yes	53	195,763	753.06	No	No
2012	12.69	Dry	No	0	180,986	748.06	No	No
2013	7.57	Dry	No	0	142,970	733.92	No	Yes
2014	9.96	Dry	No	0	91,681	710.00	No	Yes
2015	9.38	Dry	No	0	60,992	691.09	No	Yes
2016	11.45	Dry	No	0	32,900	669.57	No	Yes
2017	25.48	Wet	No	0	99,152	715.25	No	Yes
2018	9.32	Dry	No	0	82,580	706.27	No	Yes
2019	23.79	Wet	No	0	156,374	740.23	Yes	No
2020	21.03	Normal	No	0	156,960	740.45	Yes	Yes

* Bradbury Dam rainfall (Cachuma) period of record = 68 years (1953-2020) with an average rainfall of 19.91 inches.

** Year Type: dry =< 15 inches, average = 15 to 22 inches, wet => 22 inches.

Table 2: WY2020 and historic precipitation data for six meteorological stations in the Santa Ynez River Watershed (source: County of Santa Barbara and USBR).

Location	Station	Initial Year	Period of Record	Long-term Average	Minimum Rainfall		Maximum Rainfall		Rainfall (WY2020)
	(#)	(date)	(years)	(in)	(in)	(WY)	(in)	(WY)	(in)
Lompoc	439	1955	65	14.56	5.31	2007	34.42	1983	12.97
Buellton	233	1955	65	16.64	5.87	2014	41.56	1998	15.43
Solvang	393	1965	55	18.31	6.47	2007	43.87	1998	16.69
Santa Ynez	218	1951	69	15.74	6.58	2007	36.36	1998	15.13
Cachuma*	USBR	1953	68	19.91	7.33	2007	53.37	1998	21.03
Gibraltar	230	1920	100	26.28	8.50	2013	73.12	1998	24.51
Jameson	232	1926	94	28.69	8.50	2007	79.52	1969	22.89

* Bradbury Dam USBR rainfall.

Table 3: (a) Storm events greater than 0.1 inches of rainfall at Bradbury Dam with associated flow conditions (> 10 cfs) at Salsipuedes Creek (SC) and the Los Laureles (Los L) gauging stations and (b) monthly rainfall totals at Bradbury Dam during WY2020; dates reflect the starting day of the storm and not the storm duration.

(a)

#	Date	Rainfall (in.)	SC 10 cfs	Los L 10 cfs
1	11/27/2019	1.47	No	No
2	12/1/2020	0.76	No	No
3	12/3/2019	1.19	No	No
4	12/7/2019	0.56	No	No
5	12/23/2019	2.41	No	No
6	12/26/2020	1.75	No	No
7	12/30/2020	0.50	No	No
8	1/17/2020	0.43	No	No
9	3/2/2020	0.16	No	No
10	3/11/2020	6.77	No	No
11	3/23/2020	1.16	Yes	Yes
12	4/6/2020	3.56	Yes	Yes

(b)

Month	Rainfall (in.)	%
Oct-19	0.00	0.0
Nov-19	1.52	7.2
Dec-19	7.19	34.2
Jan-20	0.48	2.3
Feb-20	0.06	0.3
Mar-20	8.13	38.7
Apr-20	3.58	17.0
May-20	0.07	0.3
June-20	0.00	0.0
July-20	0.00	0.0
Aug-20	0.00	0.0
Sept-20	0.00	0.0
Total:	**21.03**	100

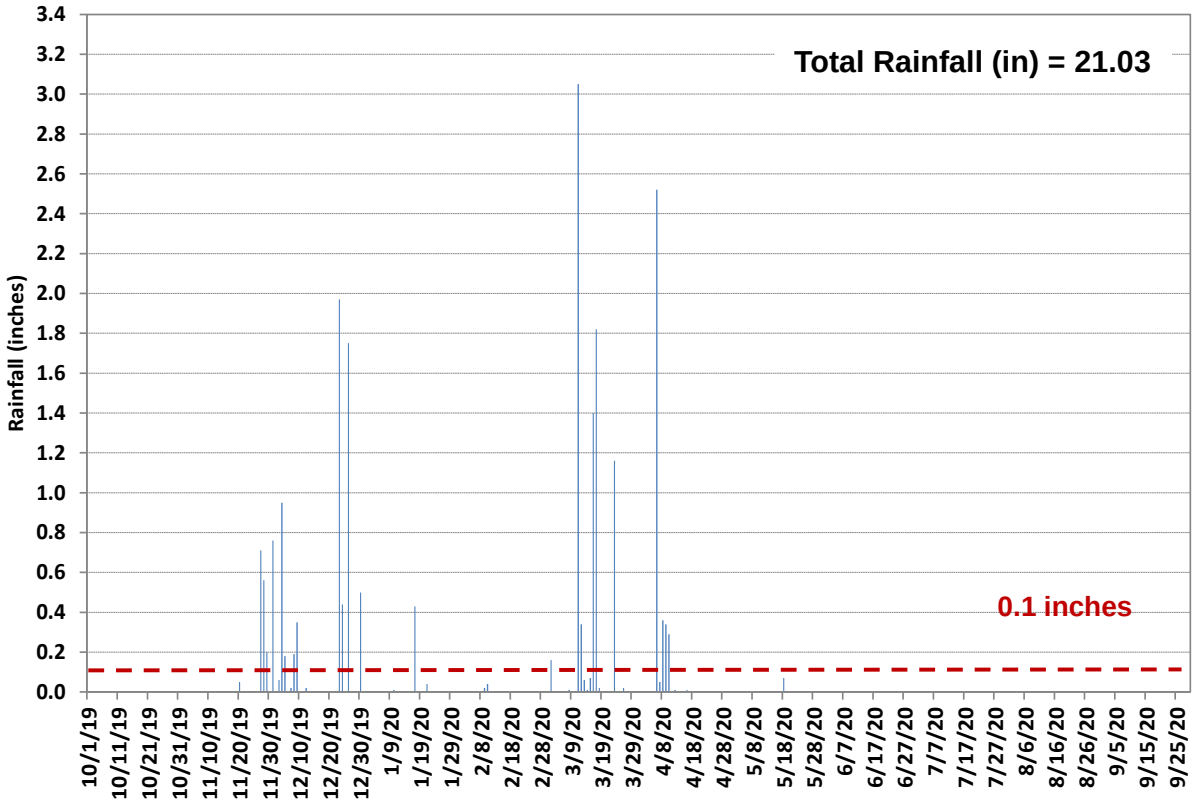


Figure 1: Rainfall in WY2020 recorded at Bradbury Dam (USBR).

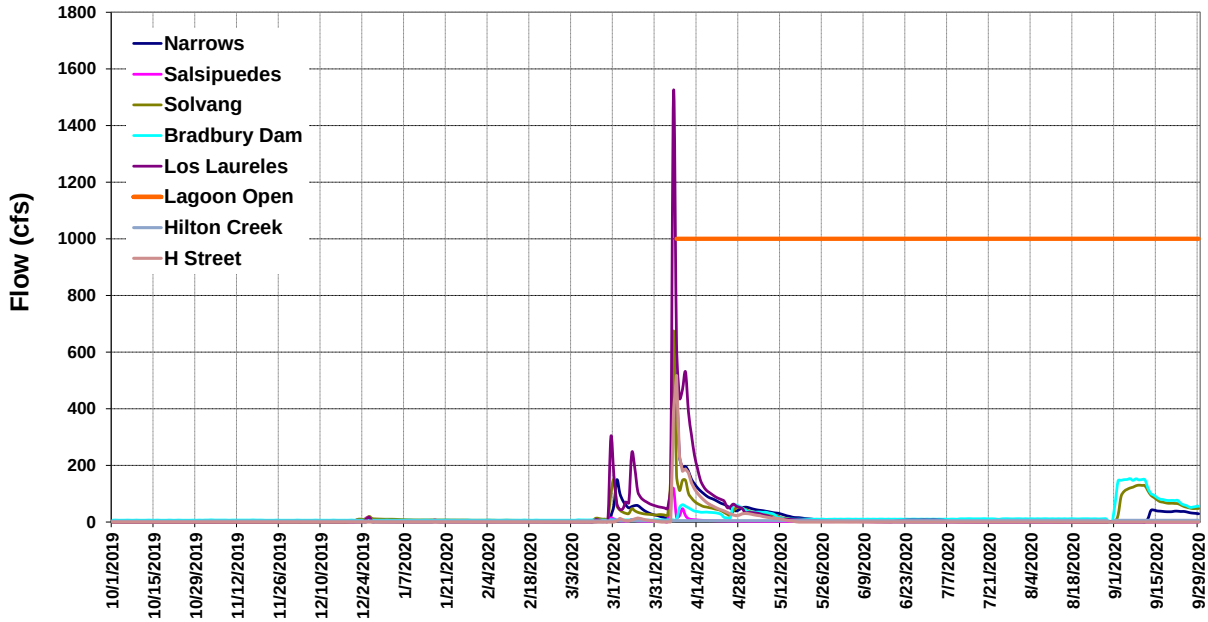


Figure 2: Santa Ynez River discharge and the period when the Santa Ynez River lagoon was open to the ocean in WY2020.

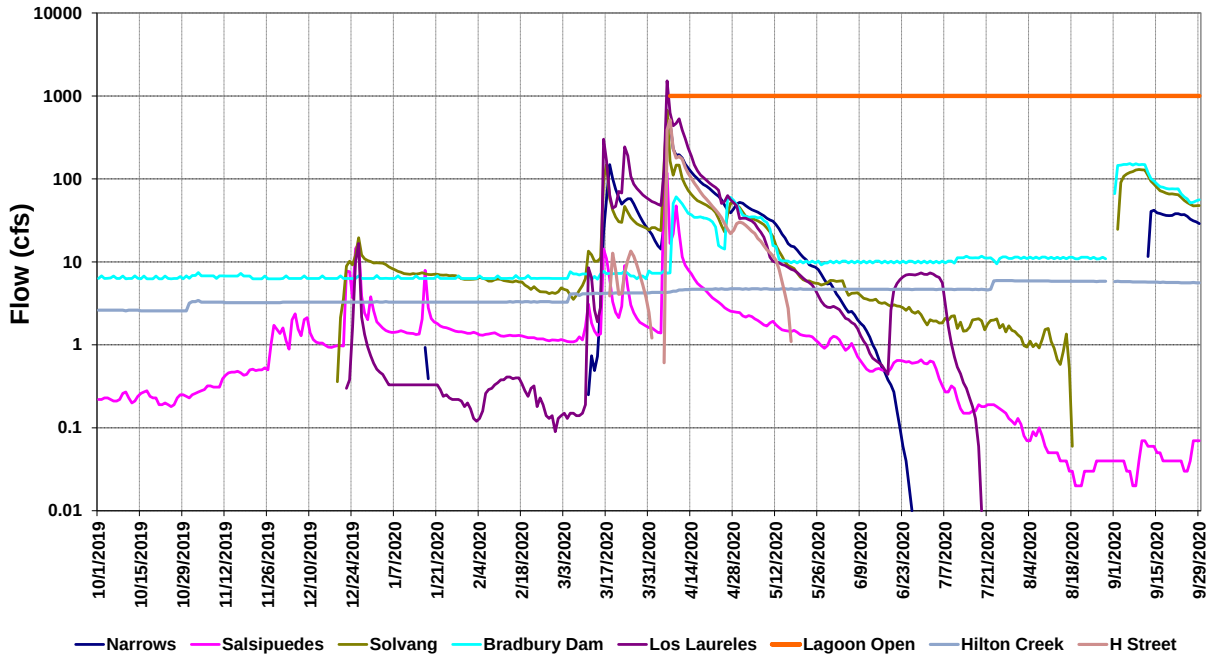


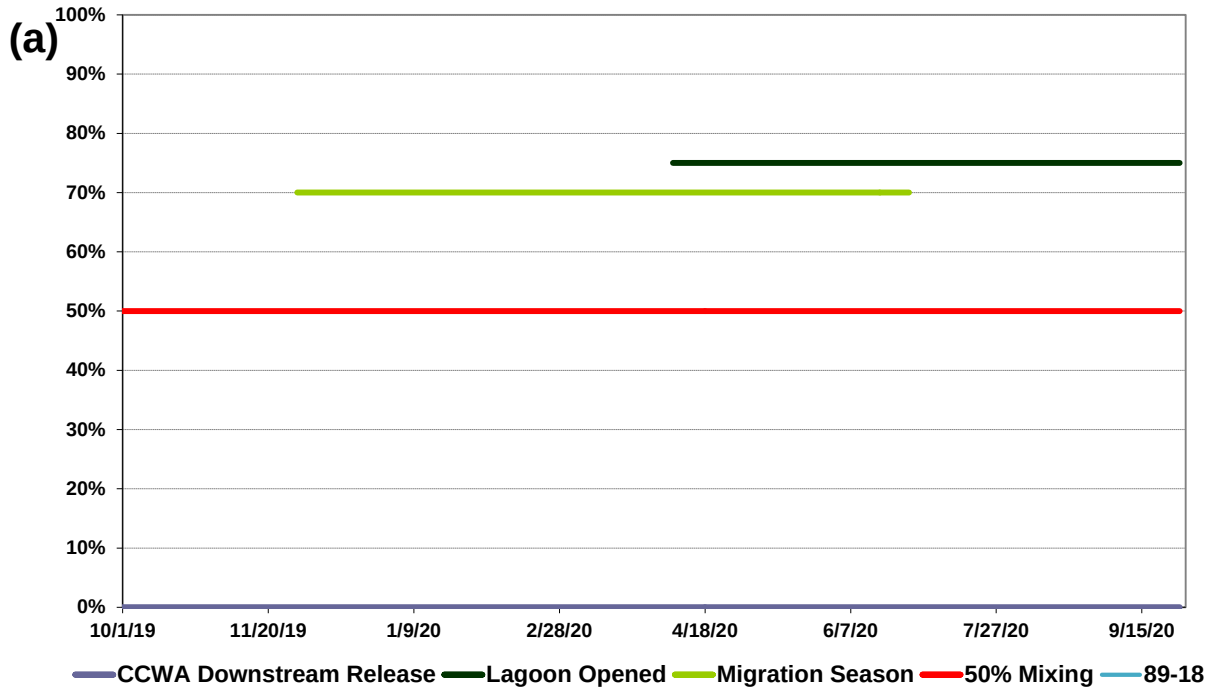
Figure 3: USGS average daily discharge at the LSYR mainstem USGS gauging stations at Los Laureles, Bradbury Dam (USBR), Hilton Creek (USBR), Alisal Bridge (Solvang), Salsipuedes Creek, the Narrows and H Street (Lompoc) during WY2020.

Table 4: Ocean connectivity, lagoon status and number of days during the *O. mykiss* migration season from WY2001 to WY2020.

Water Year	Year Type	Ocean Connectivity	Lagoon Status			# of Days Open in Migration Season*
			Open	Closed	# of Days	
2001	Wet	Yes	1/11/01	6/5/01	146	141
2002	Dry	No	-	-	0	0
2003	Normal	Yes	12/20/02	5/19/03	151	139
2004	Dry	Yes	2/26/04	3/22/04	26	26
2005	Wet	Yes	12/27/04	7/21/05	207	151
2006	Wet	Yes	3/1/06	-	214	92
2007	Dry	Yes	-	11/21/06	52	0
2008	Wet	Yes	1/6/08	5/19/08	135	135
2009	Dry	Yes	2/16/09	3/17/09	30	30
2010	Wet	Yes	1/19/10	5/6/10	107	107
2011	Wet	Yes	12/20/12	-	285	151
2012	Dry	Yes	-	5/17/12**	80	33
2013	Dry	No	-	-	0	0
2014	Dry	No	-	-	0	0
2015	Dry	No	-	-	0	0
2016	Dry	No	-	-	0	0
2017	Wet	Yes	2/7/17	4/4/17	57	57
2018	Dry	No	-	-	0	0
2019	Wet	Yes	1/18/19	5/6/19	107	107
2020	Normal	Yes	4/7/20	-	177	55

*Migration Season is January through May.

**Lagoon opened and closed several times during the water year.



(b)

CCWA was not using the Penstock for SWP deliveries to Lake Cachuma throughout the water year.

Figure 4: State Water Project (SWP) release into the LSYR regarding BiOp compliance with (a) the 50-50 mix rule showing the percentage of CCWA water being released from Bradbury Dam downstream to the Long Pool and (b) the 18 ^{o}C rule for the water temperature being released from the Outlet Works.

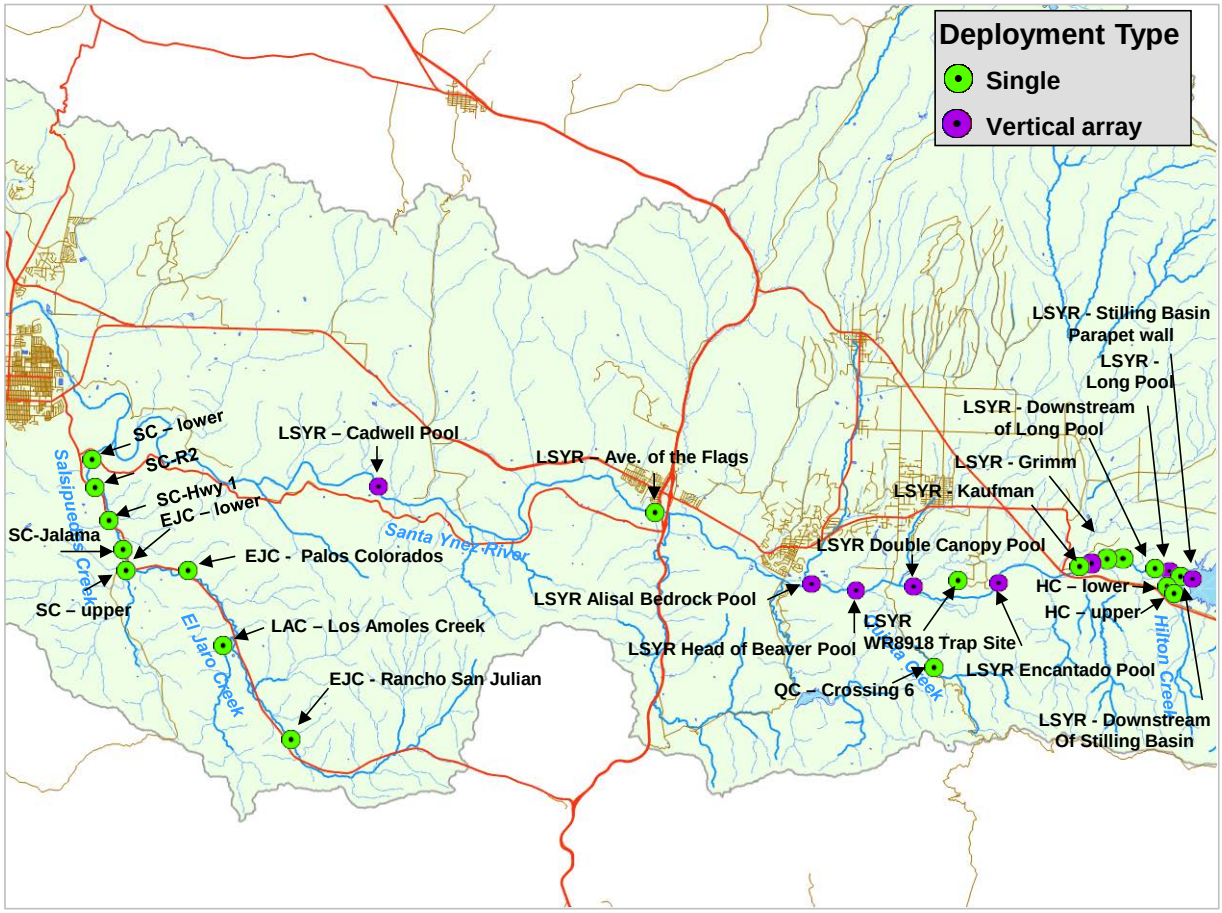


Figure 5: Thermograph single and vertical array deployment locations in WY2020 within the LSYR and its tributaries (HC – Hilton Creek, QC – Quiota Creek, SC – Salsipuedes Creek, and EJC – El Jaro Creek); the El Jaro Creek site and upper Salsipuedes Creek sites are close together with overlapping symbols.

Table 5: 2020 thermograph network locations and period of record listed from upstream to downstream.

	Location Name	Stream ID	Type	Latitude	Longitude	Deployment Date	Retrieval Date	Period of Record (Days)
Mainstem	LSYR - Stilling Basin Wall	LSYR-0.01	Vertical Array	34.585472	-119.98316	4/29/2020	11/19/2020	200
	LSYR - D/s of Stilling Basin	LSYR-0.25	Single	34.586502	-119.985333	4/29/2020	11/19/2020	200
	LSYR - Long Pool	LSYR-0.51	Vertical Array	34.588545	-119.987998	4/29/2020	11/19/2020	200
	LSYR - D/s of Long Pool	LSYR-0.68	Single	34.590550	-119.991317	4/29/2020	11/19/2020	200
	LSYR-Grimm Property-Upstream	LSYR-1.09	Single	34.590097	-119.999322	4/29/2020	11/17/2020	198
	LSYR-Grimm Property-Downstream	LSYR-1.54	Single	34.59423	-120.00537	4/29/2020	11/17/2020	198
	LSYR-Grimm Property Pool	LSYR-1.71	Vertical Array	34.594533	-120.008004	4/29/2020	11/17/2020	198
	LSYR-Kaufman Property Pool	LSYR-2.77	Single	34.589631	-120.025523	4/29/2020	11/17/2020	198
	LSYR - Encantado Pool	LSYR-4.95	Vertical Array	34.583817	-120.058500	4/30/2020	11/12/2020	192
	LSYR - WR89-18 Trap Site	LSYR-6.08	Single	34.579611	-120.077804	9/1/2020	9/17/2020	16
	LSYR - Double Canopy	LSYR-7.65	Vertical Array	34.583998	-120.096764	4/30/2020	11/12/2020	192
	LSYR - Head of Beaver	LSYR-8.7	Vertical Array	34.581116	-120.114454	4/30/2020	11/12/2020	192
	LSYR - Alisal Bedrock Pool	LSYR-10.2	Vertical Array	34.583267	-120.141369	4/30/2020	11/12/2020	192
	LSYR - Avenue of the Flags	LSYR-13.9	Single	34.606734	-120.195150	4/30/2020	11/12/2020	192
	LSYR - Cadwell Pool	LSYR-22.68	Vertical Array	34.610143	-120.306920	4/30/2020	11/12/2020	192
Tributaries	Hilton Creek (HC)-lower	HC-0.12	Single	34.587132	-119.986255	4/29/2020	11/19/2020	200
	HC at URP	HC-0.54	Single	34.581522	-119.982846	4/29/2020	11/19/2020	200
	Quiota Creek (QC)-Crossing 6	QC-2.66	Single	34.559525	-120.084834	5/1/2020	11/5/2020	184
	Salsipuedes Creek (SC)-lower-Reach 1	SC-0.77	Single	34.620473	-120.423552	5/1/2020	11/4/2020	183
	SC-Reach 2-Bedrock Section	SC-2.2	Single	34.61168	-120.42191	5/1/2020	11/5/2020	184
	SC-Reach 4-Hwy 1 Bridge	SC-3.0	Single	34.597429	-120.413034	5/1/2020	11/9/2020	188
	SC-Reach 5-Jalama Bridge	SC-3.5	Single	34.589551	-120.408944	5/1/2020	11/9/2020	188
	SC-upper at El Jaro confluence	SC-3.8	Single	34.583953	-120.408199	5/1/2020	11/10/2020	189
	El Jaro Creek (EJC)-Lower-Confluence	EJC-3.81	Single	34.584167	-120.407983	5/1/2020	11/10/2020	189
	EJC-Palos Colorados	EJC-5.4	Single	34.574767	-120.371795	5/1/2020	11/5/2020	184
	EJC-Rancho San Julian Bridge	EJC-10.82	Single	34.530013	-120.342545	5/1/2020	11/5/2020	184
	Los Amoles Creek (LAC)-Creek Crossing	LAC-7.0	Single	34.558216	-120.369581	5/1/2020	11/5/2020	184

*Stream distance for El Jaro Creek (a tributary of Salsipuedes Creek) are to the confluence with the LSYR mainstem.

Table 6: Water quality monitoring sites with *O. mykiss* and/or non-native warm water fish species presented as present/absent for reference with the water quality data; blanks indicate no fish species were observed.

Reach	Sub-Reach	Habitat Name	Stream ID	Observed Fish Species*: Spring	Summer	Fall
LSYR Mainstem:						
Reach 1	Hwy 154	Stilling Basin	LSYR-0.01	n/s	n/s	n/s
		Downstream of Stilling Basin	LSYR-0.25	n/s	n/s	
		Long Pool	LSYR-0.51	n/s	n/s	n/s
		Downstream of Long Pool	LSYR-0.68	O, B	n/s	O
		LSYR-Grimm Property Upstream	LSYR-1.09	O	n/s	
		LSYR-Grim Property Downstream	LSYR-1.54	O	n/s	
		LSYR-Grimm Property Pool	LSYR-1.71	O, B	n/s	O
		LSYR-Kaufman Property Run	LSYR-2.77	O, B	n/s	O
Reach 2	Refugio	Encantado	LSYR-4.95	O, B	O, B, S	O, B
		Double Canopy Pool	LSYR-7.65	B, S, C	O, B, C	B, C
		Head of Beaver Pool	LSYR-8.7		B	
		Bedrock Pool	LSYR-10.2	C	B	C
Reach 3	Ave. of the Flags	Ave. of the Flags (HWY 101)	LSYR-13.9	B, C		
	Cadwell	Cadwell Pool	LSYR-22.68	B, S, C	B, C	B, C
Tributaries:						
Hilton	Upper Hilton	Hilton Creek URP Pool	HC-0.12	O	n/s	O
	Lower Hilton	Lower Hilton Creek near Conf.	HC-0.54	O	n/s	O
Quiota	Crossing 6	Crossing 6 Pool	QC-2.66	O	n/s	
Salsipuedes	Reach 1	Salsipuedes Creek at Trap Site	SC-0.77	O, B, S, C	n/s	S
	Reach 2	Salsipuedes Creek Reach 2 Bedrock Section	SC-2.2	O	n/s	S
	Reach 4	Salsipuedes Creek at Highway 1 Bridge	SC-3.0	O	n/s	
	Reach 5	Salsipuedes Creek at Jalama Bridge	SC-3.5	O	n/s	O, S
	Upper Salsipuedes	Salsipuedes Creek upstream of El Jaro Conf.	SC-3.8		n/s	
El Jaro	Lower El Jaro	El Jaro upstream of Conf. with Salsipuedes	EJC-3.81	O, S	n/s	
	Palos Colorados	Palos Colorados Pool	EJC-5.4		n/s	
	Rancho San Julian	EL Jaro at Rancho San Julian Bridge	EJC-10.82	O	n/s	
Los Amoles	Lower Los Amoles	Lower Los Amoles Creek Crossing	LAC-7.0		n/s	

* O - *O. mykiss*, B - bass, S - sunfish, C - carp, Ca - catfish, blank means zero observed.

n/s - not snorkeled due to turbidity.

Figure 6: **:** 2020 LSYR mainstem temperature unit deployment locations at: a) LSYR-0.01, b) LSYR-0.25, c) LSYR-0.51, d) LSYR-0.68, e) LSYR-1.09, f) LSYR-1.54.

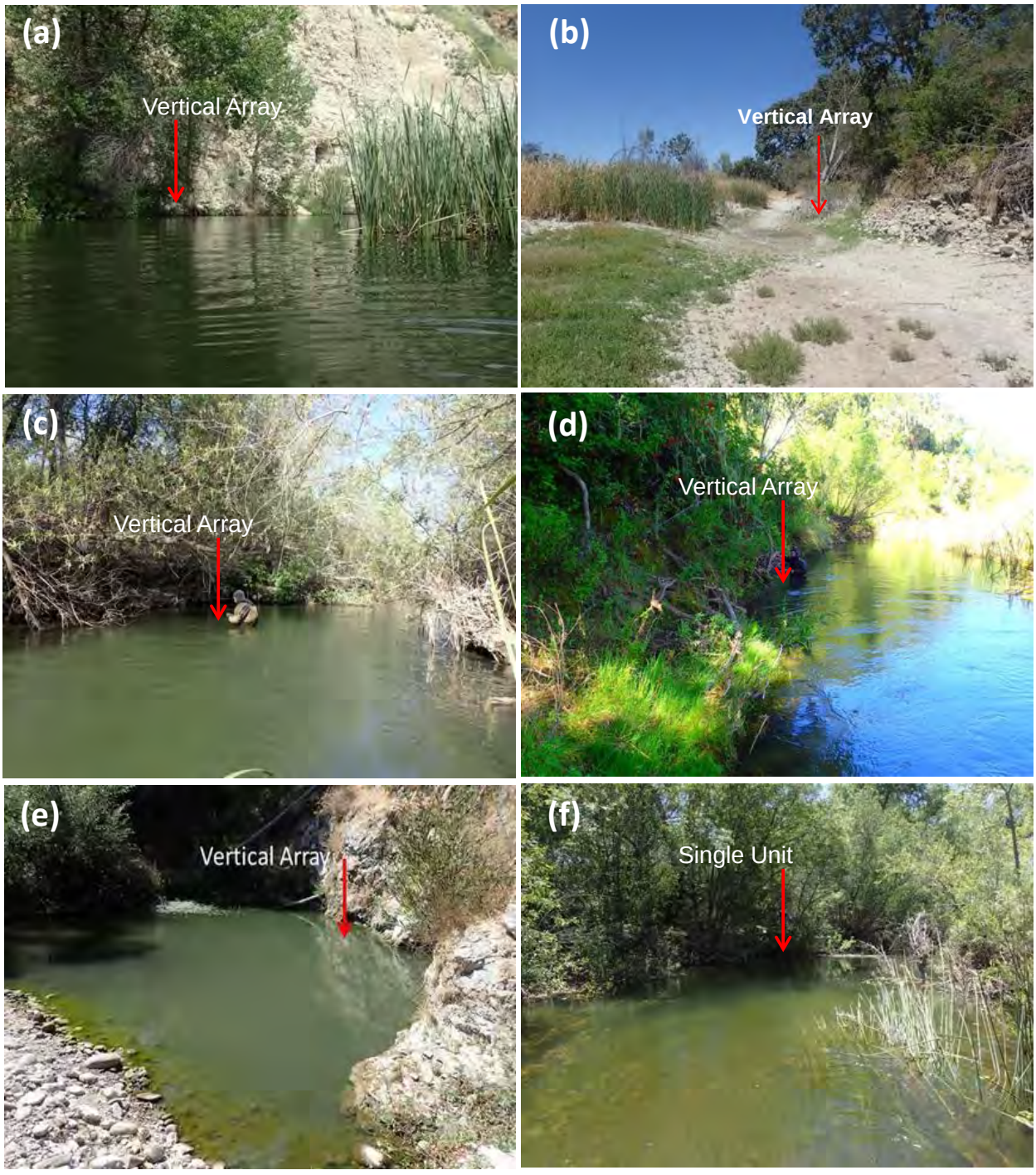


Figure 7: 2020 LSYR mainstem temperature unit deployment locations at: a) LSYR-1.71, b) LSYR-4.95 (dry 2019), c) LSYR-7.65, d) LSYR-8.7, e) LSYR-10.2, f) LSYR-13.9.

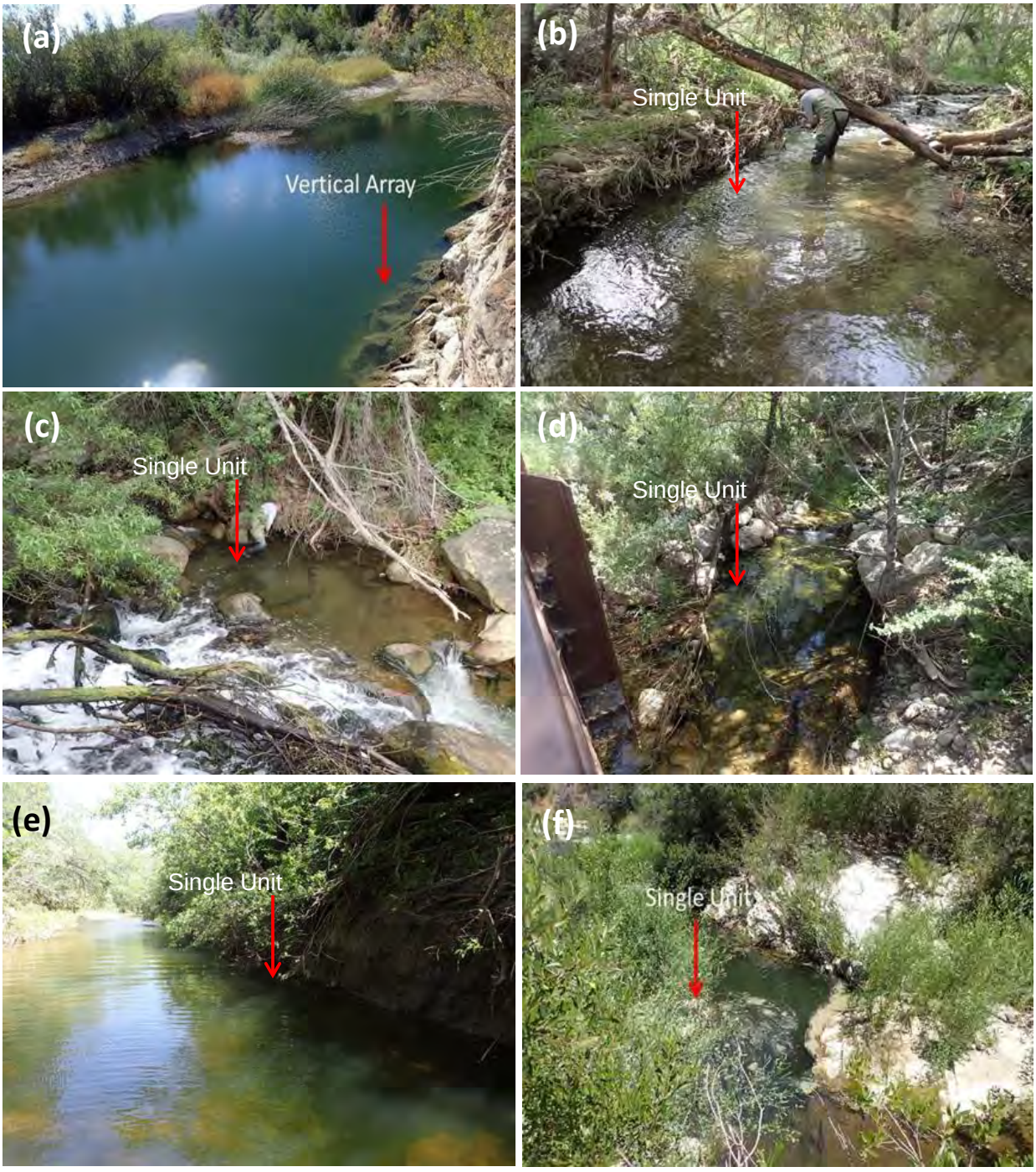


Figure 8: 2020 LSYR mainstem temperature unit deployment location at: a) LSYR-22.68 and tributary deployment locations at: b) HC-0.12, c) HC-0.54, d) QC-2.66, e) SC-0.77 and, f) SC-2.2.

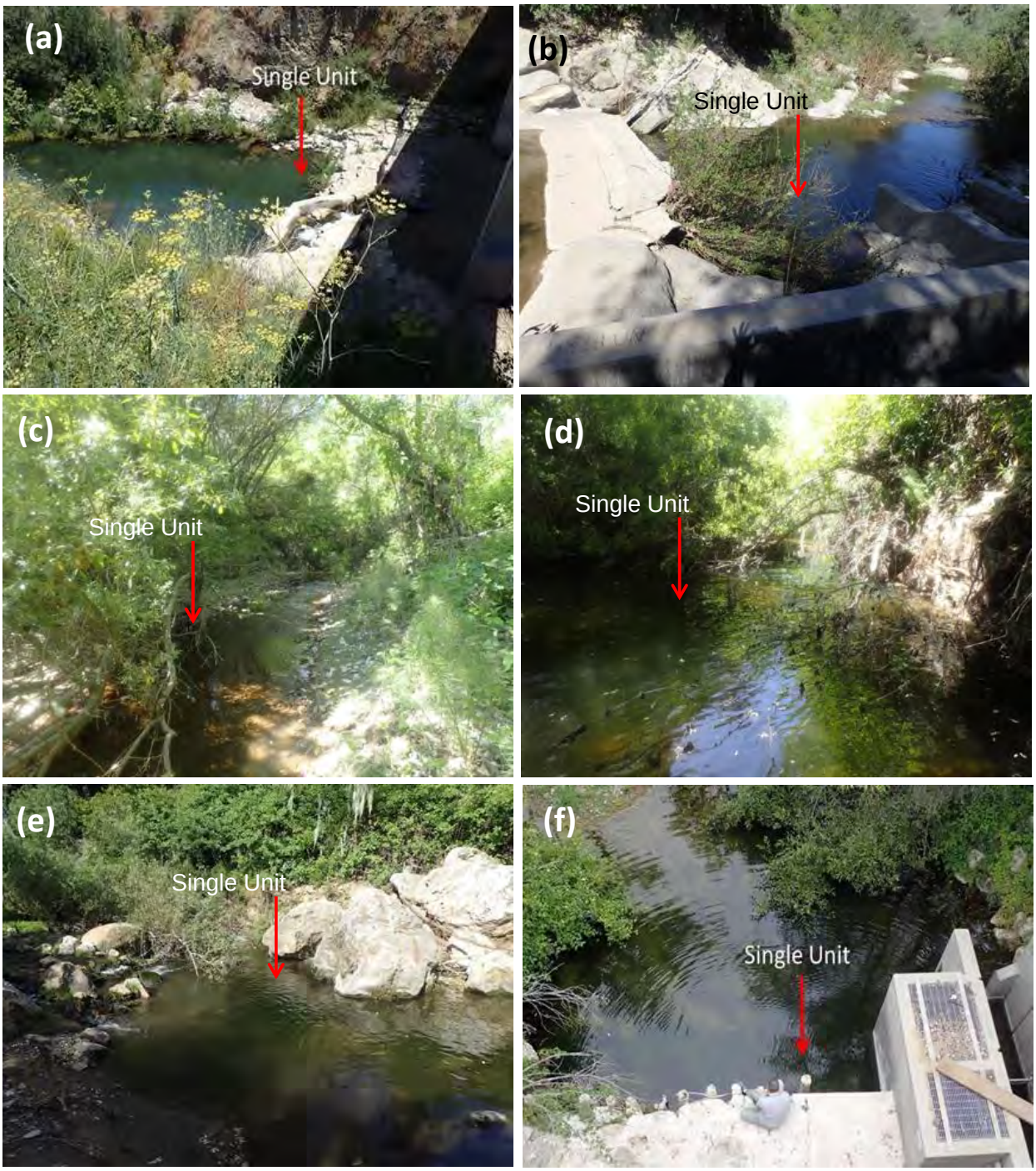


Figure 9: 2020 Tributary thermograph deployment locations at: a) SC-3.0, b) SC-3.5, c) SC-3.8, d) EJC-3.81, e) EJC-5.4, and f) EJC-10.82.

Figure 10: 2020 Tributary temperature unit deployment location at: a) LAC-7.0.

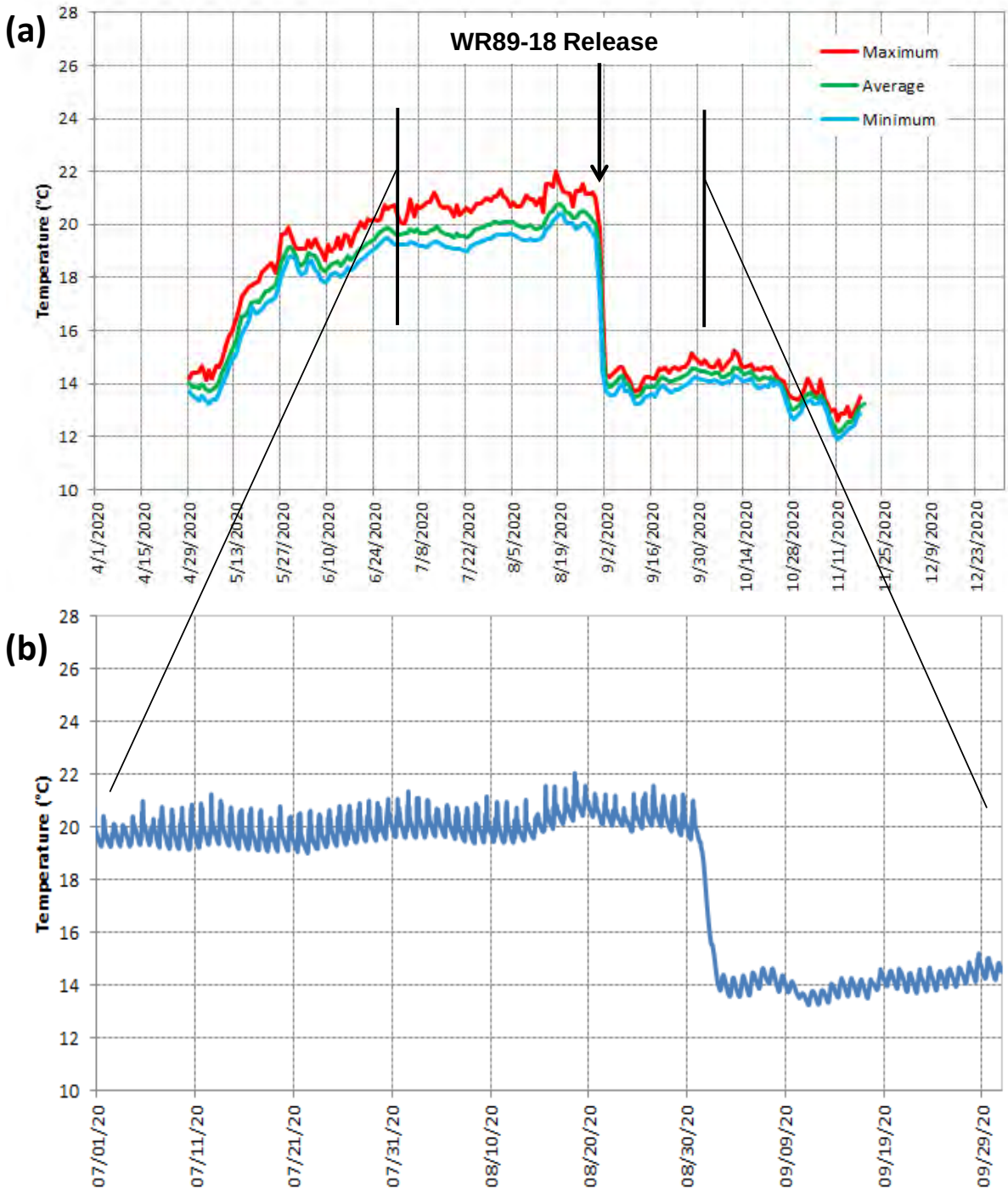


Figure 11: 2020 LSYR-0.01 (Stilling Basin parapet wall) surface (1.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements for the period of 7/1/20 – 10/1/20.

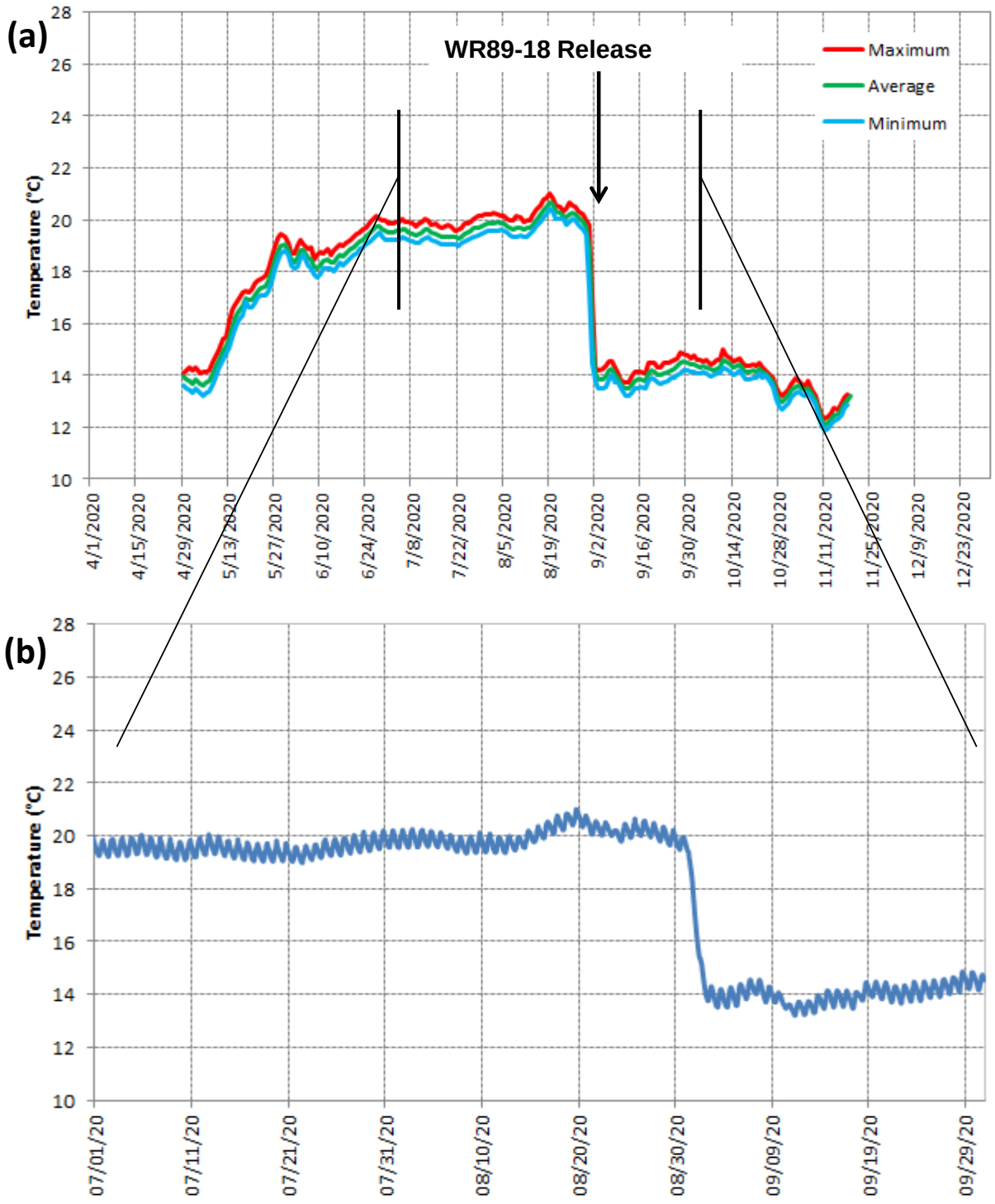


Figure 12: 2020 LSYR-0.01 (Stilling Basin parapet wall) middle (14 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements for the period of 7/1/20 – 10/1/20.

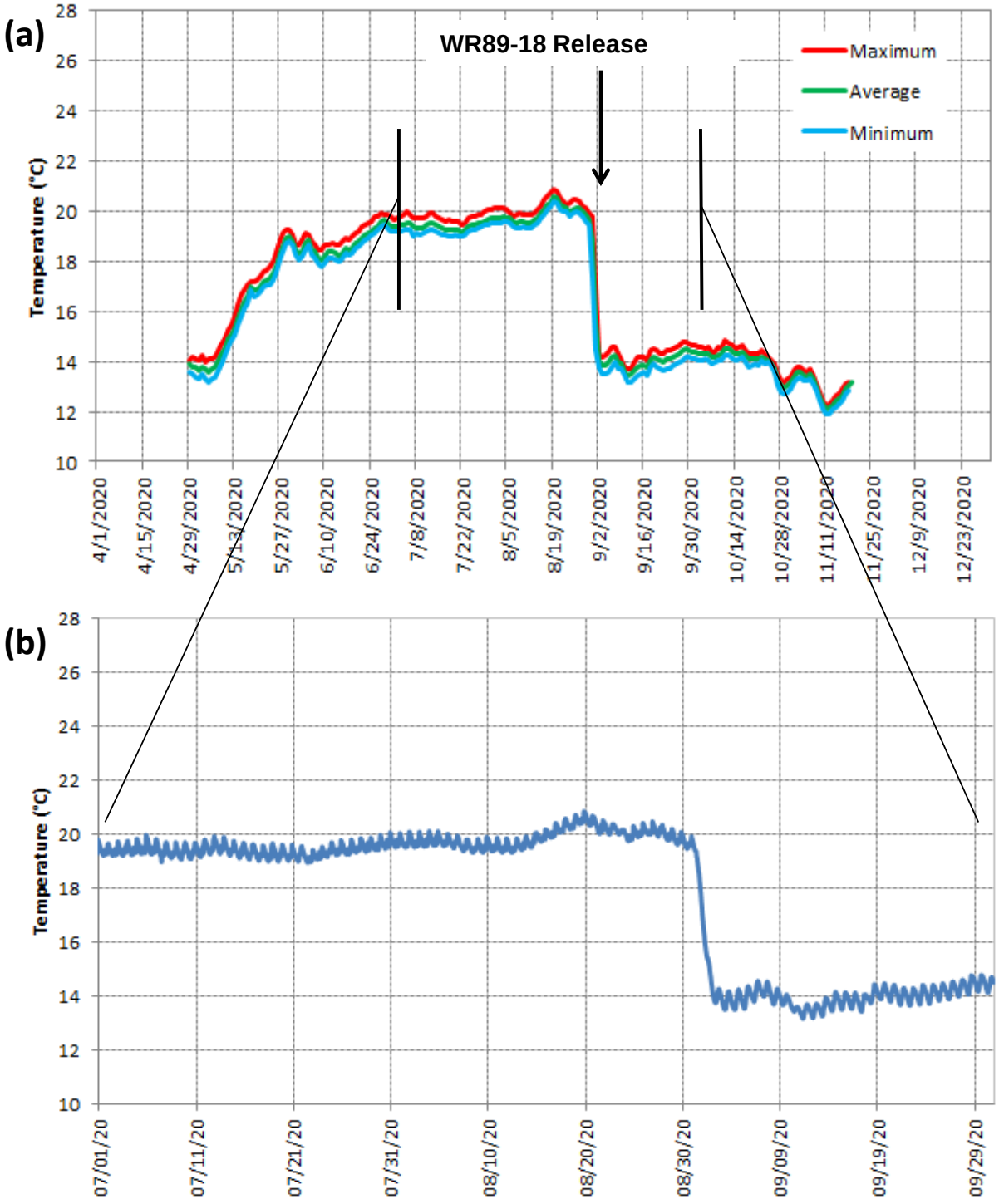


Figure 13: 2020 LSYR-0.01 (Stilling Basin parapet wall) bottom (28 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements for the period of 7/1/20 – 10/1//20.

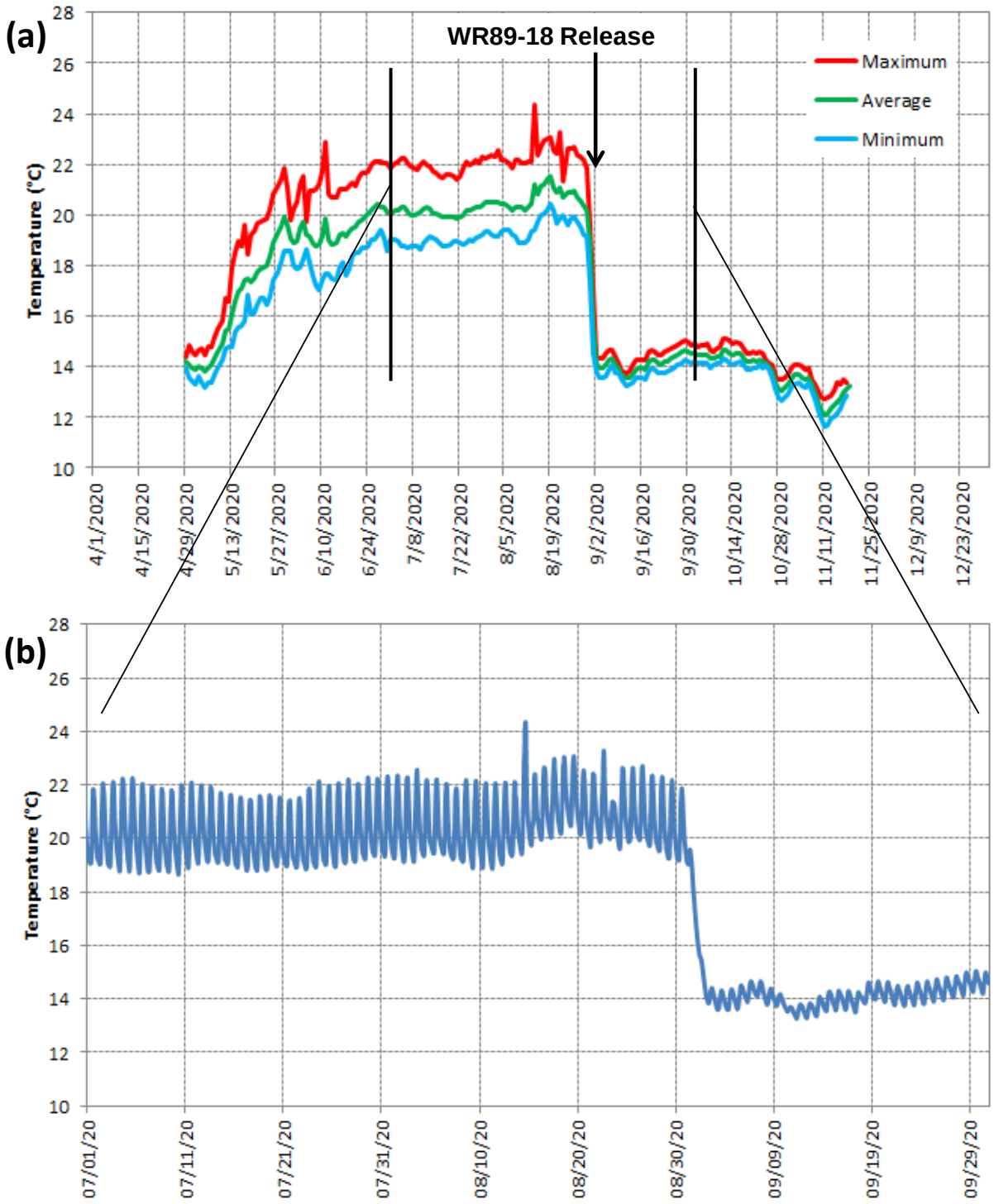


Figure 14: 2020 LSYR-0.25 (Downstream of Stilling Basin) bottom (1.5 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements for the period of 7/1/20 – 10/1/20.

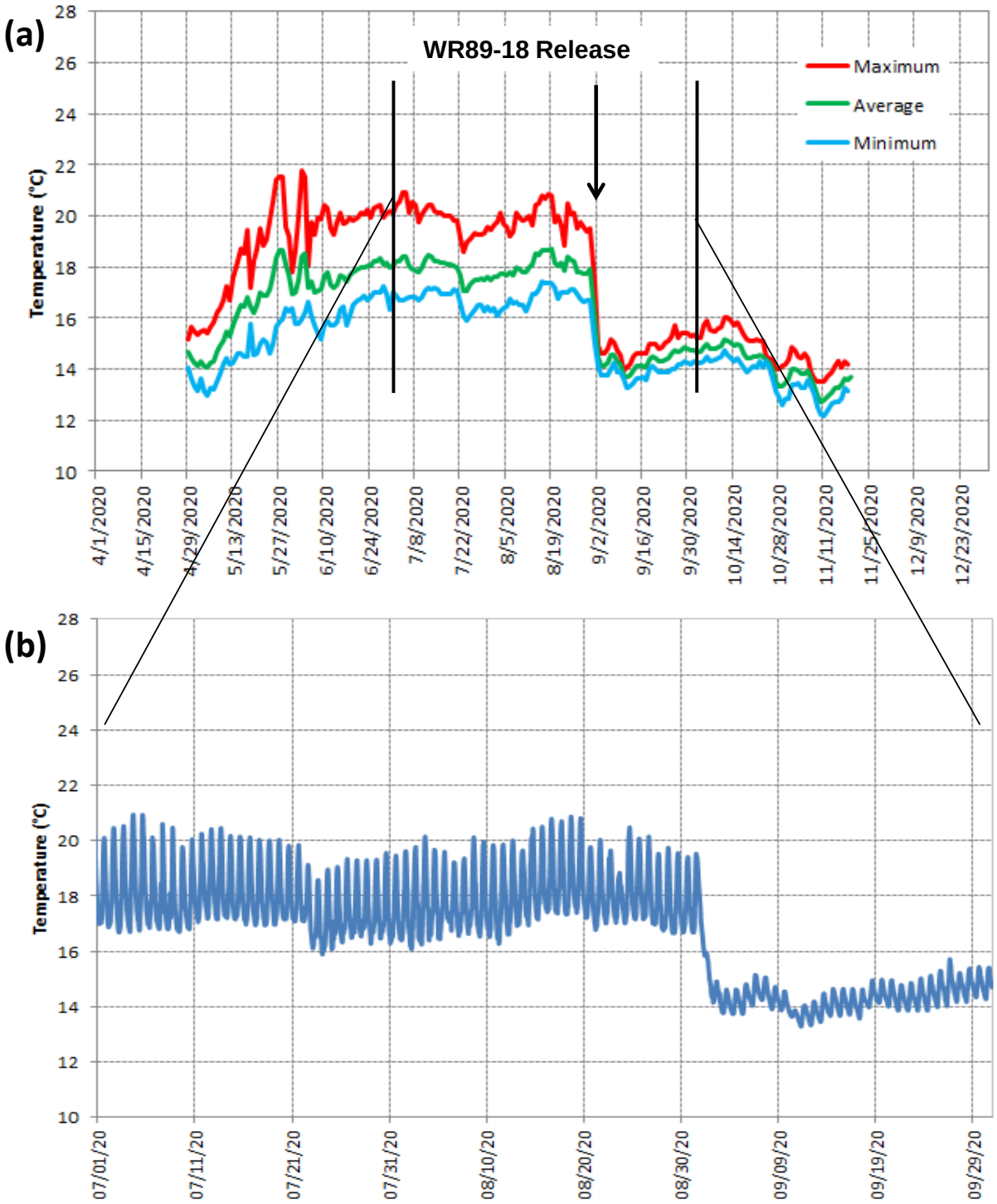


Figure 15: 2020 LSYR-0.51 (Long Pool) surface (1.0 foot) thermograph for (a) daily maximum, average, and minimum values for the entire period of deployment and (b) hourly data from 7/1/20 – 10/1/20; the Long Pool depth decreased over 3-feet due to storm flow siltation from the Whittier Fire.

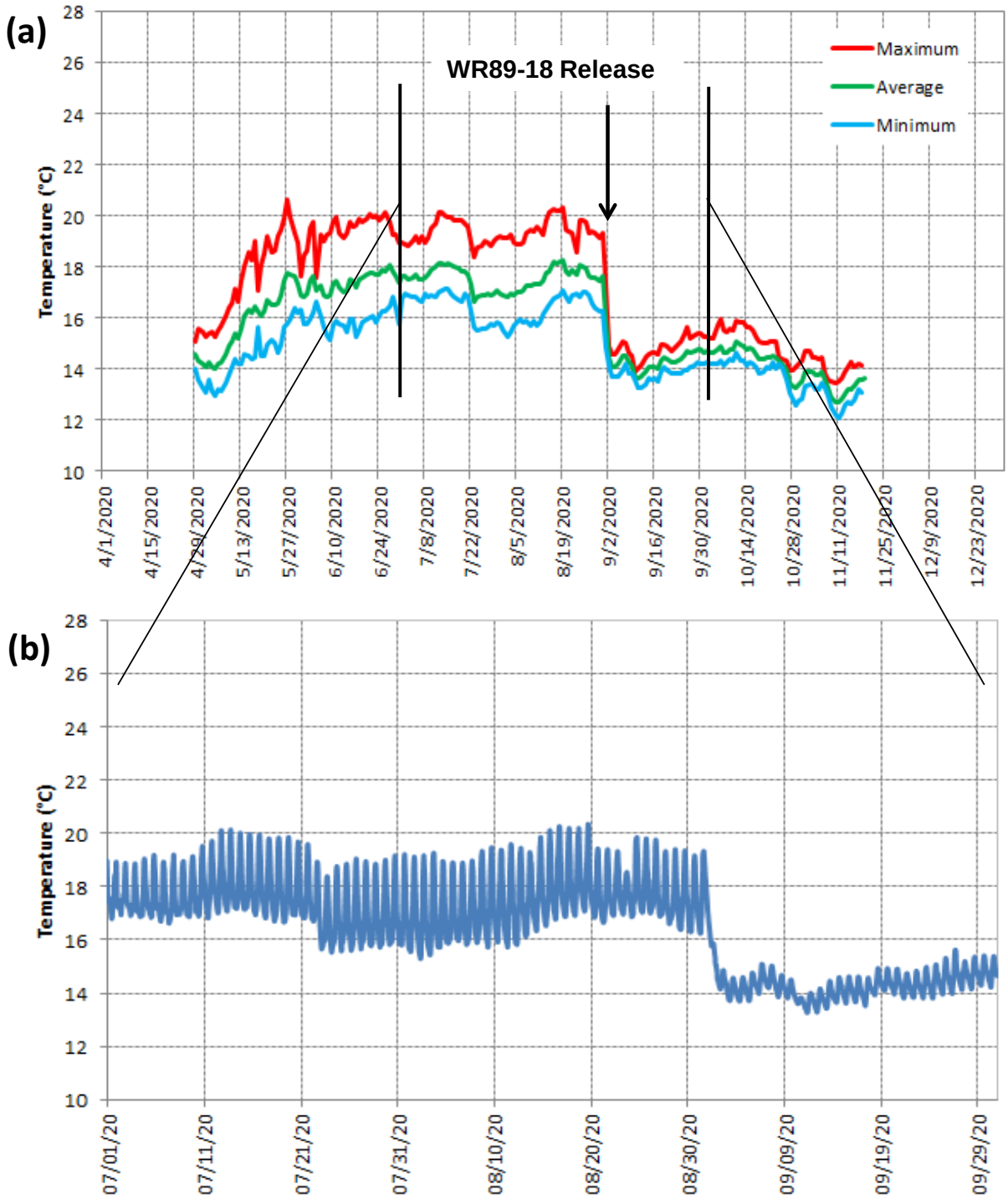


Figure 16: 2020 LSYR-0.51 (Long Pool) middle (2.5 feet) thermograph for (a) daily maximum, average, and minimum values and (b) hourly data from 7/1/20 – 10/1/20 the Long Pool depth decreased over 3-feet due to storm flow siltation from the Whittier Fire.

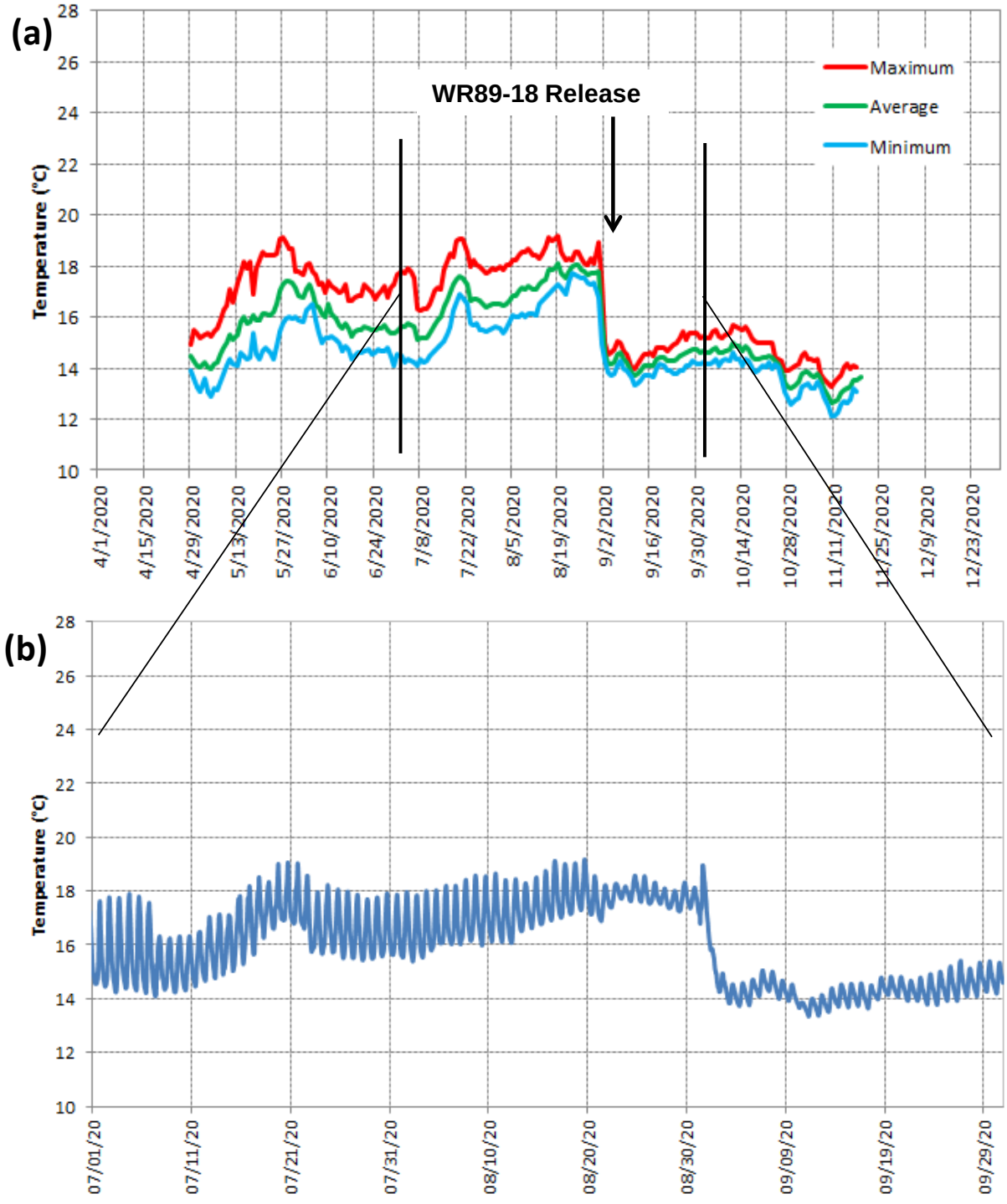


Figure 17: 2020 LSYR-0.51 (Long Pool) bottom (5.5 feet) thermograph for (a) daily maximum, average, and minimum values and (b) hourly data from 7/1/20 – 10/1/20; the Long Pool depth decreased over 3 feet due to storm flow siltation from the Whittier Fire.

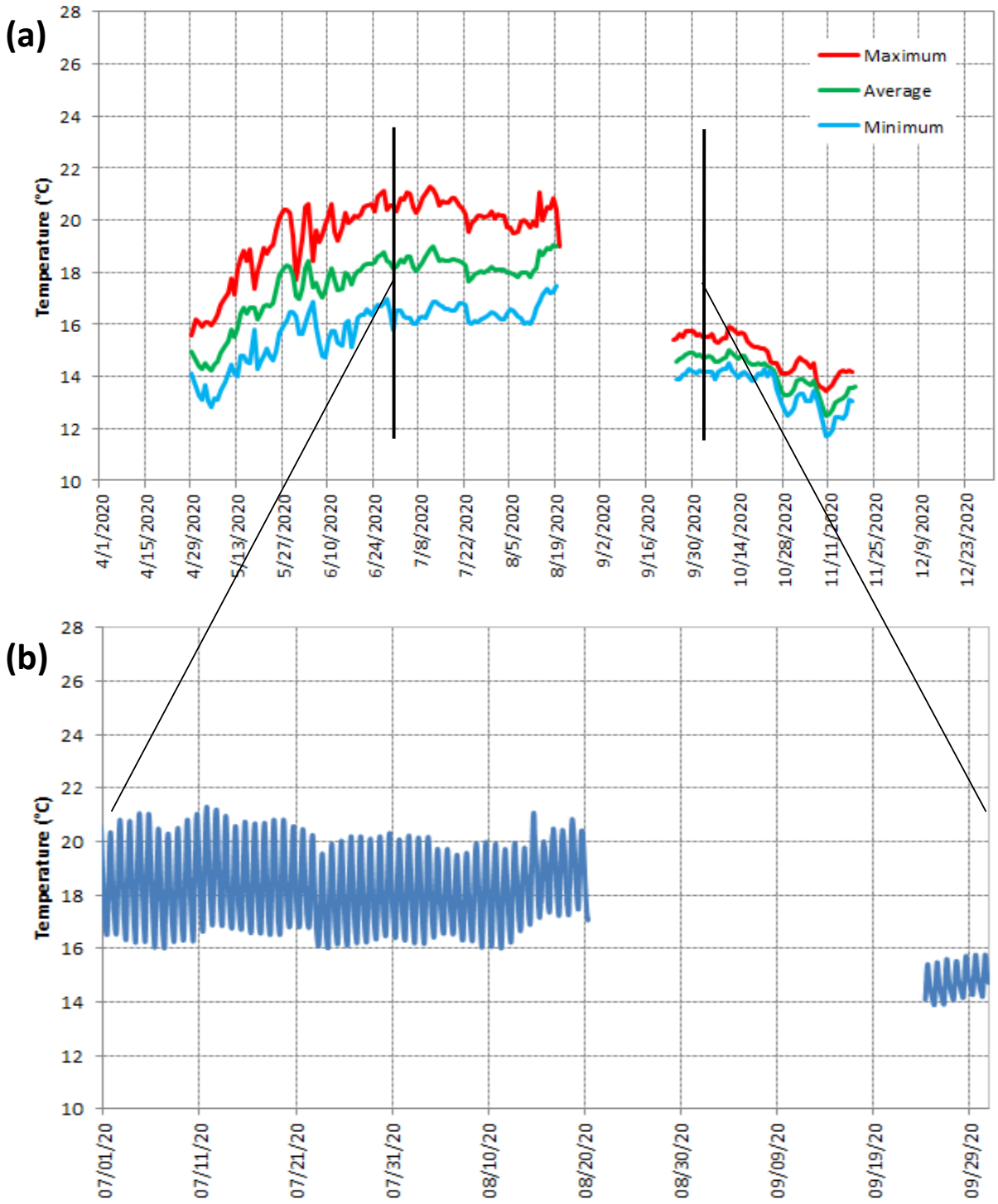


Figure 18: 2020 Reclamation property boundary at LSYR 0.68 (downstream of the Long Pool) bottom (2 feet) thermograph for (a) daily maximum, average, and minimum values and (b) hourly data from 7/1/20 – 10/1/20; optic shuttle malfunction resulted in loss of data from 8/20/20 through 9/24/20.

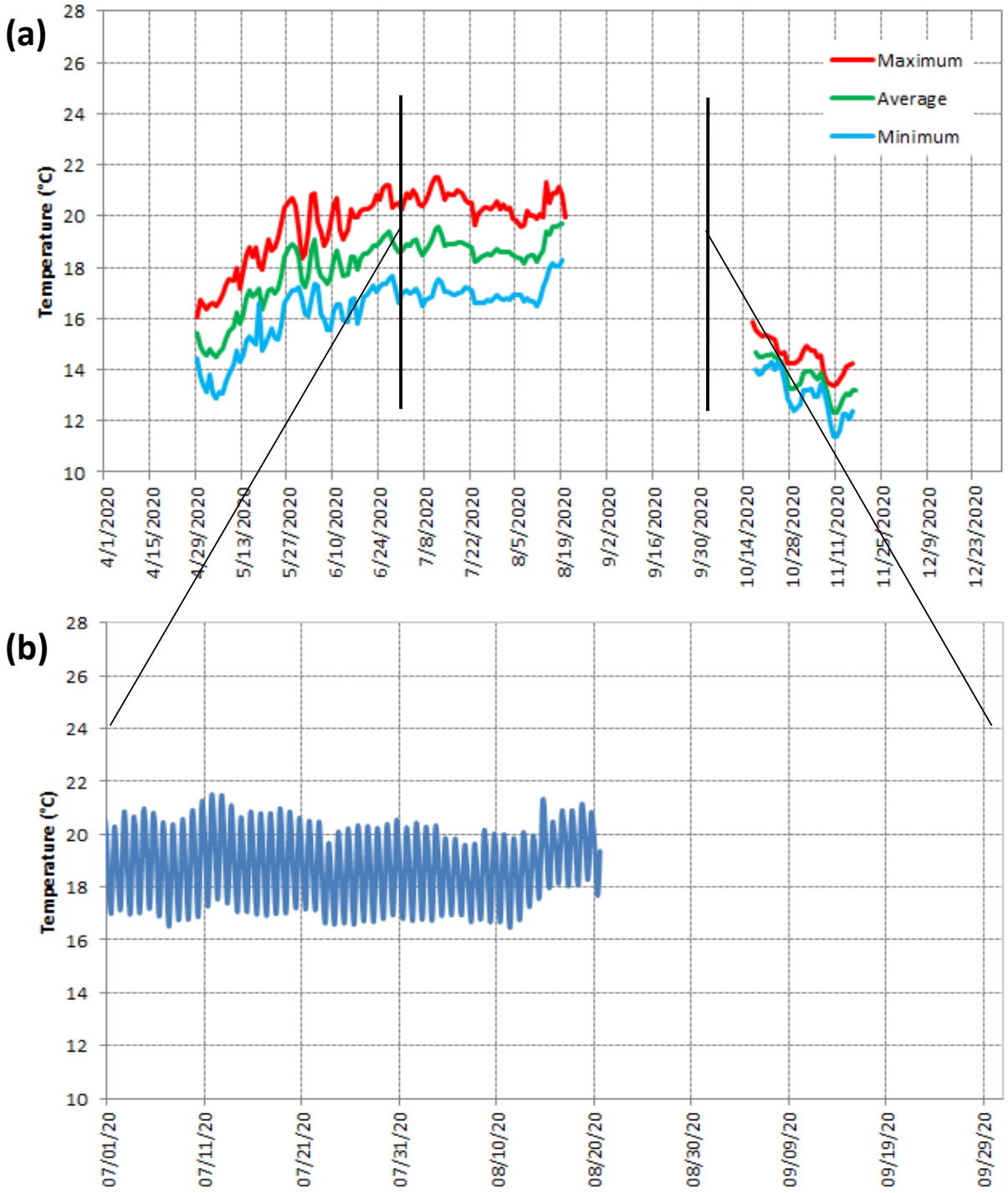


Figure 19: 2020 LSYR-1.09 (Grimm Property upstream-run) bottom (1.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20; optic shuttle malfunction resulted in a loss of data between 8/20/20 and 10/16/20.

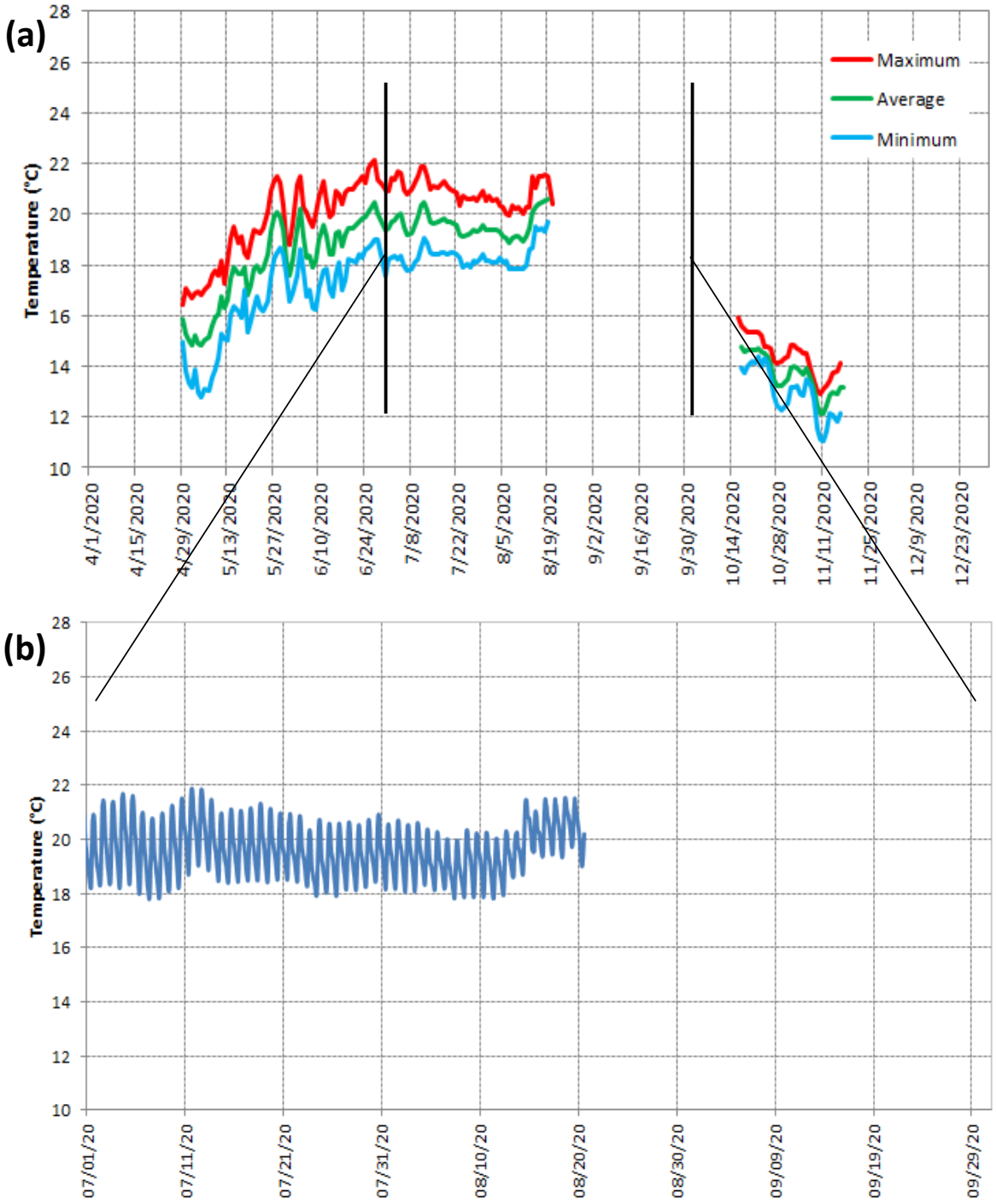


Figure 20: 2020 LSYR-1.54 (Grimm Property downstream-run) bottom (1.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20; optic shuttle malfunction resulted in a loss of data between 8/20/20 and 10/16/20.

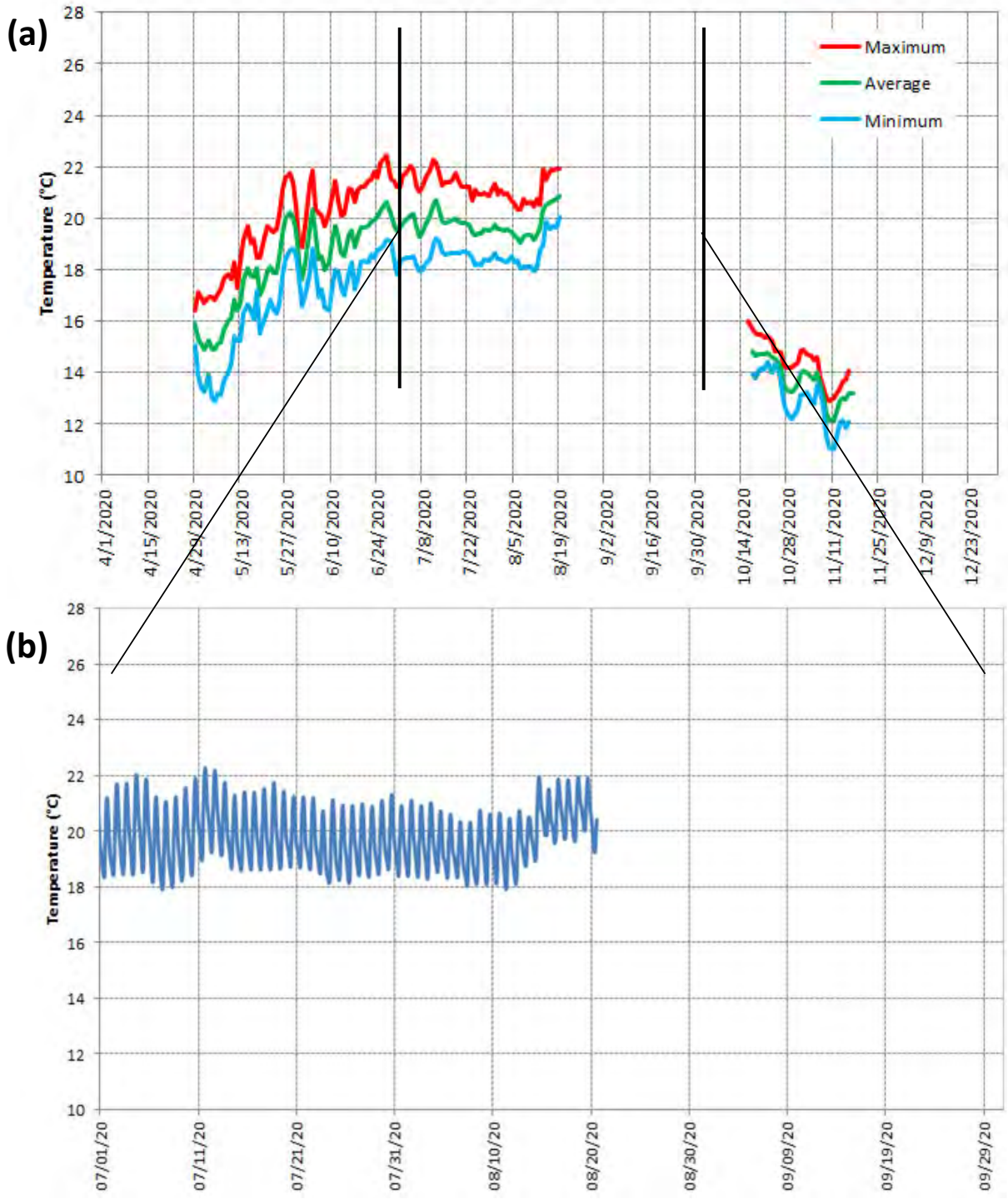


Figure 21: 2020 LSYR-1.71 (Grimm Property pool) surface (1.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20: optic shuttle malfunction resulted in a loss of data between 8/20/20 and 10/16/20.

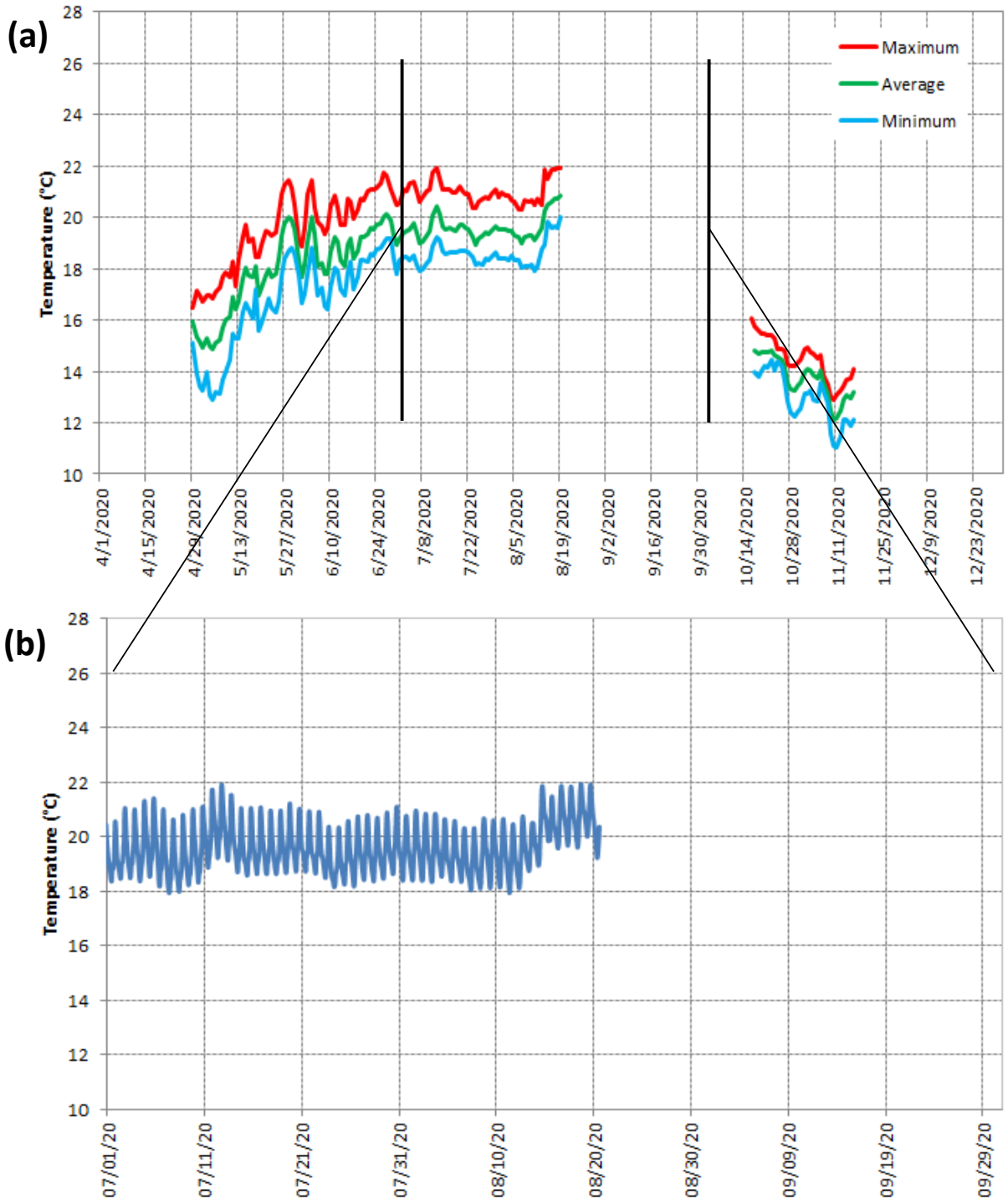


Figure 22: 2020 LSYR-1.71 (Grimm Property pool) bottom (6.5 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20; optic shuttle malfunction resulted in a loss of data between 8/20/20 and 10/16/20.

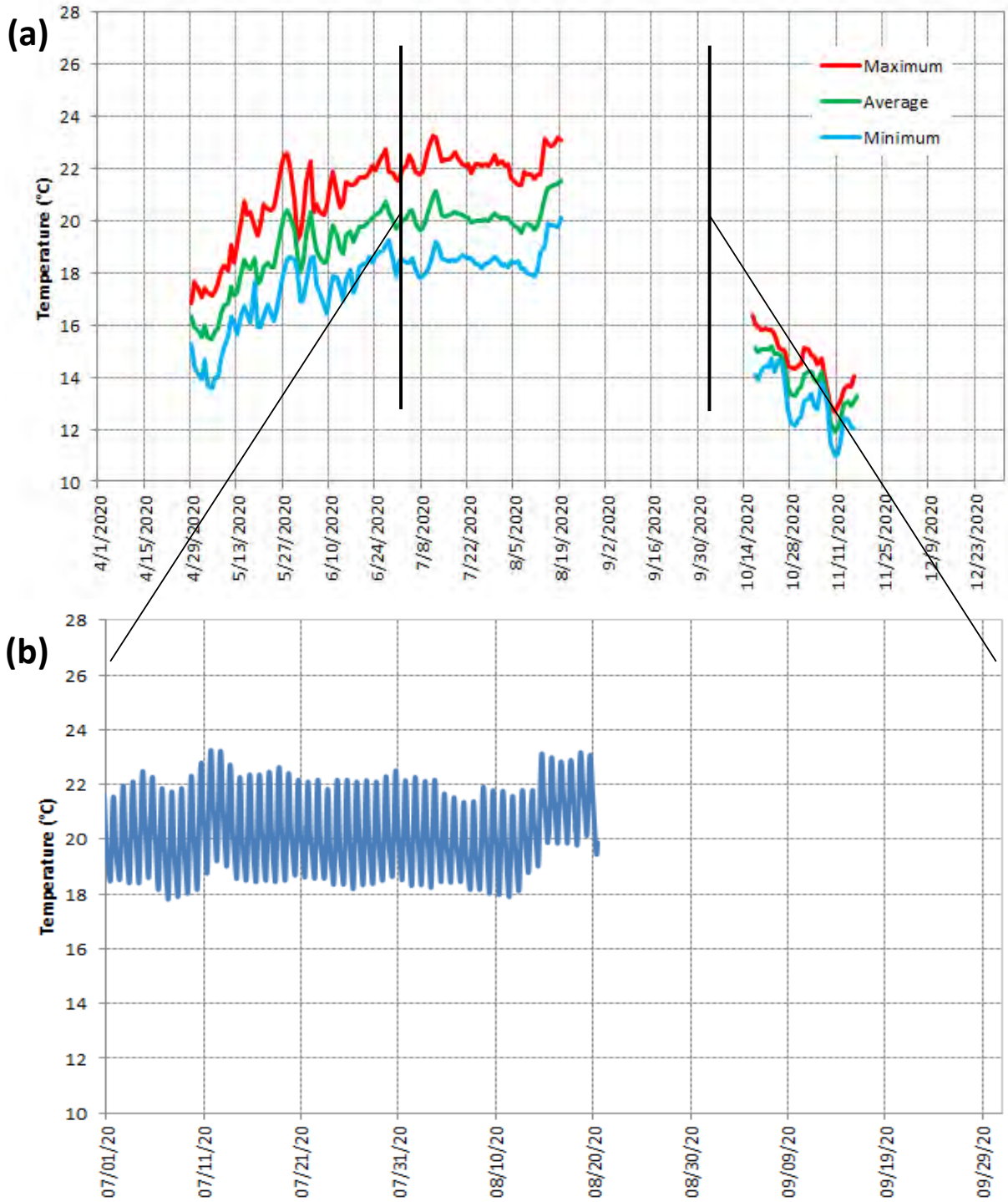


Figure 23: 2020 LSYR-2.77 (Kaufman run) bottom (1.0-feet) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20; optic shuttle malfunction resulted in a loss of data between 8/20/20 and 10/16/20.

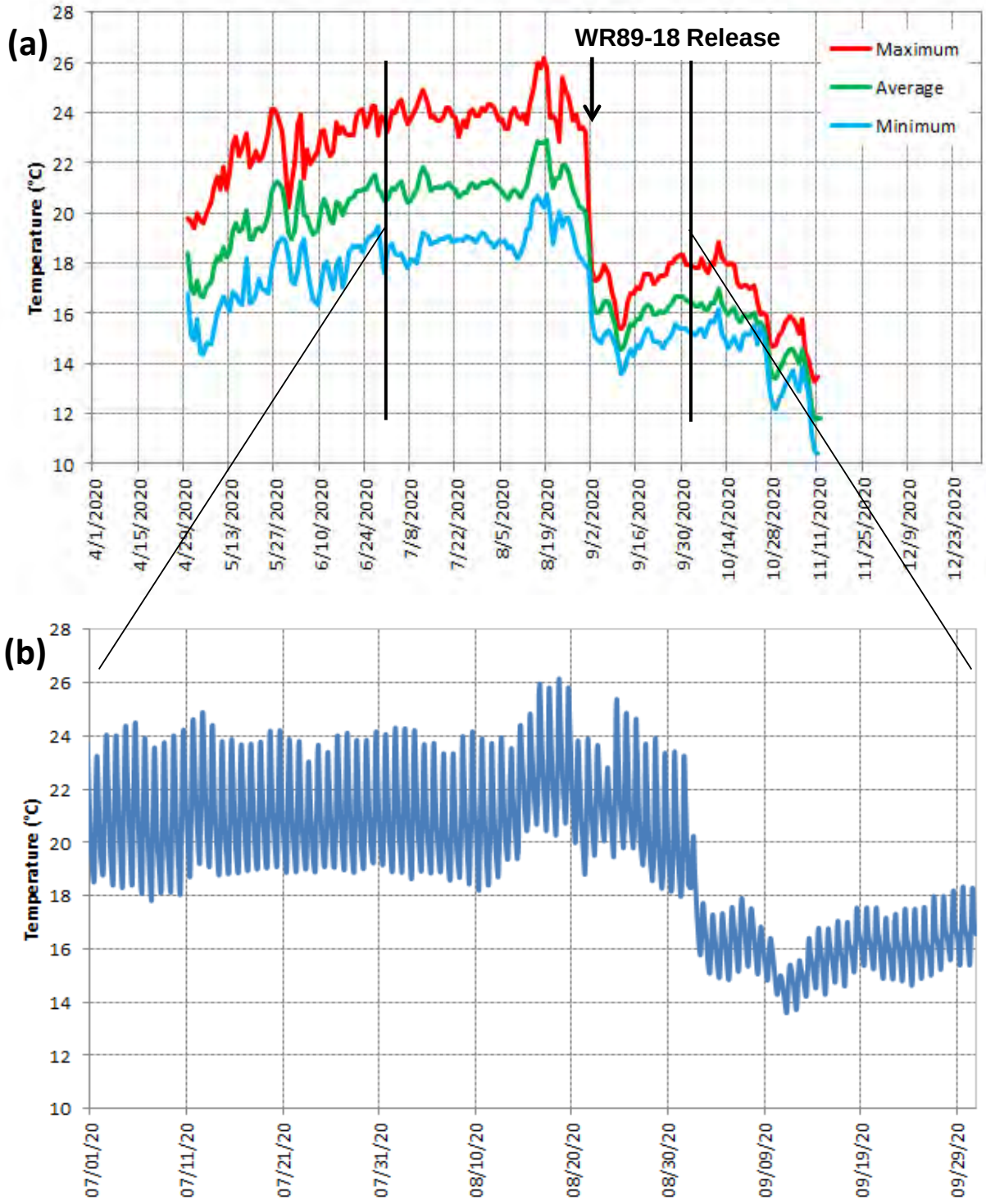


Figure 24: 2020 LSYR 4.95 (Encantado Pool) surface (1.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

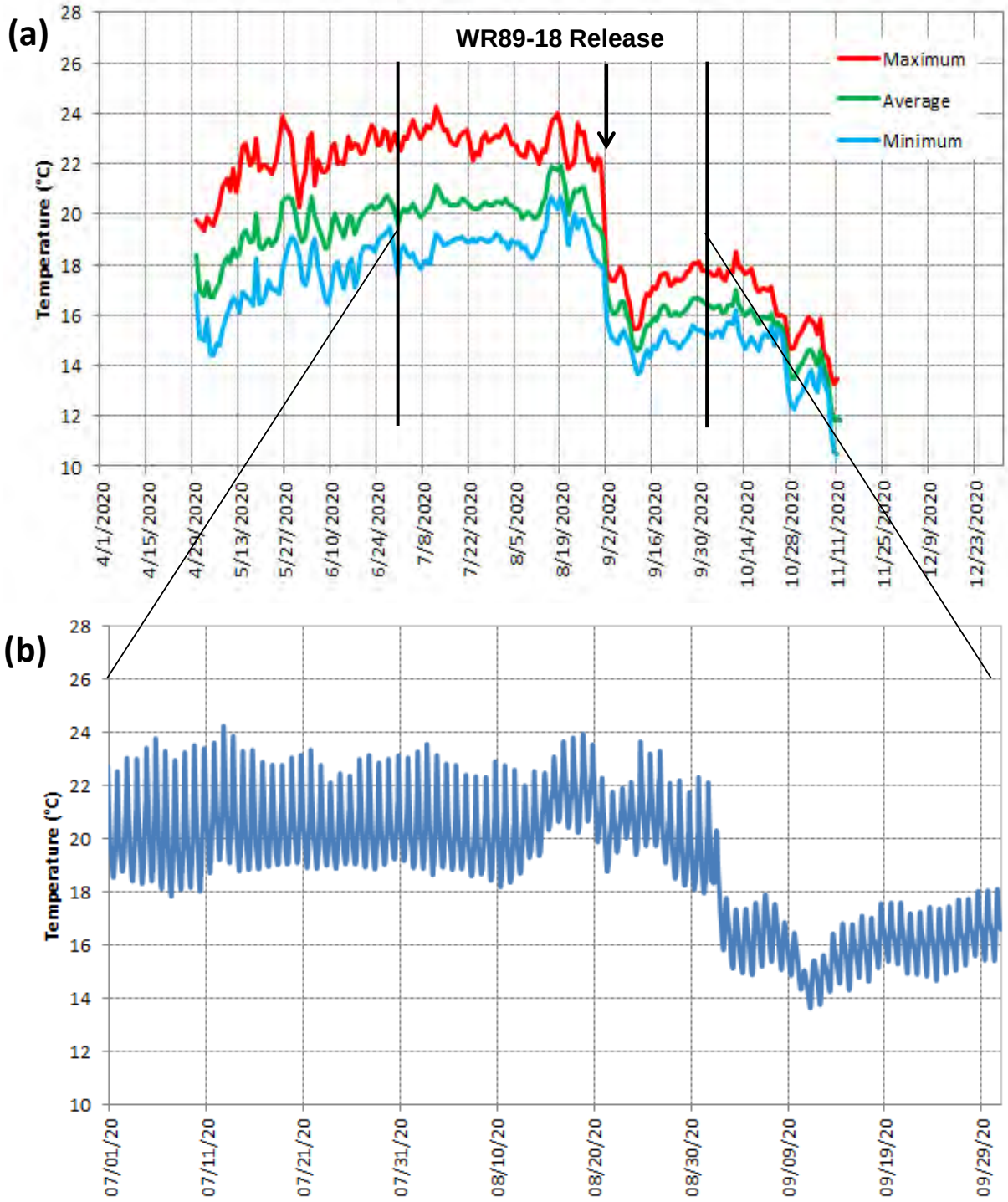


Figure 25: 2020 LSYR-4.95 (Encantado Pool) middle (4.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

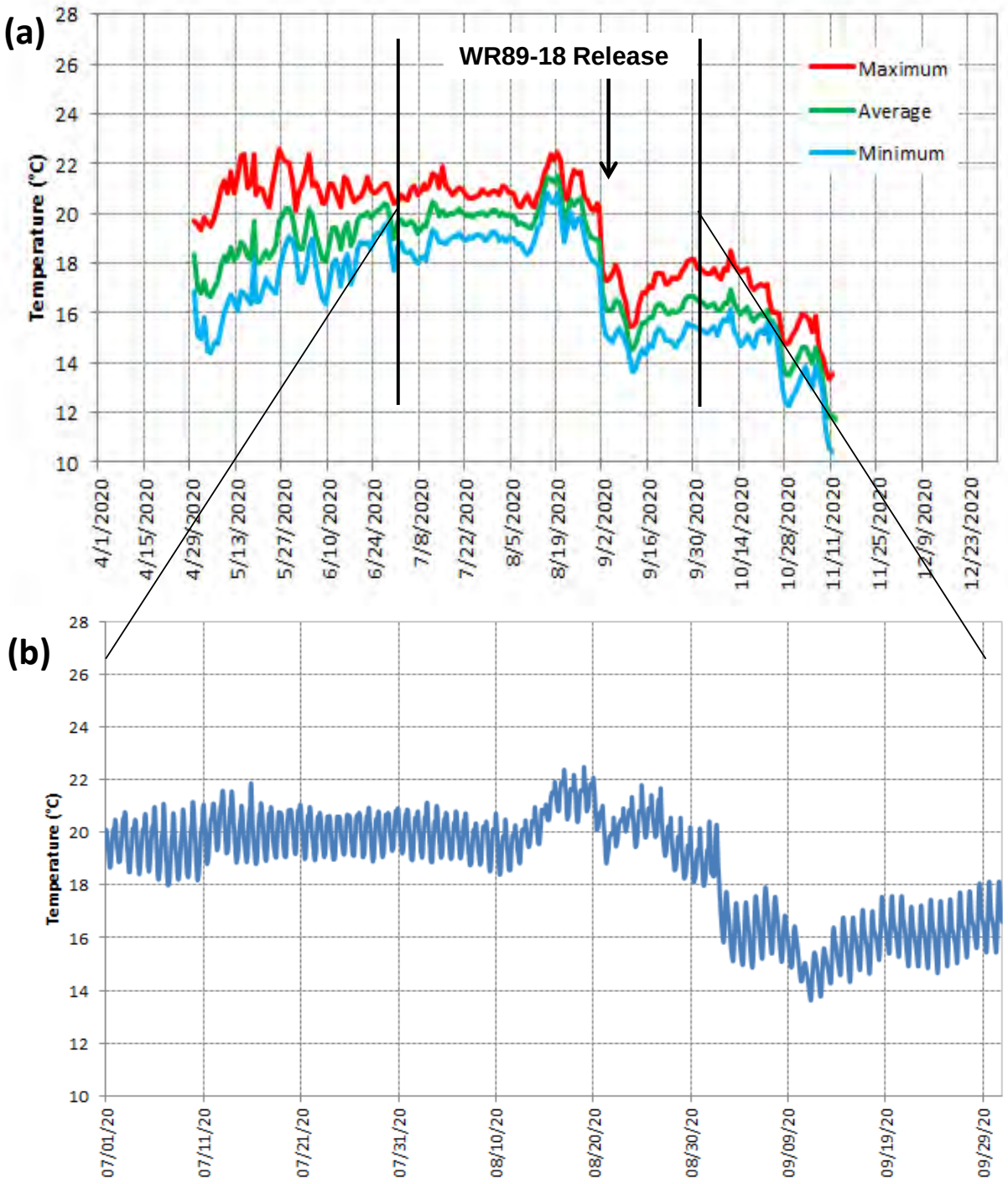


Figure 26: 2020 LSYR-4.95 (Encantado Pool) bottom (8.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

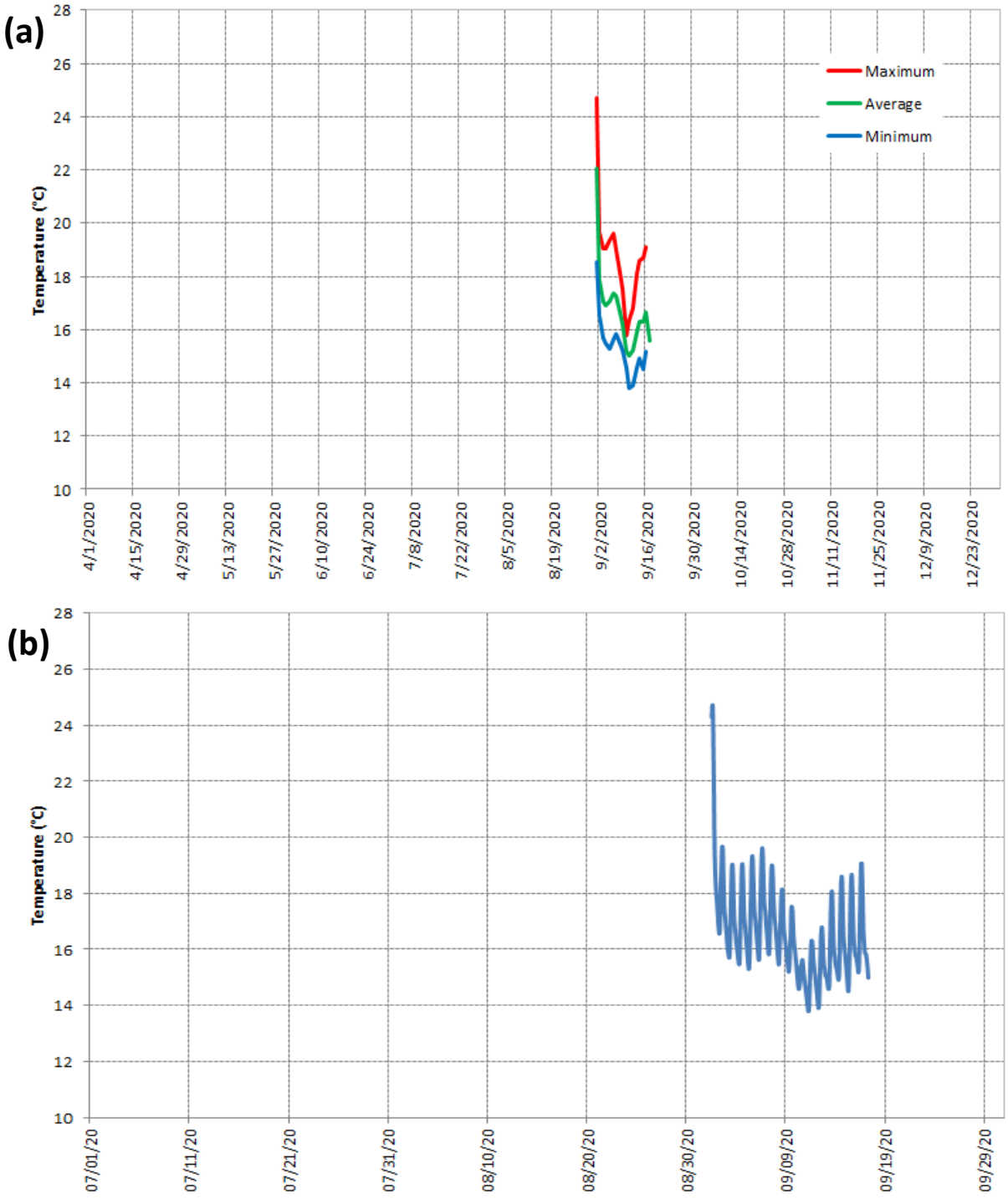


Figure 27: 2020 LSYR-6.08 (Mainstem Trap Site) bottom (3.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements for the entire period of record; unit deployed to monitor water temperature conditions during trapping of the WR89-18 release.

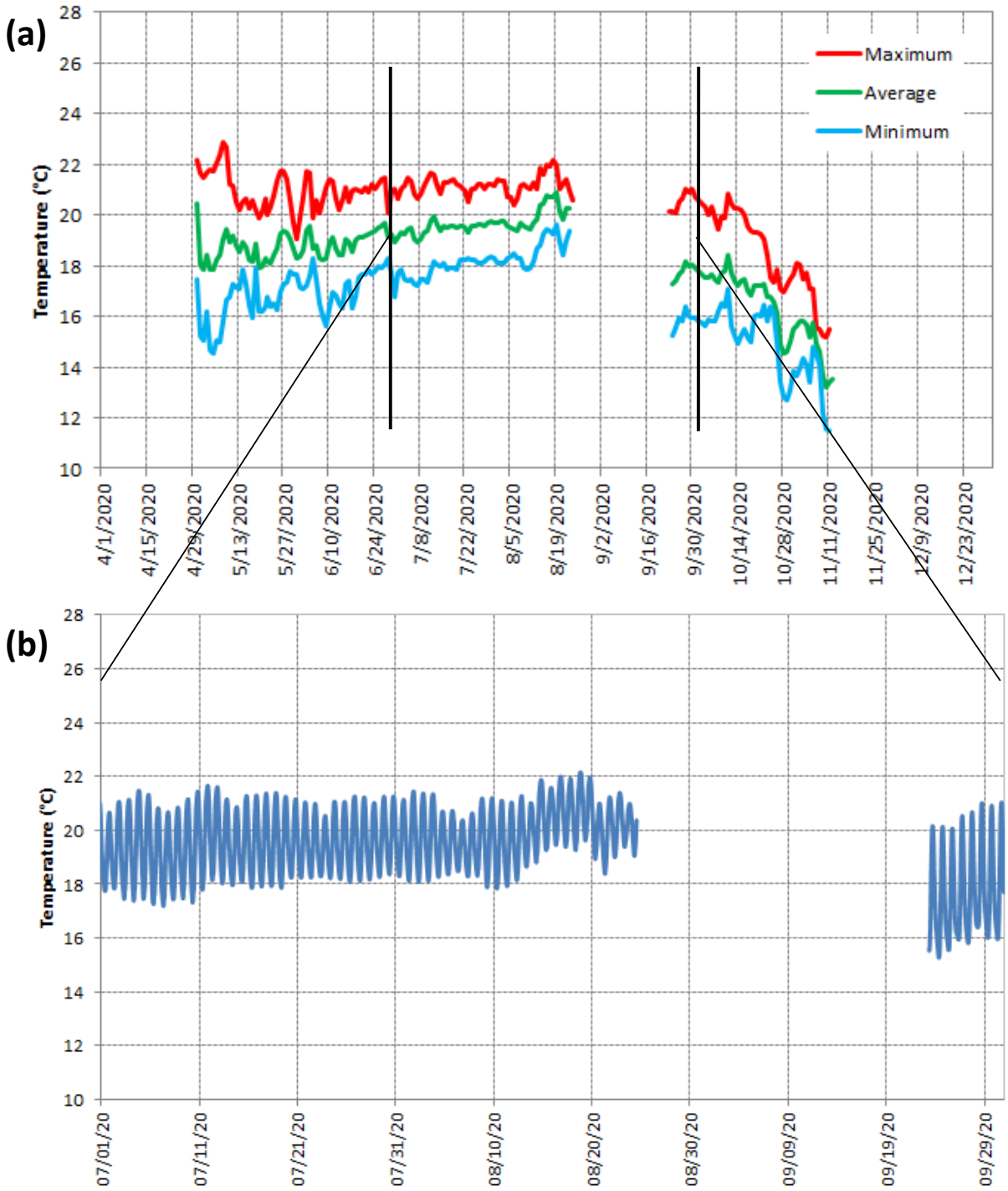


Figure 28: 2020 LSYR-7.65 (Double Canopy Pool) surface (1.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20; optic shuttle malfunction resulted in loss of data from 8/24/20 to 9/22/20.

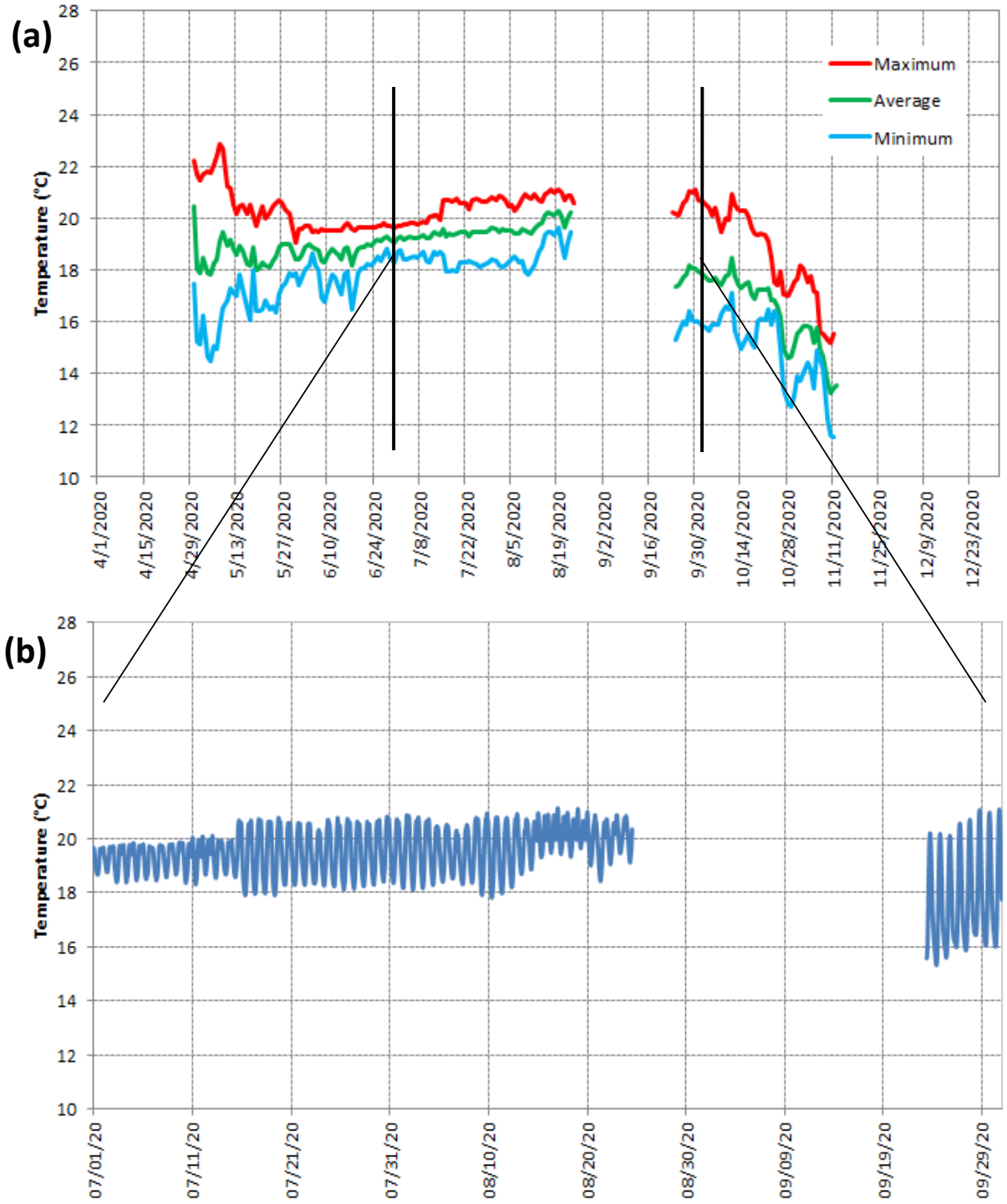


Figure 29: 2020 LSYR-7.65 (Double Canopy Pool) bottom (3.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 - 10/1/20; optic shuttle malfunction resulted in loss of data from 8/24/20 to 9/22/20.

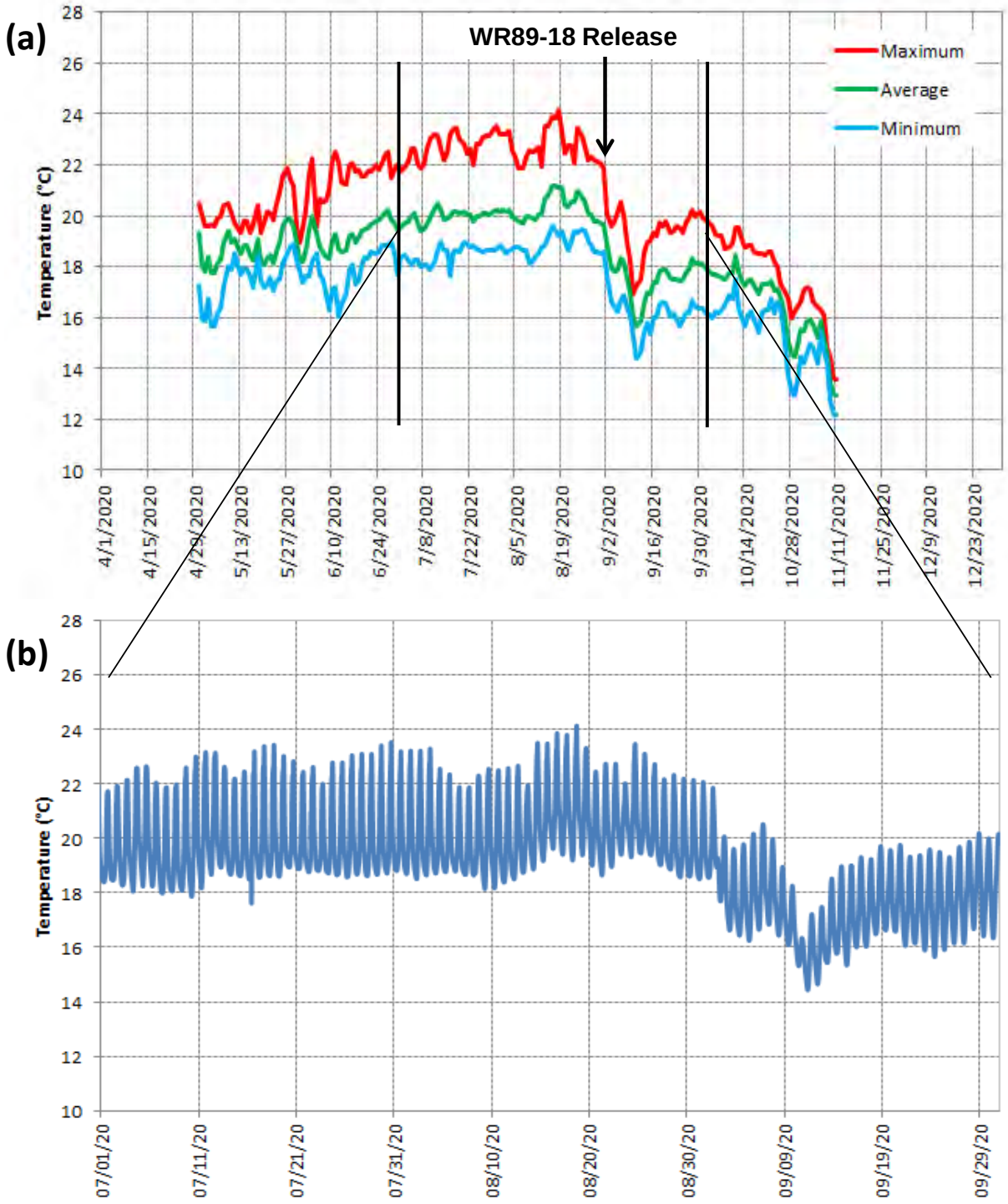


Figure 30: 2020 LSYR-8.7 (Head of Beaver Pool) surface (1.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 - 10/1/20.

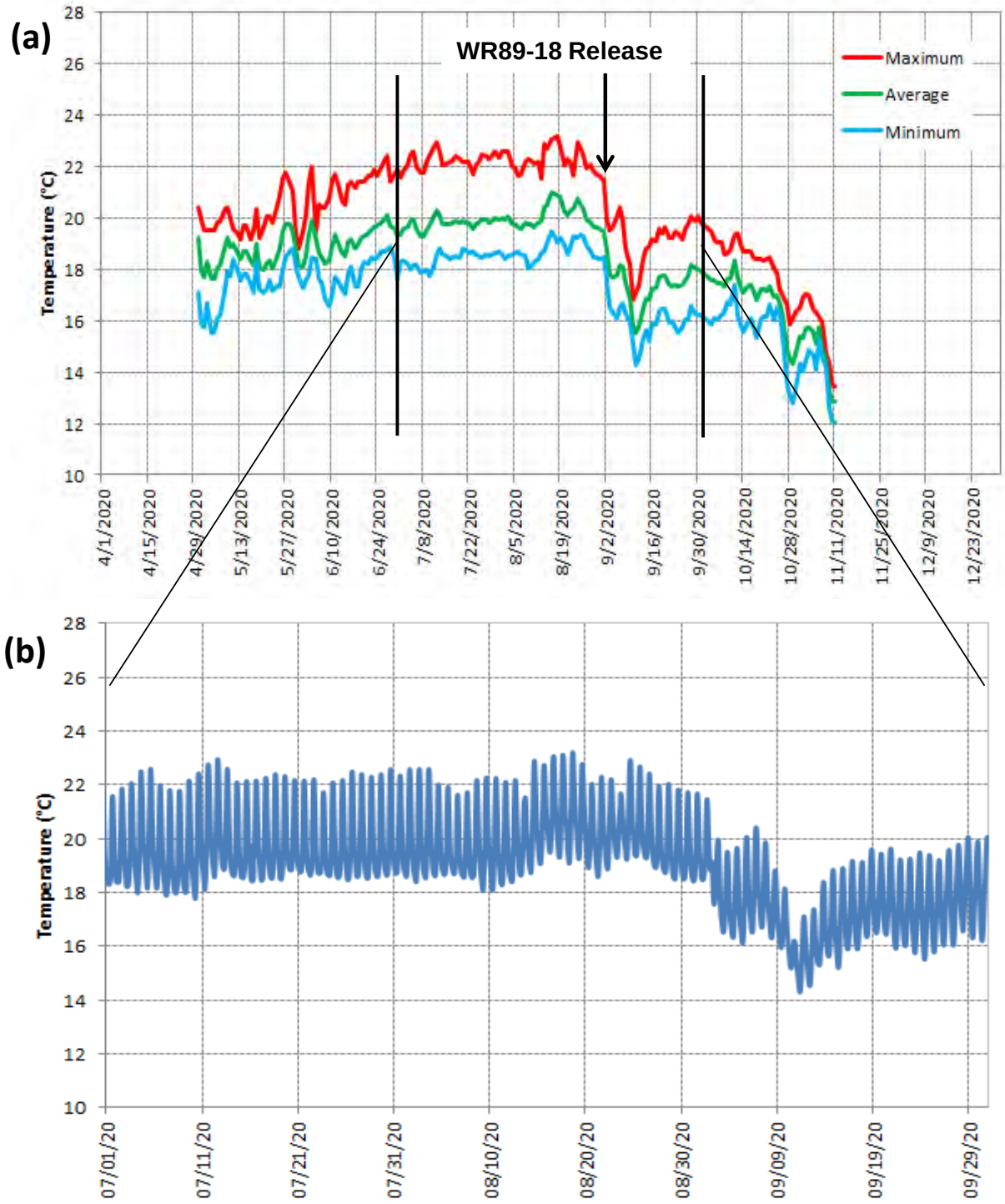


Figure 31: 2020 LSYR-8.7 (Head of Beaver Pool) middle (2.5 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 - 10/1/20.

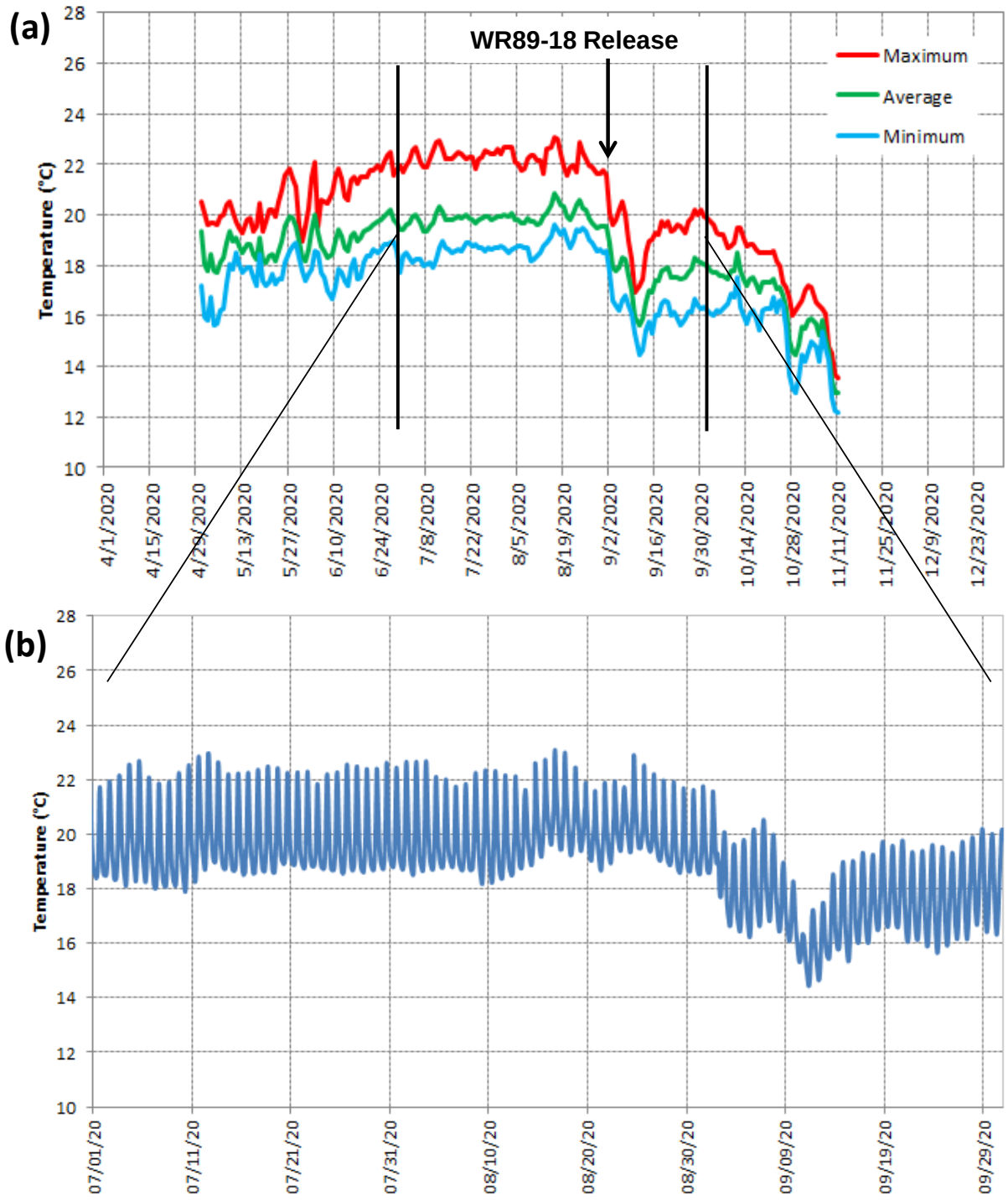


Figure 32: 2020 LSYR-8.7 (Head of Beaver Pool) bottom (5.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20.

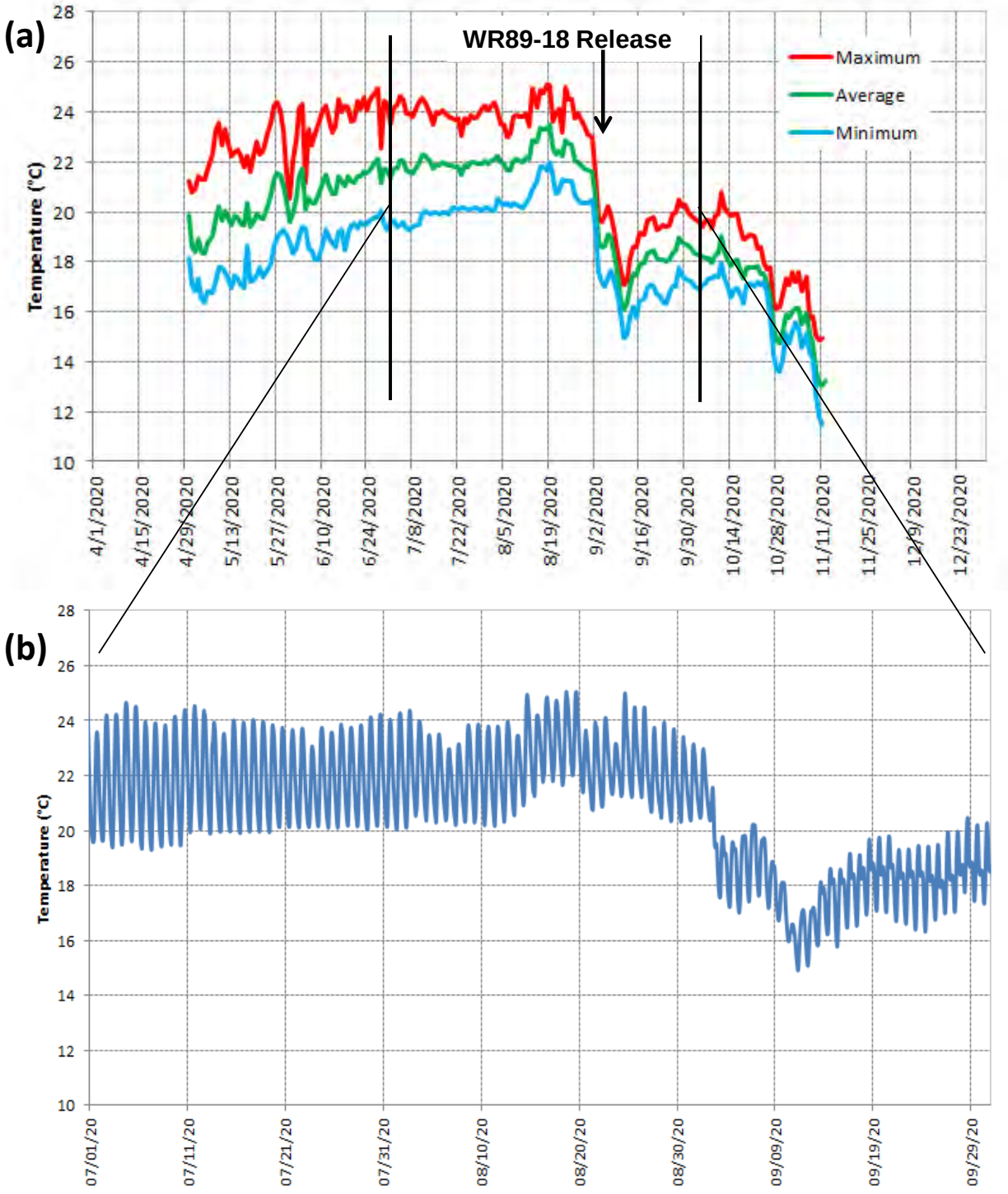


Figure 33: 2020 LSYR-10.2 (Bedrock Pool) surface (1.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

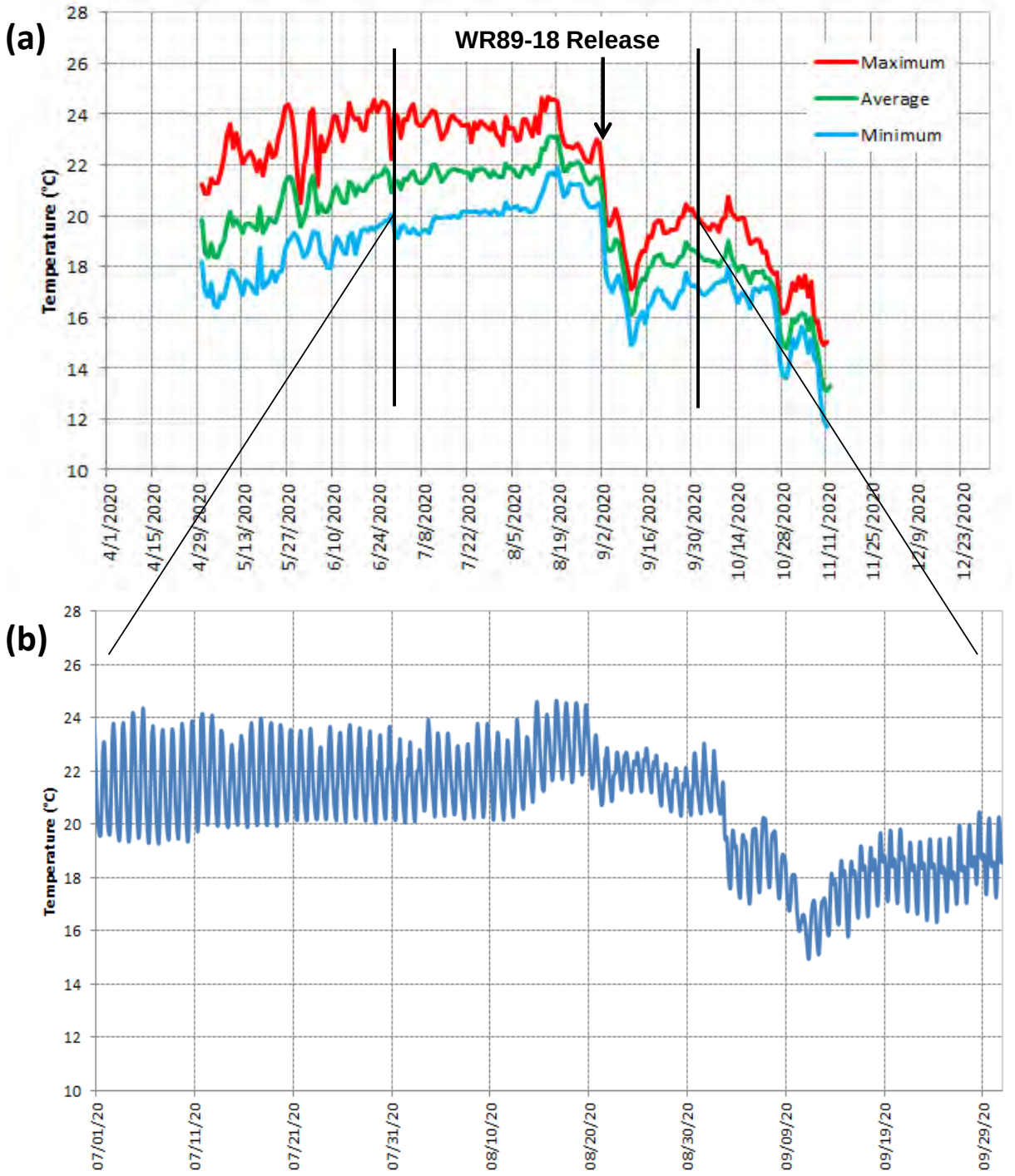


Figure 34: 2020 LSYR-10.2 (Bedrock Pool) middle (4.5 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

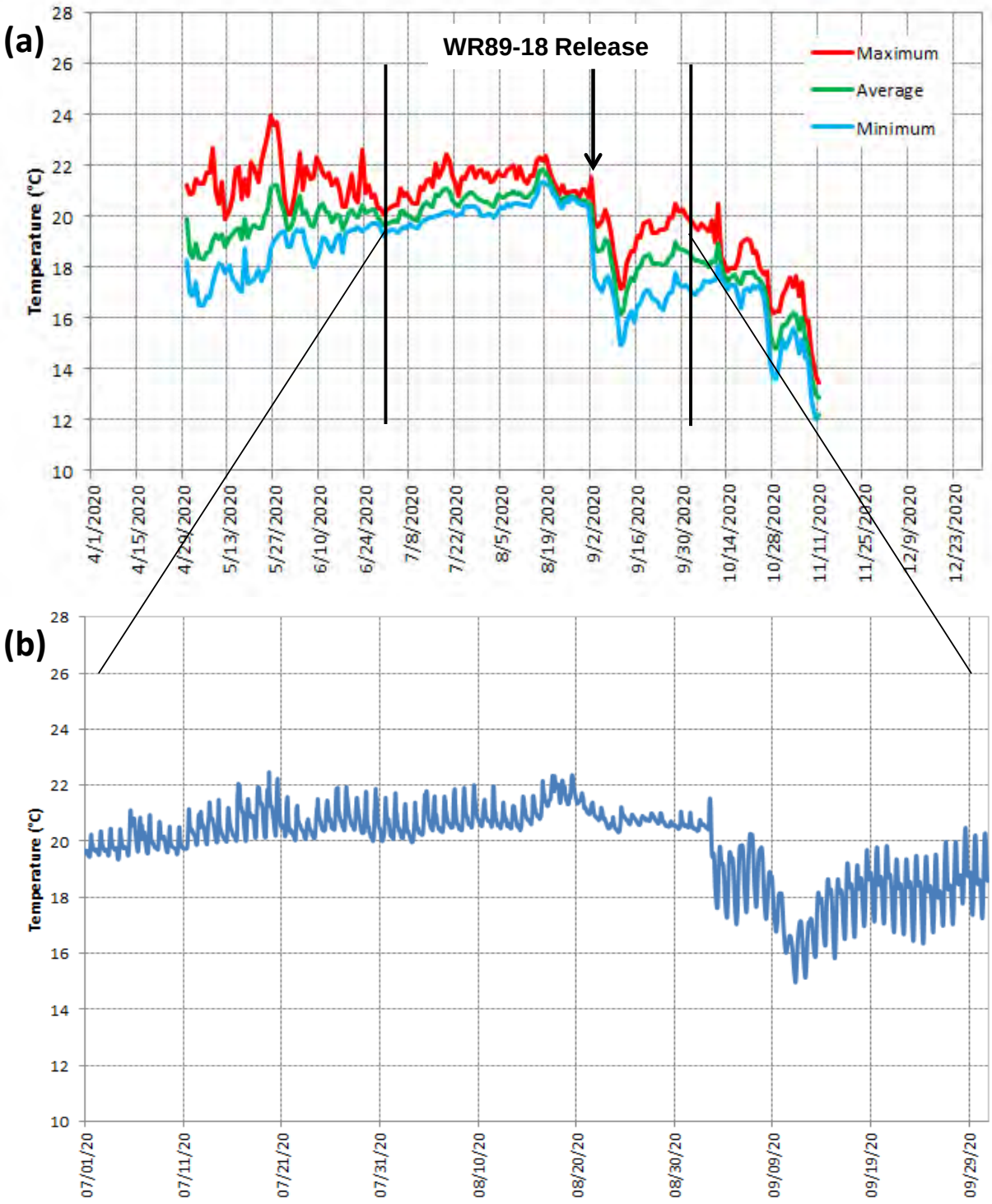


Figure 35: 2020 LSYR-10.2 (Bedrock Pool) bottom (9.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

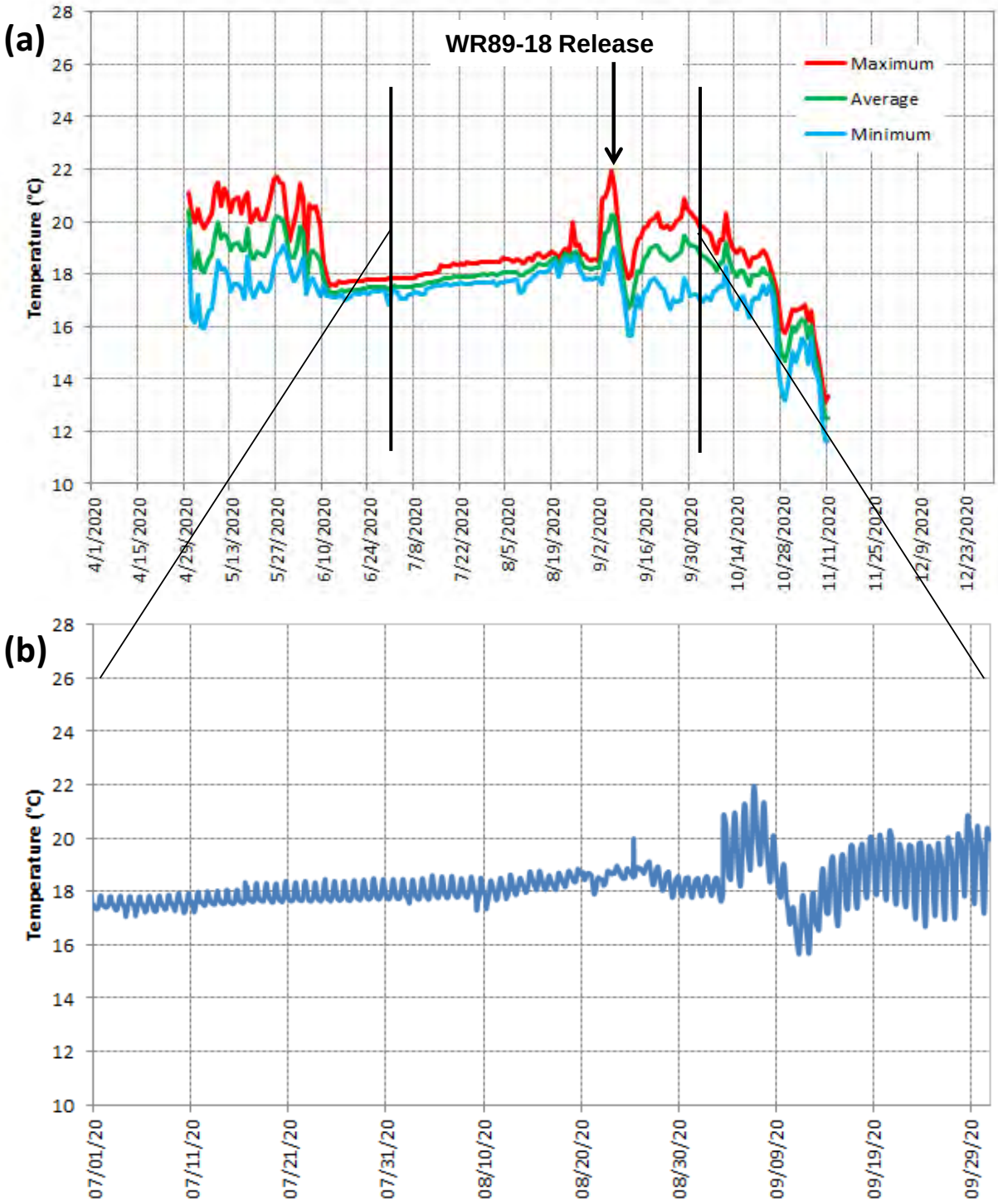


Figure 36: 2020 LSYR-13.9 (Avenue of the Flags) bottom (3.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

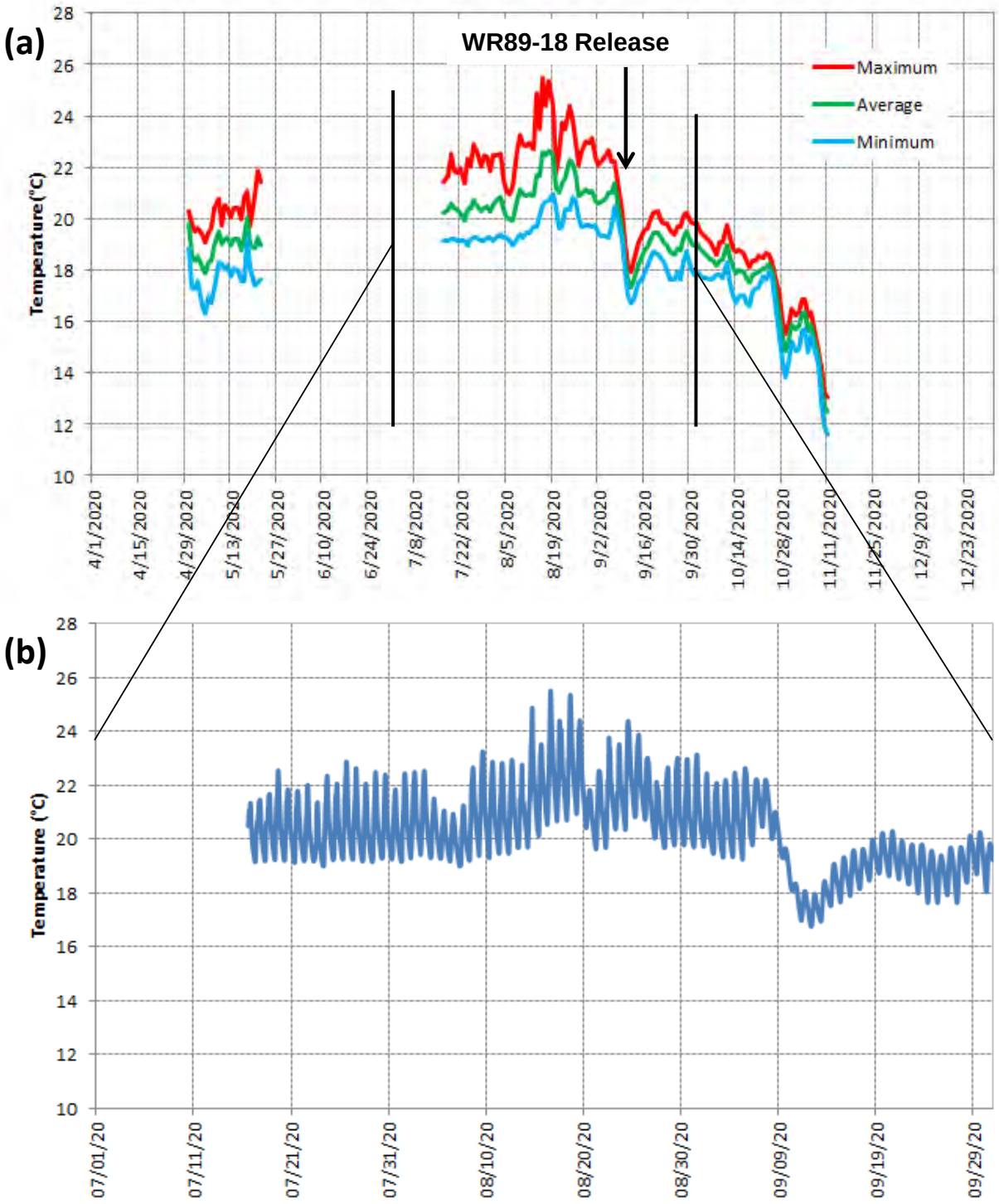


Figure 37: 2020 LSYR-22.68 (Cadwell Pool) surface (1.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20; the surface unit was out of the water from 5/23/20 – 7/16/20 due to declining water levels.

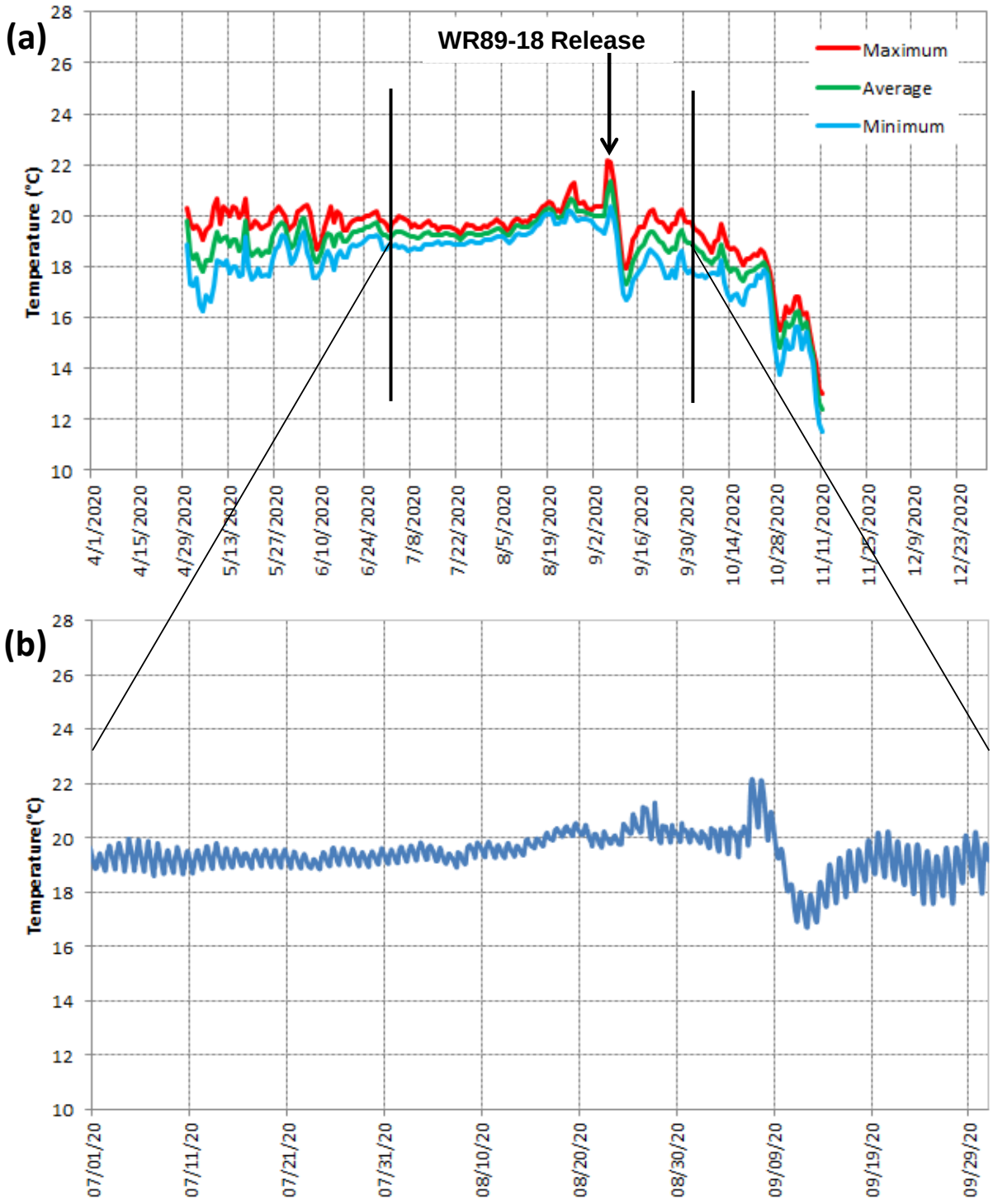


Figure 38: 2020 LSYR-22.68 (Cadwell Pool) middle (7.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20.

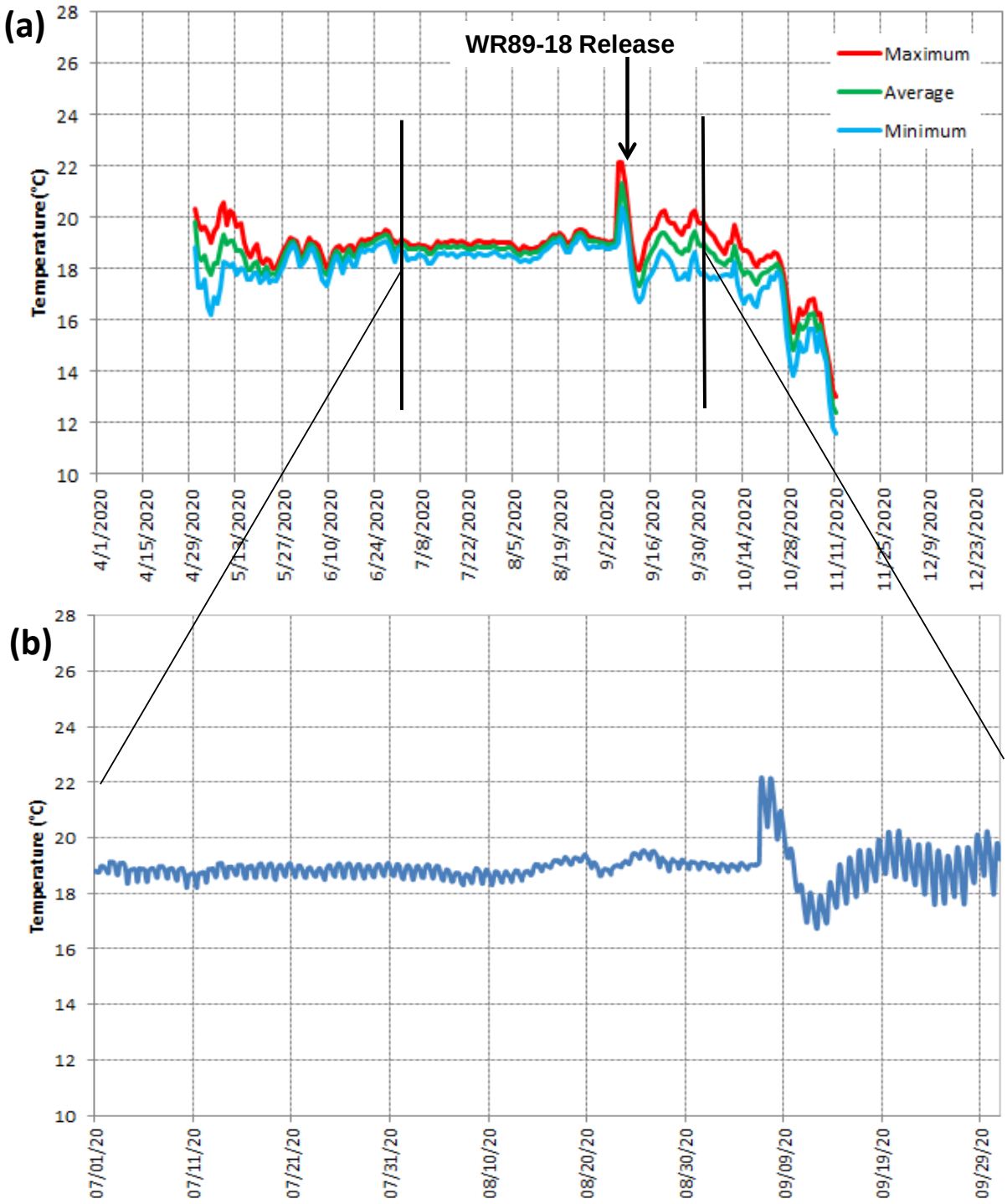


Figure 39: 2020 LSYR-22.68 (Cadwell Pool) bottom (14.0 feet) water temperatures for (a) daily maximum, average, and minimum for the entire period of record and (b) hourly measurements from 7/1/20 – 10/1/20.

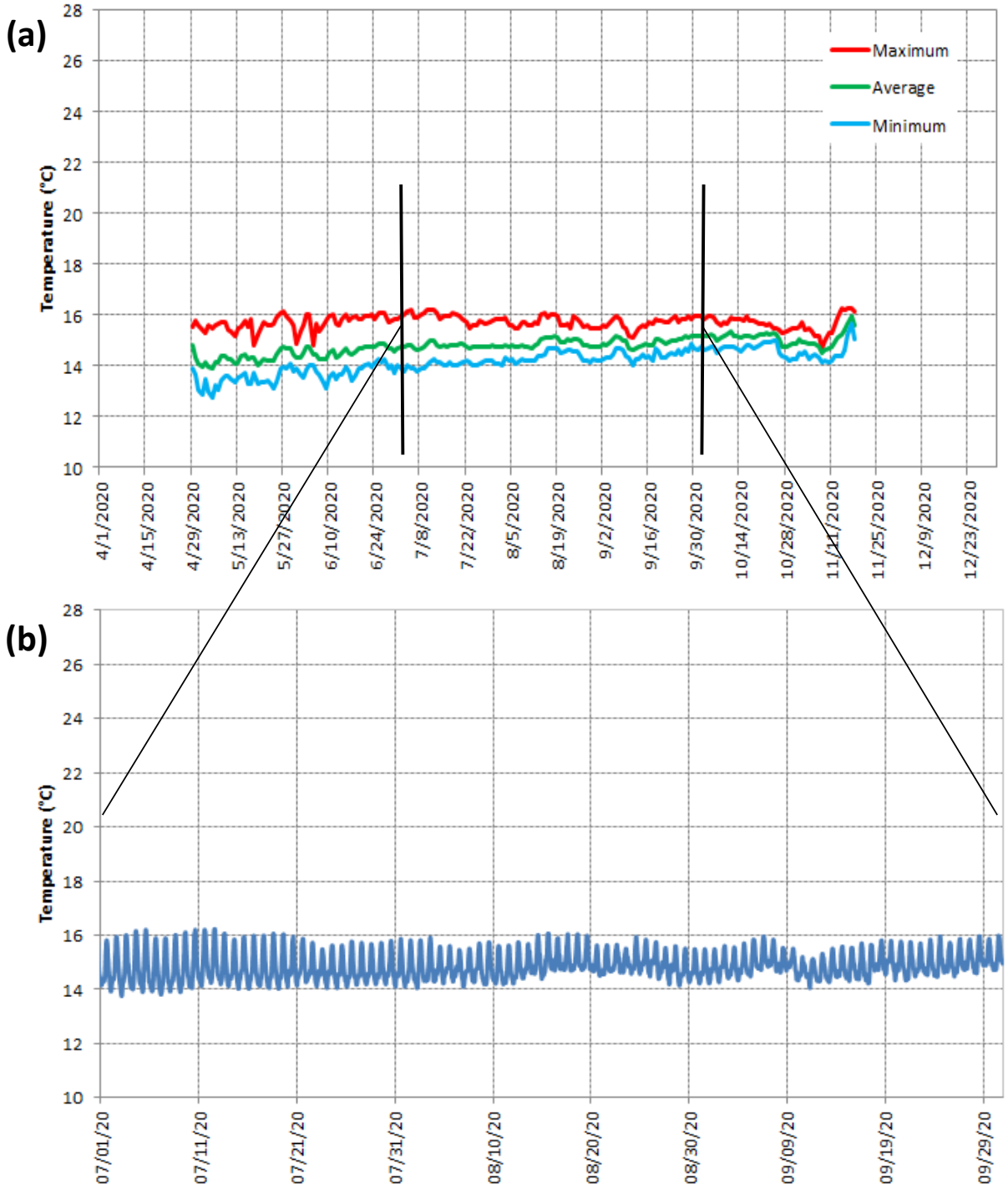


Figure 40: 2020 Lower Hilton Creek (HC-0.12) bottom (1.5 feet) thermograph for (a) daily maximum, average, and minimum daily values and (b) hourly data from 7/1/20 – 10/1/20.

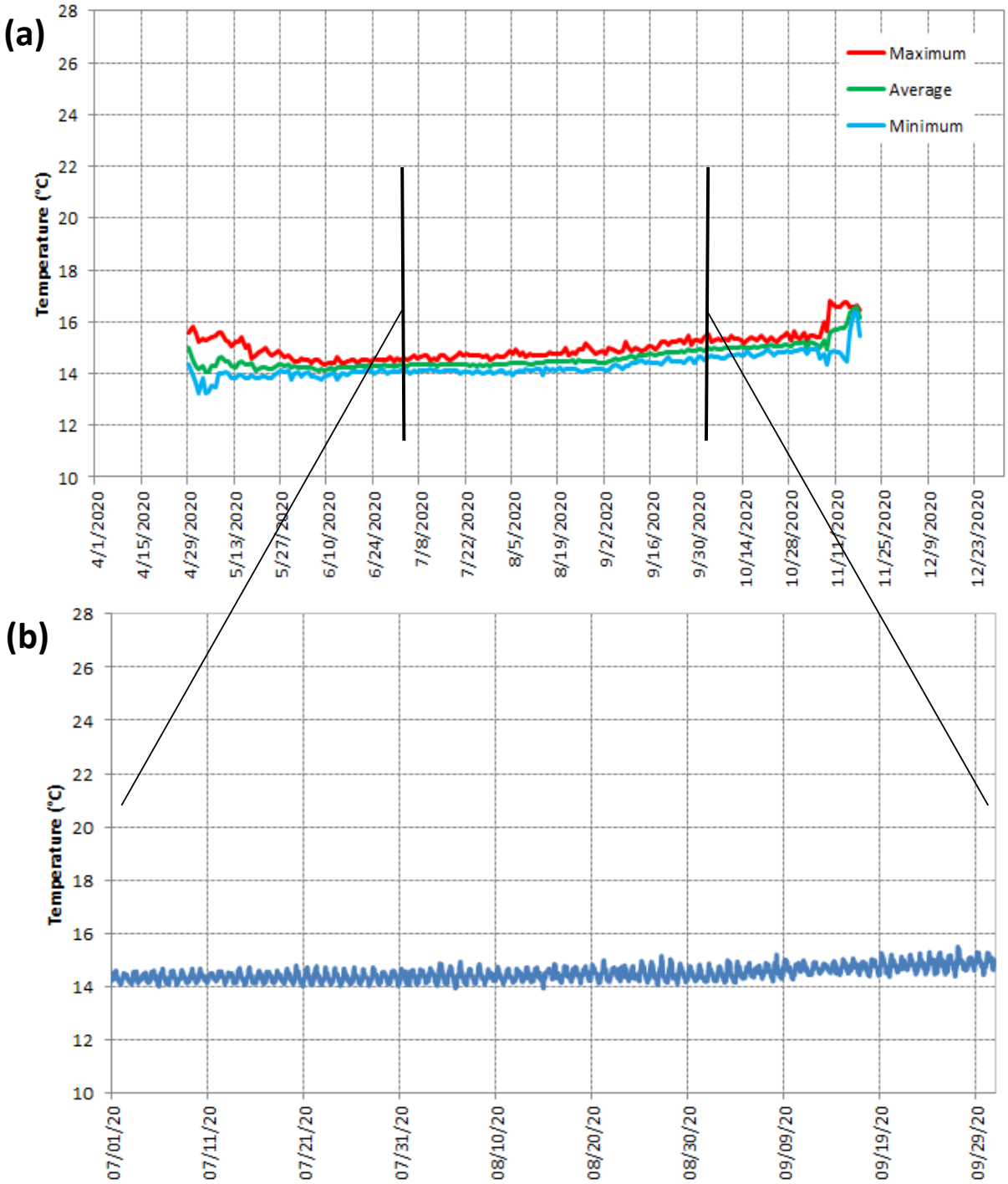


Figure 41: 2020 Hilton Creek at the Upper Release Point (HC-0.54) bottom (2.5 feet) water temperatures for: (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

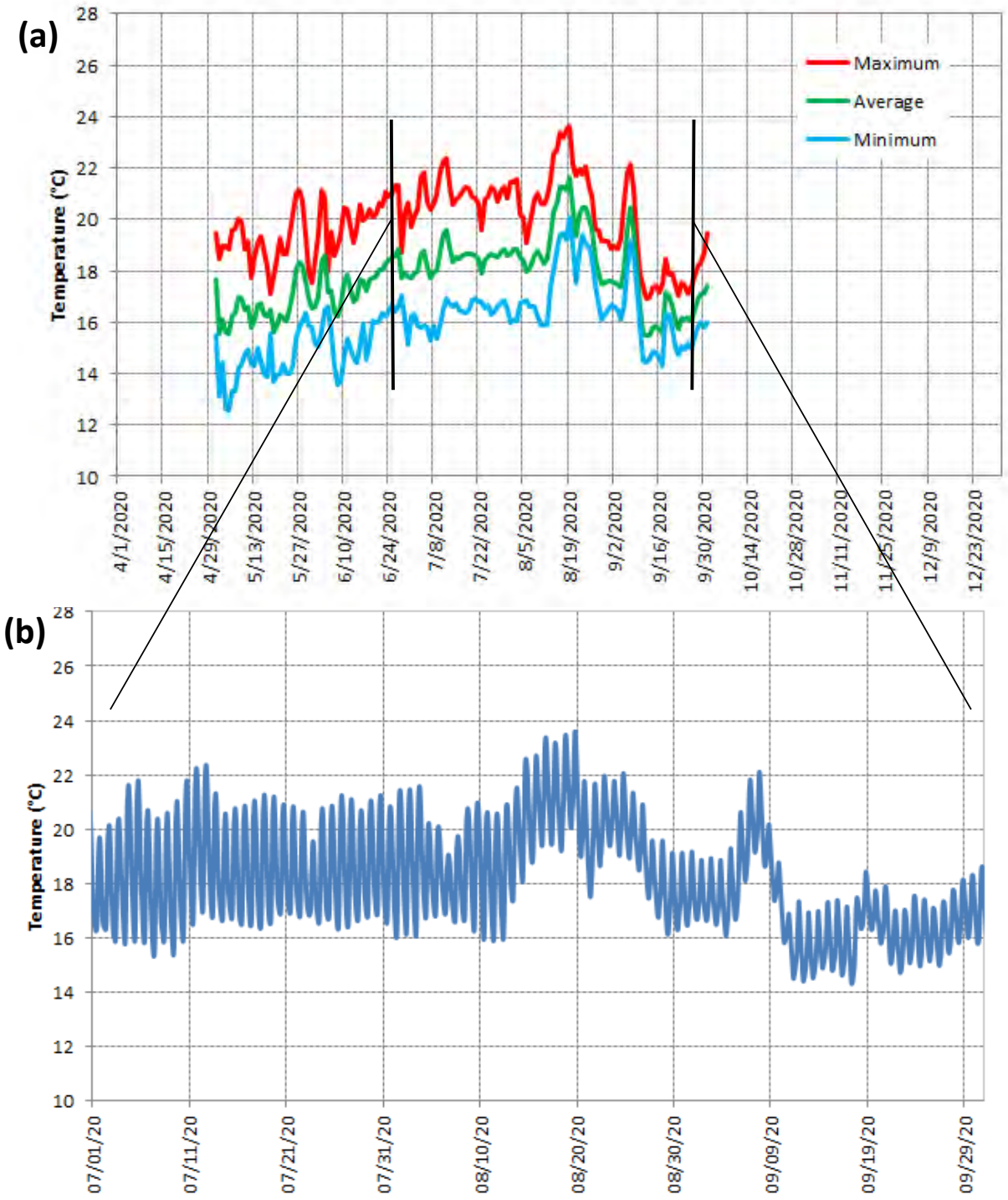


Figure 42: 2020 Quiota Creek (QC-2.66) bottom (2.5 feet) thermograph for (a) daily maximum, average, and minimum daily values and (b) hourly data from 7/1/20 – 10/1/20.

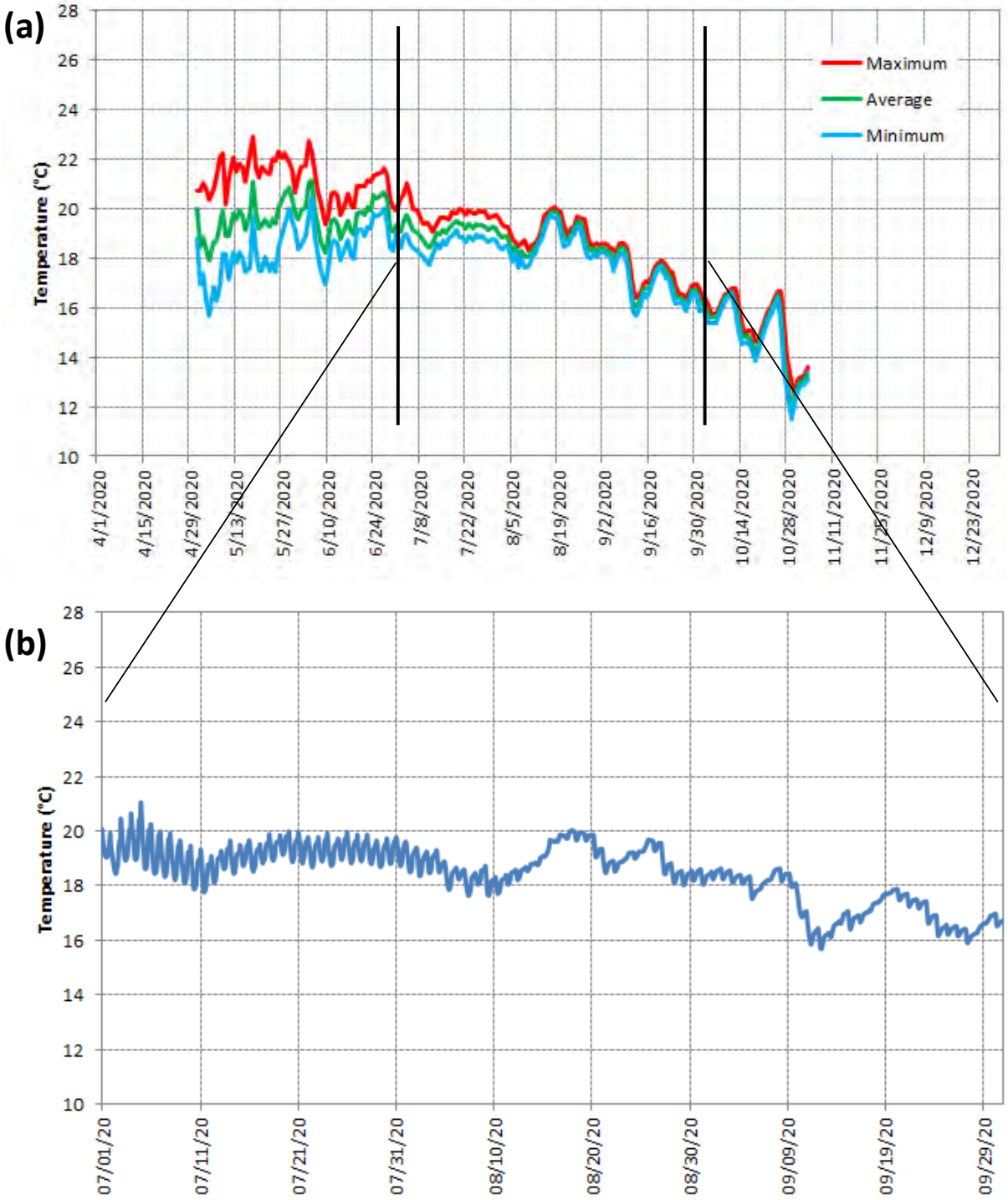


Figure 43: 2020 SC-0.77 bottom (5.0 foot) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

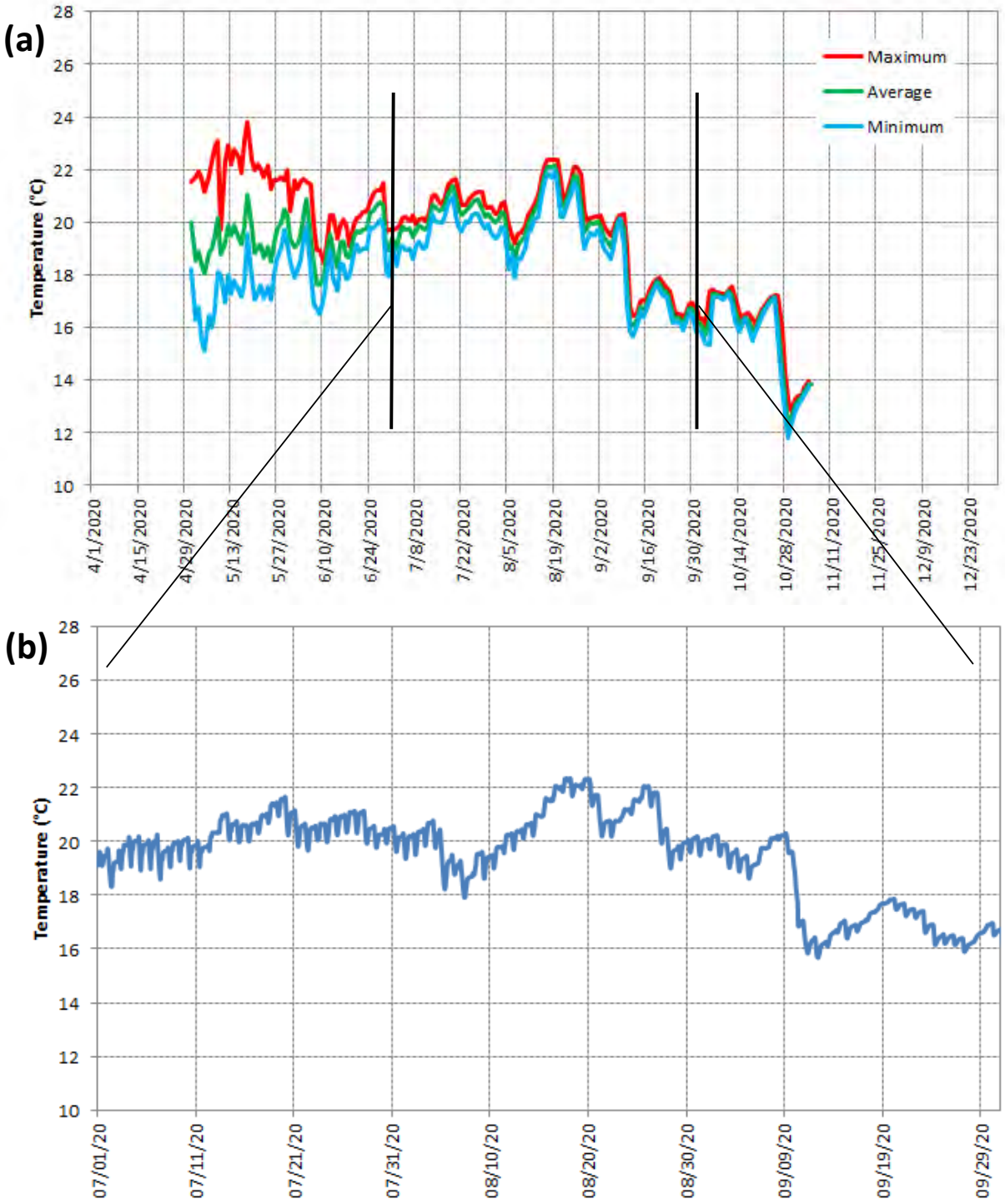


Figure 44: 2020 SC-2.20 (Reach 2 Bedrock Section) bottom (4.0 feet) water temperatures for (a) daily maximum, average, and minimum temperatures for the entire period of deployment and (b) hourly measurements for the period from 7/1/20 – 10/1/20.

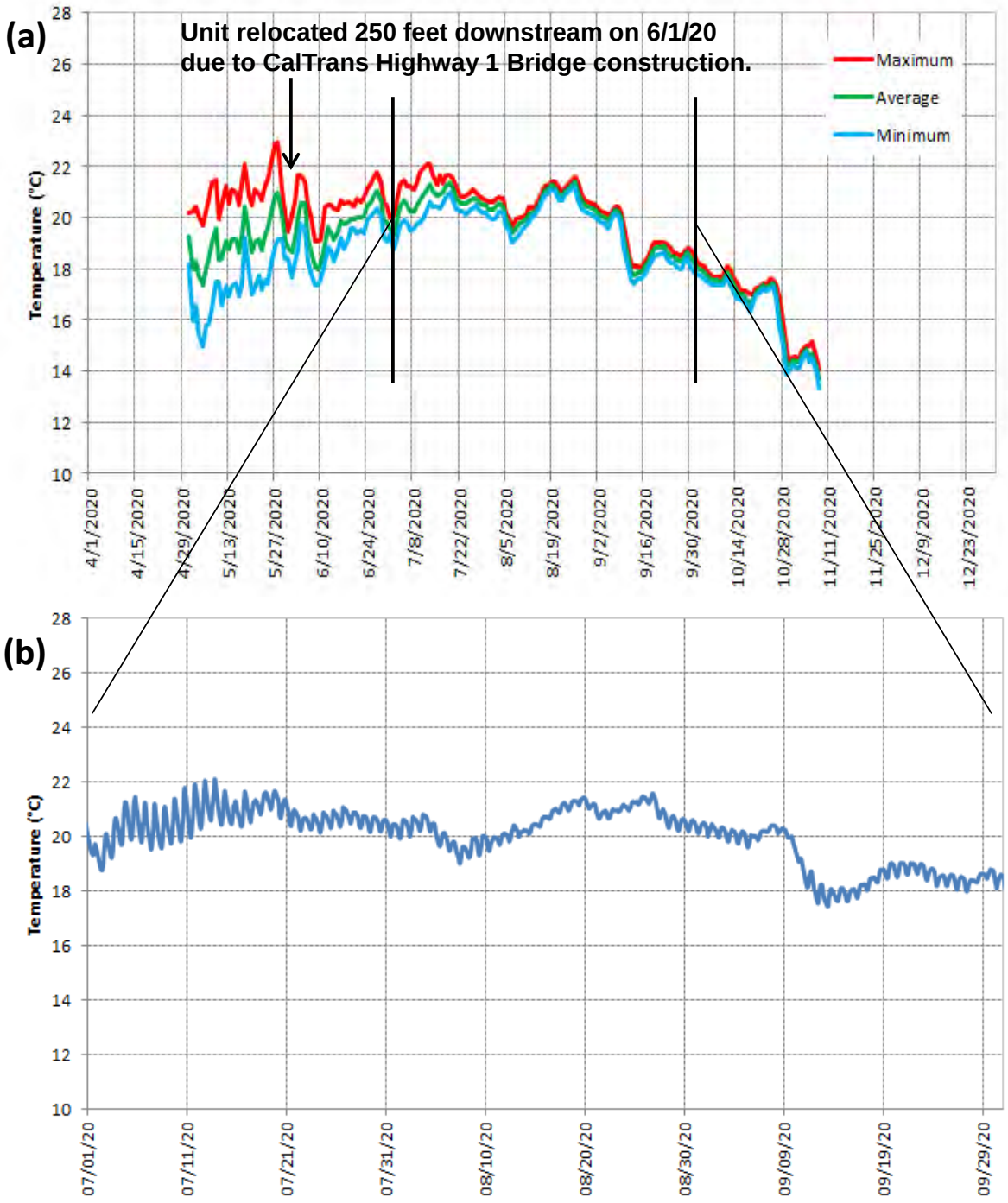


Figure 45: 2020 SC-3.0 (Highway 1 Bridge Pool Habitat) bottom (4.5 feet) water temperature for (a) maximum, average, and minimum for the entire period of deployment and (b) hourly measurements for the period from 7/1/20 – 10/1/20.

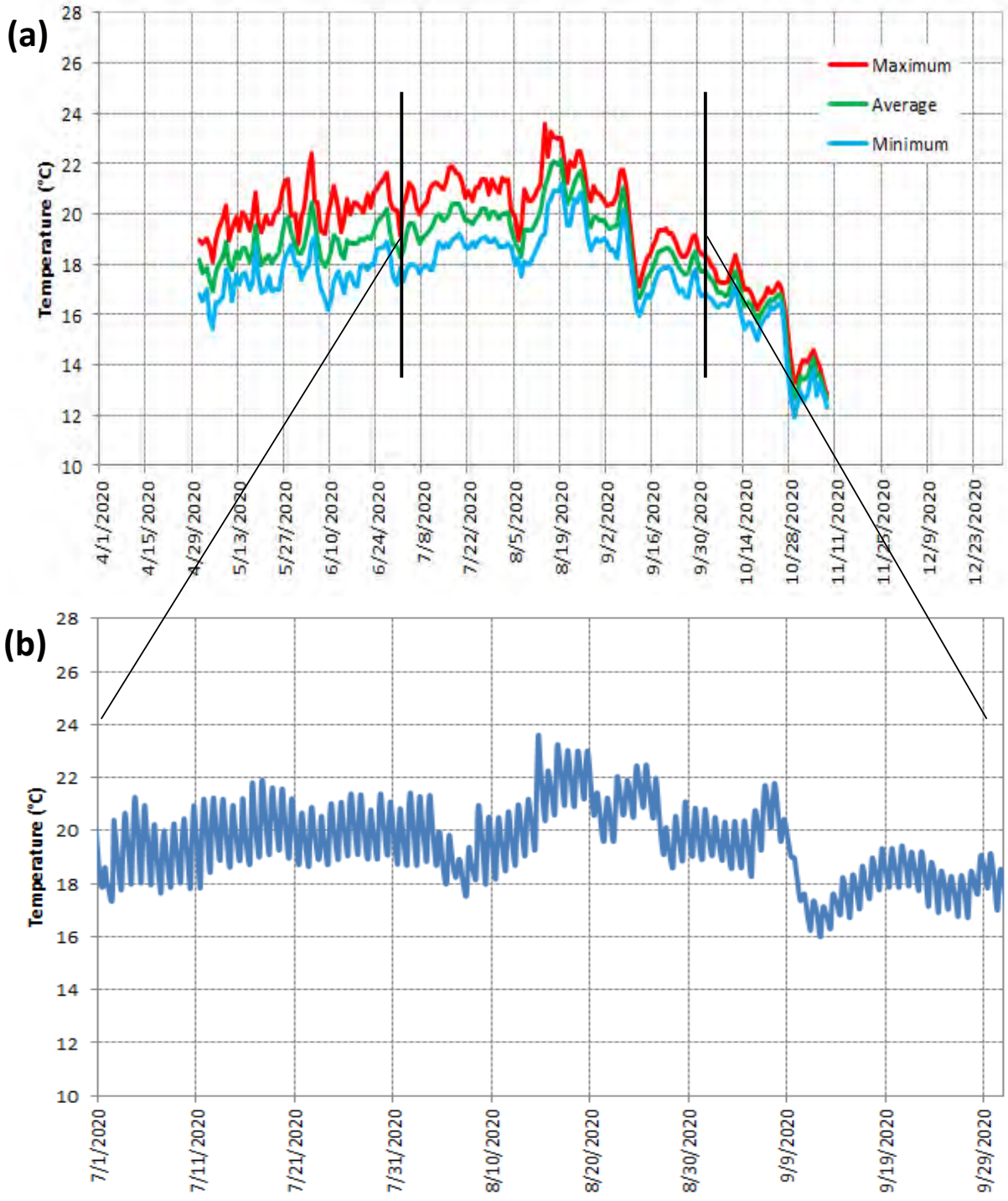


Figure 46: 2020 SC-3.5 (Jalama Bridge Pool Habitat) bottom (4.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements for the period from 7/1/20 – 10/1/20.

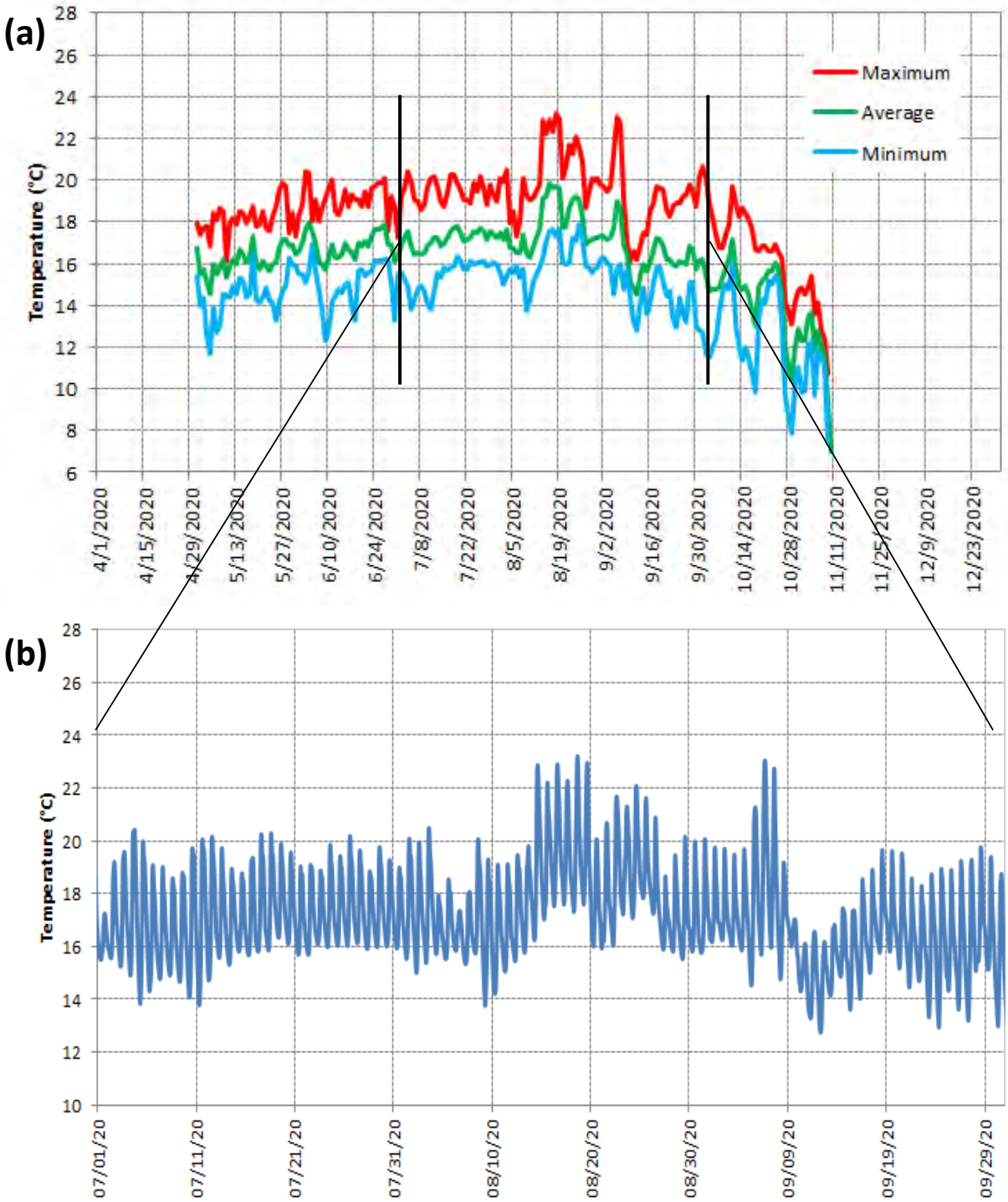


Figure 47: 2020 SC-3.80 Upper Salsipuedes Creek (0.5 feet) water temperatures for (a) daily maximum, average and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

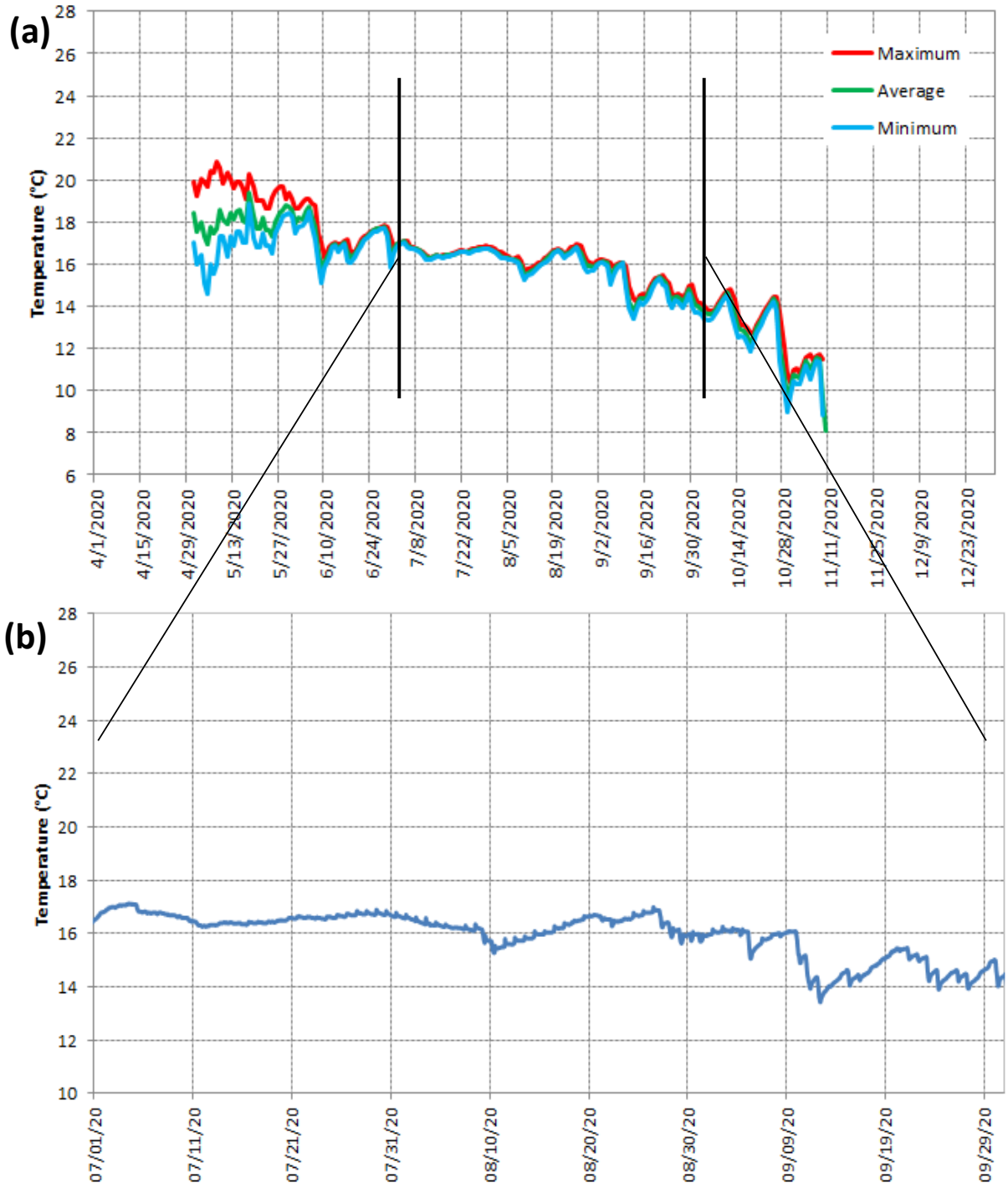


Figure 48: 2020 EJC-3.81 directly upstream of the Upper Salsipuedes Creek confluence – bottom (3.0 - feet) water temperatures for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

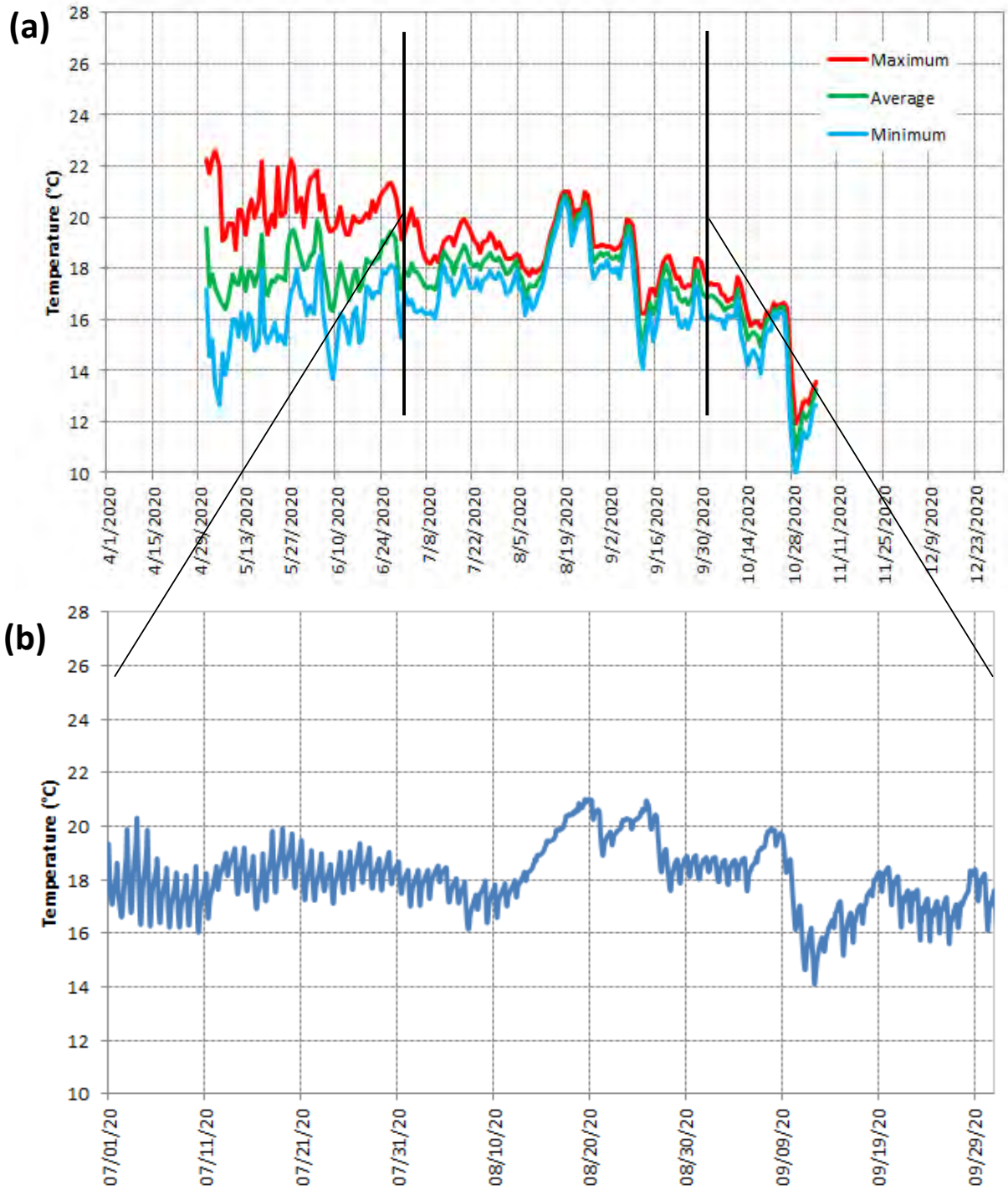


Figure 49: 2020 EJC-5.4 (Palos Colorados Pool Habitat) bottom (3.0 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements for the period from 7/1/20 – 10/1/20.

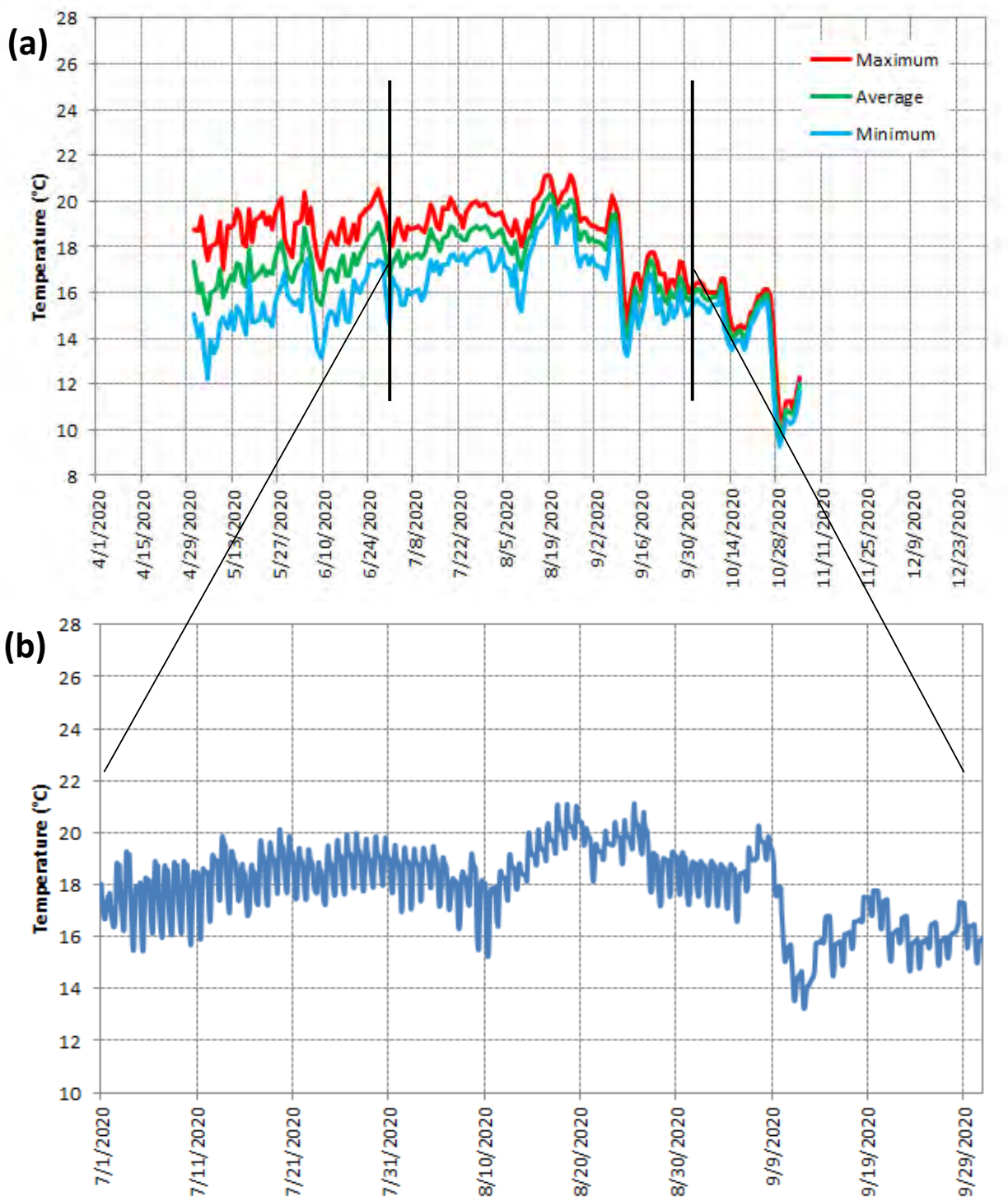


Figure 50: 2020 EJC-10.82 water temperature at Rancho San Julian Fish Ladder bottom (3.5-feet) for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements from 7/1/20 – 10/1/20.

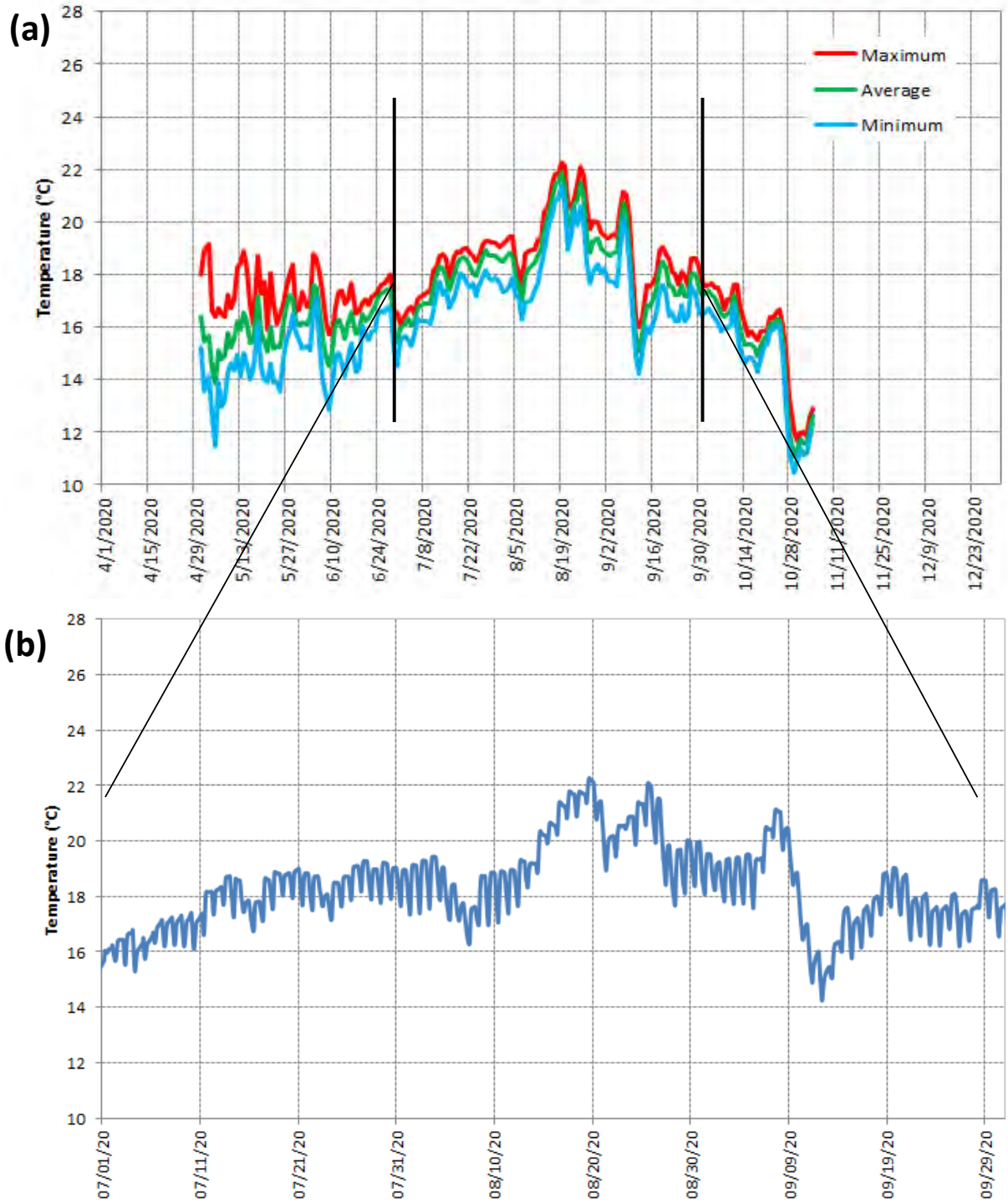


Figure 51: 2020 LAC-7.0 (Los Amoles Creek at Ford Crossing) bottom (2.5 feet) water temperature for (a) daily maximum, average, and minimum for the entire period of deployment and (b) hourly measurements for the period from 7/1/20 – 10/1/20.

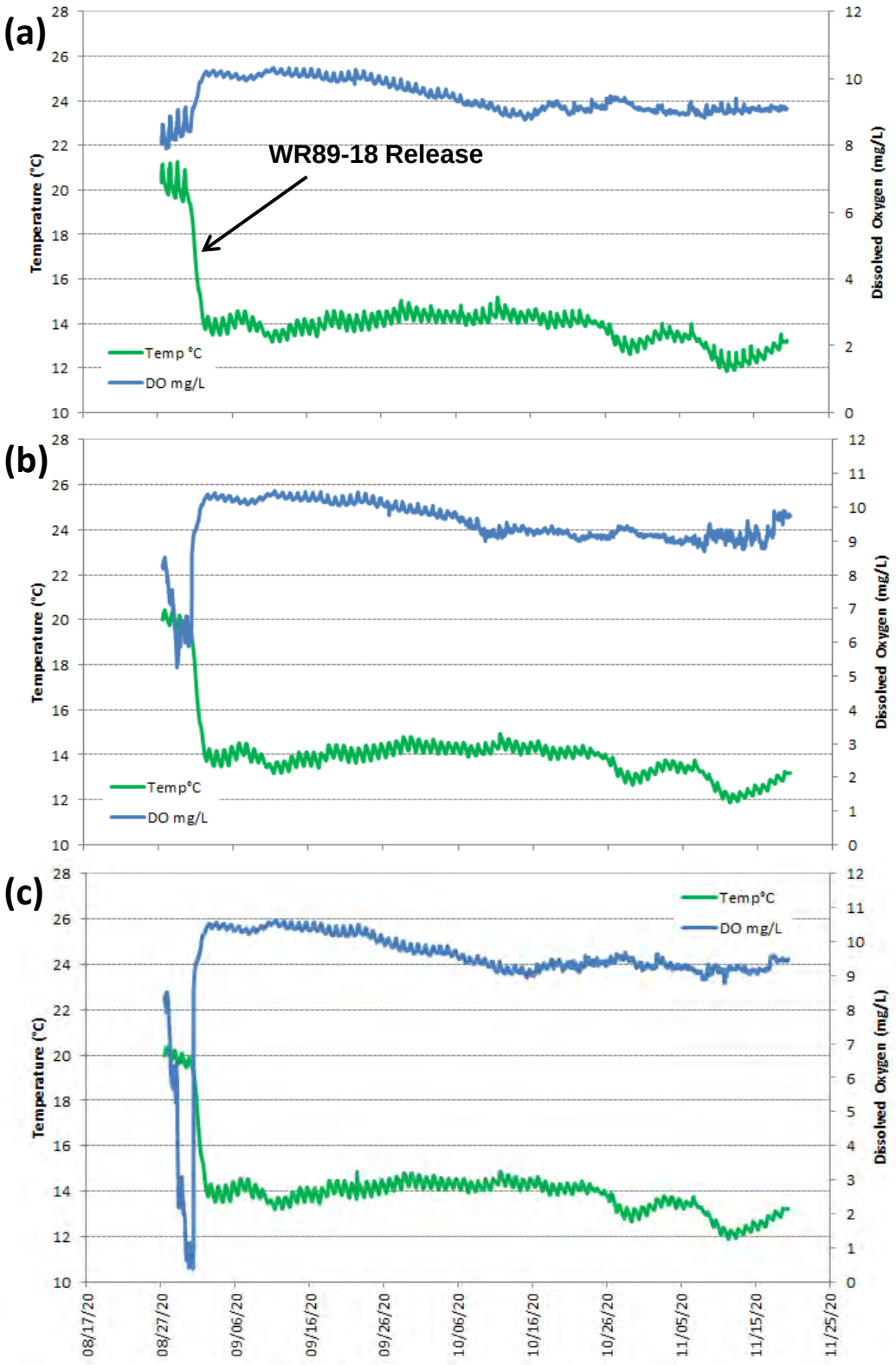


Figure 52: 2020 Temperature and dissolved oxygen at LSYR-0.01 at: a) 1-foot below the surface, b) 14-foot below the surface and c) 28-foot below the surface; WR89-18 releases started on 8/31/20.

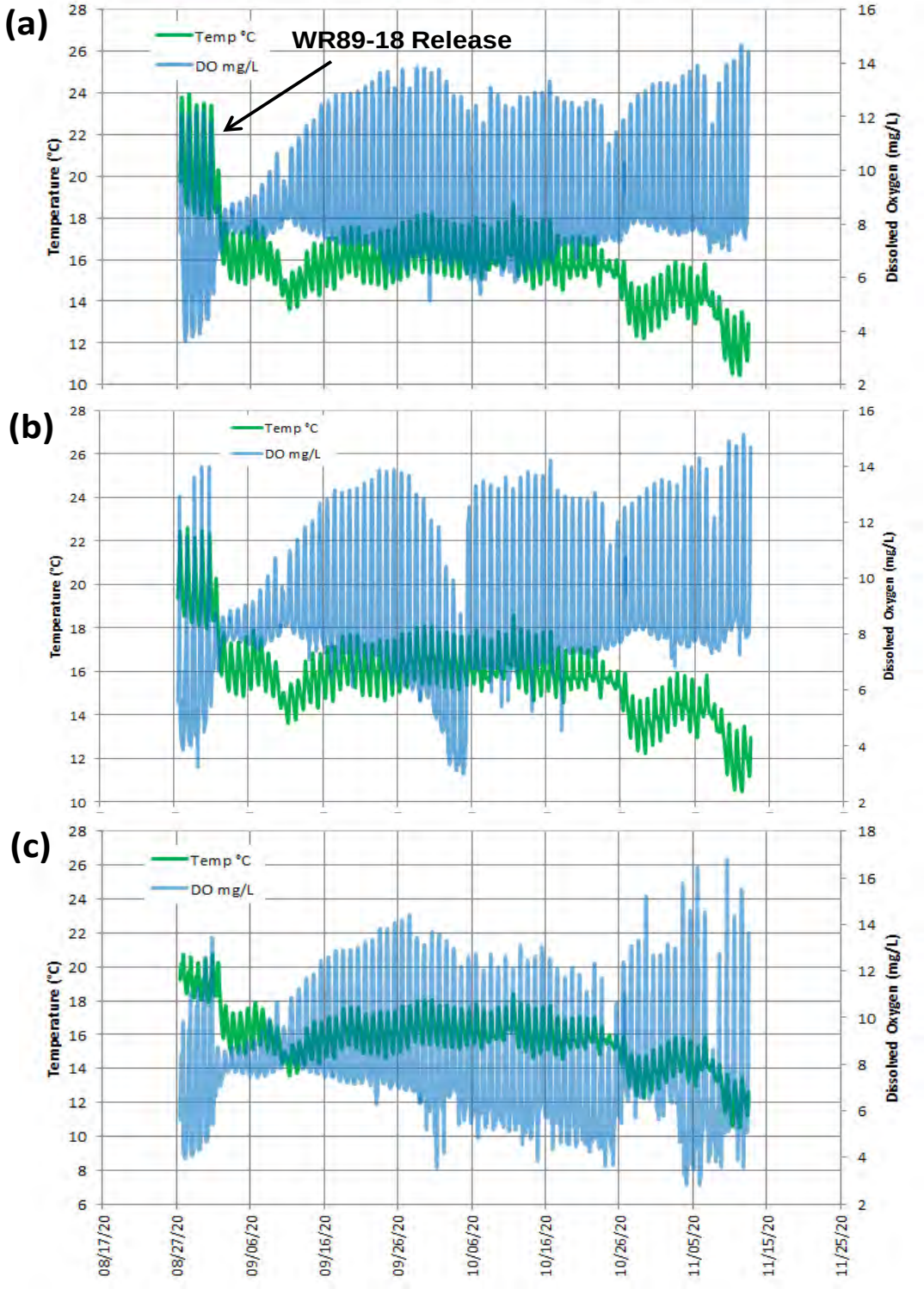


Figure 53: 2020 Temperature and dissolved oxygen at LSYR-4.95 at: a) 1-foot below the surface, b) 4-foot below the surface and c) 8-foot below the surface: WR89-18 releases started on 8/31/20.

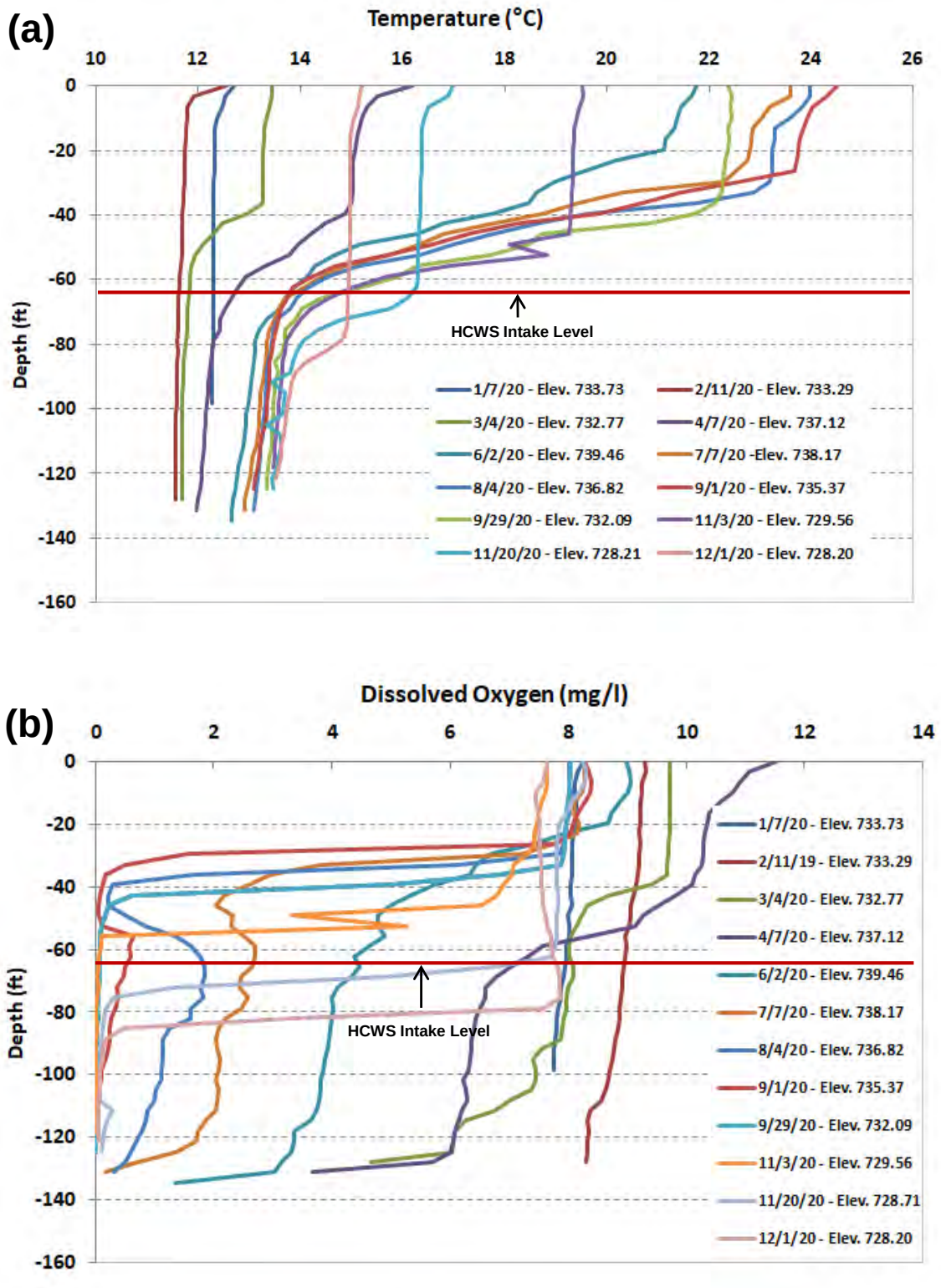


Figure 54: Lake Cachuma 2020 water quality profiles for (a) temperature and (b) dissolved oxygen concentrations at the intake barge for the HCWS; the target depth of HCWS intake hose is 65 feet of depth throughout the monitoring period.

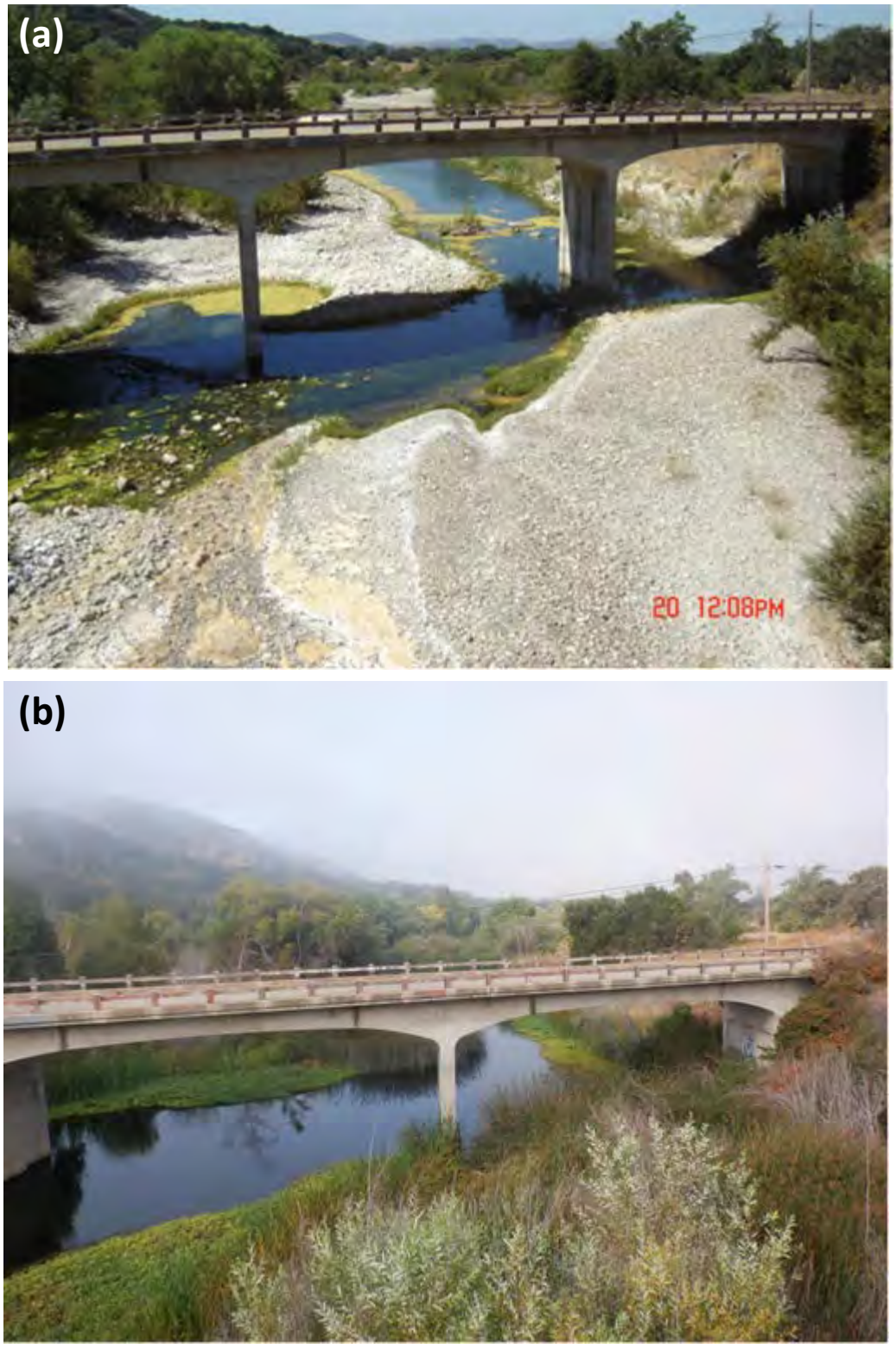


Figure 55: Photo points (M-6) collected at Highway 154 Bridge looking downstream in (a) September 2005 and (b) September 2020.

Figure 56: Photo point (M-12) collected at Refugio Bridge looking upstream in (a) May 2005, and (b) September 2020.

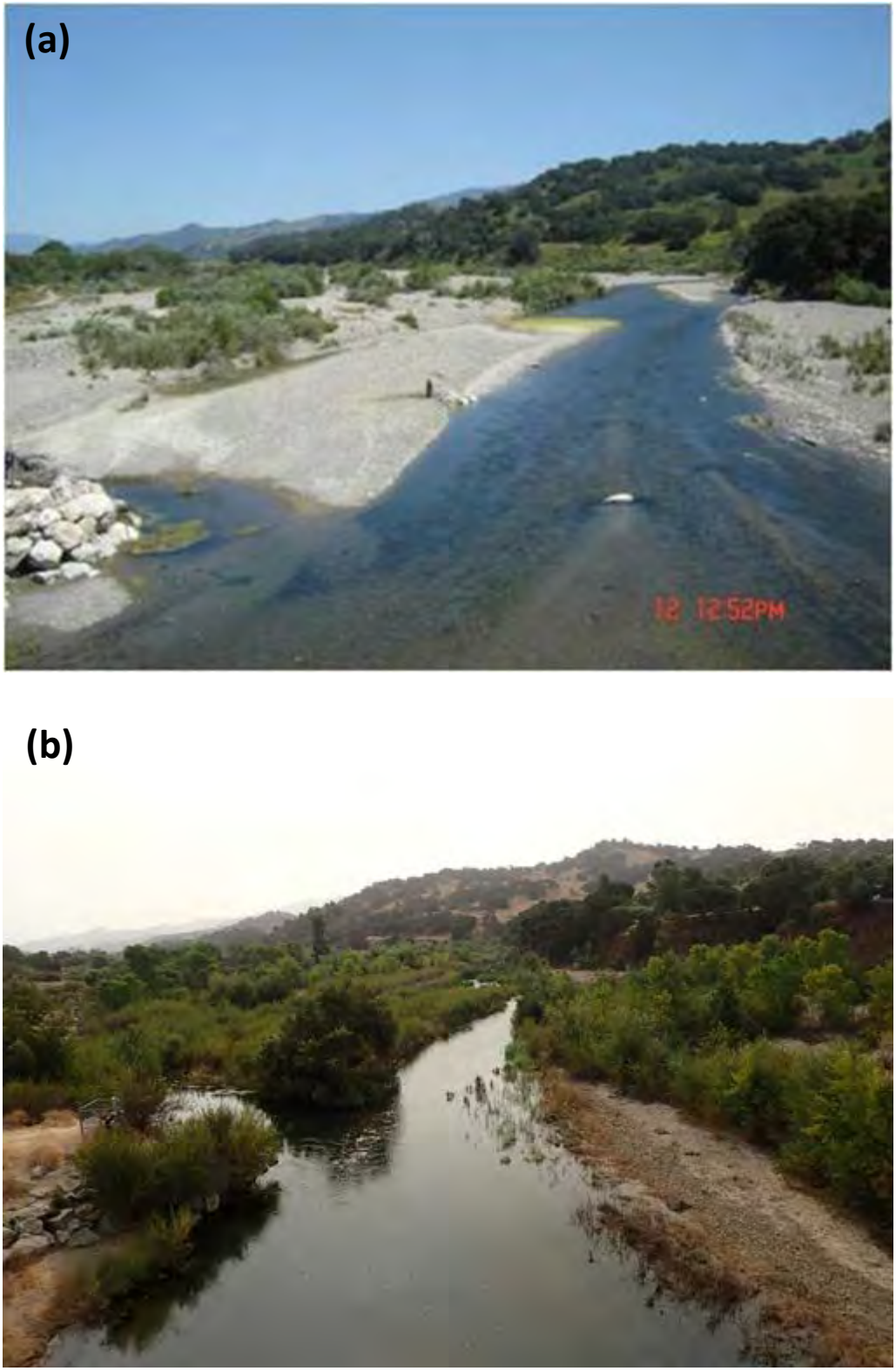


Figure 57: Photo point (M-14) collected at Alisal Bridge looking upstream in a) May 2005, and b) September 2020.

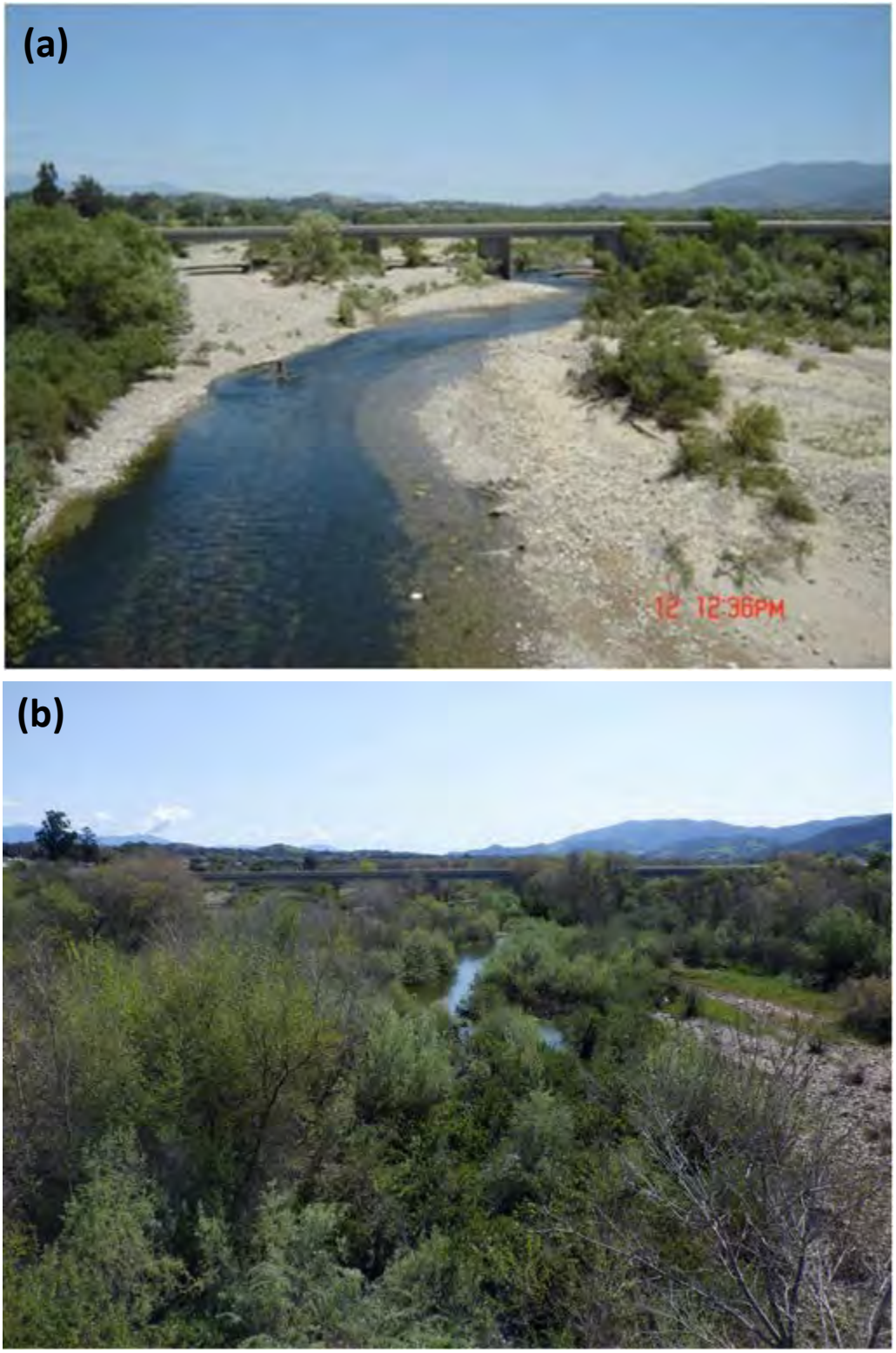


Figure 58: Photo point (M-19) collected at Avenue of the Flags Bridge looking upstream in (a) May 2005, and (b) March 2020.

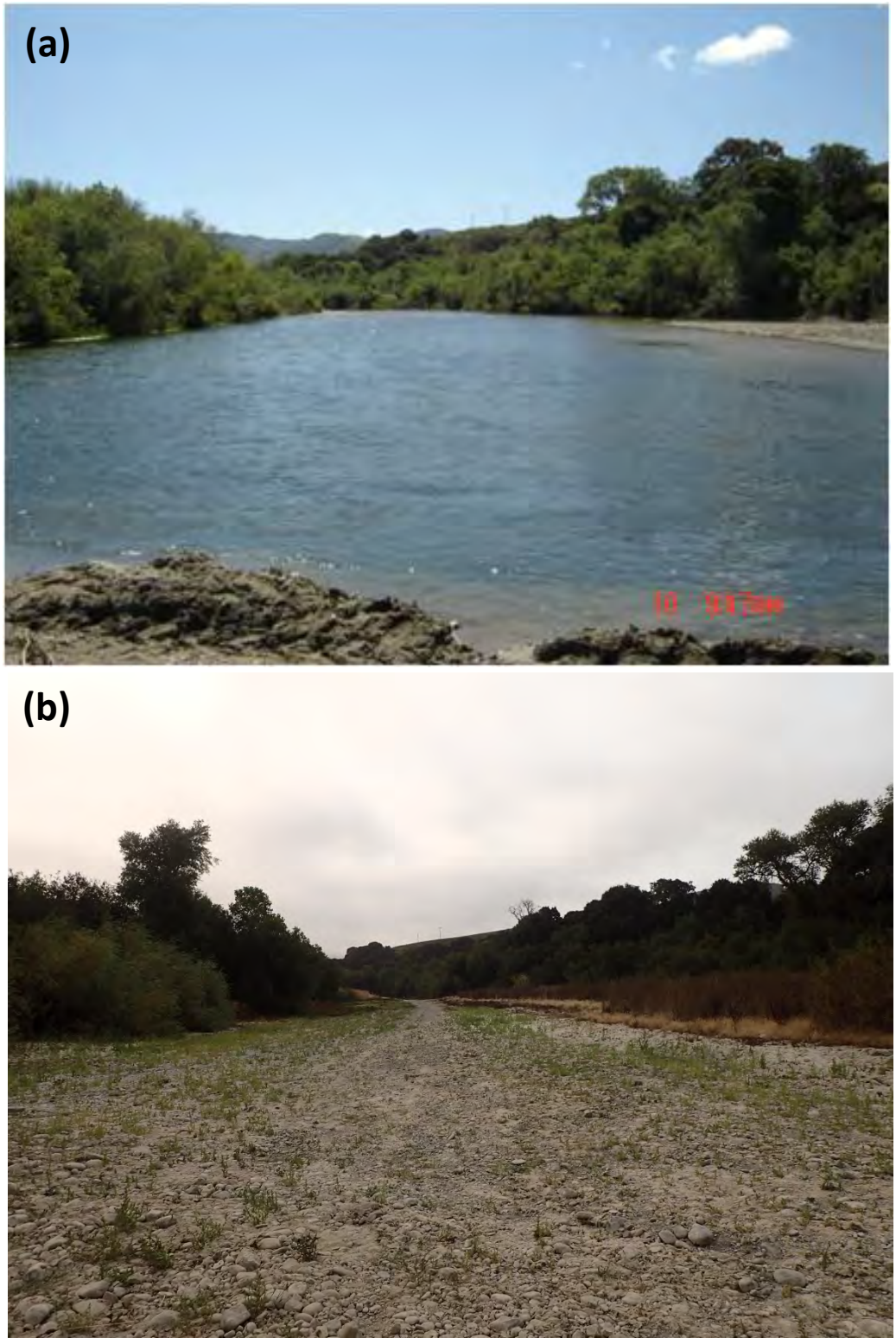


Figure 59: Photo point (M-21) collected at Sweeney Road Crossing looking upstream in (a) May 2005, and (b) September 2020.

Figure 60: Photo point (T-1) collected at Hilton Creek looking upstream towards the trap site on (a) May 2005, and (b) September 2020.

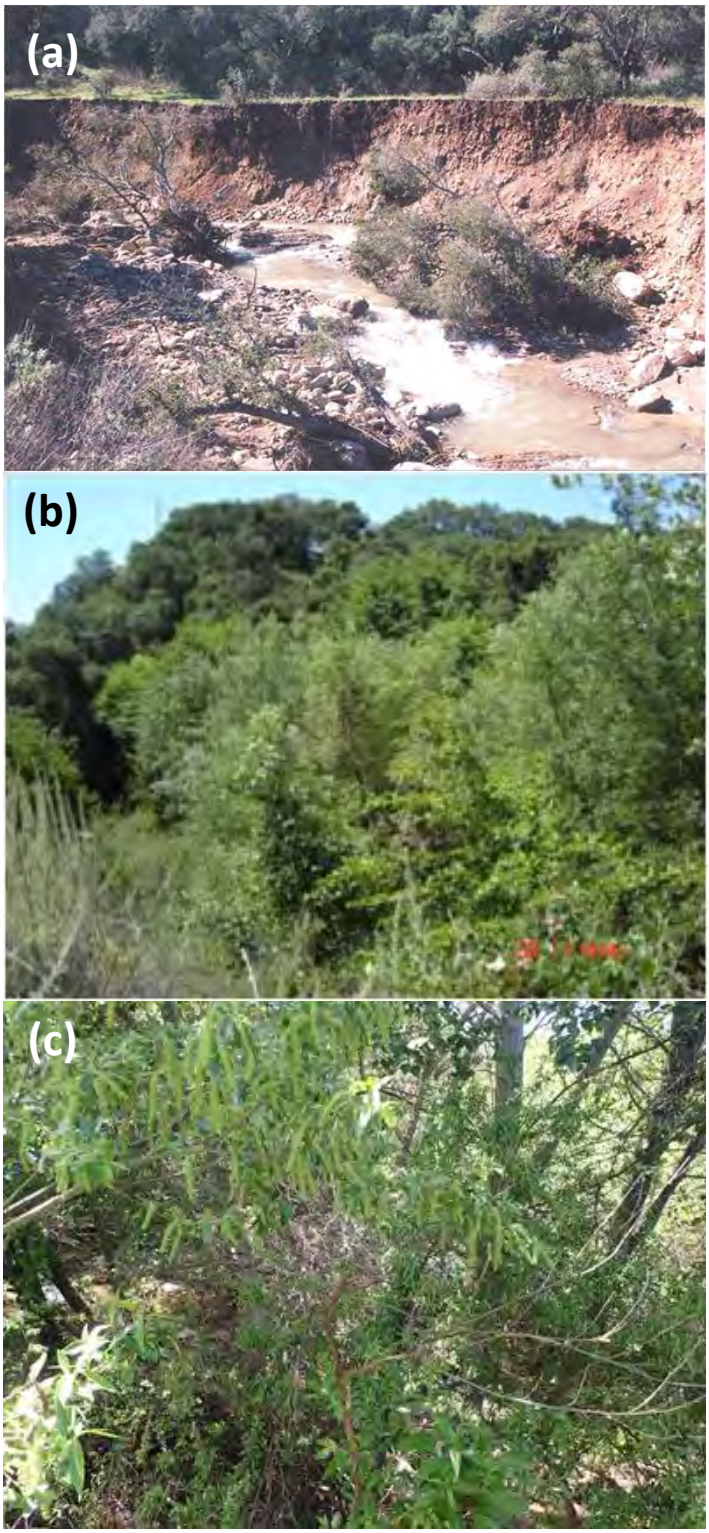


Figure 61: Photo point (T-6) collected at the Hilton Creek ridge trail looking upstream in (a) March 1999, (b) May 2005, and (c) September 2020; the creek is nearly invisible now from this vantage point.

Figure 62: Photo point (T-28) collected at Salsipuedes Creek at Santa Rosa Bridge in (a) May 2005 and (b) September 2020.

Figure 63: Photo point (T-39) collected at Salsipuedes Creek at Hwy 1 Bridge in May 2005 and (b) September 2020 (during Caltrans bridge replacement project).

Figure 64: Photo point (T-42) collected at Salsipuedes Creek at Jalama Road Bridge in May 2005 and (b) September 2020.

Table 7: WY2020 migrant trap deployments.

Location	Date Traps Deployed	Date Trap Removed	Date Traps Removed (storm event)	Date Traps Installed (Storm Event)	# of Days Not Trapping	Functional Trapping Days	Functional Trapping %
	(dates)	(dates)	(dates)	(dates)	(days)	(days)	(days)
Hilton Trap	2/5/2020	5/19/2020	3/9/2020	3/12/2020	3		
			3/14/2020	3/24/2020	10		
			4/5/2020	4/10/2020	5		
	Total:	104		**Total:**	18	86	83%
Salsipuedes	3/24/2020	5/15/2020	4/5/2020	4/10/2020	5		
	Total:	51		**Total:**	5	46	90%
Mainstem	4/9/2020	4/24/2020					
	Total:	15		**Total:**	0	15	100%

Table 8: WY2020 *O. mykiss* Catch Per Unit Effort (CPUE) for each trapping location.

Location	Upstream Captures	Downstream Captures	Functional Trap Days	Trap Season	Trapping Effeciency	CPUE Upstream	CPUE Downstream	CPUE (Total)	Avg Flow	Median Flow
	(#)	(#)	(days)	(days)	(%)	(Captures/day)	(Captures/day)	(Captures/day)	(cfs)	(cfs)
Hilton	49	90	86	104	82.7	0.57	1.05	1.62	4.5	4.3
Salsipuedes	2	1	46	51	90.2	0.04	0.02	0.07	5.1	1.6
Mainstem	0	5	15	15	100.0	0.00	0.33	0.33	39.1	25.7

Table 9: Number of *O. mykiss* migrant captures, including recaptures but not young-of-the-year, associated with each trap check at each trapping location over 24-hours in WY2020.

Location	Trap	Trap Check				Total
		1st AM (05:00-10:00)	2nd AM (10:01-14:00)	1st PM (18:00-22:00)	2nd PM (22:01-01:59)	
Hilton	Upstream	19	11	7	12	49
	Downstream	32	9	12	37	90
	Total:	51	20	19	49	139
Salsipuedes	Upstream	0	1	1	0	2
	Downstream	0	1	0	0	1
	Total:	0	2	1	0	3
Mainstem	Upstream	0	0	0	0	0
	Downstream	0	1	0	4	5
	Total:	0	1	0	4	5

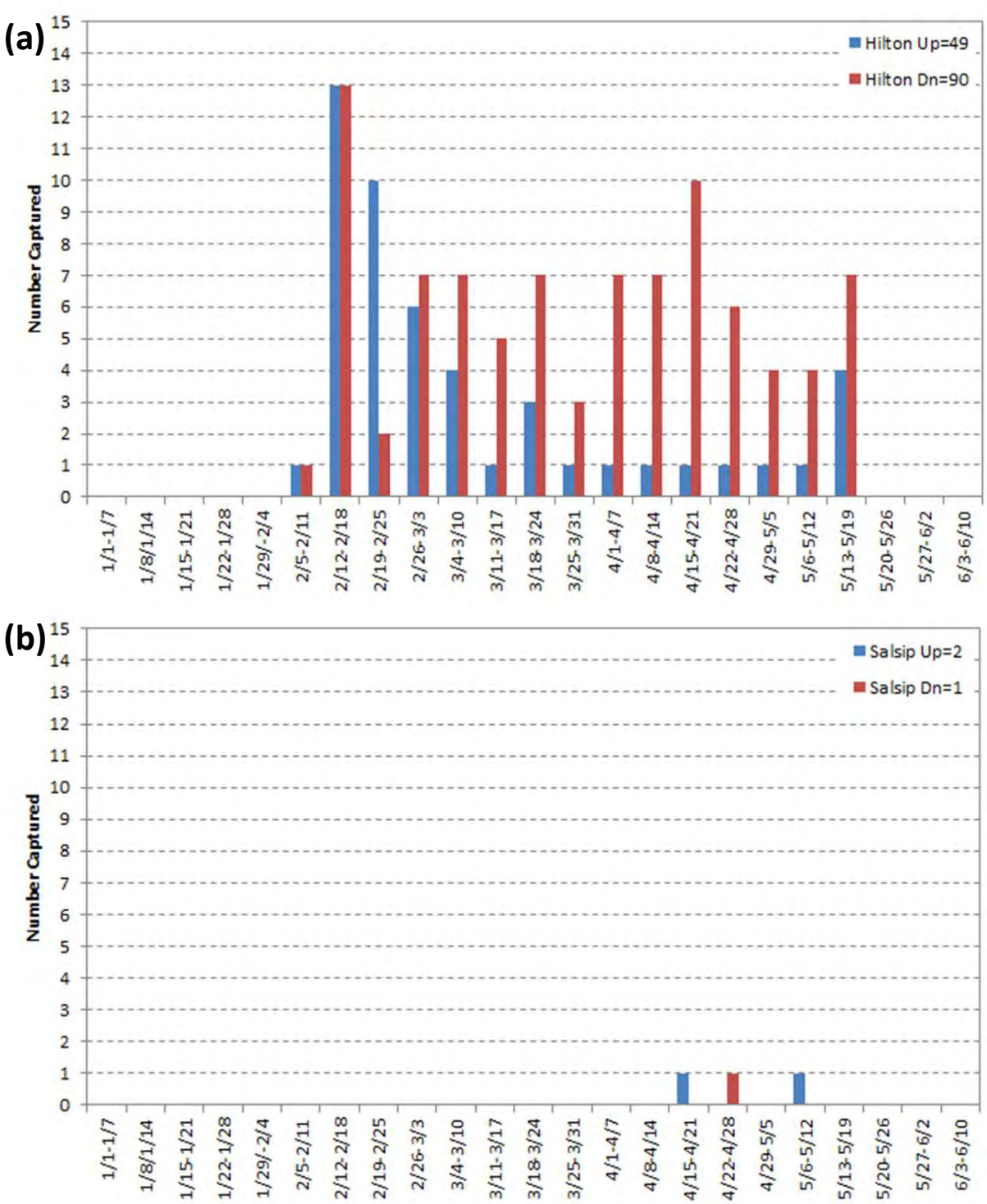


Figure 65: WY2020 paired histogram of weekly upstream and downstream *O. mykiss* captures by trap site for: (a) Hilton Creek and (b) Salsipuedes Creek.

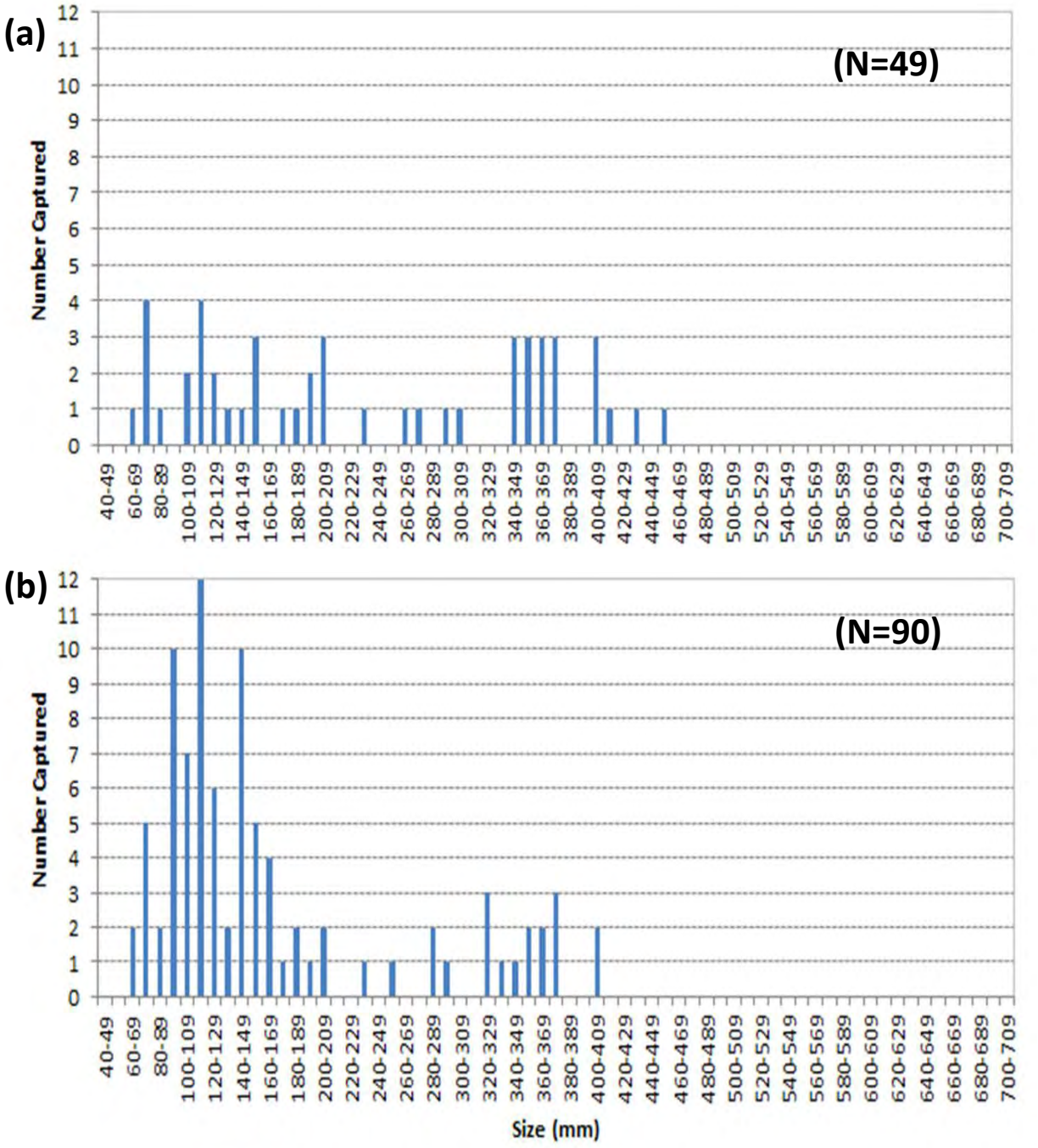


Figure 66: WY2020 Hilton Creek trap length-frequency histogram in 10-millimeter intervals for (a) upstream and (b) downstream *O. mykiss* migrant captures.

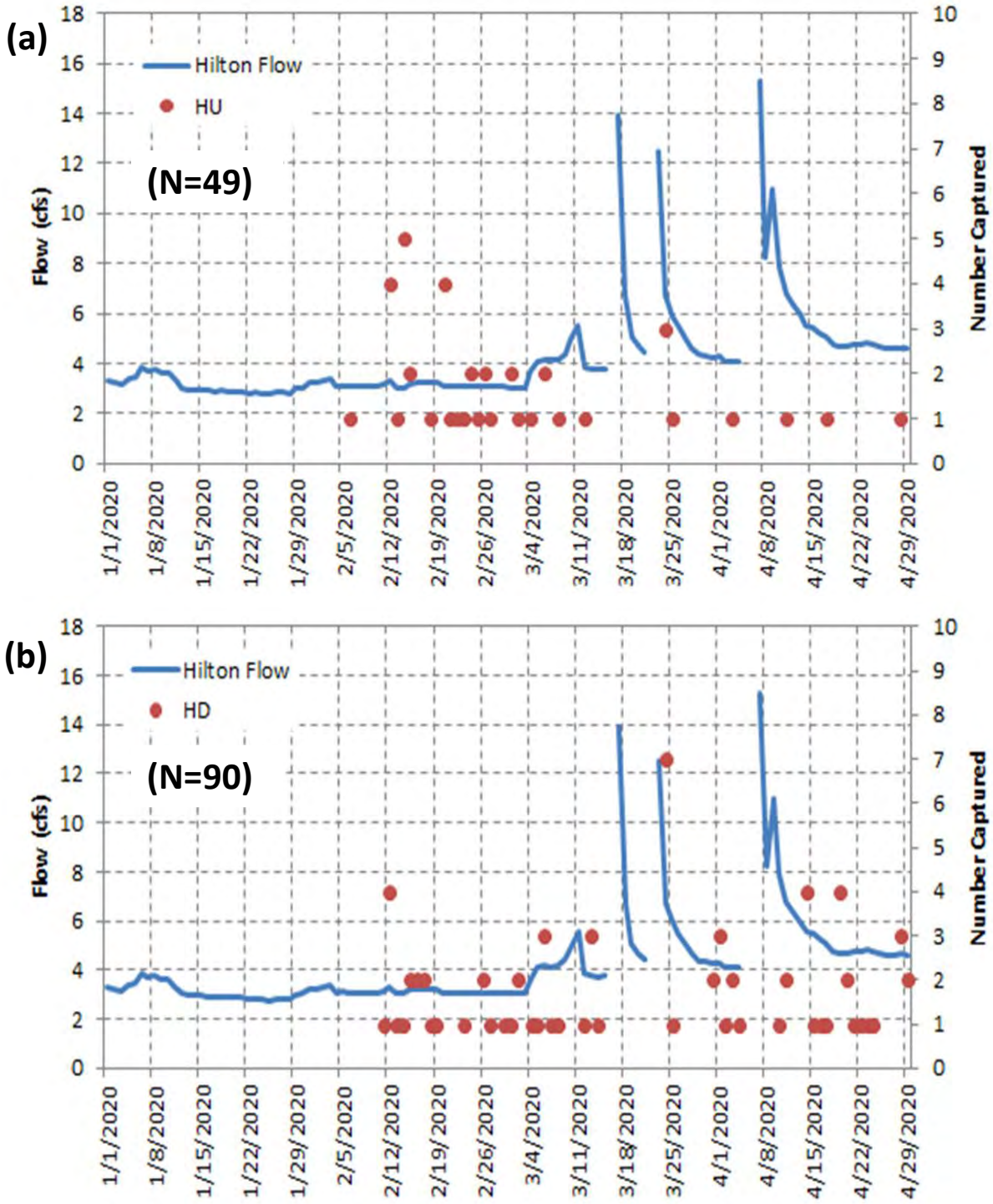


Figure 67: WY2020 Hilton Creek *O. mykiss* migrant captures (red dots) vs. flow: (a) upstream migrant captures and (b) downstream migrant captures.

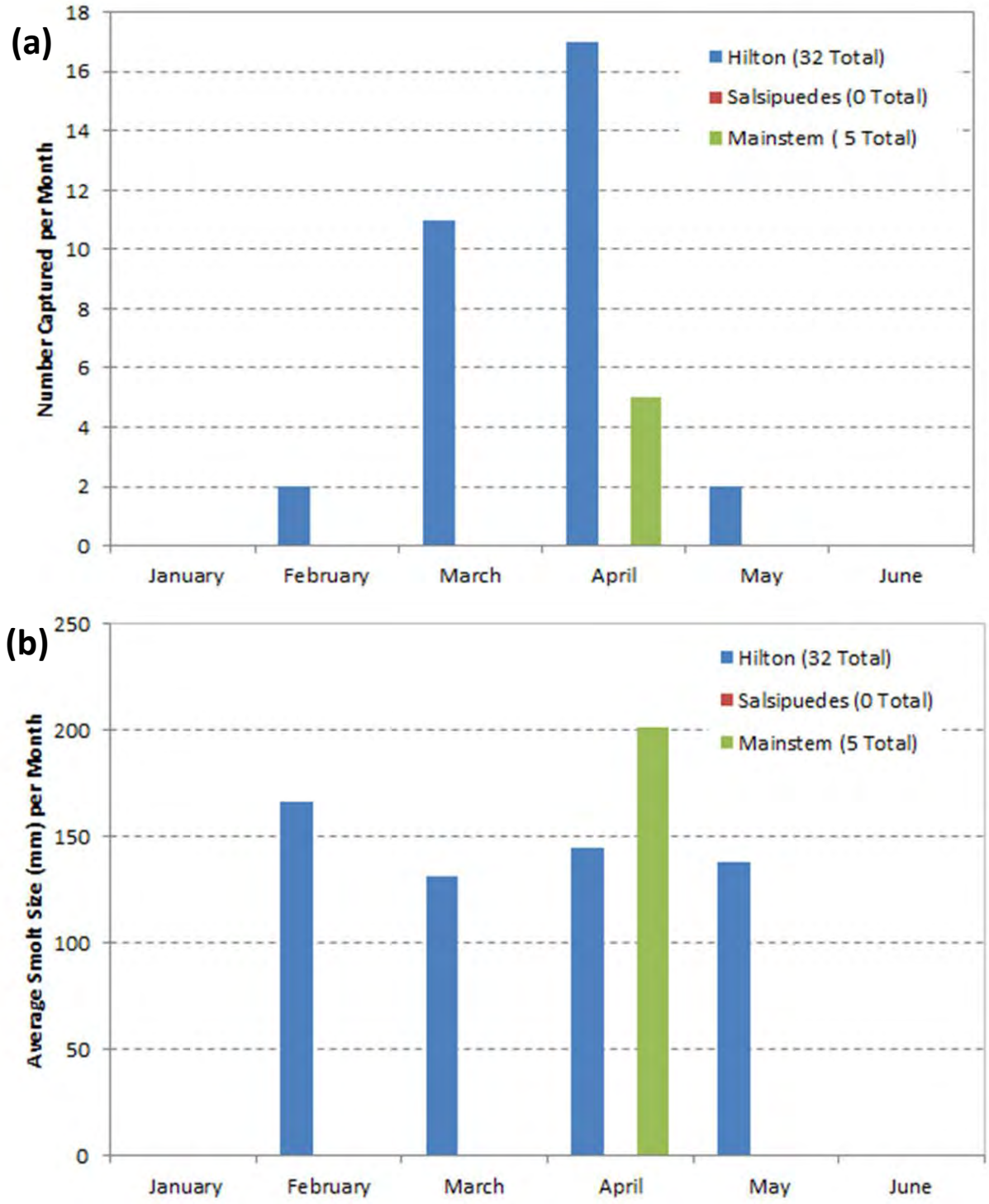


Figure 68: Monthly *O. mykiss* smolt captured at the Hilton Creek, Salsipuedes Creek, and LSYR mainstem traps in WY2020 showing: (a) number of molts captured and (b) average size of smolts captured at each site by month.

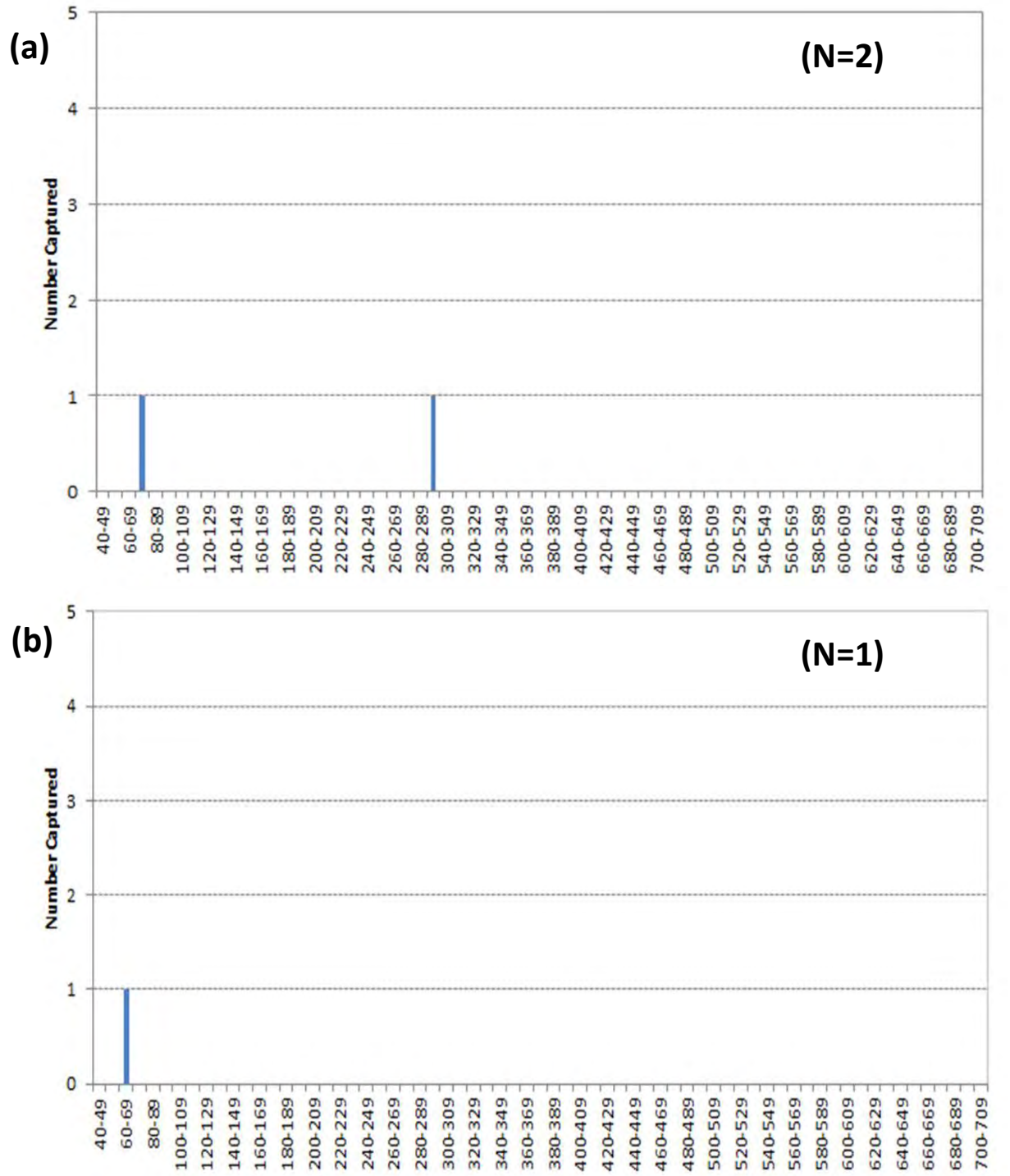


Figure 69: WY2020 Salsipuedes Creek trap length frequency histogram in 10-millimeter intervals for (a) upstream and (b) downstream *O. mykiss* captures.

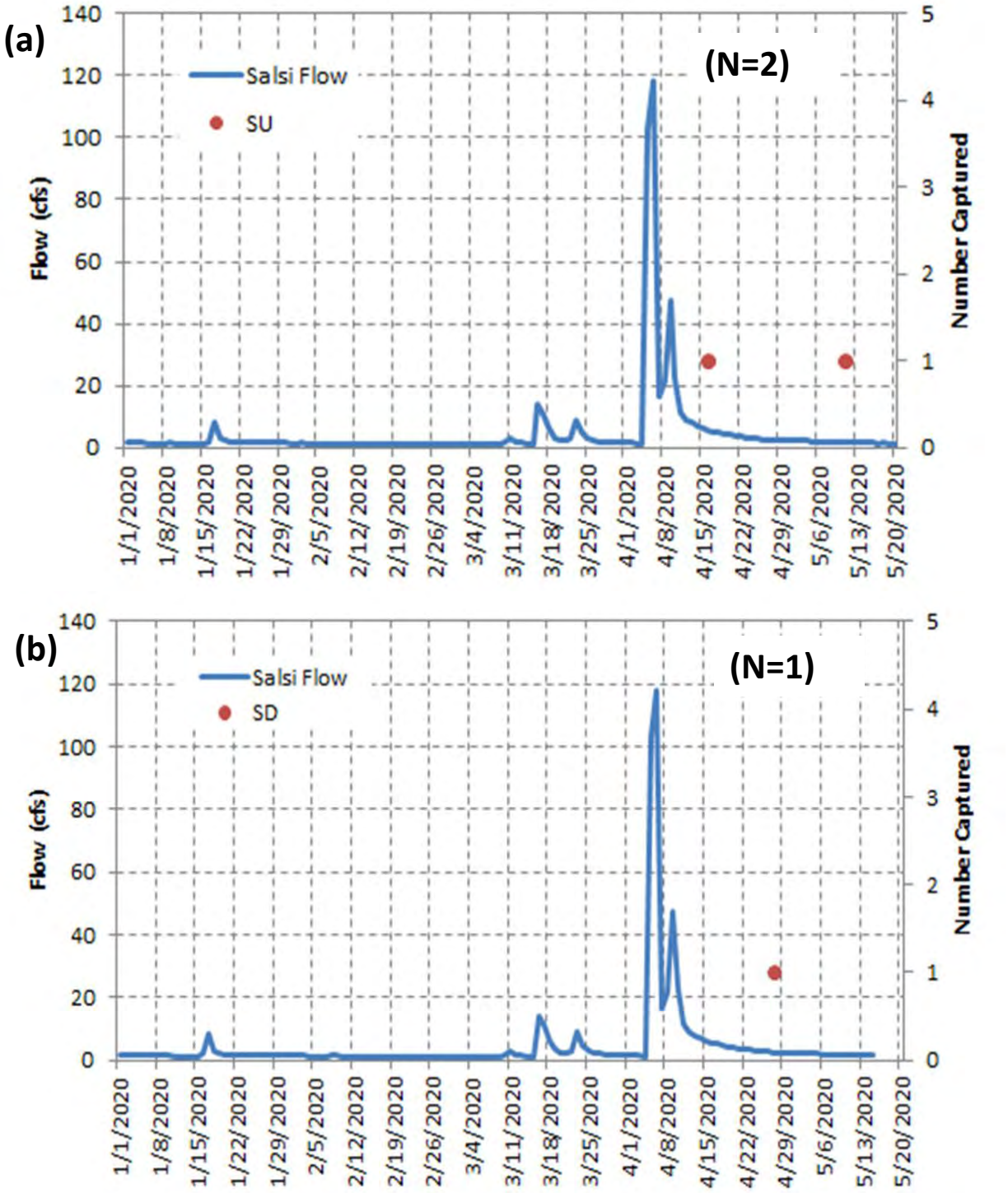


Figure 70: WY2020 Salsipuedes Creek *O. mykiss* migrant captures (red dots) vs. flow for (a) upstream migrants and (b) downstream migrants.

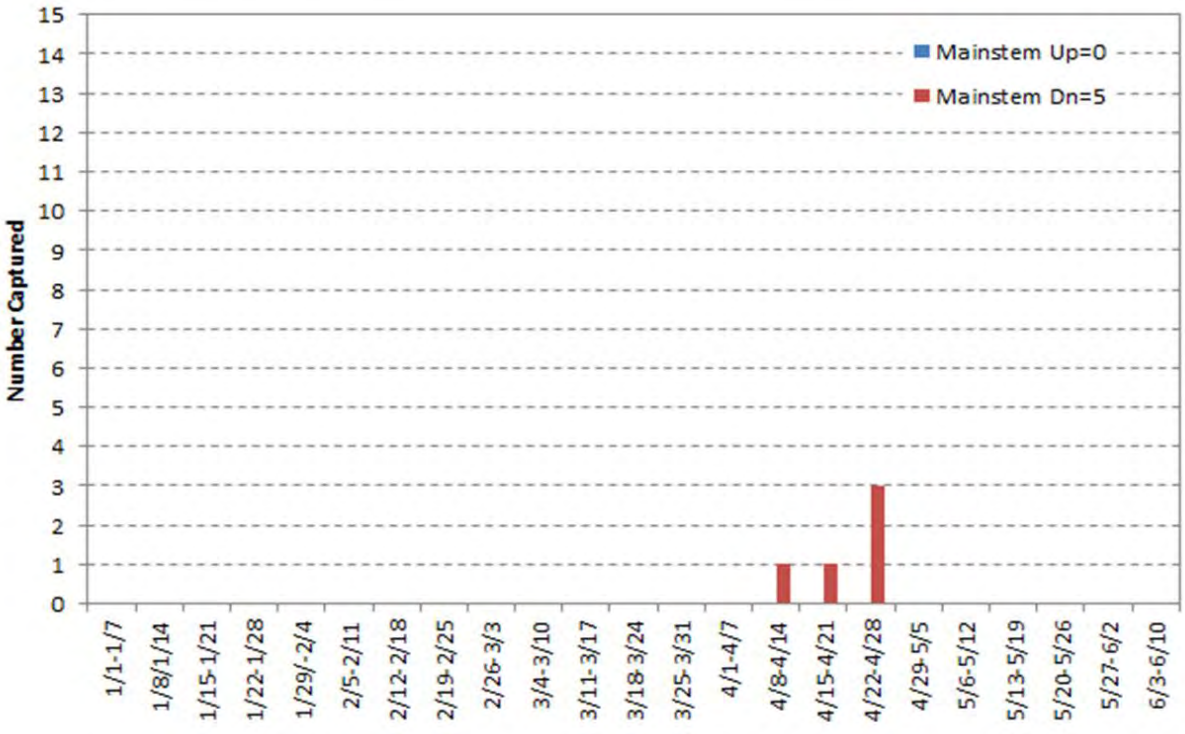


Figure 71: WY2020 paired histogram of weekly upstream and downstream *O. mykiss* captures by trap site for the Santa Ynez River mainstem at LSYR-6.08; no upstream migrants were captured in the mainstem in 2020.

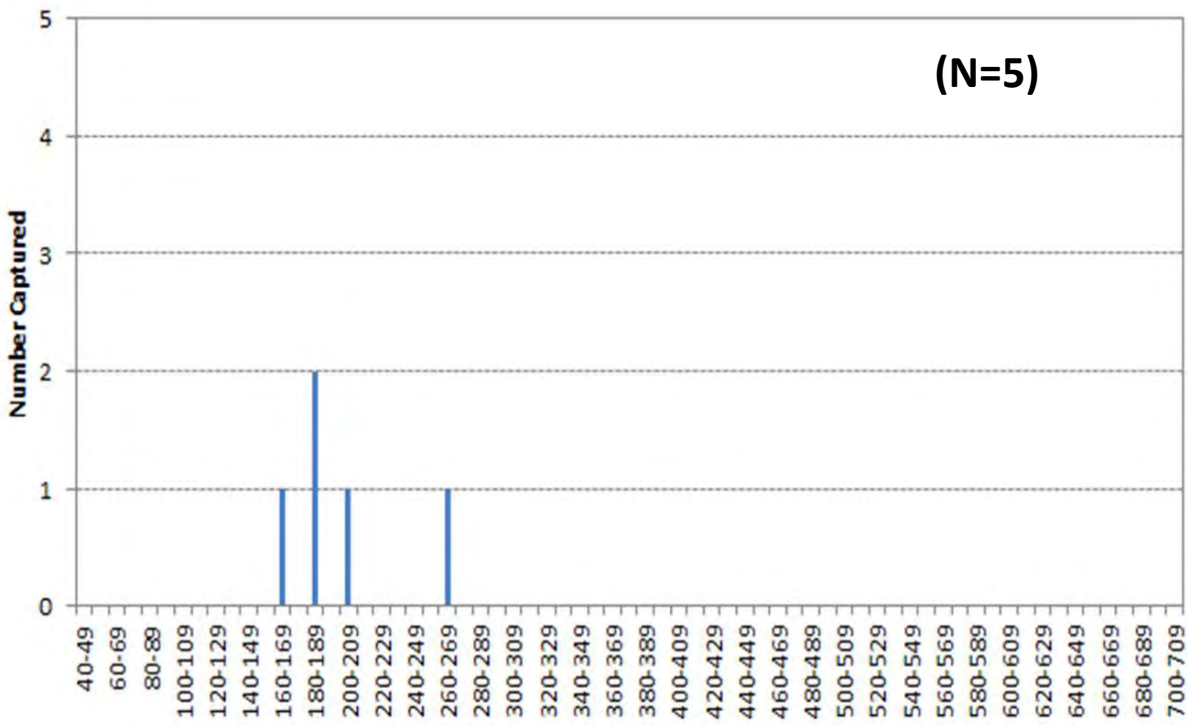


Figure 72: WY2020 Lower Santa Ynez mainstem trap length frequency histogram in 10-millimeter intervals for downstream migrants; no upstream migrants were captured in 2020.

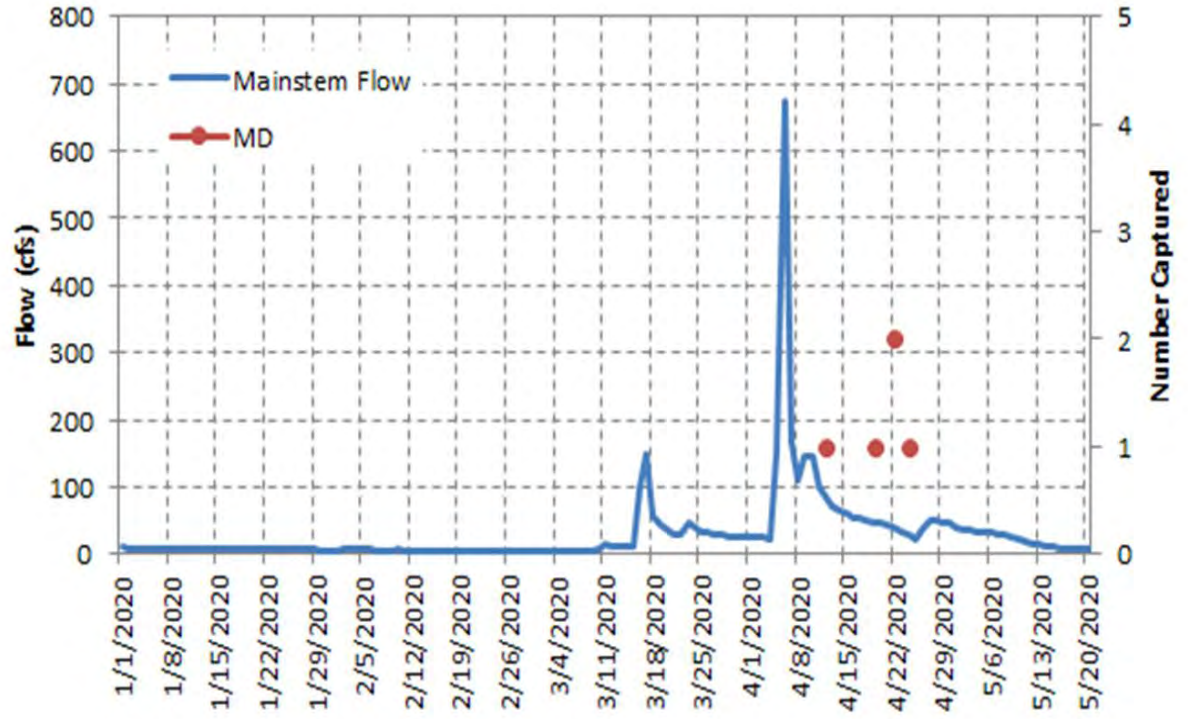


Figure 73: WY2020 Lower Santa Ynez River mainstem trap at LSYR-6.08 *O. mykiss* migrant captures (red dots) vs. flow for downstream migrants; no upstream migrants were captured in 2020.

Table 10: Tributary upstream and downstream *O. mykiss* migrant captures for Hilton Creek and Salsipuedes Creek and the Santa Ynez River mainstem in WY2020; blue lettering represents breakdown of smolts, pre-smolts, and resident trout for each size category.

Hilton Captures		Size		Salsipuedes Captures
(#)		(mm)		(#)
		Upstream Traps		
0		>700		0
0		650-699		0
0		600-649		0
0		550-599		0
0		500-549		0
0		450-499		0
6		400-449		0
13		300-399		0
7		200-299		1
17		100-199		0
6		<99		1
49		**Total**		**2**
		Downstream Traps		
0		>700		0
0		650-699		0
0		600-649		0
0		550-599		0
0		500-549		0
0		450-499		0
2		400-449		0
12		300-399		0
7		200-299		0
	1	*Smolts*	*0*	
	0	*Pre-Smolt*	*0*	
	6	*Res*	*0*	
50		100-199		0
	11	*Smolts*	*0*	
	18	*Pre-Smolt*	*0*	
	19	*Res*	*0*	
19		<99		1
	0	*Smolts*	*0*	
	2	*Pre-Smolt*	*0*	
	17	*Res*	*1*	
90		**Total**		**1**

Size	Mainstem Captures	
(mm)		(#)
Upstream Trap		
>700		0
650-699		0
600-649		0
550-599		0
500-549		0
450-499		0
400-449		0
300-399		0
200-299		0
100-199		0
<99		0
Total		**0**
Downstream Trap		
>700		0
650-699		0
600-649		0
550-599		0
500-549		0
450-499		0
400-449		0
300-399		0
200-299		2
Smolts	*2*	
Pre-Smolt	*0*	
Res	*0*	
100-199		3
Smolts	*3*	
Pre-Smolt	*0*	
Res	*0*	
<99		0
Smolts	*0*	
Pre-Smolt	*0*	
Res	*0*	
Total		**5**

Table 11: The results of scale analyses of *O. mykiss* migrant captures and mortalities found over the monitoring period aggregated by 10 mm size classes.

		Age:									
Size (mm)	**Amount**	**0+**	**1**	**1+**	**2**	**2+**	**3**	**3+**	**4**	**4+**	**5**
<120	*			1							
120-129	****	1		3							
130-139	***			3							
140-149	******			6							
150-159	********	1	1	5							
160-169	****			4							
170-179	*			1							
180-189	****		1	2		1					
190-199	**		1	1							
200-209	****			3	1						
210-219											
220-229											
230-239	*				1						
240-249											
250-259	**					1		1			
260-269	**				1	1					
270-279	*				1						
280-289	**				1			1			
290-299	**				2						
300-309	*						1				
310-319											
320-329	***					1	1	1			
330-339	*							1			
340-349	*						1				
350-359	**						2				
360-369	****						1	3			
370-379	***						2	1			
380-389											
390-399											
400-409	****						1	1	1		1
410-419	*								1		
420-429											
430-439	*								1		
Total:	**67**	**2**	**3**	**29**	**7**	**4**	**9**	**9**	**3**	**0**	**1**

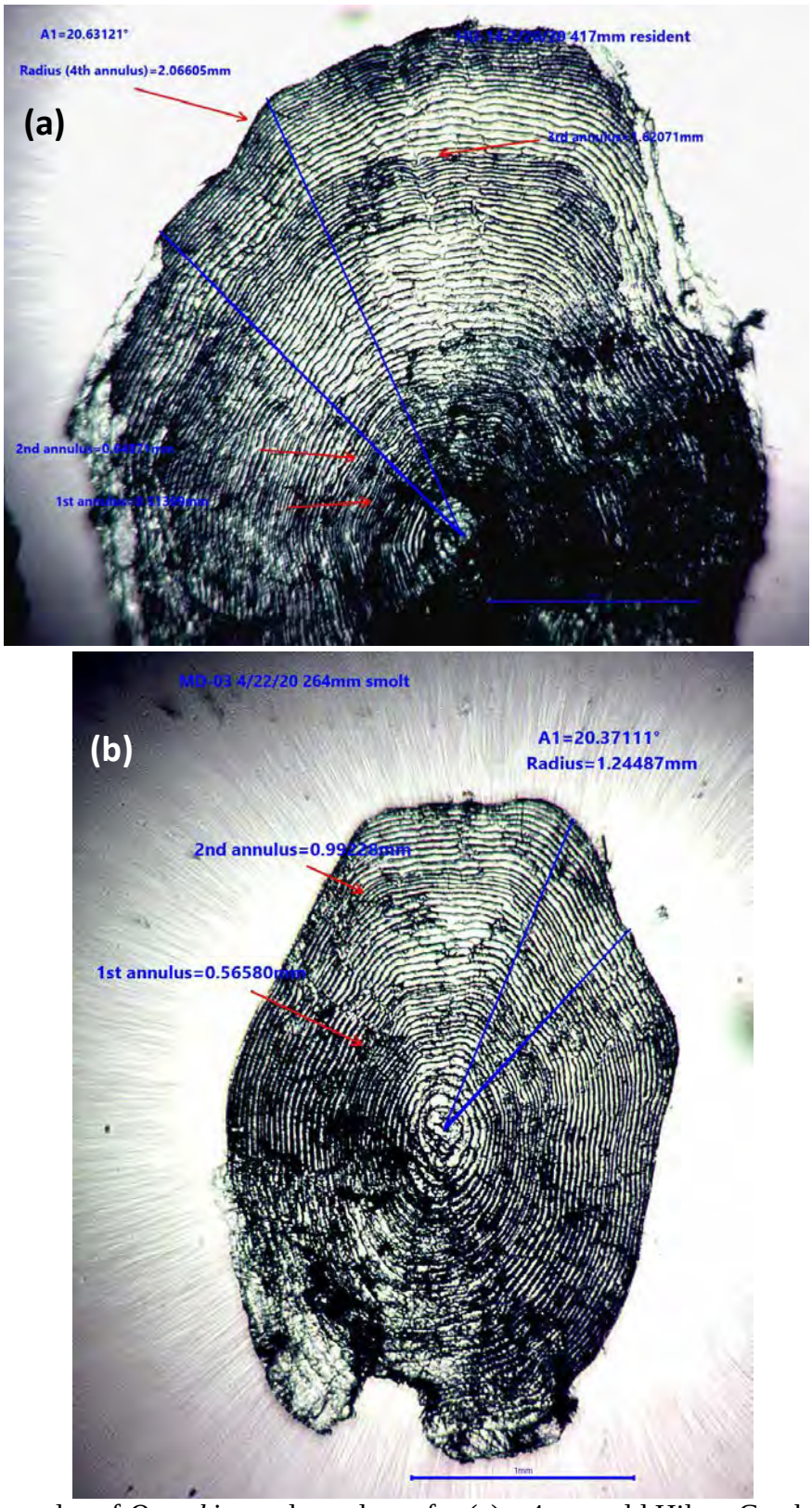


Figure 74: Examples of *O. mykiss* scale analyses for (a) a 4 year old Hilton Creek 417 mm upstream migrating resident fish and (b) and a 2+ year old LSYR mainstem 264 mm downstream migrating smolt.

Table 12: WY2020 tributary *O. mykiss* redd survey results; lengths and widths are given in feet and Salsipuedes Creek watershed includes Upper Salsipuedes, El Jaro, Ytias, and Los Amoles creeks.

Location	Date	Redd #	Length*	Width**
Tributary Redds				
Hilton Creek	1/14/2020	1	2.1	0.9
	1/14/2020	2	2.6	1.0
	1/27/2020	3	2.9	1.2
	1/27/2020	4	3.8	1.6
	1/27/2020	5	3.6	2.4
	1/27/2020	6	3.8	1.7
	1/27/2020	7	4.6	2.0
	2/4/2020	8	5.4	1.7
	2/12/2020	9	2.9	1.3
	2/12/2020	10	3.4	1.4
	2/12/2020	11	2.9	1.6
	2/12/2020	12	3.0	1.4
	2/12/2020	13	3.5	1.4
	2/20/2020	14	3.6	1.7
	2/26/2020	15	3.9	1.5
	2/26/2020	16	3.4	1.9
	2/26/2020	17	4.3	2.1
	2/26/2020	18	4.2	1.8
	2/26/2020	19	3.3	1.4
	2/27/2020	20	2.2	1.4
	3/3/2020	21	2.8	1.3
	3/5/2020	22	4.8	2.6
	3/13/2020	23	3.2	1.5
	3/13/2020	24	2.7	1.4
Salsipuedes Creek	1/29/2020	25	3.6	1.8
	1/29/2020	26	3.3	1.6
	2/28/2020	27	3.1	1.7
	2/28/2020	28	3.9	1.3
	3/2/2020	29	3.3	1.4
	3/2/2020	30	4.1	1.6
	3/2/2020	31	2.7	1.4
	3/2/2020	32	3.4	1.4
	3/2/2020	33	3.4	1.7
Quiota Creek	3/3/2020	34	1.6	0.8
* Pit length plus tailspill length.				
** Average of pit width and tailspill widths.				

Table 13: WY2020 tributary redd observations by month for each creek surveyed.

	January	February	March	April	May	Total
Hilton Ck	7	13	4	0	n/s	24
Quiota Ck	0	0	1	0	n/s	1
Salsipuedes Ck	2	2	5	0	n/s	9
El Jaro Ck	0	0	0	0	n/s	0
Los Amoles CK	0	0	0	n/s	n/s	0
Ytias Ck	n/s	n/s	n/s	n/s	n/s	n/s
					Total:	**34**
n/s - not surveyed due to trubid conditions or low water level.						

Table 14: WY2020 LSYR mainstem redd survey results within the management reaches (Refugio and Alisal reaches) by month.

	January	February	March	April	May	Total
Highway 154	n/s	0	0	0	n/s	0
Refugio Reach	n/s	n/s	n/s	n/s	n/s	n/s
Alisal Reach	n/s	n/s	n/s	n/s	n/s	n/s
					Total:	**0**
n/s - not surveyed due to trubid conditions or low water level.						

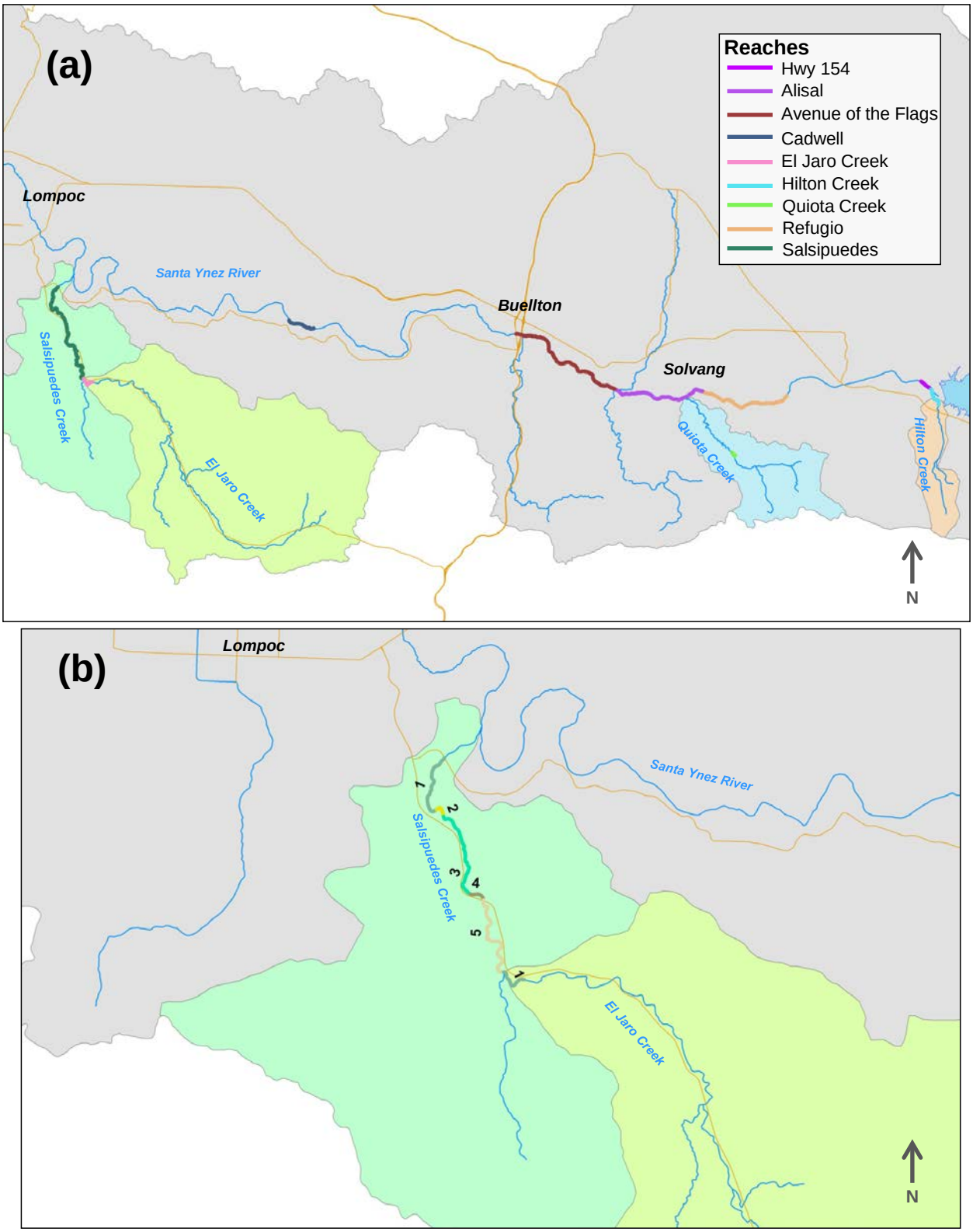


Figure 75: Stream reaches snorkel surveyed in 2020 with suitable habitat and where access was granted within the (a) LSYR mainstem and its tributaries, and (b) Salsipuedes Creek.

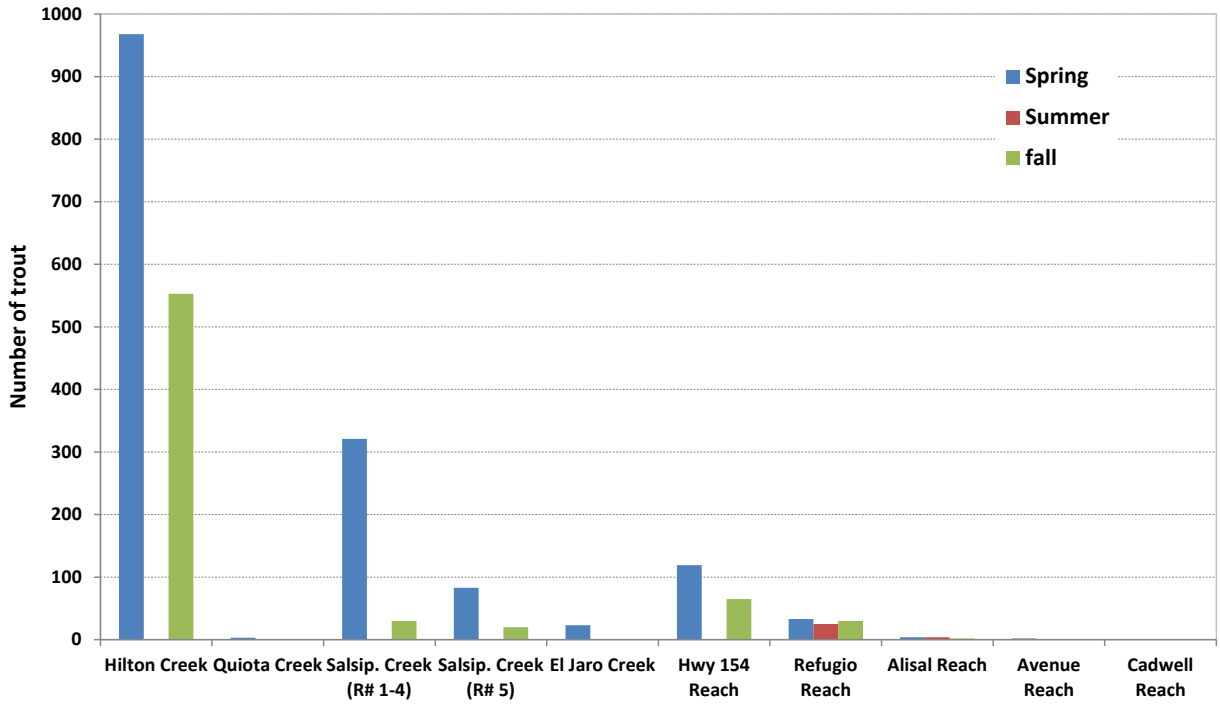


Figure 76: 2020 LSYR *O. mykiss* observed during spring, summer, and fall snorkel surveys.

Table 15: 2020 LSYR mainstem snorkel survey schedule.

Mainstem/Stream Miles	Season	Survey Date
Hwy 154 Reach	Spring	7/6/2020
(LSYR-0.2 to LSYR-0.7)	Summer	n/s
	Fall	12/3/2020
Refugio Reach	Spring	5/20/20 - 5/21/20
(LSYR-4.9 to LSYR-7.8)	Summer	10/9/20 - 10/14/20
	Fall	12/2/2020
Alisal Reach	Spring	5/22/20 & 5/26/20
(LSYR-7.8 to LSYR-10.5)	Summer	10/8/20 & 10/9/20
	Fall	12/2/2020
Avenue Reach	Spring	6/1/20 - 6/4/20
(LSYR-10.5 to LSYR-13.9)	Summer	10/7/20 & 10/8/20
	Fall	12/3/20 -12/7/20
Reach 3 Downstream of Avenue	Spring	5/26/20 - 6/9/20
(LSYR-13.9 to LSYR-25.0)	Summer	10/6/2020
	Fall	12/7/20 - 12/8/20
*n/s - not surveyed.		

Table 16: LSYR mainstem spring, summer, and fall snorkel survey results in 2020 with the miles surveyed; the level of effort was the same for each snorkel survey.

LSYR Mainstem	Spring (# of *O. mykiss*)	Summer (# of *O. mykiss*)	Fall (# of *O. mykiss*)	Survey Distance (miles)
Hwy 154 Reach	119	n/s	65	0.26
Refugio Reach	33	25	30	2.95
Alisal Reach	4	4	2	2.80
Avenue of the Flags Reach	2	0	0	3.4
Cadwell Reach	0	0	0	0.3
n/s - not surveyed.				

Table 17: LSYR mainstem spring, summer, and fall snorkel survey results in 2020 broken out by three inch size classes.

Survey	Reach	Size Class (inches)									Total
		0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24-27	
Spring	Hwy 154	58	48	12	1						119
	Refugio			16	13	3	1				33
	Alisal		1	2	1						4
	Avenue				2						2
	Cadwell										0
Summer	Hwy 154										n/s
	Refugio				7	15	3				25
	Alisal				2	2					4
	Avenue										0
	Cadwell										0
Fall	Hwy 154		34	29	2						65
	Refugio				6	19	5				30
	Alisal				1	1					2
	Avenue										0
	Cadwell										0
n/s - not surveyed.											

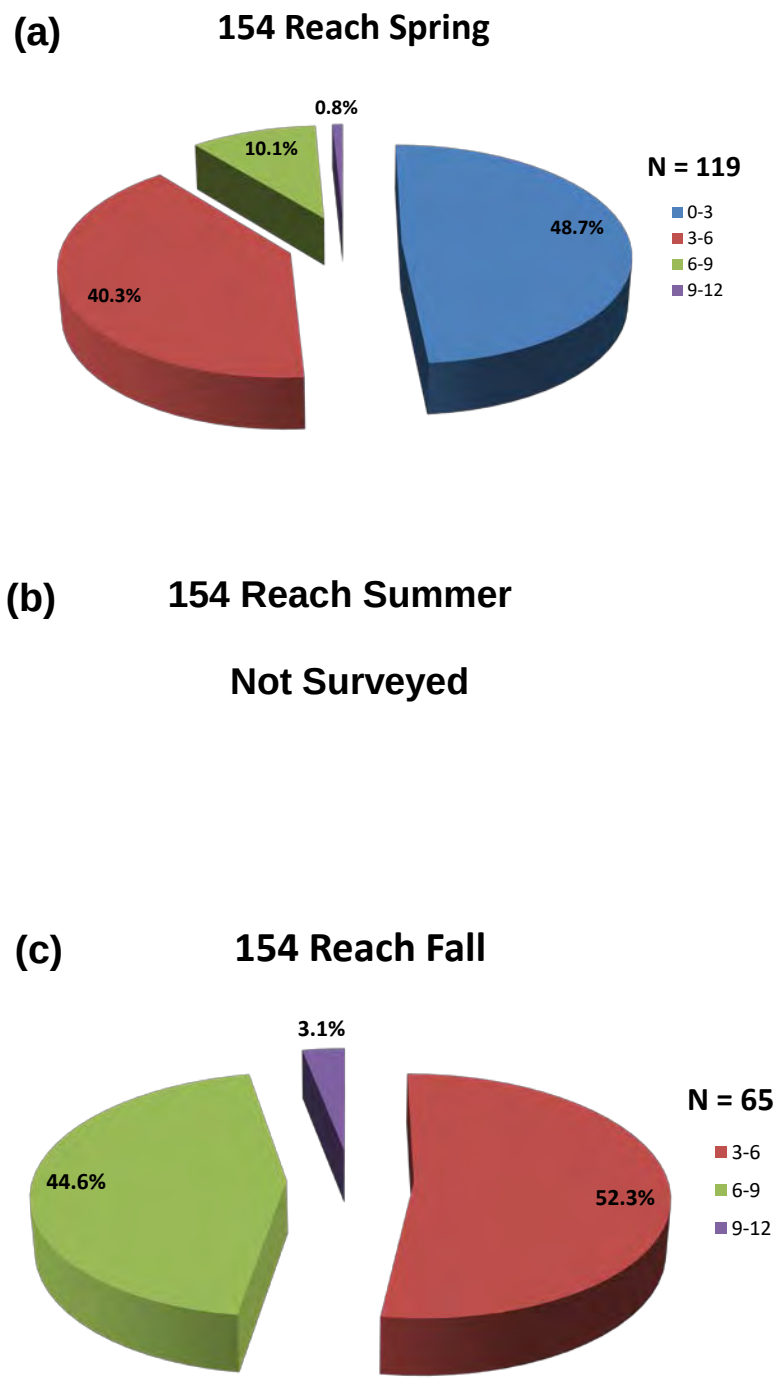


Figure 77: 2020 LSYR Mainstem Highway 154 Reach snorkel survey results of *O. mykiss* proportioned by size class in inches in the (a) spring, and (b) fall.

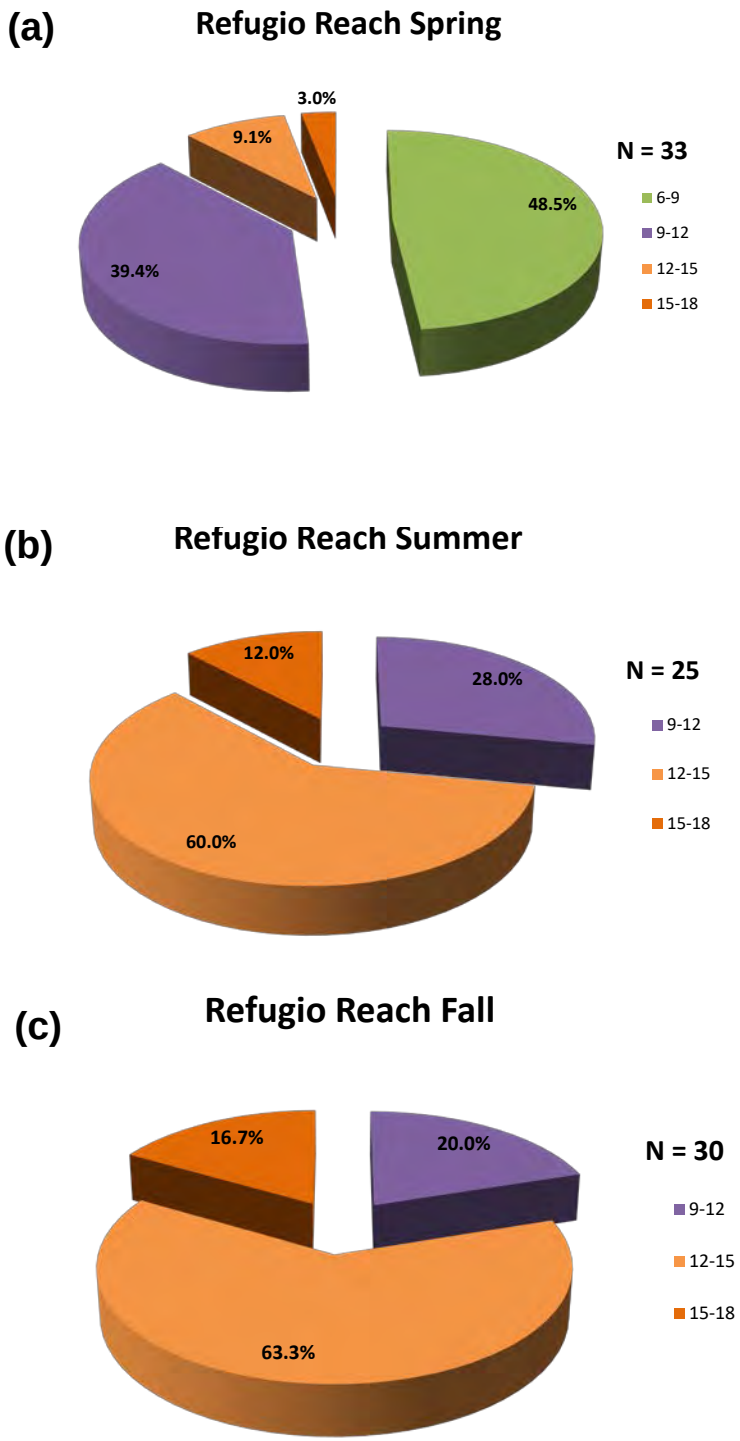


Figure 78: 2020 LSYR Mainstem Refugio Reach snorkel survey results of *O. mykiss* proportioned by size class in inches in the (a) spring, (b) summer, and (c) fall.

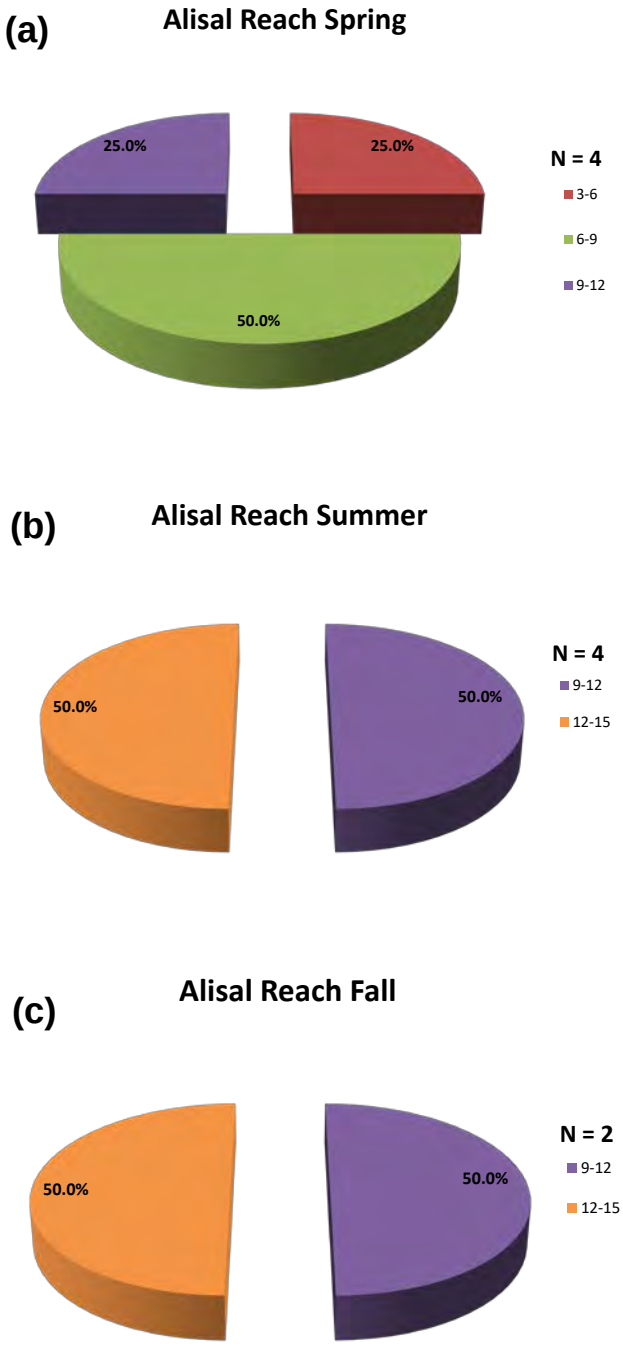
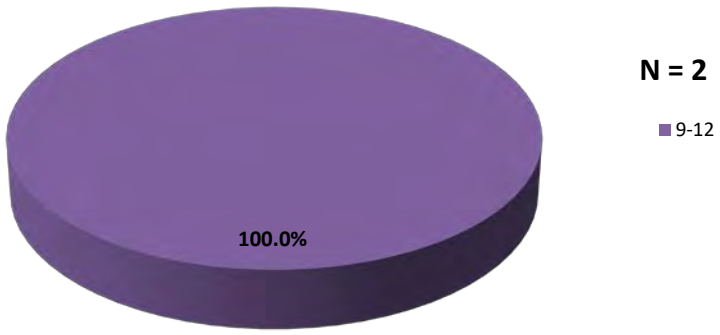


Figure 79: 2020 LSYR Mainstem Alisal Reach snorkel survey results of *O. mykiss* proportioned by size class in inches in the (a) spring, (b) summer, and (c) fall.

(a) **Avenue Reach Spring**



(b) **Avenue Reach Summer**

No *O. mykiss* observed

(c) **Avenue Reach Fall**

No *O. mykiss* observed

Figure 80: 2020 LSYR Mainstem Avenue of the Flags Reach snorkel survey results of *O. mykiss* proportioned by size class in inches in the (a) spring, (b) summer, and (c) fall.

Table 18: 2020 tributary snorkel survey schedule; no summer surveys were conducted in 2020.

Tributaries/Stream Miles	Season	Survey Date
Hilton Creek	Spring	7/8/20 - 7/9/20
(HC-0.0 to HC-0.54)	Summer	n/s
	Fall	11/2/20 - 11/3/20
Quiota Creek	Spring	6/11/20 & 6/15/20
(QC-2.58 to QC-2.73)	Summer	n/s
	Fall	11/4/2020
Salsipuedes Creek	Spring	5/27/20 - 6/4/20
(Reach 1-4)	Summer	n/s
	Fall	11/4/20-11/5/20 & 11/9/20
Salsipuedes Creek	Spring	5/28/20 & 6/2/20
(Reach 5)	Summer	n/s
	Fall	11/9/20 - 11/10/20
El Jaro Creek	Spring	6/2/20
(ELC-0.0 to ELC-0.4)	Summer	n/s
	Fall	11/10/20
*n/s - not surveyed.		

Table 19: *O. mykiss* observed and miles surveyed during all tributary snorkel surveys in 2020; the level of effort was the same for each survey.

Tributaries	Spring (# of *O. mykiss*)*	Summer (# of *O. mykiss*)	Fall (# of *O. mykiss*)	Survey Distance (miles)
Hilton Creek				
Reach 1	382	n/s	191	0.133
Reach 2	152	n/s	73	0.050
Reach 3	69	n/s	11	0.040
Reach 4	79	n/s	44	0.075
Reach 5	285	n/s	234	0.242
Reach 6	1	n/s	0	0.014
Total:	***968***	***n/s***	***553***	***0.554***
Quiota Creek	3	n/s	0	0.11
Salsipuedes Creek (Reach 1-4)	321	n/s	30	2.85
Salsipuedes Creek (Reach 5)	83	n/s	20	0.45
El Jaro Creek	23	n/s	0	0.35
n/s - not surveyed.				

Table 20: 2020 tributary spring and fall snorkel survey results broken out by three-inch size classes.

Survey	Reach	Size Class (inches)									Total
		0-3	3-6	6-9	9-12	12-15	15-18	18-21	21-24	24-27	
Spring	Hilton	598	314	50	6						968
	Quiota		1	2							3
	Salsipuedes (R 1-4)	180	117	13	8	2	1				321
	Salsipuedes (R-5)	21	40	16	4	2					83
	El Jaro	13	5	5							23
Summer	Hilton										n/s
	Quiota										n/s
	Salsipuedes (R 1-4)										n/s
	Salsipuedes (R-5)										n/s
	El Jaro										n/s
Fall	Hilton	194	297	56	6						553
	Quiota										0
	Salsipuedes (R 1-4)	1	28	1							30
	Salsipuedes (R-5)		14	5	1						20
	El Jaro										0

n/s - not surveyed.

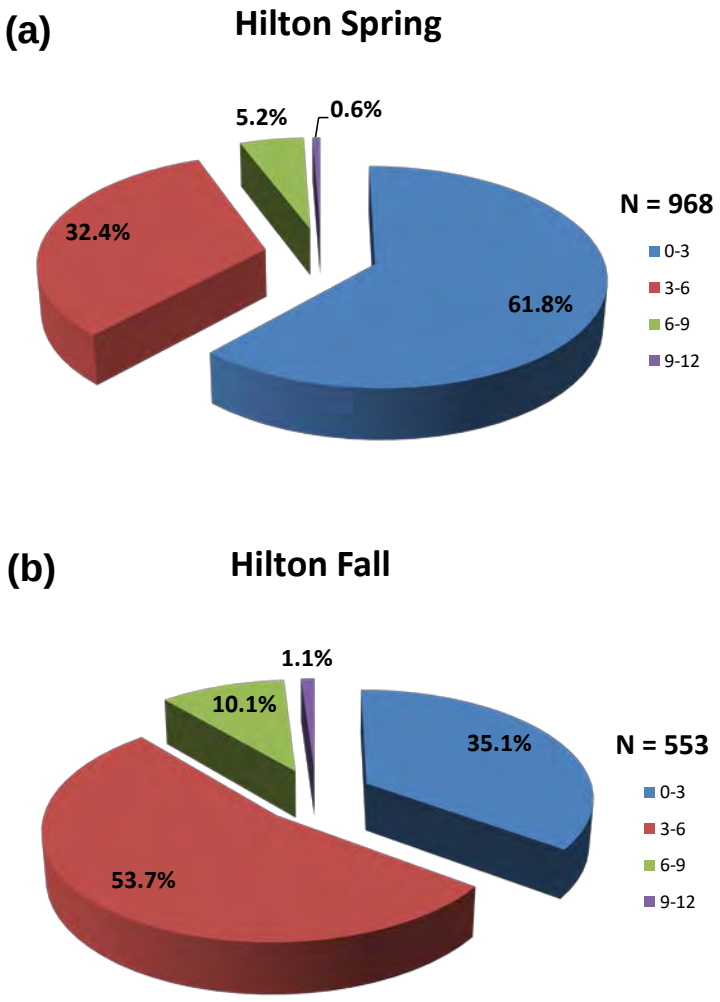


Figure 81: 2020 Hilton Creek snorkel survey results of *O. mykiss* proportioned by size class in inches in the (a) spring, and (b) fall.

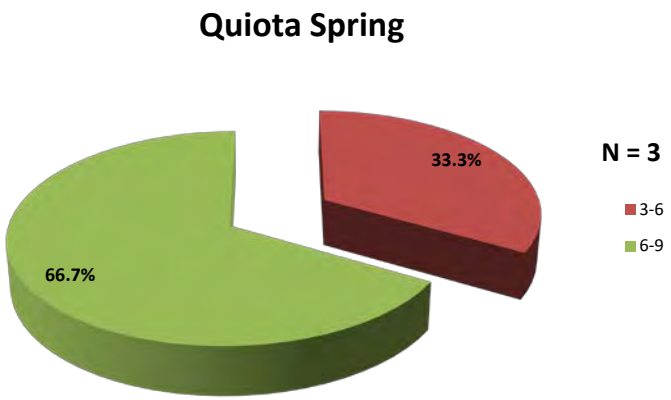


Figure 82: 2020 Quiota Creek snorkel survey results of *O. mykiss* proportioned by size class in inches; no *O. mykiss* were observed during the fall snorkel survey.

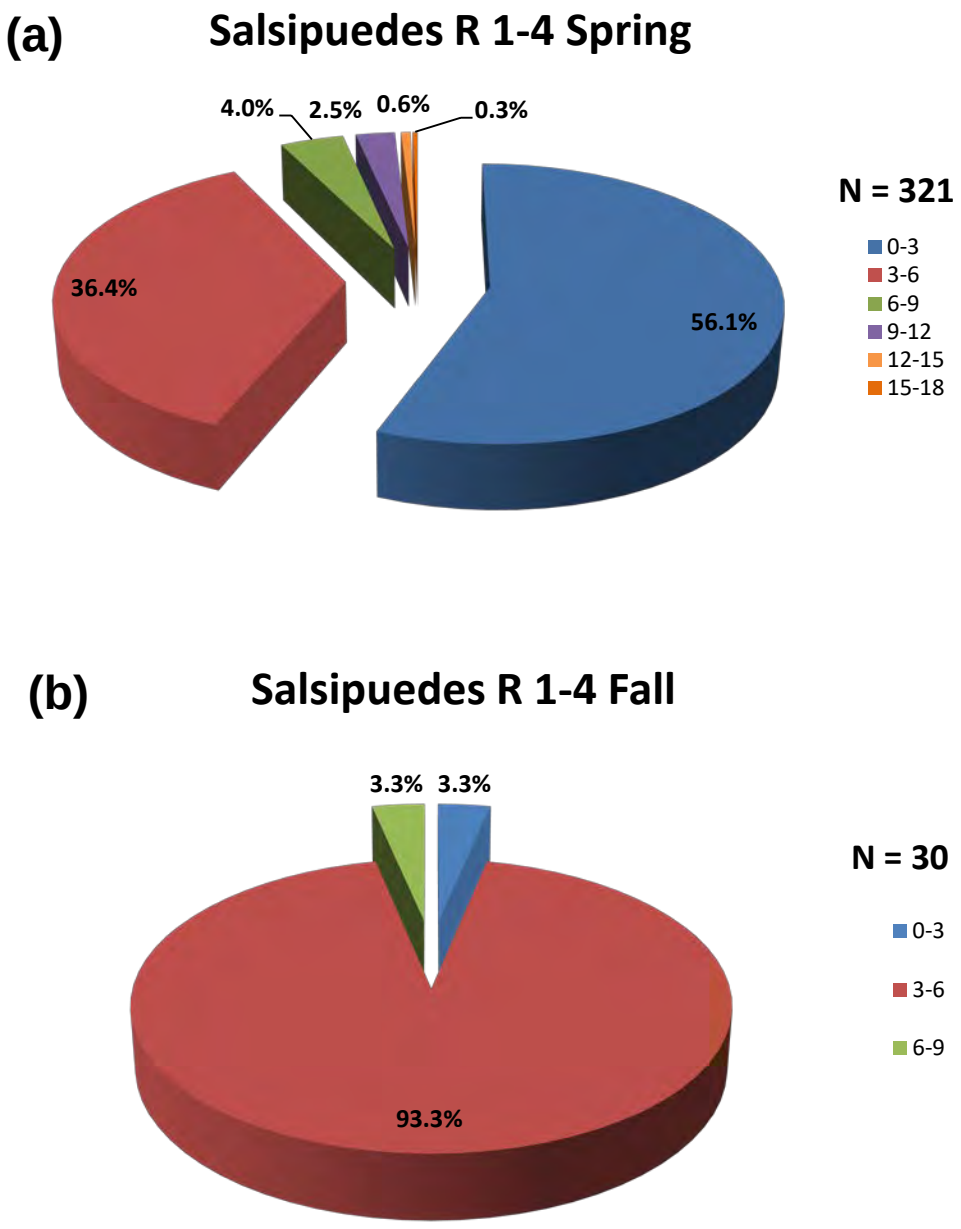


Figure 83: 2020 Salsipuedes Creek Reaches 1-4 snorkel survey results of *O. mykiss* proportioned by size class in inches in the (a) spring, and (b) fall.

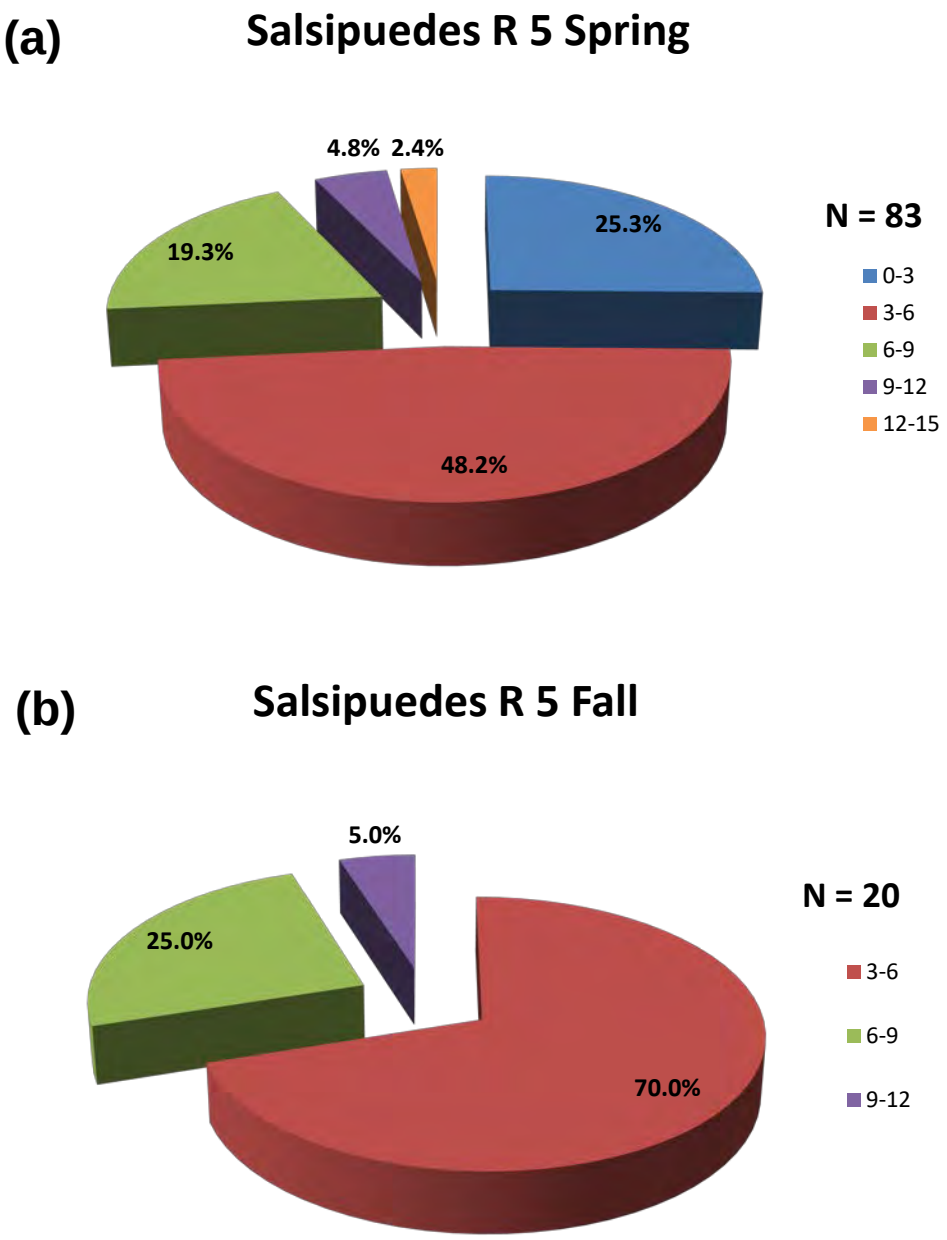


Figure 84: 2020 Salsipuedes Creek Reach 5 snorkel survey results of *O. mykiss* proportioned by size class in inches in the (a) spring, and (b) fall.

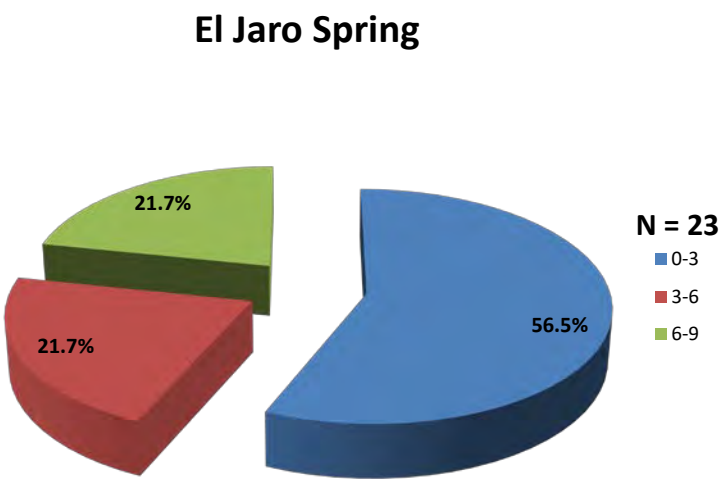


Figure 85: 2020 El Jaro Creek snorkel survey results of *O. mykiss* proportioned by size class in inches. No *O. mykiss* were observed during the fall snorkel survey.

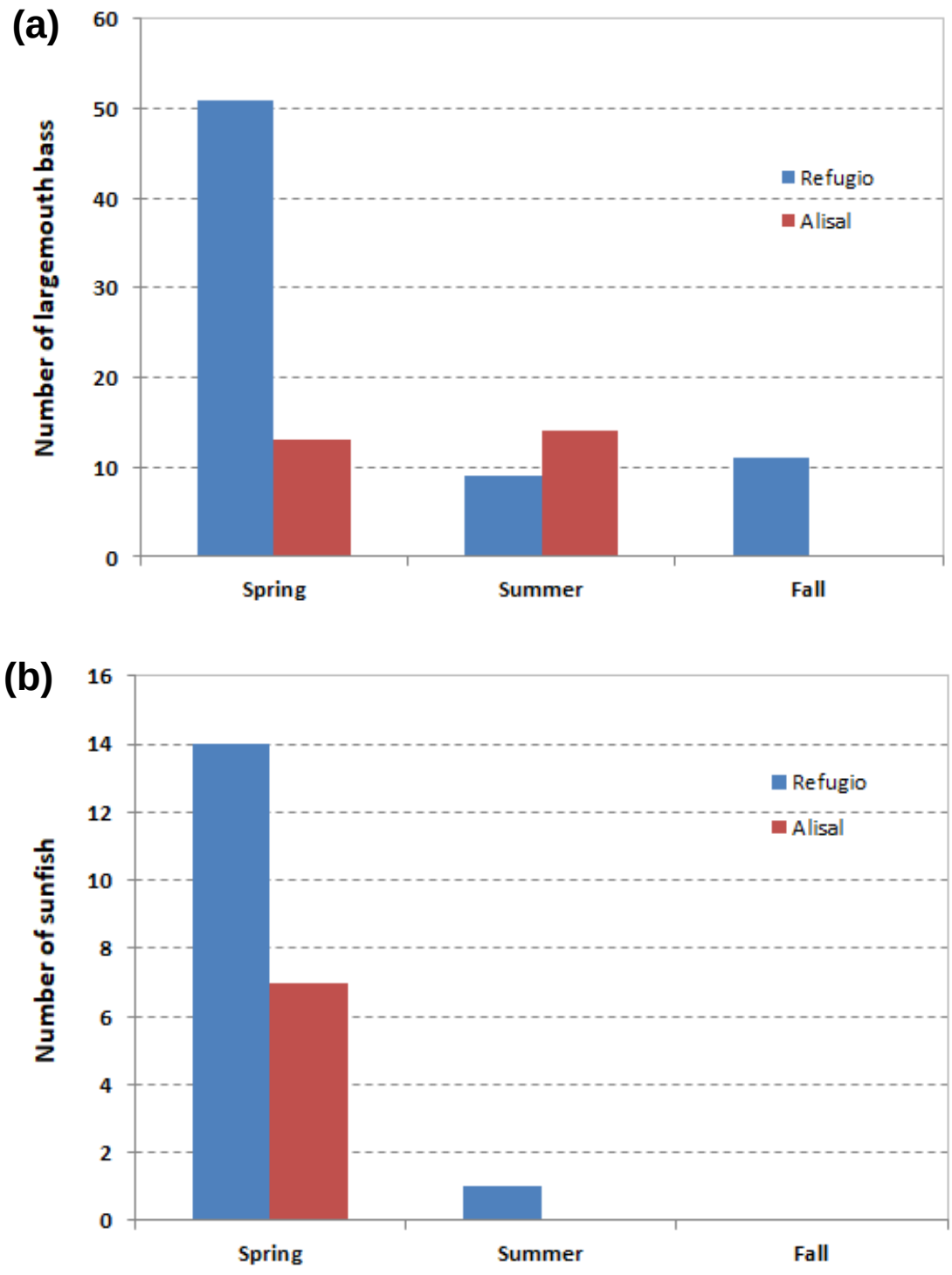


Figure 86: Count of warm water predators, (a) largemouth bass and (b) sunfish, observed in Refugio and Alisal reaches during the spring, summer and fall snorkel surveys in 2020.

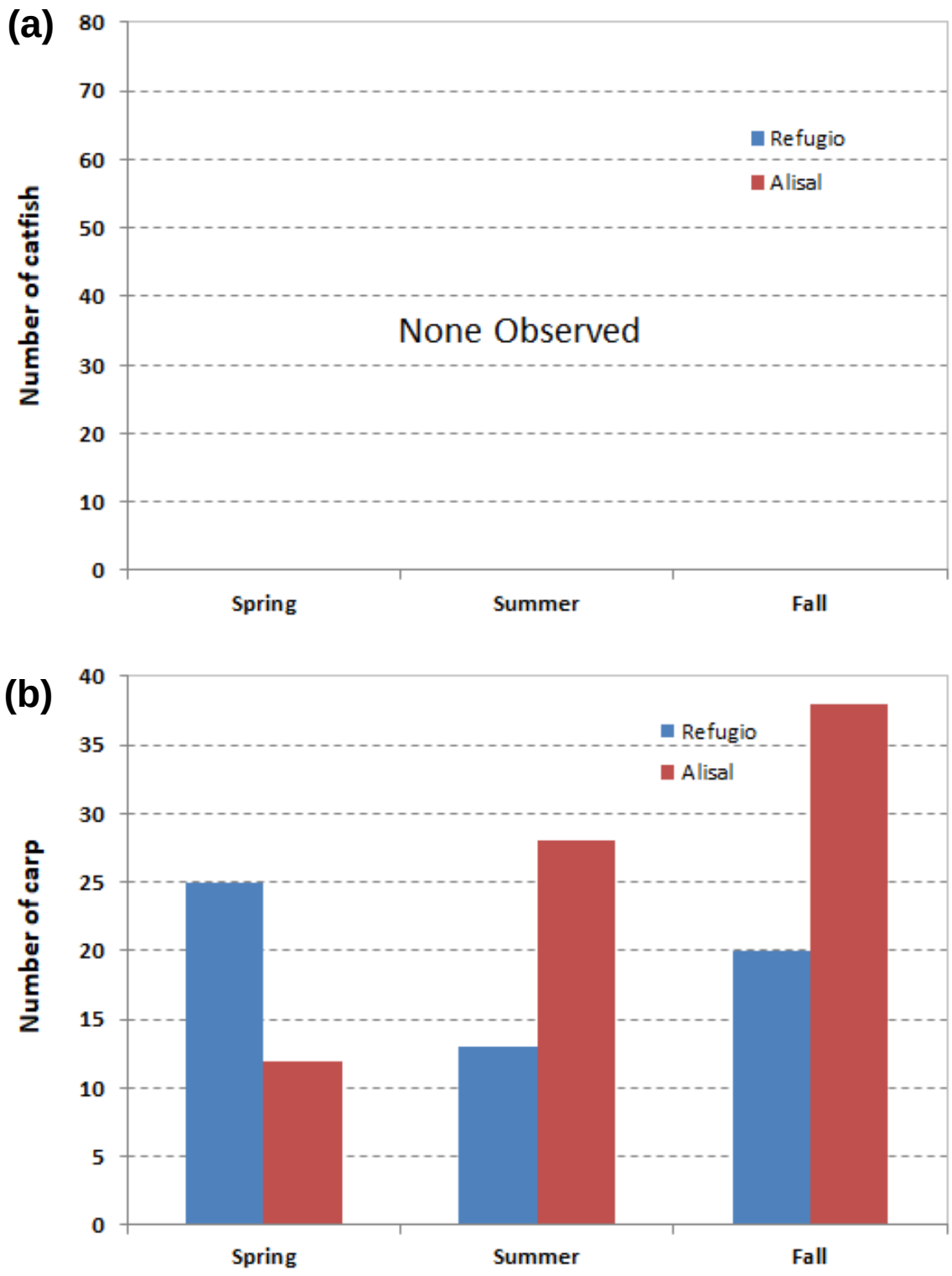
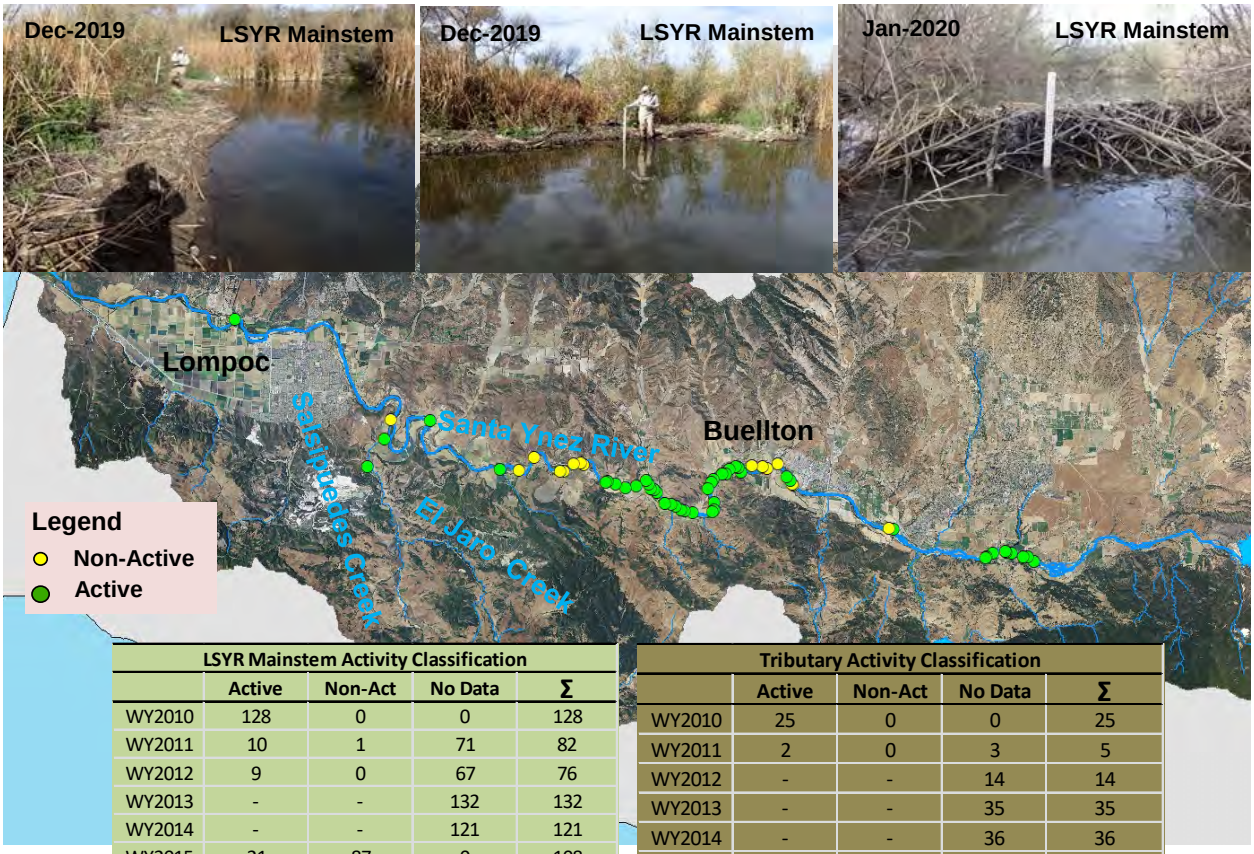


Figure 87: Count of warm water predators, (a) catfish and (b) carp, observed in Refugio and Alisal reaches during the spring, summer and fall snorkel surveys in 2020.



LSYR Mainstem Activity Classification				
	Active	Non-Act	No Data	Σ
WY2010	128	0	0	128
WY2011	10	1	71	82
WY2012	9	0	67	76
WY2013	-	-	132	132
WY2014	-	-	121	121
WY2015	21	87	0	108
WY2016	16	29	0	45
WY2017*	14	52	0	66
WY2018	37	10	0	47
WY2019	42	3	0	45
WY2020	43	15	0	58

* Additional reaches surveyed from previous year.
- Indicates limited attribute data taken at each dam site.

Tributary Activity Classification				
	Active	Non-Act	No Data	Σ
WY2010	25	0	0	25
WY2011	2	0	3	5
WY2012	-	-	14	14
WY2013	-	-	35	35
WY2014	-	-	36	36
WY2015	6	15	0	21
WY2016	1	7	0	8
WY2017	0	8	0	8
WY2018	0	2	0	2
WY2019	0	0	0	0
WY2020	2	0	0	2

- Indicates limited attribute data taken at each dam site.

Figure 88: Spatial extent of beaver dams from the WY2020 survey within the LSYR drainage where 58 dams (43 active) were observed in the mainstem and two dams observed in the Salsipuedes/El Jaro Creek watershed.

Table 21: Annual count of 2010-2020 beaver dams in the LSYR mainstem and Salsipuedes/El Jaro watershed broken out by dam height.

	LSYR Mainstem Beaver Dams						Tributary Beaver Dams					
Height Year	0.0-1.0 (ft)	1.1-2.0 (ft)	2.1-3.0 (ft)	3.1-4.0 (ft)	> 4.0 (ft)	Σ	0.0-1.0 (ft)	1.1-2.0 (ft)	2.1-3.0 (ft)	3.1-4.0 (ft)	> 4.0 (ft)	Σ
WY2010	3	65	40	17	3	128	0	17	5	3	0	25
WY2011	5	34	31	10	2	82	3	1	1	0	0	5
WY2012*	9	38	23	4	0	74	5	6	3	0	0	14
WY2013	23	75	27	7	0	132	8	23	4	0	0	35
WY2014	21	48	36	15	1	121	10	24	2	0	0	36
WY2015	19	52	32	4	1	108	9	10	2	0	0	21
WY2016	7	21	14	3	0	45	1	6	1	0	0	8
WY2017	8	29	28	1	0	66	1	5	2	0	0	8
WY2018	13	24	9	1	0	47	2	0	0	0	0	2
WY2019	7	24	12	2	0	45	0	0	0	0	0	0
WY2020	13	30	13	2	0	58	1	1	0	0	0	2
* There are 76 mainstem beaver dams in 2012, two were not measured												

Attachment C:
Reclamation Response to Comments and Comment Letters on Draft Term 27 Annual Report

Introduction

On December 31, 2020, pursuant to Term 17 of the Cachuma Water Rights Order WR-2019-0148 (Order), the Bureau of Reclamation (Reclamation) provided a draft of the Term 27 Annual Compliance Report for Water Year 2020 (Draft Term 27 Annual Report) to the National Marine Fisheries Service (NMFS) and the California Department of Fish and Wildlife (CDFW) for their 30-working day review.

On February 12, 2021, Reclamation received a comment letter on the Draft Term 27 Annual Report from NMFS. Reclamation did not receive a comment letter from CDFW; however, on February 18, 2021, Reclamation was copied on an email to the State Water Board that included a comment letter directed to the State Water Board regarding the Annual Report with requests to the State Water Board to compel Reclamation regarding specific terms of the Order.

Reclamation's response to NMFS comments and the comment letters are included below. The sequential comment numbering (i.e., NMFS-1 through NMFS-10) correspond to the comments identified by Reclamation in the attached NMFS comment letter. As the requests from CDFW were not directed to Reclamation or the Draft Term 27 Annual Report, Reclamation has not provided responses to their requests.

Response to National Marine Fisheries Comments

NMFS-1: Comment noted. Reclamation is in receipt of NMFS' insufficiency letter regarding the Biological Assessment for the *Operation and Maintenance of the Cachuma Project* sent electronically to NMFS on December 18, 2020. Reclamation provided a response to the insufficiency memo electronically on March 18, 2021 and intends to provide a revised Biological Assessment near the end of April 2021.

NMFS-2: Comment noted. As stated in the Draft Term 27 Annual Report, "there is no feasible and reliable way to get a direct measurement of flows at Highway 154; therefore, Reclamation used an alternate site downstream of the Highway 154 bridge to measure flows and confirm releases made from the Dam were meeting target flow requirements as described in the Term 18 Plan provided to the State Water Board." It should be noted that this is an issue that has been pointed out during the water right hearings and is acknowledged in the Order. Pursuant to Term 25 of the Order, Reclamation is coordinating with the State Water Board, NMFS, and CDFW on a mutually agreeable methodology.

NMFS-3: Comment noted. As stated in the Draft Term 27 Annual Report, "At present, there are no current or planned reductions to the Cachuma Project's safe and operational yield. Reclamation will notify the Executive Director of the State Water Board in writing of any changes to the safe yield."

NMFS-4: Comment noted. As stated in the Draft Term 27 Annual Report, "Reclamation is developing a plan to conduct a study pursuant to Term 19". The Draft Term Annual Report is meant to address Reclamation's compliance with terms and

conditions of the Order for Water Year 2020 not future actions. Reclamation will provide a draft study plan, once completed, to NMFS and CDFW for review as required by Term 17 of the Order.

NMFS-5: Comment noted. Reclamation appreciates the comments provided by CDFW and NMFS on the content and development of the Term 24 plans and will consider and incorporate as appropriate these comments upon approval of the Term 20 Plan by the State Water Board.

NMFS-6: See response to NMFS-5.

NMFS-7: See response to NMFS-2.

NMFS-8: Comment noted. Reclamation intends to make available data and analyses on a publicly accessible website pursuant to the requirements of the Order.

NMFS-9: Comment noted.

NMFS-10: See response to NMFS-3.

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

February 12, 2021

Rain L. Emerson
Environmental Compliance Branch
U.S. Bureau of Reclamation
1243 N. Street
Fresno, CA 93727

Re: Comments on Draft Cachuma Order WR-2019-0148 Term 27 Annual Compliance Report for Water Year 2020.

Dear Mr. Emerson:

Thank you for providing the Draft Annual Compliance Report for Water Year 2020 (Draft Report) to NOAA's National Marine Fisheries Service (NMFS) pursuant to Term 27 of the State Water Resources Control Board's (SWRCB) Order WR-2019-0148 (Order) for the Cachuma Project.

The Draft Report was dated December 31, 2020, corresponding to the date for which the Bureau of Reclamation (BOR) is required to deliver a Report to SWRCB. Yet, BOR had not provided NMFS the draft Report prior to December 31, 2020, for review and comment as required under Term 17(3) of the Order.[1] We understand BOR requested and received a 90-day extension from the SWRCB regarding submittal of the Report for this year.

Per the provisions of Term 17 of the SWRCB's Order, NMFS hereby provides comments on the Draft Report for Water Year 2020 dated December 31, 2020. These comments are intended to guide revisions to the December 31, 2020, Draft Report.

NMFS-1

Term 15: The administrative record of the NMFS consultation for the operation and maintenance of the Cachuma Project indicates that on one or more occasion BOR has not maintained and operated the Cachuma Project as proposed in the June 2000 biological assessment and analyzed in the September 2000 biological opinion, nor complied with all terms and conditions required therein.

It does not appear that the BOR is "taking into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion," or using the information contained therein to inform development and implementation of the conservation measures identified in WR-2019-0148.

[1] WR-2019-0148, Term 17(3): " Right holder shall provide CDFW and NMFS with at least 30-business days to comment on the documents prior to submittal to the Deputy Director. This 30-business day comment period shall apply to all draft, final, or revised submissions to the Deputy Director."

NMFS-1 cont. With regard to the December 2020 biological assessment for operation and maintenance of the Cachuma Project BOR, the Report indicates the BOR submitted the document to NMFS on December 18, 2020; however, NMFS did not receive the new biological assessment until January 7, 2021. This new biological assessment was expected to provide the basis for undertaking required formal consultation under the U.S. Endangered Species Act. However, NMFS' review concluded the December 2020 biological assessment is insufficient for beginning formal consultation (see attached NMFS' February 8, 2021, letter to BOR).

NMFS-2 Term 15(a): The Draft Report indicates compliance with required minimum flows under Term 15(a), referencing Figure 2 (Lower Santa Ynez River Measured Flows at Refugio Road) of the Draft Report. However, the frequency of data collection and method of reporting depicted in the Draft Report is inconsistent with the requirements Order (i.e., Term 25), which stipulates that BOR "shall make instream flow records available daily on a publicly accessible website on as close to a real-time basis as feasible."

NMFS-3 Term 16(f): The Draft Report indicates that the BOR has been coordinating with the County of Santa Barbara and the Cachuma Project Member Units on potential changes to the safe yield for the Cachuma Project and that these analyses and discussions are ongoing. The Draft Report makes no mention of the recently proposed, and perhaps signed, 3-year contract between BOR and the County of Santa Barbara that provides no change to safe-yield, or the proposed long-term contract (i.e., in perpetuity) that also provides no change to safe-yield for the operation of the Cachuma Project.

NMFS-4 Term 19: The Draft Report references a plan to conduct a study pursuant to Term 19, yet provides no outline of the contents of this study plan, no reference to information BOR intends to rely upon for developing and undertaking this study, and no schedule for submitting a draft study plan to NMFS for review and comment.

Term 20: On March 2, 2019, NMFS provided comments on the BOR's the Draft Study Plan identified in Term 20 and Term 24 of the SWRCB's Order WR-2019. This Study Plan (and its individual components identified in Term 24) were intended to guide much of the field investigations and analysis regarding the conservation of the endangered steelhead (*Oncorhynchus mykiss*) resources of the Santa Ynez River.

NMFS-5 As NMFS indicated in its letter dated March 2, 2019, the Draft Study Plan appeared to be an incomplete outline of the specific study components identified in Term 20 and Term 24. The most significant omission is the response to Term 24(a) that requires BOR to evaluate options for providing upstream passage of endangered steelhead (*Oncorhynchus mykiss*) adults and downstream emigrating smolts around Bradbury Dam.

The Draft Report states that "As Reclamation is awaiting a response from the State Water Board on the Term 20 Plan, no studies are planned to begin a this time." (p. 11). Consequently, the BOR Compliance Report for Water Year 2020 does not report any study results required by Term 20 (or the specific study results identified in Terms 21-24). The Annual Compliance Report for 2020 further states in response to the NMFS comment letter of March 2, 2020 on the BOR Draft Study Plan "As noted in the submittal, Reclamation did not provide specific responses to the comments as they . . . predominantly focused on content and development of the various Term 24 studies rather than addressing the plan for the Term 24 studies required under

Term 20. Consequently, very minimal edits to the plan were warranted." (p. 13). The BOR further notes that "Reclamation is awaiting a response from the State Water Board regarding the Term 20 Plan. (p. 13)

Rather than providing a study plan to address this specific study components of Term 24, the Draft Study Plan only provides a general and incomplete description (and in several cases simply repeats the language of Term 20 and 24) of the study plan components . As NMFS noted in its March 2, 2020, letter the Study Plan in its present form does not provide sufficient detail to give adequate direction to those who may be tasked with conducting the various studies. This is evidence by the BOR acknowledgment that "no studies are planned to begin at this time."

NMFS-5 cont.

One additional comment on the Draft Report. Under Term 20, the Report notes that "Reclamation did revise the section titled Term 24(b)(1) and the draft proposal to use the instream flow incremental method (IFIM) to conduct studies based on feedback provided by NMFS and CDFW." (p. 13). However, NMFS' March 2, 2020, letter specifically questioned the adequacy of the IFIM methodology to assess or prescribe instream flows for highly migratory species such as steelhead. Specifically, NMFS noted that:

> "This methodology is a standard method for determining the minimum instream flow needs for fish and wildlife; however, minimum flows cannot satisfactorily address the broader life history needs and habitat requirements of steelhead and, by extension the long-term survival and recovery of this endangered species. Further, the IFIM was not intended to assess the flow requirements for anadromous fishes whose life cycle involves migrating long distances between the freshwater and marine environment. Therefore, this proposed methodology is not an appropriate or adequate methodology to satisfy Term 24(b) (1)." (p. 3).

NMFS-6

Term 24: See NMFS' letter to the BOR dated March 2, 2020 which provides more detailed comments on the required studies identified in Term 24, and which comprise the individual components of the Term 20 Study Plan.

NMFS-7

Term 25: BOR responded to NMFS' recommendations dated December 11, 2019, that it disagreed it is necessary or appropriate to incorporate application and compliance of Term 25 into the Term 18 Plan and that BOR's compliance with Term 25 will be addressed pursuant to the requirements of the Order. NMFS believes this approach is inappropriate because measuring instream flow to ensure compliance with Terms 15(a) and 16(b) (i.e., Table 1 and Table 2, respectively) under Term 18 of the Order is required under Term 25. Furthermore, Term 25 does not specify a date for implementing the requirements therein, instead referring the purpose to ensuring compliance with other Terms of the Order (i.e., Terms 15(a), 16(b), and 18).

NMFS-8

Term 27: The Draft Report indicates that annual monitoring in response to term and condition 11 of the September 2000 biological opinion, and consequently the Term 27 Annual Report, was delayed because scheduled snorkel surveys were postponed as a result of water-rights releases (WR-89-18) extending into November 2020. Because the BOR expects similar delay in completing annual monitoring in the future, the BOR suggests extending the delivery of the Annual Report under Term 27 to March 31 rather than December 31 when water-rights releases extend into November. In this regard, NMFS suggests BOR make all data and any analyses

NMFS-8 cont. readily available (i.e., publically accessible website) incrementally throughout the year as the data and analyses become available.

NMFS-9 With regard to the Attachment B to the Draft Report, we note the attached report prepared in compliance with monitoring requirements pursuant to RPM 11 of NMFS' 2000 Biological Opinion for the Cachuma Project contains a limited discussion or narrative compared to previous annual-monitoring reports. The extensive tables and figures presented in the attached report would benefit from explanatory text provided by the observers and analyzers of the monitoring data. We recommend future annual monitoring reports be developed and presented accordingly.

NMFS-10 Term 35: See comments to Term 16(f).

Please contact either Mark Capelli at (805) 963-6478 or mark.capelli@noaa.gov or Darren Brumback at (562) 480-0240 or darren.brumback@noaa.gov should you have any questions regarding this letter.

Sincerely,

Anthony P. Spina
Chief, Southern California Branch
California Coastal Office

cc: Michael Buckman, State Water Resources Control Board
Jane Farwell Jensen, State Water Resources Control Board
Mary Larson, CA Department of Fish and Wildlife
Mary Ngo, CA Department of Fish and Wildlife
Kristie Klose, U.S. Forest Service, Los Padres National Forest
Chris Dellith, U.S. Fish and Wildlife Service, Ventura Field Office

Administrative File: 151422SWR2010PR00316

Attachment

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
501 West Ocean Boulevard, Suite 4200
Long Beach, California 90802-4213

February 8, 2021

Michael Jackson
U.S. Bureau of Reclamation
1243 N Street
Fresno, California 93721-1813

Re: Insufficient information to initiate formal consultation under Section 7(a)(2) of the Endangered Species Act for Operation and Maintenance of the Cachuma Project in Santa Barbara County, California.

Dear Mr. Jackson:

Thank you for your letter requesting initiation of formal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 1531 *et seq*.) for the Operation and Maintenance of the Cachuma Project. We also received your request to consult on Essential Fish Habitat (EFH) under the Magnuson-Stevens Fishery Conservation and Management Act (MSA). Your letter included a Biological Assessment (BA) for Operation and Maintenance of the Cachuma Project with appendices regarding effects on endangered Southern California steelhead (*Oncorhynchus mykiss*) and designated critical habitat for this species.

Unfortunately, the materials provided with your consultation request do not include all of the information necessary to initiate formal consultation under the ESA as described in the regulations governing interagency consultations (50 CFR §402.14(c)). Below, we identify the information needed to initiate formal ESA consultation.

Information Needed to Begin Formal Consultation

50 CFR §402.14(c)(1)(i) requires a description of the proposed action, including any measures intended to avoid, minimize, or offset effects of the action. Consistent with the nature and scope of the proposed action, the description shall provide sufficient detail to assess the effects of the action on listed species and critical habitat. However, the materials we received do not sufficiently describe the proposed action such that NMFS is able to develop a clear understanding of the proposed action and assess the effects on listed species and critical habitat. Accordingly, please provide the following information.

- The revised BA should thoroughly describe the extent to which the Bureau of Reclamation (Reclamation) has discretion in all proposed water releases from Cachuma Reservoir into the Santa Ynez River and include the extent to which Reclamation has discretion in such water releases under the proposed action for reasons described in greater detail below under this heading and under the heading Considerations When Revising the Biological Assessment below.

- Clearly describe what is meant or intended by the following statements regarding the proposed action: *the "Order WR-2019-0148" scenario was modeled to include diversion of the available Cachuma Project yield*; and, *the effects of implementing the Order WR-2019-0148 required releases and the effects of diverting Santa Ynez River flows for Cachuma Project water supply cannot be meaningfully separated* (BA, page 6-9).

- The BA should describe the criteria for determining the amount of water to be allocated under the proposed water service contract (Master Contract), including but not limited to the specific hydrologic conditions such allocations are dependent upon. Because the potential annual water allocation under the proposed contract is the same amount allocated since about 1992, the revised BA should include a description and table summarizing the amount of water allocated annually since 1992, the actual amount of water diverted from Cachuma Reservoir under the former contract including the amount unused from previous year (i.e., "carry-over" water, or similar term), and the relevant hydrologic conditions informing each annual water allocation. Also, if the new contract under the proposed action is the same or sufficiently similar to the recently issued three-year contract, the revised BA should acknowledge and append a copy of the current contract.

- Reclamation previously predicated proposed water releases from Bradbury Dam on the amount of a specific category of water stored in Cachuma Reservoir (i.e., *Unallocated Project Water*).[1] Should Reclamation intend this criterion apply to the current proposed action, clearly identify this criterion and describe the process for determining the amount of Unallocated Project Water. In describing this process, please include descriptions and quantification of its component parts,[2] the relative range of observed or calculated Unallocated Project Water corresponding to a range of total water stored in the reservoir, and how that calculation is used for implementing water releases under the proposed action.

- We understand that an emergency pumping facility is proposed to be installed and operated in Cachuma Reservoir for the purpose of diverting water into the Tecolote Tunnel-South Coast Conduit (out-of-basin water delivery) when the reservoir water-surface elevation is <685 feet above mean sea level.[3] However, this activity is not described in the BA. The revised BA should describe this activity in sufficient detail to understand and assess potential consequences of the proposed action. The description should include but not be limited to the frequency, timing, rate and duration the proposed emergency pumping facility would be operated to inform the effects on water releases

[1] Biological Assessment for the Operation and Maintenance of the Cachuma Project—Effects on Southern California Steelhead and Their Critical Habitat. Bureau of Reclamation. November 2019. (2019 BA)

[2] Reclamation defines *Unallocated Project Water* to mean the total water stored in Cachuma Reservoir minus (1) water rights accounts, (2) remaining annual allocation, (3) carryover, and (4) any water stored pursuant to any existing or future Warren Act contracts. (See 2019 BA footnote 8, Table 4-1, pages 4-4 and 4-5).
Reclamation defines *Project Water* to mean all water that is developed, diverted, stored, or delivered by the United States pursuant to the Project Water Rights, and accretions to the Tecolote Tunnel. *Project Water Rights* means the permits and licenses issued for the Cachuma Project pursuant to State law together with all orders of the California State Water Resources Control Board directed to, or binding upon, the permittee or licensee with respect to the Cachuma Project. Contract No. I75r-1802R between the United States [Reclamation] and Santa Barbara County Water Agency Providing for Water Service from the Project. April 14, 1996.

[3] Cachuma Operation and Maintenance Board Memorandum—Monthly Engineering Report. January 25, 2021.

from Cachuma Reservoir into the Santa Ynez River and Hilton Creek below Bradbury Dam and the consequences to Southern California steelhead and critical habitat designated for this species.

- Please provide the water-release capacity of the Bradbury Dam outlet works over the full range of reservoir water-surface elevations.
- Describe the actual rate (cfs) and location that water will be released into Hilton Creek under each operational scenario of the proposed action. This includes but is not limited to delivery of water through the Hilton Creek Water System and Emergency Backup System to the upper-release point and lower-release point under gravity flow and pumped flow. We suggest the revised BA include a table summarizing the foregoing relative to Cachuma Reservoir water-surface elevation.
- The revised BA should describe the anticipated delay when transitioning from one water-release mechanism to another resulting from scheduled or unscheduled interruption or failure of one or more water-delivery modes to Hilton Creek and the Santa Ynez River (i.e., Bradbury Dam outlet works, Hilton Creek Water System, Emergency Backup System, Stilling Basin pump(s), and Hilton Creek water tanks).
- The revised BA should clearly describe the scenarios or criteria for which Reclamation intends to capture and then relocate *O. mykiss* under the proposed activity *Fish Rescue*. For instance, the proposed Fish Rescue Plan appears solely in context to interrupted or failed water releases into Hilton Creek and the Santa Ynez River in reference to WR-2019-0148 and NMFS' November 2000 Biological Opinion for the Cachuma Project. Yet, the Fish Rescue Plan proposes fish rescues in streams that are not affected by water releases into Hilton Creek or the Santa Ynez River (i.e., Quiota Creek, Salasipuedes Creek and El Jaro Creek in the Santa Ynez River Watershed and all streams intersected by the South Coast Conduit). Therefore, the description in the revised BA should include the relationship of each proposed waterway-specific fish rescue to the proposed action
- Also, regarding proposed rescue of *O. mykiss*, please delineate and describe the location(s) and length of the Santa Ynez River where Reclamation expects to undertake this activity, and the location(s) and length of river where Reclamation would forego Southern California steelhead rescue due to inaccessibility.
- The revised BA should thoroughly describe each activity that constitutes the proposed Monitoring Program, including the objectives and methods for undertaking each activity, and incorporate the manner in which Reclamation plans to implement the Monitoring Program under the proposed action.[4] The number of *O. mykiss* Reclamation proposes to capture and handle each year needs to be provided, including the basis of quantification.

[4] Based on Order WR-2019-0148 Term 26, Reclamation shall implement a monitoring program. However, it appears that Reclamation has a reasonable basis for describing the manner in which it implements the monitoring program as discretionary, because Reclamation must implement the monitoring program described in the 2000 Revised Biological Assessment, taking into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion, with consideration of other existing monitoring programs including the California Coastal Salmonid Monitoring Plan. If Reclamation does not include the manner in which it implements the monitoring program as part of the proposed action, then NMFS would not be able to address implementation of the monitoring program in the incidental take statement of its biological opinion, and Reclamation would need to seek a permit for authorization of any take of listed species as a result of the monitoring program.

- We understand that Reclamation removes trees and shrubs located within 15 feet on either side of the South Coast Conduit where the pipeline is buried less than five feet.[5] Yet, this activity does not appear in the description of the proposed action. Please identify and describe all locations where the South Coast Conduit intersects streams occupied by Southern California steelhead or containing critical habitat designated for this species where Reclamation proposes to remove vegetation.
- We do not believe the proposed action is appropriate for consideration as a "mixed programmatic action" for the reasons described in greater detail under the heading Considerations When Revising the Biological Assessment below.

50 CFR §402.14(c)(1)(ii) requires a map or description of all areas to be affected directly or indirectly by the Federal action, and not merely the immediate area involved in the action (i.e., the action area), yet certain boundaries of the action area described in the BA do not appear to be directly or indirectly affected by the proposed action. For instance, while the current action area includes all streams intersected by the South Coast Conduit from the point of intersection to the Pacific Ocean, a clear description of how the delineated streams may be affected by the Federal action is not provided. Likewise, almost the entire stream network within the Salsipuedes Creek and Quiota Creek watersheds is included in the action area, yet the BA does not describe how the proposed action may affect these areas. A review of NMFS' November 28, 2016, draft biological opinion for operation and maintenance of the Cachuma Project may assist Reclamation when describing the action area. See also NMFS' February 13, 2020, letter in this regard.

50 CFR §402.14(c)(1)(iv) requires a description of the effects of the action and an analysis of any cumulative effects. In this regard, although we appreciate the time and effort invested in developing the BA to date, our review indicates the description of the consequences of the proposed action on Southern California steelhead and designated critical habitat for this species is incomplete. What follows is a list of the information needed for NMFS to develop a clear and complete understanding of the consequences of the action on this species and its designated critical habitat. As a matter of clarification, when considering the consequences of the proposed action, both beneficial and adverse consequences should be evaluated and then described in the revised BA.

- A description of the consequences of Reclamation's non-discretionary activities[6] or cumulative effects beyond Reclamation's purview should be included in the revised BA. For instance, the consequences of water releases from Bradbury Dam to support downstream water rights in the Santa Ynez River (i.e., Order WR 89-18) and associated alluvial groundwater pumping should be fully described. Also, the consequences of the water operations and studies stipulated in the Board's Order WR 2019-0148, including those carried over from Reclamation's June 2000 BA, should be described as well.
- Our review of the BA indicates that, although the proposed action has consequences on designated critical habitat for endangered steelhead, there is little if any substantive

[5] Regional General permit (RGP) No. 63 Project Completion Report—San Jose Creek Stream Emergency Maintenance for the South Coast Conduit (SCC) SPL 2019-00714-CLH. Cachuma Operation and Maintenance Board.

[6] Reclamation may wish to consider NMFS' letter dated December 13, 2017, when classifying certain activities as non-discretionary in the context of ESA Section 7 consultation.

description of such consequences. For this reason, the revised BA should include an updated description that clearly and completely describes the expected consequences of the proposed action on freshwater rearing areas, freshwater spawning areas, and freshwater migration corridors for endangered steelhead throughout the action area.

- We appreciate that the BA outlines the expected beneficial consequences of the proposed action on endangered steelhead, yet the BA contains little discussion regarding the adverse consequences. Accordingly, the revised BA should fully describe the anticipated adverse consequences of the proposed action on Southern California steelhead and designated critical habitat for this species.
- The revised BA should include a clear description of the consequences of the proposed action on the pattern (timing, frequency, duration, rate-of-change) and magnitude of hydrology in the lower Santa Ynez River. This analysis should include an analysis of individual annual hydrographs comparing the consequences of the proposed action to the without-action scenario and without Bradbury Dam scenario, and the results should be displayed graphically for each annual hydrograph.
- The revised BA should include a description of the consequences of the proposed action on natural-river processes, including geomorphic consequences in the lower Santa Ynez River.
- The current description of consequences is often exceedingly general, not describing consequences to specific life stage of steelhead. Therefore, the revised BA should clearly describe the consequences of the proposed water releases from Bradbury Dam, including subsequent reduction of water releases, on each life stage of Southern California steelhead (i.e., egg, fry, parr, smolt, and adult). The life-stage specific assessment of the consequences should be in the context of the duration of each life stage or event. For example, the assessment involving juvenile migrants should include the consequences to this life stage during the entirety of the juvenile-migrant period from December through June.
- The revised BA should provide context for comparing the proposed water management (i.e., WR-2019-0148) to the without-action scenario. For instance, Reclamation concluded that the Santa Ynez River would have experienced ten or more consecutive days with zero flow in all water-year types under the without-action scenario and that the proposed action would have resulted in no consecutive days with zero flow. Yet, reference to the respective location(s) and length of river with zero flow and non-zero flow is not provided.
- The revised BA should fully disclose consequences of installing and operating the proposed emergency pumping facility for diverting water from Cachuma Reservoir.
- Regarding the juvenile steelhead-passage analysis, the timing of elevated discharge in tributary streams when a high percentage of juvenile steelhead are migrating to the river mainstem should be considered.
- In addition to the existing information regarding the consequences of the proposed action on “passage days” for steelhead, the revised BA should describe the consequences of the proposed action on the migration behavior and ecology of Southern California steelhead

(see the discussion regarding "passage" and "migration" for an understanding of each of these in NMFS' 2016 draft biological opinion for the Cachuma Project).

- The revised BA should describe the consequences of the proposed action for egg-to-smolt survival and ocean entry of endangered steelhead.
- The revised BA should include a description of the consequences of the proposed action on the estuary. In this context, the analyses that inform the consequences should consider how the proposed action would affect the timing, frequency and duration that the estuary is connected with the ocean.
- The revised BA should include the number of *O. mykiss* anticipated to be captured and handled as a result of proposed fish rescues and weir trapping, separately. The annual estimated take should correspond to proposed water management operation scenarios.
- The revised BA should include the estimated number of steelhead likely to be stranded as a result of all discretionary and non-discretionary water releases from Bradbury Dam, including specifying the number of individuals likely stranded and then injured or killed because proposed fish rescues could not be effectively carried out (e.g., accessibility or staffing limitations or both). The estimated take should be presented as an annual total relative to operational categories (e.g., water-year type, Cachuma Reservoir inflow and volume) and for each water-release activity under the respective operational scenarios.
- Clearly describe in the revised BA the consequences to Southern California steelhead and designated critical habitat from testing, maintaining and repairing each valve and gate appurtenance to the Bradbury Dam outlet works described in Appendix B of the BA (Maintenance Activities at the Cachuma Project Facilities).
- The BA acknowledges that an average of 2,000 acre-feet per year of groundwater is captured and diverted through the Tecolote Tunnel, averaging 1,200 acre-feet per year during the recent drought (2012-2016). However, the BA does not describe the consequences of diverting groundwater through the Tecolote Tunnel on Southern California steelhead or critical habitat designated for this species (e.g., Dos Pueblos Creek and Tecolote Creek). The BA should be revised accordingly, including the effects on surface flow in streams transected by the Tecolote Tunnel.

Considerations When Revising the Biological Assessment

The revised BA should incorporate edits regarding certain calculations and descriptions of purported increased habitat accessibility in the Santa Ynez River Watershed below Bradbury Dam resulting from steelhead-passage barrier remediation projects implemented from 2002 through 2019 (e.g., Chapter 3—Environmental Baseline, Table 3-6).[7]

We understand that Reclamation contracted private consulting services (i.e., Stetson Engineers, Inc.) for conducting hydrological analyses to support the proposed action and inform the BA. Because the results of the hydrological analyses were not available when the BA was completed on or about December 18, 2020, Reclamation intended to submit that information later as a

[7] January 25, 2021, email between Reclamation (Lisa Buck) and NMFS (Darren Brumback). RE: Cachuma project BA clarification request.

supplement to the BA.[8] Upon inquiry, Reclamation indicated the information was not necessary for completing the BA and undertaking formal consultation. However, if these modeling results are informative for describing the proposed action and consequences of the proposed action to Southern California steelhead and designated critical habitat, and available in a timely manner, Reclamation should incorporate this information into the revised BA.

The BA should be revised to describe the extent to which Reclamation has discretion in all proposed water releases from Cachuma Reservoir into the Santa Ynez River and include the extent to which Reclamation has discretion in such water releases under the proposed action. In addition, the BA should be revised to describe the consequences of those activities on Southern California steelhead and critical habitat designated for this species. Reclamation has demonstrated at least some level of discretion for the conduct of these proposed operations (timing, rate, and duration of water releases). These include the following activities as described in the BA: *Required Instream Flows*; *Hilton Creek Water Supply Operation*; *Fish Passage Supplementation*; *Winter Storm Operations*; *Downstream Water Rights Releases*; *Ramp Down Releases*; and, *Releases of CCWA Water*. Reclamation describes these activities as non-discretionary based on requirements in WR-2019-0148. In this regard, Reclamation cites instream flow requirements. However, instream flow requirements are minimum flows based on certain water year types and certain periods. Reclamation has some choice in how those flows are implemented in addition to the minimum flows and the timing, rate, and duration of water releases within prescribed periods. In addition, Reclamation states it is required under Term 15 of WR-2019-0148 to "operate and maintain the Cachuma Project and implement conservation measures including but not limited to those described in Revised Section 3 (Proposed Project) of the Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River, June 2000…" However, Term 15 also stipulates consideration of the 2013 Biological Assessment with any amendments and NMFS' November 28, 2016, draft Biological Opinion for Operation and Maintenance of the Cachuma Project in this regard. Term 15 further stipulates, *To prevent any conflicting requirements upon issuance of any new Biological Opinion, the Executive Director may modify this term upon request of right holder* [Reclamation] *after receiving the approval of NMFS*. WR-2019-0148 clearly demonstrates the expectation and discretion for Reclamation to make appropriate adjustments (particularly in consultation with NMFS) when conducting these water releases.

Regarding proposed *Releases of CCWA Water*, the BA refers to Reclamation's June 2000 BA for a description of this activity and then provides conflicting information in this regard. We recommend Reclamation adopt measures recently proposed for this activity[9] and inform revisions to the BA from relevant correspondence.[10, 11] In particular, State Water Project water delivered by CCWA into or through Cachuma Project facilities *would only be introduced or released to the Santa Ynez River between the months of July and October*. Additionally,

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[8] Cachuma Operation and Maintenance Board Memorandum for January 14, 2021, meeting. Subject: State Water Board Order and Federal Consultation Process Update. https://www.ccrb-board.org/mtgdocs/443/2021-1-14_Bd-pkg.pdf

[9] Reclamation, June 2020. Biological Evaluation—Five Year Warren Act Contract for Central Coast Water Authority.

[10] NMFS, July 14, 2020. Endangered Species Act Section 7(a)(2) Concurrence Letter for the Proposed Issuance of a 5-Year Warren Act Contract to the Central Coast Water Authority.

[11] July 21, 2020, email between NMFS (Darren Brumback) and Reclamation (Lisa Buck, Rain Emerson, and David Hyatt). Subject: Update on CCWA Warren Act Contract.

Reclamation's discretion with regard to ongoing operation and maintenance of the pipeline that delivers CCWA water to the Bradbury Dam outlet works should be clearly described and such activities incorporated into the revised BA, as appropriate.

Regarding the proposed *Fish Passage Supplementation Program*, the BA simply refers to Reclamation's June 2000 BA and subsequent modifications rather than describing the proposed activity and consequences of this action. Furthermore, the BA does not consider analysis regarding this activity presented in NMFS' November 28, 2016, draft Biological Opinion for Operation and Maintenance of the Cachuma Project as required by WR-2019-0148. Therefore, we recommend the BA be revised in consideration of the analysis and recommendations NMFS provided to Reclamation in the November 2016, draft Biological Opinion.

The BA describes *Water Rights Releases* as non-discretionary actions, and provides Reclamation does not retain discretion over the timing, rates or duration of water rights releases from Bradbury Dam. However, the BA also includes conservation measures to minimize the effects of stranding due to water rights releases on Southern California steelhead as described in Section 4.1.2.2.5. That section provides ramping rates that apply to water rights releases, which indicate that Reclamation determines how such water releases occur. To be clear, NMFS understands that Reclamation has a non-discretionary obligation to make certain water rights releases, but the BA indicates that Reclamation has some choice in how these water rights releases are conducted. Reclamation should clearly describe the water releases, including aspects of the water rights releases it intends to undertake as part of the proposed action, the potential consequences of these activities, and the methods that will be employed to avoid or minimize impacts to Southern California steelhead and designated critical habitat for this species.

The BA should be revised to describe the current capacity and operability of each mechanism proposed for delivering water into the Santa Ynez River and Hilton Creek below the dam, and the proposed schedule for repairing or replacing any relevant water-delivery mechanism should it not function properly. For example, information indicates the Hilton Creek Water System may not function properly and is subject to failure for delivering water into Hilton Creek with consequences to Southern California steelhead.[12] The question of capacity and reliability of this water-delivery mechanism was corroborated by recent statements from Cachuma Operation and Maintenance Board: [Reclamation] "reportedly inspected the HCWS pumping barge and its electrical systems during the week of 12/7/20. No date has been set for installation of the long-standing ordered parts or any noted repairs during the current inspection."[13] As another example, the Hilton Creek Water System's Emergency Backup System has been inoperable since February 5, 2020, because the pipeline connecting the Bradbury Dam outlet works to the Hilton Creek Water System was disconnected. Reclamation communicated to NMFS during a meeting on January 27, 2021, that the pipeline had been disconnected to protect it from winter-storm flows should Bradbury Dam spill. Yet, this water-delivery system remained disconnected and inoperable throughout the following dry season (summer and fall 2020). Reclamation scheduled reinstallation of the pipeline for January 27, 2021, nearly a year later corresponding with the first appreciable storm since the past winter.

[12] August 21, 2020, email between Reclamation (Daniel Cavanaugh) and NMFS (Darren Brumback). RE: Collaborative Proposal to Change Flows in Hilton Creek.

[13] Cachuma Operation and Maintenance Board Memorandum—Monthly Fisheries Division Report. January 25, 2021.

In addition, the approach for determining and considering potential effects of the proposed action is not reliable. Reclamation established a "without-action scenario" as part of the environmental baseline and compared the effects of the proposed action to that scenario. The without-action scenario represents effects related to the existence of project facilities and provides context for how these facilities have shaped the habitat conditions for Southern California steelhead and critical habitat in the action area. However, it is inappropriate to merely compare the effects of the action to the environmental baseline or a part of it; in relation to the effects of the proposed action, the BA needs to analyze the incremental, aggregate and synergistic effects of the activities proposed. This was likely, in part, cause for inaccurate characterization and conclusions regarding the consequences of one or more activities under the proposed action. Therefore, the BA should be revised to describe the potential consequences to Southern California steelhead and designated critical habitat for all activities under the proposed action that would be added to the environmental baseline rather than comparing the effects of the proposed action to the environmental baseline.

Furthermore, the BA is incorrect to conclude that several certain activities are not likely to adversely affect Southern California steelhead or designation critical habitat for this species. As a matter of background, a conclusion of "not likely to adversely affect" is appropriate when effects on listed species are expected to be discountable, insignificant or completely beneficial. *Beneficial effects* are contemporaneous positive effects without any adverse effects to the species. *Insignificant effects* relate to the size of the impact and should never reach the scale where take occurs. *Discountable effects* are those unlikely to occur. Based on the best judgement, a person would not: (1) be able to meaningfully measure, detect, or evaluate insignificant effects; or (2) expect discountable effects to occur.[14] A "not likely to adversely affect" conclusion applies only if all effects of the action on listed species or critical habitat are expected to be discountable, insignificant, or completely beneficial. Such a conclusion does not apply to specific activities or elements of the proposed action. Therefore, if any effect of the proposed action is not discountable, insignificant, or completely beneficial, then the entire proposed action should be considered "likely to adversely affect" listed species or critical habitat. Based on Reclamation's determination in the BA that the proposed action may result in incidental take and may adversely affect Southern California steelhead, the additional "not likely to adversely affect" determinations related to specific activities within the proposed action are inappropriate because the entire proposed action is "likely to adversely affect" Southern California steelhead. Moreover, as described in examples below, the conclusions regarding the effects of certain activities within the proposed action being wholly beneficial effects are inaccurate.

One example is the *Fish Passage Supplementation* releases. Reclamation concludes that continued implementation of Fish Passage Supplementation releases is not likely to adversely affect, and would be wholly beneficial to, Southern California steelhead and their designated critical habitat. Yet, NMFS undertook thorough analysis of the same or similar activity in the November 28, 2016, draft Biological Opinion concluding the contrary.

As another example, Reclamation inappropriately concludes that proposed operation of the Hilton Creek Water System is not likely to adversely affect Southern California steelhead and

[14] Endangered Species Act Consultation Handbook—Procedures for Conducting Consultation and Conference Activities Under Section 7 of the Endangered Species Act. U.S. Fish and Wildlife Service and National Marine Fisheries Service. March 1998.

critical habitat designated for this species. However, Reclamation describes in the BA that water releases into Hilton Creek and the Santa Ynez River are expected on occasion to fail or be interrupted and expose Southern California steelhead to risk of harm or death. This also would likely reduce or temporarily eliminate physical or biological features of designated critical habitat. Furthermore, information contained in both Reclamation's and NMFS' administrative records regarding operation and maintenance of the Cachuma Project document mortalities of Southern California steelhead and adverse impacts to designated critical habitat in this regard, yet such information is understated or absent in the BA.

A third example is Reclamation's conclusion that capturing and handling steelhead (i.e., fish rescue) under the proposed action when water releases into the Santa Ynez River or Hilton Creek are interrupted due to mechanical or human error is not likely to adversely affect Southern California steelhead. This is based on the premise that Southern California steelhead survival will be improved compared to the without-action scenario resulting from proposed fish rescues. The act of capturing Southern California steelhead in and of itself is "take";[15] this alone is inconsistent with a conclusion that the activity is not likely to adversely affect Southern California steelhead. Furthermore, the underlying cause for undertaking "fish rescues" is the operation and maintenance of the Cachuma Project, the proposed action, which is likely to adversely affect Southern California steelhead and critical habitat designated for this species. The BA should be revised accordingly.

As mentioned above, we do not believe the proposed action is appropriate for consideration as a "mixed programmatic action." 50 CFR §402.02 provides, "*Mixed programmatic action* means, for purposes of an incidental take statement, a Federal action that approves action(s) that will not be subject to further section 7 consultation, and also approves a framework for the development of future action(s) that are authorized, funded, or carried out at a later time and any take of a listed species would not occur unless and until those future action(s) are authorized, funded, or carried out and subject to further section 7 consultation." That definition does not appear to apply here. For example, the BA lacks description of any Federal action related to the studies stipulated under WR-2019-0148, Term 24 that approves a framework for the development of a future action(s) that would be authorized, funded, or carried out at a later time and subject to future section 7 consultation. Instead, the BA outlines general elements considered for these studies, refers to a plan for "fully" developing these studies, and defers to a future yet unspecified consultation on those study activities that may affect listed species, as well as actions that may be proposed as a result of the studies. In addition, the BA lacks any description of the effects of any Federal action approving such a framework. Similarly, the BA lacks description of any Federal action related to steelhead-passage improvements at the South Coast Conduit stream crossings that approves a framework for the development of a future action(s) that would be authorized, funded, or carried out at a later time and subject to future section 7 consultation. The BA lacks any description of the effects of any Federal action approving such a framework. However, sufficient information can be developed at this time so these steelhead-passage improvements at the South Coast Conduit stream crossings could be reasonably considered in the pending consultation and not relegated to one or more future separate consultations.

[15] *Take* means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect. 50 CFR 222.102.

The revised BA should provide a description of how anticipated climate change would influence the consequences of the proposed action on Southern California steelhead and critical habitat designated for this species.

The revised BA should include conservation measures informed by Reclamation's previous proposals reviewed and advised by NMFS. In particular, we recommend incorporating into the proposed action steelhead-habitat improvement measures (e.g., gravel and cobble augmentation, and large woody material placement), and removal of non-native fish species (e.g., draining and seining Bradbury Dam stilling basin) in the Santa Ynez River. Similar or same conservation measures have previously been proposed and undertaken by Reclamation in cooperation with NMFS with documented success. These examples should be useful in describing such activities and the potential consequences to Southern California steelhead and critical habitat designated for this species.[16]

The BA should be revised to clearly demonstrate Reclamation's coordination with the California Department of Fish and Wildlife (CDFW) and the California State Water Resources Control Board (Board). As described in the BA, these agencies have direct authority over or involvement in the implementation of the proposed action, or both. Yet, Reclamation does not demonstrate that coordination with these State agencies regarding the proposed action and contents of the BA has occurred, including consistency with the respective agencies' policies, regulations and statutes. NMFS understands that Reclamation received requests from CDFW and the Board to receive and review the BA; however, it is unclear if or how Reclamation intends to coordinate with these agencies to inform revisions to the BA.

The request for consultation on the proposed action also includes consultation on effects to EFH under the Magnuson-Stevens Fishery Conservation and Management Act. Although information is provided in this regard, the assessment and conclusions are unclear or conflicting or both. Reclamation states in the BA that EFH for groundfish and coastal pelagic species may be adversely affected[17] by the proposed action, prompting the requirement for consultation. Yet, the BA appears to conclude the opposite. That is, the proposed action "is not expected to cause direct or indirect physical, chemical, or biological alterations of the waters or substrate, and would not cause loss of, or injury to, benthic organisms, prey species and their habitat, or other ecosystem components, that would reduce the quality and/or quantity of EFH in estuarine or marine environments within or adjacent to the Action Area." (Emphasis added). The BA should be revised to clearly state and support Reclamation's determination whether the proposed action may adversely affect EFH.

We will continue to engage in informal consultation with Reclamation until we receive the information needed to begin formal consultation. We are available to help you determine how

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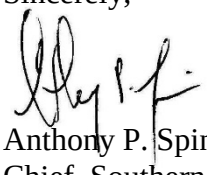
[16] See Reclamation's May 17, 2018, letter and attached Initial Project Implementation Report—Hilton Creek Short-Term Gravel Augmentation Action.
See Reclamation's October 31, 2017, letter and attached memorandum in reference to Stilling Basin Dewatering and Fish Removal below Bradbury Dam on the Lower Santa Ynez River.

[17] 50 CFR 600.810(a): *Adverse effect* means any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components, if such modifications reduce the quality and/or quantity of EFH. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

best to develop and provide this information. If we do not receive a response from you within 45 days, we will consider this formal consultation request withdrawn and we will close this request in our consultation tracking system. We recommend that Reclamation schedule a meeting with us as soon as possible to discuss a schedule for Reclamation to provide us with the information needed to begin formal consultation.

Please contact Darren Brumback at (562) 980-4060 or Darren.Brumback@noaa.gov if you have a question concerning this letter or if you require additional information.

Sincerely,



Anthony P. Spina
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California Coastal Office

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Chris Dellith, U.S. Fish and Wildlife Service
Mary Larson, CA Department of Fish and Wildlife
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Administrative File: 151422SWR2010PR00316

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February 18, 2021

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State Water Resources Control Board
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Via Electronic Mail

Subject: California Department of Fish and Wildlife Comments on U.S. Bureau of Reclamation's Annual Compliance Report for Water Year 2020 Plan for Term 27 of Water Rights Order WR-2019-0148

Dear Mr. Buckman:

California Department of Fish and Wildlife (CDFW) received on December 31, 2020 the U.S. Bureau of Reclamation's (USBR) Annual Compliance Report (Report) for Water Year 2020 Plan for Term 27 of Final Order WR-2019-018 (Final Order). The Final Order amends USBR's State Water Resources Control Board's (SWRCB) Water Rights permit number 11308 and 11310 for the operation of Bradbury Dam (Project). CDFW appreciates this opportunity to comment on the Report and encourages SWRCB to consider CDFW's previous comments provided on December 9, 2016, May 29, 2019, September 13, 2019, and March 6, 2020 (see Attachment A - CDFW Comment Letters) to enforce compliance with the Final Order.

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State [(Fish & G. Code §§ 711.7, subd. (a) & 1802; Pub. Resources Code § 21070; CEQA Guidelines § 15386, subd. (a)]). CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species including wetlands and estuarine habitat (Fish & G. Code § 1802).

The following comments and requests are based on USBR's Report and CDFW's previously submitted comments (Attachment A).

Comment #1 Term 15 Plan of Order WR-2019-0148

Issue #1: CDFW disagrees with the USBR conclusion that USBR is unable to perform fish passage feasibility studies as required by Term 24(a) of the Final Order.

Issue #2: USBR needs to investigate autonomous flow metering devices that will allow recording of flow without endangering staff.

Specific Impact: Final Order Term 15 states, "Except as otherwise provided in this term and in term 16 below, right holder shall operate and maintain the Cachuma Project and implement conservation measures including but not limited to those described in Revised Section 3

(Proposed Project) of the Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River, June 2000, taking into consideration the 2013 Biological Assessment with any amendments and the 2016 Draft Biological Opinion, and right holder shall comply with all of the Reasonable and Prudent Measures 5 and 7 through 13, set forth at page 68, and the Terms and Conditions, set forth at pages 70–78, in the National Marine Fisheries Service's (NMFS) Biological Opinion: U.S. Bureau of Reclamation operation and maintenance of the Cachuma Project on the Lower Santa Ynez River in Santa Barbara County, California, September 2000 (2000 Biological Opinion). Right holder shall notify the State Water Board's Executive Director (Executive Director) within 30 days of the issuance of a new Biological Opinion. To prevent any conflicting requirements upon issuance of any new Biological Opinion, the Executive Director may modify this term upon request of right holder after receiving the approval of NMFS. Any modification to this term shall be made in accordance with section 780 of title 23 of the California Code of Regulations" (Pg. 133, Final Order).

USBR's annual report states: "*As noted in the Term 18 Plan submitted to the State Water Board on December 17, 2019, Reclamation has and will continue to comply with terms and conditions of the 2000 Biological Opinion issued by the National Marine Fisheries Service (NMFS) for the Cachuma Project. Reclamation is in re-consultation with NMFS on the Operation and Maintenance of the Cachuma Project. A Biological Assessment was submitted to NMFS on December 18, 2020. Reclamation will notify the State Water Board's Executive Director within 30 days of the issuance of a new Biological Opinion"* (Pg. 5, Report).

USBR's decision to only comply with the terms and conditions of the 2000 Biological Opinion (2000 BO) will not improve the conditions of the steelhead fishery and continues to take public trust resources.

Why Impact Would Occur: The Final Order and the Project's hearing record "establishes that steelhead remain in poor condition at the population and community levels despite the fact the 2000 BO has been in effect for several years. Moreover, there is no indication that the condition of the fishery will improve unless additional measures are implemented to increase the amount of suitable habitat for spawning and rearing" (Pg. 126-127, Final Order).

Rationale: According to the Final Order, "*the 2000 Biological Opinion is not designed to achieve fish below a dam in good condition as required by section 5937 of the Fish and Game Code" (Pg. 68, Final Order). . The 2000 BO measures do not provide restorative actions necessary to lift the steelhead fishery to a viable, self-sustaining population. Evidence in the hearing record "clearly indicates that habitat, and, in particular, juvenile rearing habitat, is the primary limiting factor preventing the Santa Ynez River steelhead fishery from being in good condition*" (Pg. 123-124, Final Order). The 2000 BO does not incorporate the best available science and regulatory agencies and other stakeholders have collected a lot of additional data in the past 20 years to understand what is needed to have fish in good condition below Bradbury Dam.

Federal reclamation law requires that the USBR comply with California State water law when diverting water. State water law requirements include obtaining a permit from the SWRCB for diversions that have begun after 1914. Because the USBR diversion began after 1914, USBR must comply with the Final Order to lawfully divert water for this project.

Request #1-1: CDFW requests SWRCB take action to protect public trust resources and require USBR to abide by Term 15 and "take into consideration the 2013 Biological

Assessment with any amendments and the 2016 Draft Biological Opinion (2016 Draft BO)" (Term 15 of Final Order).

Request #1-2: In regard to Term 15(a) and Term 25 Flow Gauge measurement of flows: "*It should be noted that measurements at Refugio Road were discontinued after August 25, 2020 due to safety concerns as a result of higher flows in the Santa Ynez River due to releases to comply with Water Rights Order 89-18 as requested by the Santa Ynez River Water Conservation District*" (Pg. 6, Report). CDFW requests SWRCB require USBR to investigate autonomous flow metering devices which will allow recording of flow without endangering staff. The installation of flow meters in the area will enable the USBR to collect valuable flow information.

Comment #2 Term 16(a) Cachuma Reservoir Inflow Index for Water Year Classification Plan of Order WR-2019-0148

Issue #1: The water year types table, Cachuma Reservoir Inflow Index for Water Year Classification, in Term 16(a) of the Final Order does not provide normal as a water year type. As currently written in the Final Order, that inflow can be above normal or below normal but never normal:

Term 16(a)
Cachuma Reservoir Inflow Index for Water Year Classification

Water Year Classification (Oct. 1 – Sep. 30)	Index (Cachuma Reservoir Inflow) (af)
Wet	> 117,842
Above Normal	≤ 117,842 > 33,707
Below Normal	≤ 33,707 > 15,366
Dry	≤ 15,366 > 4,550
Critical	≤ 4,550

Page 136, Final Order

Specific Impact: CDFW is concerned that a lack of a normal water year classification will not accurately capture the cumulative Cachuma inflow that would trigger flow releases.

Why Impact Would Occur: The Cachuma Reservoir Inflow must be comprehensive to effectively manage flows to support fish habitat restoration and provide sufficient habitat to maintain steelhead in good condition pursuant to Fish and Game Code section 5937 (FGC § 5937).

Rationale: An accurate water year classification that includes a normal water year will provide the data needed to support steelhead recovery.

Request #1-1: CDFW requests a change in the Table to include a normal year.

Comment #3 Term 20 Plan of Order WR-2019-0148

In the Report, USBR stated that "*The Term 20 Plan was submitted to NMFS and CDFW for the minimum 30-working day review period on January 23, 2020. NMFS provided comments on March 2, 2020 and CDFW provided comments on March 6, 2020. Reclamation submitted the plan along with the comments to the State Water Board on March 17, 2020. As noted in the submittal, Reclamation did not provide specific responses to the comments as they were similar and predominantly focused on the content and development of the various Term 24 studies rather than addressing the plan for the Term 24 studies required under Term 20. Consequently, very minimal edits to the plan were warranted. Reclamation did revise the section titled Term 24(b)(l) and the draft proposal to use the instream flow incremental method (IFlM) to conduct studies based on feedback provided by NMFS and CDFW*" (Pg. 12-13, Report).

To respond to USBR's "*very minimal edits*" performed in response to CDFW's comments, CDFW is reiterating the Term 20 Plan and Term 24 studies[1] comments submitted to USBR and SWRCB on March 6, 2020 below.

Comment #3.1. Term 20 Plan: Term 24(a) study: Fish Passage Study

Issue: CDFW disagrees with the USBR conclusion that it is unable to perform fish passage feasibility studies as required by Term 24(a) of its permit issued by the SWRCB.

Specific Impact: USBR is jeopardizing the recovery of the steelhead population and public trust resources by refusing to perform fish passage studies.

Why Impact Would Occur: Historically, steelhead used the mainstem of the Santa Ynez River as a migration corridor to reach the tributaries above Bradbury Dam to spawn and rear in the summer. USBR is not complying with the current Water Right Order that deems Term 24(a) a necessary measure to protect the public trust resources of the Santa Ynez River and keep the *Oncorhynchus mykiss (O. mykiss* or steelhead*)* fishery in the Santa Ynez River in good condition pursuant to FGC § 5937 at the individual, population, and community level. Bradbury Dam is currently an ongoing obstruction that is impeding native *O. mykiss* and other native fish species from accessing upstream habitat pursuant to Fish and Game Code Section 5901 (FGC § 5901).

Rationale: Federal reclamation law requires that the USBR comply with California State water law when diverting water. State water law requirements include obtaining a permit from the SWRCB for diversions that have begun after 1914. Because USBR diversion began after 1914, USBR must comply with the Final Order to lawfully divert water for this project. Performing fish passage studies is a critical step to mitigation for steelhead population decline and impacts associate with inaccessible upstream steelhead habitat that can support essential life history functions to reduce extirpation in the Santa Ynez River watershed.

Request #3.1.1: CDFW requests SWRCB to take action to protect public trust resources and require USBR to perform fish passage feasibility studies as required by Term 24(a). USBR

[1] Please note that USBR's Term 20 Plan discussed in detail the subsections of Term 24. To avoid confusion, CDFW had requested in our March 6, 2020 comment letter that the Term 20 Plan be renamed Term 24 Plan.

shall also be required to provide an update regarding the status of fish passage feasibility studies. The completion of the studies and the reports are due 24 months from the date of the Final Order.

Comment #3.2. Term 20 Plan: Term 24(b) study- Instream Flow Study

Issue: The Term 24(b) study plan does not include the evaluations of channel incisions or the direct and indirect effects of channel incisions on channel morphology.

Specific Impact: A lack of channel incision evaluations will inaccurately represent current channel conditions and therefor fail to address aspects of channel morphology necessary to support steelhead recovery. This information is the basis for measures to protect public trust resources.

Why Impact Would Occur: An inaccurate instream flow study will limit the understanding of all habitat components necessary for steelhead recovery and for steelhead in the Santa Ynez River to be maintained in good condition under FGC § 5937.

Rationale: Evaluating channel incisions would assist in understanding stream channel integrity, processes, and instream flow needs to support healthy riparian and aquatic habitats.

Request #3.2.1: CDFW requests SWRCB to compel USBR to evaluate: 1) channel incision (including effects on tributary access) because of the impoundment of sediment behind Bradbury Dam; and 2) the direct and indirect effects of channel incision on channel morphology, channel complexity, habitat complexity, fish and wildlife, and appropriate beneficial uses.

Request #3.2.2: CDFW requests SWRCB to compel USBR to include information on remediating direct and indirect impacts from the impoundment of sediment behind Bradbury Dam and provide potential operational changes to facilitate sediment movement through or around the dam.

Request #3.2.3: CDFW requests SWRCB to compel USBR to develop and submit the plans to National Marine Fisheries Service (NMFS) and CDFW for review and approval prior to initiation of the Term 24(b) studies. The following shall be referred to as an example of the appropriate level of detail for the Term 24(b) study plans:

> *CDFW. 2017a. Study plan habitat and instream flow evaluation for steelhead (Oncorhynchus mykiss) in the Ventura River, Ventura County. January 2017. Available online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=137996&inline*

Comment #3.3. Term 20 Plan: Term 24(b)(1) study – Evaluate the flow conditions necessary to protect each stage

Issue: The previously conducted instream flow studies evaluating migration flow requirements are not consistent with the methods of CDFW (2017b). As such, the results of the Term 24(b)(1) study should not be used to evaluate the magnitude of migration flow requirements. Flows needed for upstream passage need to consider both physical conditions at critical riffles and compensation for surface-flow loss through percolation that are consistent with the methods of CDFW (2017b).

Specific Impact: An inaccurate evaluation of the magnitude of migration flow requirements will not support steelhead recovery and any measures that develop from USBR's current study plan may not protect public trust resources.

Why Impact Would Occur: The study plan proposed to use the Instream Flow Incremental Methodology (IFIM) developed by the U.S. Fish and Wildlife Service (USFWS) to identify and evaluate appropriate flow conditions for adult and juvenile steelhead in the lower Santa Ynez River. This is not an appropriate or adequate methodology to satisfy Term 24(b)(1). The use of an inadequate study plan will limit the understanding of all habitat components necessary for steelhead recovery and for steelhead in the Santa Ynez River to be maintained in good condition under FGC § 5937.

Rationale: The role of streamflow in the life history of anadromous steelhead can be divided into two basic categories: 1) creation and maintenance of essential freshwater habitat (principally for spawning and rearing), and 2) providing opportunities for migratory behavior (both seasonal upstream migration and downstream emigration) for both adults and juveniles to move between the marine and freshwater habitats.

The IFIM is a methodology for determining instream flow needs for fish and wildlife, but was not intended to assess the flow requirements for anadromous fishes because their life cycle involves moving long distances and over critical riffles between the freshwater and marine environment.

Request #3.3.1: CDFW requests SWRCB to require USBR to assess the magnitude of upstream and downstream fish passage flows using the following methods from CDFW's standard operating procedure analysis:

> *CDFW. 2017b. Standard Operating Procedure for Critical Riffle Analysis for Fish Passage in California. CDFW-IFP-001. September 2017. Available online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=150377&inline*

Request #3.3.2: CDFW requests SWRCB to compel USBR to assess the timing and duration of upstream and downstream passage flows using the methods in:

> *Booth, D.B., Y. Cui, Z. Diggory, D. Pedersen, J. Kear and M. Bowen. 2013. Determining appropriate instream flows for anadromous fish passage on an intermittent mainstream river, coastal southern California, USA. Ecohydrology 2013; e1396. Available online at: https://doi.org/10.1002/eco.1396*

Request #3.3.4: CDFW requests SWRCB to compel USBR to quantify fry and juvenile rearing habitat using the methods in:

> *Harrison, L.R., A Pike and D.A. Boughton. 2017. Coupled geomorphic and habitat response to a flood pulse revealed by remote sensing. Ecohydrology 2017; e1845. Available online at: https://doi.org/10.1002/eco.1845*

Comment #3.4. Term 20 Plan: Term 24(b)(2.1) study – Assess flow conditions necessary to ensure hydrologic connectivity and opportunities for steelhead movement

Issue: The study plan does not specify what hydrologic connectivity means as it relates to the migration of both adult and juvenile steelhead. Improved fish passage opportunities for both smolt and adult steelhead must not be limited to the Lower Santa Ynez River.

Specific Impact: An inaccurate evaluation of the flow conditions necessary for steelhead movement will not support steelhead recovery and any measures that develop from USBR's current study plan may not protect public trust resources.

Why Impact Would Occur: The assessment of flow conditions must consider the flows for adult outmigration for the entire Santa Ynez River Watershed (i.e., including tributaries). This is critical to satisfy Term 24(b)(2.1). The use of an inadequate study plan will limit the understanding of all habitat components necessary for steelhead recovery and for steelhead in the Santa Ynez River to be in good condition under FGC § 5937.

Rationale: The SWRCB has repeatedly indicated, the SWRCB's interest in and jurisdiction over the public trust interests in the steelhead (and other public trust resources) of the Santa Ynez River is not limited to the Lower Santa Ynez River. It includes the entire River and extends above Bradbury Dam. The study plan description covers hydrologic connectivity in the Lower Santa Ynez River (mainstem and "key" tributaries).

Request #3.4.1: CDFW requests SWRCB to compel USBR to assess the flow conditions necessary to guarantee hydrologic connectivity and opportunities for movement between the habitats needed by each stage of the steelhead life cycle.

Request # 3.4.2: CDFW requests SWRCB to compel USBR to complete an instream flow study. The instream flow study shall identify an adequate flow regime that supports the migratory behavior and ecology of adult and juvenile steelhead in their freshwater habitats. The study shall also take into consideration several factors in its analysis; these include, but are not limited to:

1) In semi-arid regions, rainfall events can trigger periods of elevated discharge that serve as the primary environmental cue for migration of steelhead into, within, and out of a watershed. As such, the elevated discharge promotes migration opportunities for this species that would otherwise not exist.
2) Streams in Southern California watersheds can experience high runoff of short duration. Peak counts or observation of steelhead migrants coincide with these elevated discharges. This underscores the functional value and importance of periods of elevated discharge for migration of steelhead in rivers such as the Santa Ynez River that are characterized by a naturally "flashy" discharge.

3) Steelhead show positive rheotaxis (facing into a current) that provides important cues for fish navigating its way upstream.

4) Steelhead can more easily navigate streams at higher discharge rates because of the increased number of pathways through a complex channel morphology provided by higher flows.

5) Steelhead do not enter and subsequently migrate upstream as a single "run," but rather enter river systems in "waves". Each rainfall-induced discharge event prompts additional

steelhead to enter a river from the ocean, while at the same time, adults already in the river migrate further upstream to the spawning areas. This behavior reflects an evolutionary adaptation to the rainfall and runoff pattern of Southern California watersheds, and underscores the ecological importance of the natural hydrological regime of repeated rainfall events and migratory opportunities that promote fish passage throughout the watershed.

Comment #3.5. Term 20 Plan: Term 24(b)(2.2) study – Assess flow conditions necessary to ensure appropriate channel morphology and sediment transport for steelhead habitat

Issue: The study plan lacks: 1) an assessment of stream bank stability, channel incision rates, and perched tributaries; 2) an evaluation of the magnitude, duration and frequency of high flows needed to moderate the channel morphology and encroachment of vegetation; and 3) an estimate of the volume and spatial distribution of sediment deficiency, including particle-size disparity, and sediment transport capacity in the Santa Ynez River below Bradbury Dam.

Specific Impact: An inaccurate evaluation of the flow conditions necessary to ensure appropriate channel morphology and sediment transport will not support steelhead recovery. Any measures that develop from USBR's current study plan may not protect public trust resources.

Why Impact Would Occur: Channel changes due to flow regulation and/or sediment trapping, precede changes in fish habitat, and must be understood to effectively manage flows for fish passage and other life history phases. A study plan to assess flow conditions needs to include stream bank stability, channel incision rates, and perched tributaries that will provide sufficient habitat to maintain steelhead in good condition pursuant FGC § 5937.

Rationale: The forces of streamflow operating on the geomorphic setting, in conjunction with vegetative cover, is principally responsible for creating a wide variety of habitats used by steelhead to complete the freshwater phase of their life cycle. Critical functions of streamflow include the flushing of fine sediments from spawning and rearing habitats, distribution of nutrients, recruitment and sorting of spawning gravels, recruitment and sorting of large woody debris, and the maintenance of riparian vegetation.

Reduced frequency and/or magnitude of channel forming flows has resulted in changes to channel size and shape. Bradbury Dam and Cachuma Reservoir attenuate natural annual flood flows. Large flood releases are less frequent since completion of Bradbury Dam in 1953. Typically, unimpaired alluvial stream channel morphology is the result of flood flows within one- to five-year recurrence intervals. Interactions between natural hydrologic cycles, flood flow regulation, sediment regulation, riparian vegetation, shallow groundwater processes, and channel manipulation all complicate the response of channels downstream from Bradbury Dam.

The approach that CDFW utilizes when identifying appropriate streamflow regime for steelhead in southern California involves quantitatively estimating the unimpaired pattern (i.e., timing, frequency, duration, and rate-of-change) and magnitude of streamflow in the watershed. Specific quantitative data are drawn from USGS gauging stations, and if necessary, supplemented by models using appropriate rainfall/runoff coefficients. These data form the basis for identifying an appropriate streamflow regime. The advantage of this approach involves using the knowledge of the natural (pre-dam) pattern and magnitude of streamflow.

The unimpaired pattern and magnitude of streamflow can be used for promoting viability of a population in an individual watershed. These modeled streamflow regimes will include characteristics and conditions that define the evolution of the species' essential life history traits, individual population's abundance, distribution, and population growth rates.

Cachuma Reservoir's storage capacity has diminished over the past 60-plus years as all bed material and portions of the finer grained sediment load become trapped behind the dam. The Santa Ynez River downstream of Bradbury Dam is deprived of bedload material for some distance until tributary sediment inputs contribute to the mainstem. Flood flow regulation can cause tributary confluences to aggrade downstream from large impoundments such as Bradbury Dam. The reduced frequency and/or magnitude of effective sediment transporting flows can result in localized sediment accumulations in streams that are generally degrading.

CDFW Request #3.5.1: CDFW requests SWRCB to require USBR to incorporate an assessment of stream bank stability, channel incision rates, and perched tributaries that will provide sufficient habitat to maintain steelhead in good condition pursuant to FGC § 5937.

CDFW Request #3.5.2: CDFW requests SWRCB to compel USBR to incorporate an evaluation of the magnitude, duration, and frequency of high flows needed to moderate channel morphology and encroachment of vegetation in the active river channel, and to establish and maintain pools for juvenile steelhead rearing.

CDFW Request #3.5.3: CDFW requests SWRCB to compel USBR to estimate of the volume and spatial distribution of sediment deficiency, including particle-size disparity, and sediment transport capacity in the Santa Ynez River below Bradbury Dam.

CDFW Request #3.5.4: To maximize migratory conditions, CDFW requests SWRCB to compel USBR to incorporate the following information:

1) Investigate changes in channel geometry since completion of Bradbury Dam and make correlations to fish habitat changes;

2) Determine how channel and fish habitat might be improved through incrementally reinstating historic channel forming flow regimes as baseline for assessing management alternatives;

3) Determine the distance downstream from Bradbury Dam where tributary inputs of bed material achieve approximate equilibrium with regulated sediment transport capacity;
4) Assess the potential to improve fish habitat by managing releases to shift the equilibrium point upstream or downstream; and,

5) Prepare a sediment augmentation plan to approximately satisfy the downstream sediment deficit.

<u>Comment #3.6. Term 20 Plan: Term 24(b)(3) study – Assess potential instream or streamside habitat restoration in relation to flow</u>

Issue: It is not clear how the implementation of the Term 24(b)(3) actions will to be assessed. The scope, scale and exact locations of their proposed habitat restoration measures is not specified. The study plan description focuses on three potential habitat restoration actions:

1) spawning gravel augmentation in the Lower Santa Ynez River and Hilton Creek;

2) addition of large woody debris (LWD) or boulder clusters in the Lower Santa Ynez River and large tributaries; and,

3) installation of cattle exclusion fencing in the Salsipuedes/El Jaro watershed.

There is a lack of detail regarding proposed gravel augmentation quantities, sizes of proposed LWD and boulder installations, and cattle exclusion fencing details. There is also a lack of a detailed monitoring plan that will quantify geomorphic and habitat responses in the river resulting from implementation of gravel augmentation.

Specific Impact: An inaccurate assessment of potential instream or streamside habitat restoration in relation to flow will not support steelhead recovery. Any measures or habitat restoration actions that develop from USBR's current study plan may not protect public trust resources.

Why Impact Would Occur: USBR's study plan proposal must be comprehensive to effectively manage flows to support fish habitat restoration and provide sufficient habitat to maintain steelhead in good condition pursuant to FGC § 5937.

Rationale: There are apparent inconsistencies regarding proposed gravel augmentation quantities as specified in Table 1 of the Lower Santa Ynez River Habitat Enhancement Plan (i.e., 200 tons per year, 2,800 pounds per year, versus 1,500 cubic yards per year). Clarification is needed on: 1) the prospective sizes of LWD and boulders to be installed relative to site-specific hydraulic and hydrologic conditions (e.g., channel width and slope, and discharge magnitude); 2) the proposed gravel augmentation quantities; 3) the proposed fencing excludes cattle from one or both sides of the river; 4) the location of fence endpoints and stream crossings; and 5) the location of related cattle-watering facilities will provide a better assessment of habitat restoration actions.

Request #3.6.1: CDFW recommends the Term 24(b)(3) study plan provide more specificity regarding these potential habitat restoration actions.

Request #3.6.2: CDFW requests SWRCB to compel USBR to identify gravel and cobble dispersal mechanisms, including active placement to restore bars and riffles; active injection during high river discharge events; and strategic stockpiling for passive dispersal.

Request #3.6.3: CDFW requests SWRCB to compel USBR to identify the sources of augmented gravel.

Request #3.6.4: CDFW requests SWRCB to compel USBR to include a detailed monitoring plan that will quantify geomorphic and habitat responses in the river resulting from implementation of gravel augmentation.

Request #3.6.5: CDFW requests SWRCB to compel USBR to include a discussion of the role of LWD in forming steelhead habitat in a southern California river in the study plan. For more information, please see Thompson *et al*. (2007):

Thompson L. C., J. L. Voss, R. E. Larsen, W. D. Tietje, R. A. Cooper, and Peter B. Moyle. 2007. Role of Hardwood in Forming Habitat for Southern California Steelhead. General Technical Report PSW-GTR-19. Cooperative Extension, Integrated Hardwood Range Management Program, University of California, Berkeley. Available online at: https://www.fs.fed.us/psw/publications/documents/psw_gtr217/psw_gtr217_307.pdf

Request #3.6.6: CDFW requests SWRCB to compel USBR to refer to the following studies for instream habitat enhancement:

Stoecker Ecological. 2004. Steelhead Migration Barrier Inventory and Recovery Opportunities for the Santa Ynez River, California. Available online at: http://stoeckerecological.com/reports/SantaYnezReport.PDF

Block, H. and A. Francis. 2013. Santa Ynez River Watershed Report Final Report, May 2013. Available online at: https://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/santa_ynez/nutrient/sy_watershed_report_may2013.pdf

Comment #3.7. Term 20 Plan: Term 24(b)(4) study – Evaluate water quality issues that may impact steelhead

Issue: The assessment of water quality issues in the Term 24(b)(4) study plan is missing nutrient loading, a water temperature model, and details regarding specific methods and locations at which water quality parameters would be measured.

Specific Impact: The lack of assessment of nutrient loading, water temperature modeling, and water quality parameters will not support habitat improvement projects that are intended to facilitate steelhead recovery. Any measures or habitat restoration actions that develop from USBR's current study plan may not protect public trust resources.

Why Impact Would Occur: USBR's study plan proposal must be comprehensive to effectively manage flows to support fish habitat restoration and provide sufficient habitat to maintain steelhead in good condition pursuant to FGC § 5937.

Rationale: Elevated temperatures, low dissolved oxygen, nutrient loading, and lack of sediment transport are known to increase stress levels of steelhead. Understanding these issues will help establish flow requirements to maintain suitable water quality for steelhead from Bradbury Dam to the estuary.

Request #3.7.1: CDFW requests SWRCB to compel USBR to evaluate water quality issues which may impact steelhead including, but not limited to, elevated temperatures, low dissolved oxygen, nutrient loading, and sediment transport.) study plan shall also include potential measures to address these issues.

Request #3.7.2: CDFW requests SWRCB to compel USBR to develop a water temperature model to assess what flows are needed to maintain suitable water temperatures for steelhead from Bradbury Dam to the estuary.

Request #3.7.3: CDFW requests SWRCB to compel USBR to include the specific methods (including frequency, timing, and locations) at which the water quality parameters (water

temperature, dissolved oxygen, and fine sediments) would be measured. The study plan shall also include standards used to evaluate the suitability of these water quality conditions to support all life stages of steelhead. Evaluation of existing water quality monitoring data shall include records from all National Pollution District Elimination System (NPDES) for point waste discharges to the Santa Ynez River, data from the Total Maximum Daily Load (TMDL) studies, and standards for no-point waste discharges to the Santa Ynez River.

Request #3.7.4: CDFW requests SWRCB to compel USBR to address the expected effects of discharging State Water Project water into the Santa Ynez River on steelhead and designated critical habitat, including, but not limited, to juvenile steelhead olfactory-imprinting and rearing habitat conditions (e.g., water quality).

Comment #3.8. Term 20 Plan: Term 24(b)(5) study – Evaluate operational changes to Bradbury Dam that could improve steelhead conditions

Issue: The evaluation of operational changes to Bradbury in the Term 24(b)(4) study plan is missing provisions related to water supply (including groundwater recharge) and flood control operations.

Specific Impact: The lack of evaluation of groundwater recharge and flood control operational changes will limit the understanding of the location and timing of water releases in relation to steelhead recovery actions. Any measures or habitat restoration actions that develop from USBR's current study plan may not protect public trust resources.

Why Impact Would Occur: USBR's study plan proposal must be comprehensive to effectively manage flows to support fish habitat restoration and provide sufficient habitat to keep steelhead in good condition pursuant to FGC § 5937.

Rationale: An evaluation of groundwater recharge operational changes, flood control operational changes, an evaluation of timing rates (cfs), and the location of water that will be released into Hilton Creek under each operational scenario at Bradbury Dam will better inform operation and maintenance (O&M) decisions to support steelhead from Bradbury Dam to the estuary.

Request #3.8.1: CDFW requests SWRCB to compel USBR to evaluate water release provisions related to water supply (including groundwater recharge) and flood control operations. The study plan shall evaluate timing rate (cfs), and location of water that will be released into Hilton Creek under each operational scenario at Bradbury Dam. A review of NMFS' 2016 Draft BO for O&M of Bradbury Dam may assist USBR in finalizing this component of the study plan (NMFS 2016):

> *National Marine Fisheries Service. 2016. Draft Endangered Species Act Section 7(a)(12) Biological Opinion for the Operation and Maintenance of the Cachuma Project. November 28, 2016. Copy Available Upon Request.*

Comment #3.9. Term 20 Plan: Term 24(b)(6) study – Evaluate whether timing of 89-18 Water Rights releases should be revised

Issue: The Term 24(b)(6) study plan does not fully describe the water releases from Bradbury Dam necessary to support downstream water rights in the Santa Ynez River (i.e., Order WR 89-18) and associated alluvial groundwater pumping.

Specific Impact: The lack of evaluation of groundwater recharge and flood control operational changes will limit the understanding of the location and timing of water releases in relation to steelhead recovery actions. Any measures or habitat restoration actions that develop from USBR's current study plan may not protect public trust resources.

Why Impact Would Occur: USBR's study plan proposal must be comprehensive to effectively manage flows to support fish habitat restoration and provide sufficient habitat to keep steelhead in good condition pursuant to FGC § 5937.

Rationale: An evaluation of Bradbury Dam water releases to support downstream water rights will better inform O&M decisions to support steelhead from Bradbury Dam to the estuary. An evaluation of the effects of these water releases on designated critical habitat for endangered steelhead will support steelhead recovery.

Request #3.9.1: CDFW requests SWRCB to compel USBR to include provisions for determining the effects of water releases on steelhead adult and juveniles. This shall be done by setting up trapping or tagging and passive integrated transponder (PIT) tag arrays to identify movement of fish following water releases that occur outside of the normal rain cycle (e.g., late summer).

Request #3.9.2: CDFW requests SWRCB to compel USBR to fully describe Bradbury Dam water releases, associated alluvial groundwater pumping and related to the water operations stipulated in the Final Order. The study plan shall also include an updated description that clearly and completely describes the expected consequences of the authorized releases on freshwater rearing areas, freshwater spawning areas, and freshwater migration corridors.

<u>Comment #3.10. Term 20 Plan: Term 24(c)(1) study – Evaluate effect of flows on habitat conditions to reduce predation and proliferation of nonnative species</u>

Issue: The Term 20 Draft Plan indicates that the Instream Flow Study identified above in Term 24(b) (i.e., IFIM) would be used to evaluate 1) habitat conditions for bass and other non-native species; and 2) develop measures to curtail the proliferation on non-native species to reduce non-native populations. CDFW is concerned the IFIM methodology is inadequate for this task. Please see Comment #2.3 for a discussion of issues and requests to protect public trust resources.

Specific Impact: The inaccurate evaluation of flow effects on habitat conditions to reduce predation will not support habitat improvement projects that are intended to facilitate steelhead recovery. Any measures that develop from USBR's current study plan may not protect public trust resources.

Why Impact Would Occur: The IFIM is not an appropriate or adequate methodology to satisfy Term 24(b)(1). The use of an inadequate study plan will limit the understanding of all habitat components necessary for steelhead recovery and for steelhead in the Santa Ynez River to be maintained in good condition under FGC § 5937.

Rationale: The IFIM is a methodology for determining instream flow needs for fish and wildlife, but was not intended to assess the flow requirements for anadromous fishes because their life cycle involves moving long distances and over critical riffles between the freshwater and marine environment.

Request #3.10.1: CDFW requests SWRCB to require USBR to not use the USFWS IFIM methodology, but instead, use the standard operating procedure for critical riffle analysis using CDFW's methodology (CDFW 2017a). CDFW's methods is one appropriate method to assess habitat conditions for the non-migratory non-native species, and could be used in conjunction with the approach described above for the native, migratory steelhead of the Santa Ynez River.

Comment #3.11. Term 20 Plan: Term 24(c)(2) study – Evaluate Measures to prevent introduction/reintroduction of invasive species

Issue: Term 24(c)(2) identifies the principal sources of non-native species into the Lower Santa Ynez River (including Cachuma Reservoir), but does not acknowledge the populations of non-native fish and invertebrate species within the mainstem of the upper Santa Ynez River. As noted previously, the SWRCB has repeatedly indicated, the SWRCB's interest in and jurisdiction over, the public trust interests in the steelhead (and other public trust resources) of the Santa Ynez River, is not limited to the Lower Santa Ynez River, but also extends above Bradbury Dam.

Specific Impact: The inaccurate evaluation of flow effects on habitat conditions to reduce predation will not support habitat improvement projects that are intended to facilitate steelhead recovery. Any measures that develop from USBR's current study plan may not protect public trust resources.

Why Impact Would Occur: The IFIM is not an appropriate or adequate methodology to satisfy Term 24(b)(1). The use of an inadequate study plan will limit the understanding of all habitat components necessary for steelhead recovery and for steelhead in the Santa Ynez River to be maintained in good condition under FGC § 5937.

Rationale: The IFIM is a methodology for determining instream flow needs for fish and wildlife, but was not intended to assess the flow requirements for anadromous fishes because their life cycle involves moving long distances and over critical riffles between the freshwater and marine environment.

Request #3.11.1: CDFW requests SWRCB to compel USBR to evaluate methods to stop the release of non-native fish and invertebrates from Bradbury Dam including methods employed at Grizzly Valley Dam on Lake Davis.

Request #3.11.2: CDFW requests SWRCB to compel USBR include measures to control non-native aquatic fish and invertebrate species must address all their sources to be effective. Prevention and control measures (including public education) must address the entire Santa Ynez River. Best management practices for the control of non-native include *using "large mesh" seines rather than "small mesh" seines to minimize adverse impacts to steelhead.*

Comment #3.12. Term 20 Plan: Term 24(c)(3) study – Evaluate effect of beaver dams on passage opportunities and distribution of steelhead

Issue: CDFW does not believe beaver dams have a negative impact on steelhead recovery efforts.

Specific Impact: The removal of beaver dams from the Santa Ynez River may further degrade the ecosystem. A critical limiting factor within the Santa Ynez River is the availability of rearing and over-summering habitat.

Why Impact Would Occur: Beavers have been a part of the Santa Ynez River ecosystem for the past 76 years (prior to construction of Bradbury Dam). Beavers have been shown to create holding habitat and benefits grows of salmonids (Bouwes et al. 2016; Pollock et al. 2012). Additional, beavers attenuate stream flows and provide instream complexity that is often missing in urban or agricultural areas (Bouwes et al. 2016).

Rationale: Bouwes et al. (2016) completed a twenty-year study on how beaver dams and beaver dam analogs (BDAs) impact steelhead in the Columbia River Basin. Much of their data indicates a positive response towards increasing the quantity and quality of habitat needed by steelhead and more importantly "that neither beaver dams nor BDAs, are barriers to spawner or juvenile movement" (Bouwes et al. 2016; Pollock et al. 2012). Numerous studies show beavers benefit endangered steelhead by building ponds and increasing habitat for wildlife.

Request #3.12.1: In the Term 24(c)(3) study plan, CDFW requests SWRCB to compel USBR to include an evaluation of growth rates of steelhead found in beaver ponds vs. outside of beaver ponds. Studies regarding invasive fish species shall be the priority for USBR. The study of invasive fish presence shall also be included as part of this section. CDFW recommends less attention on beaver studies and more resources directed to the non-native predatory species studies.

<u>Comment #3.13. Term 20 Plan: Term 24(c)(4) study – Identify measures to reduce impacts on steelhead from beavers</u>

Issue: Contrary to USBR's concerns of beavers, steelhead are not impacted by beavers.

Specific Impact: The removal of beavers from the Santa Ynez River may further degrade the ecosystem along the Santa Ynez River.

Why Impact Would Occur: Beavers have been a part of the Santa Ynez River ecosystem for the past 76 years (prior to construction of Bradbury Dam). Beavers have been shown to create holding habitat and benefits grows of salmonids (Bouwes et al. 2016; Pollock et al. 2012). Additional, beavers attenuate stream flows and provide instream complexity that is often missing in urban or agricultural areas (Bouwes et al. 2016).

Rationale: Programs to kill hundreds of beavers in California have continued without analyzing the impacts to endangered wildlife that use habitat created by beavers such as steelhead, tidewater goby and salmon. Multiple litigation proceedings have stemmed from a lack of detailed analysis on the benefits of beaver dams for critically endangered salmonids. On May 30, 2019, the Center for Biological Diversity filed a 60-Day Notice of Intent to Sue against the Wildlife Services Program (within the U.S. Department of Agriculture Animal and Plant Health Inspection Service), the USFWS and NMFS because they were in violation of Section 7 of the Endangered Species Act (FESA), 16 U.S.C. 1536, and the ESA 's consultation regulations, 50 C.C.R. Part 402. On July 30, 2019, the USFWS (Adkins 2019ab) agreed to complete an

analysis of its “beaver damage management program” and will stop killing beavers in California’s “critical habitats” of salmonids and several other endangered species until more research is performed.

Bouwes et al. (2016) completed a twenty-year study on how beaver dams and beaver dam analogs (BDAs) impact steelhead in the Columbia River Basin. Much of their data indicates a positive response towards increasing the quantity and quality of habitat needed by steelhead and more importantly “that neither beaver dams nor BDAs, are barriers to spawner or juvenile movement” (Bouwes et al. 2016; Pollock et al. 2012). CDFW asserts that beaver dams do not cause detrimental effects on fish passage.

Request #3.13.1: In the Term 24(c)(4) study plan, CDFW requests SWRCB to compel USBR to review the following references and recognize the benefits of beaver dams:

Adkins, Collette L. 2019a. Notification of Violations of the Endangered Species Act and its Regulations Regarding APHIS-Wildlife Services’ Beaver Killing and Dam Removal in California, Press Releases May 30, 2019. Available online at: https://biologicaldiversity.org/w/news/press-releases/lawsuit-launched-to-protect-endangered-california-salmon-harmed-by-federal-beaver-killing-2019-05-30/

Adkins, Collette L. 2019b. Notification of Violations of the Endangered Species Act and its Regulations Regarding APHIS-Wildlife Services’ Beaver Killing and Dam Removal in California, Press Releases July 30, 2019. Available online at: https://biologicaldiversity.org/w/news/press-releases/legal-action-forces-trump-administration-curb-killing-california-beavers-2019-07-30/

Bouwes, N et al. 2016. Ecosystem experiment reveals benefits of natural and simulated beaver dams to a threatened population of steelhead (Oncorhynchus mykiss). Sci Rep. 6, 28581; doi: 10.1038/srep28581. Available online at: https://www.researchgate.net/publication/304782958_Ecosystem_experiment_reveals_benefits_of_natural_and_simulated_beaver_dams_to_a_threatened_population_of_steelhead_Oncorhynchus_mykiss

Pollock, M.M., J.M. Wheaton, N. Bouwes, C. Volk, N. Weber, and C.E. Jordan. 2012. Working with beaver to restore salmon habitat in the Bridge Creek intensively monitored watershed: Design rationale and hypotheses. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-120, 47 p. Available online at: https://www.nwfsc.noaa.gov/research/divisions/fe/documents/NMFS-NWFSC-120.pdf

CDFW Comment #4 Term 24(a) through Term 24(c)(4) Studies

Please see Comments 3.1 through 3.13. These identify issues with the Term 24 study plans and present CDFW’s requests for action to ensure the protection of public trust resources.

CDFW Comment #5 Term 34

Issue: USBR‘s December 31, 2020 deadline to comply with Term 34 amended contracts was not met.

Specific Impact: USBR is jeopardizing the recovery of the steelhead population and public trust resources by refusing to require the Member Units to implement the demand management measures identified as part of the urban water shortage contingency analyses contained in the Member Units' urban water management plans.

Why Impact Occur: Historically, steelhead used the mainstem of the Santa Ynez River as a migration corridor to reach the tributaries above Bradbury Dam to spawn and rear in the summer. USBR is out of compliance with the current Water Right Order that deems Term 34 a necessary measure to protect the public trust resources of the Santa Ynez River and maintains the steelhead fishery in the Santa Ynez River in good condition pursuant to FGC § 5937 at the individual, population, and community level. Bradbury Dam is currently an ongoing obstruction that is impeding native *O. mykiss* and other native fish species from accessing upstream habitat pursuant to FGC § 5901.

Rationale: The implementation of water conservation measures will minimize water supply impacts of the Final Order measures that may be necessary to protect public trust resources. The Final Order requires USBR "to require the Member Units to implement the demand management measures identified as part of the urban water shortage contingency analyses contained in the Member Units' urban water management plans. In the event Reclamation does not succeed in amending its contracts by December 31, 2020, this order reserves the authority for the Deputy Director to modify Reclamation's (USBR) permits to achieve comparable water use reductions to the Member Units' water demand management measures and delegates that authority to the Deputy Director" (pg. 119, Final Order). The Report confirms USBR did not complete these contract amendments by December 31, 2020.

Request #5.1: CDFW requests SWRCB to take action to protect public trust resources and modify USBR permits to achieve comparable water use reductions to Member Units' water demand management measures.

Conclusion

CDFW appreciates the opportunity to comment on the Report and requests SWRCB to take enforcement action to achieve full public trust protection pursuant to Fish and Game Code section and the Public Trust Doctrine.

If you have questions regarding this letter and further coordination on these issues, please contact Mary Ngo, Senior Environmental Scientist (Specialist) at (562) 477-0743 and Mary.Ngo@wildlife.ca.gov.

Sincerely,

DocuSigned by:
Erinn Wilson-Olgin
B6E58CFE24724F5...

Erinn Wilson-Olgin
Environmental Program Manager I
South Coast Region

Enclosures:

ATTACHMENT A – CDFW Comment Letters
ATTACHMENT B – Cachuma Project Evidentiary Hearings Service List (updated June 10, 2019)

ec: Cachuma Project Evidentiary Hearings Service List (updated June 10, 2019)

CDFW

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CDFW's Comments on USBR's Annual Compliance Report for Water Year 2020 Plan for Term 27 of Water Rights Order WR-2019-0148

ATTACHMENT A - CDFW Comment Letters

State of California – Natural Resources Agency
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GAVIN NEWSOM, Governor
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March 6, 2020

Mr. David E. Hyatt, Chief
Resource Management Division
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1243 N Street
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Subject: California Department of Fish and Wildlife Comments on U.S. Bureau of Reclamation's Draft Cachuma Order WR-2019-0148 Term 20 Plan

Dear Mr. Hyatt:

California Department of Fish and Wildlife (CDFW) received the U.S. Bureau of Reclamation's (USBR) Draft Cachuma Order WR-2019-0148 Term 20 Plan (Draft Plan) on January 23, 2020. CDFW appreciates this opportunity to comment on the Draft Plan and encourages the USBR to consider CDFW's pervious comments provided on December 9, 2016, May 29, 2019, and September 13, 2019 (see Attachment A- CDFW Comment Letters) during the review and adoption processes of the Final Order WR-2019-048 (Final Order) that amends the Bureau's State Water Resources Control Board's (SWRCB) Water Rights permit number 11308 and 11310 for the operation of Bradbury Dam.

CDFW is California's Trustee Agency for fish and wildlife resources and holds those resources in trust by statute for all the people of the State [(Fish & G. Code §§ 711.7, subd. (a) & 1802; Pub. Resources Code § 21070; CEQA Guidelines § 15386, subd. (a)]). CDFW, in its trustee capacity, has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species including wetlands and estuarine habitat (Fish & G. Code § 1802). Similarly, for purposes of CEQA, CDFW is directed charged by law to provide, as available, biological expertise during public agency environmental review efforts, focusing specifically on projects and related activities that have the potential to adversely affect fish and wildlife resources.

The following comments and recommendations are based on an independent review by our CDFW Senior Hydraulic Engineer, Mark Gard, (see Attachment B- CDFW Engineering Comments) of the Draft Plan provided by USBR.

General Comments

CDFW COMMENT #1: CDFW recommends the title of the Draft Plan be changed to Draft Cachuma Order WR-2019-0148 Term 24 Plan to adequately represent the subsections of the terms that are being discussed. Term 24 of Order WR-2019-0148 requires [USBR] to do the following:

> *"…conduct the following studies to evaluate measures that may be necessary to keep the steelhead fishery in the Santa Ynez River below Bradbury Dam in good*

condition at the individual, population, and community level and shall be informed by current scientific information on southern California steelhead recovery, including NMFS' 2012 Final Southern California Steelhead Recovery Plan".

CDFW COMMENT #2: The Draft Plan is a responsive document to the SWRCB's Final Order. The Draft Plan should function as a standalone document and all necessary information should be included. As a responsive document the introduction should include all directives and constraints given by the SWRCB (e.g., reasonable and prudent measures). The introduction should also describe in more detail the documents that will be used to inform the Draft Plan.

Term 24(a) of Order WR-2019-0148

CDFW COMMENT #3: Federal reclamation law requires that the USBR comply with California state water law when diverting water. State water law requirements include obtaining a permit from the SWRCB for diversions that have begun after 1914. Because USBR diversion began after 1914, USBR must comply with in order to lawfully divert water for this project.

CDFW COMMENT #4: CDFW disagrees with the USBR conclusion that it is unable to perform fish passage feasibility studies as required by Term 24(a) of its permit issued by the SWRCB. CDFW recommends USBR provide an update regarding the status of the fish passage feasibility studies. The completion of the studies and the reports are due 24 months from the date of the Final Order.

Term 24(b) of Order WR-2019-0148

CDFW COMMENT #5: The Term 24(b) study plan does not include the evaluations of channel incisions. CDFW recommends Term 24(b) evaluate 1) channel incision (including effects on tributary access) as a result of the impoundment of sediment behind Bradbury Dam, 2) the direct and indirect effects of channel incision on channel morphology, fish and wildlife, and appropriate beneficial uses.

The evaluation should include a recommendation and timeline to remediate direct and indirect impacts from the impoundment of sediment behind Bradbury Dam and provide potential operational changes to facilitate sediment movement through or around the dam.

CDFW COMMENT #6: CDFW recommends the Term 24(b) study plans be developed and submitted to National Marine Fisheries Service (NMFS) and CDFW for review and approval prior to initiation of the Term 24(b) studies. The following should be referred to as an example of the appropriate level of detail for the Term 24(b) study plans:

CDFW. 2017a. Study plan habitat and instream flow evaluation for steelhead (Oncorhynchus mykiss) in the Ventura River, Ventura County. January 2017. Available online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=137996&inline

Term 24(b)(1) – Evaluate the flow conditions necessary to protect each stage

CDFW COMMENT #7: The role of streamflow in the life history of anadromous steelhead can be divided into two basic categories: 1) creation and maintenance of essential freshwater habitat (principally for spawning and rearing), and 2) providing opportunities for migratory

behavior (both seasonal upstream migration and downstream emigration) for both adults and juveniles to move between the marine and freshwater habitats.

The Term 24(b)(1) study plan proposes to use the Instream Flow Incremental Methodology (IFIM) developed by the U.S. Fish and Wildlife Service (USFWS) to identify and evaluate appropriate flow conditions for adult and juvenile steelhead in the lower Santa Ynez River. This is not an appropriate or adequate methodology to satisfy Term 24(b)(1). The IFIM is a methodology for determining instream flow needs for fish and wildlife, but was not intended to assess the flow requirements for anadromous fishes because their life cycle involves moving long distances and over critical riffles between the freshwater and marine environment.

CDFW COMMENT #8: The previously conducted instream flow studies evaluating migration flow requirements are not consistent with the methods of CDFW (2017b), and thus the results of these studies should not be used to evaluate the magnitude of migration flow requirements. CDFW recommends that the magnitude of upstream and downstream passage flows should be assessed using the following methods from CDFW's standard operating procedure analysis:

> *CDFW. 2017b. Standard Operating Procedure for Critical Riffle Analysis for Fish Passage in California. CDFW-IFP-001. September 2017. Available online at: https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=150377&inline*

CDFW COMMENT #9: CDFW recommends the timing and duration of upstream and downstream passage flows be assessed using the methods in:

> *Booth, D.B., Y. Cui, Z. Diggory, D. Pedersen, J. Kear and M. Bowen. 2013. Determining appropriate instream flows for anadromous fish passage on an intermittent mainstream river, coastal southern California, USA. Ecohydrology 2013; e1396. Available online at: https://doi.org/10.1002/eco.1396*

CDFW COMMENT #10: Flows needed for upstream passage should consider both physical conditions at critical riffles and compensation for surface-flow loss through percolation.

CDFW COMMENT #11: Fry and juvenile rearing habitat should be quantified using the methods in:

> *Harrison, L.R., A Pike and D.A. Boughton. 2017. Coupled geomorphic and habitat response to a flood pulse revealed by remote sensing. Ecohydrology 2017; e1845. Available online at: https://doi.org/10.1002/eco.1845*

CDFW COMMENT #12: The instream flow study should be conducted consistent with the standards in:

> *USFWS (United States Fish and Wildlife Service). 2011. Sacramento Fish and Wildlife Office Standards for Physical Habitat Simulation Studies. Sacramento Field and Wildlife Office Prepared by The Restoration and Monitoring Program. Available online at: http://www.donpedro-relicensing.com/Documents/20140226-5254(29159448)-USFWS%20Enclosures.pdf*

Term 24(b)(2.1) – Assess flow conditions necessary to ensure hydrologic connectivity and opportunities for steelhead movement

CDFW COMMENT #13: Improved fish passage opportunities for both smolt and adult steelhead must not be limited to the Lower Santa Ynez River. The SWRCB has repeatedly indicated, the SWRCB's interest in and jurisdiction over the public trust interests in the steelhead (and other public trust resources) of the Santa Ynez River is not limited to the Lower Santa Ynez River. It includes the entire River and extends above Bradbury Dam.

CDFW COMMENT #14: The Term 24(b)(2.1) study plan description covers hydrologic connectivity in the Lower Santa Ynez River (mainstem and "key" tributaries). The Term 24(b)(2.1) study plan does not specify what hydrologic connectivity means, in particularly, as it relates to the migration of both adult and juvenile steelhead.

CDFW COMMENT #15: The assessment of flow conditions must consider the flows for adult outmigration for the entire San Ynez River Watershed (i.e., including tributaries). CDFW recommends USBR assess the flow conditions necessary to guarantee hydrologic connectivity and opportunities for movement between the habitats needed by each stage of the steelhead life cycle.

CDFW COMMENT #16: An instream flow study to identify an adequate flow regime that supports the migratory behavior and ecology of adult and juvenile steelhead in their freshwater habitats should expressly recognize and take into consideration a number of factors in its analysis; these include, but are not limited to:

1) In semi-arid regions, rainfall events can trigger periods of elevated discharge that serve as the primary environmental cue for migration of steelhead into, within, and out of a watershed. As such, the elevated discharge promotes migration opportunities for this species that would otherwise not exist.
2) Streams in Southern California watersheds can experience high runoff of short duration. Peak counts or observation of steelhead migrants coincide with these elevated discharges. This underscores the functional value and importance of periods of elevated discharge for migration of steelhead in rivers such as the Santa Ynez River that are characterized by a naturally "flashy" discharge.
3) Steelhead show positive rheotaxis (facing into a current) that provides important cues for fish navigating its way upstream.
4) Steelhead can more easily navigate streams at higher discharge rates because of the increased number of pathways through a complex channel morphology provided by higher flows.
5) Steelhead do not enter and subsequently migrate upstream as a single "run," but rather enter river systems in "waves". Each rainfall-induced discharge event prompts additional steelhead to enter a river from the ocean, while at the same time, adults already in the river migrate further upstream to the spawning areas. This behavior reflects an evolutionary adaptation to the rainfall and runoff pattern of Southern California watersheds, and underscores the ecological importance of the natural hydrological regime of repeated rainfall events and migratory opportunities that promote fish passage throughout the watershed.

Term 24(b)(2.2) – Assess flow conditions necessary to ensure appropriate channel morphology and sediment transport for steelhead habitat

CDFW COMMENT #17: The forces of streamflow operating on the geomorphic setting, in conjunction with vegetative cover, is principally responsible for creating a wide variety of habitats used by steelhead to complete the freshwater phase of their life cycle. Critical functions of streamflow include the flushing of fine sediments from spawning and rearing habitats, distribution of nutrients, recruitment and sorting of spawning gravels, recruitment and sorting of large woody debris, and the maintenance of riparian vegetation.

Reduced frequency and/or magnitude of channel forming flows has resulted in changes to channel size and shape. Bradbury Dam and Cachuma Reservoir attenuate natural annual flood flows. Large flood releases are less frequent since completion of Bradbury Dam in 1953. Typically, unimpaired alluvial stream channel morphology is the result of flood flows within one- to five-year recurrence intervals. Interactions between natural hydrologic cycles, flood flow regulation, sediment regulation, riparian vegetation, shallow groundwater processes, and channel manipulation all complicate the response of channels downstream from Bradbury Dam.

The approach that CDFW utilizes when identifying appropriate streamflow regime for steelhead in Southern California involves quantitatively estimating the unimpaired pattern (i.e., timing, frequency, duration, and rate-of-change) and magnitude of streamflow in the watershed. Specific quantitative data are drawn from USGS gauging stations, and if necessary, supplemented by models using appropriate rainfall/runoff coefficients. These data form the basis for identifying an appropriate streamflow regime. The advantage of this approach involves using the knowledge of the natural (pre-dam) pattern and magnitude of streamflow. The unimpaired pattern and magnitude of streamflow can be used for promoting viability of a population in an individual watershed. These modeled streamflow regimes will include characteristics and conditions that define the evolution of the species' essential life history traits, individual population's abundance, distribution, and population growth rates.

Channel changes due to flow regulation and/or sediment trapping, precede changes in fish habitat, and must be understood to effectively manage flows for fish passage and other life history phases. Cachuma Reservoir's storage capacity has diminished over the past 60-plus years as all bed material and portions of the finer grained sediment load become trapped behind the dam. The San Ynez River downstream of Bradbury Dam is deprived of bedload material for some distance until tributary sediment inputs contribute to the mainstem. Flood flow regulation can cause tributary confluences to aggrade downstream from large impoundments such as Bradbury Dam. The reduced frequency and/or magnitude of effective sediment transporting flows can result in localized sediment accumulations in streams that are generally degrading.

CDFW COMMENT #18: CDFW recommends the Term 24(b)(2.2) study plan include an assessment of stream bank stability, channel incision rates, and perched tributaries that will provide sufficient habitat to keep steelhead in good condition in.

CDFW COMMENT #19: CDFW recommends the Term 24(b)(2.2) study plan evaluate the magnitude, duration and frequency of high flows needed to moderate the effects of beaver

dams and encroachment of vegetation in the active river channel, and to establish and maintain pools for juvenile steelhead rearing.

CDFW COMMENT #20: CDFW recommends the Term 24(b)(2.2) study plan estimate the volume and spatial distribution of sediment deficiency, including particle-size disparity, and sediment transport capacity in the Santa Ynez River below Bradbury Dam.

CDFW COMMENT #21: In order to maximize migratory conditions, CDFW recommends that the following information be developed as part of the Term 24(b)(2.2) study plan:

1) Investigate changes in channel geometry since completion of Bradbury Dam and make correlations to fish habitat changes;
2) Determine how channel and fish habitat might be improved through incrementally reinstating historic channel forming flow regimes as baseline for assessing management alternatives;
3) Determine the distance downstream from Bradbury Dam where tributary inputs of bed material achieve approximate equilibrium with regulated sediment transport capacity;
4) Assess the potential to improve fish habitat by managing releases to shift the equilibrium point upstream or downstream; and,
5) Prepare a sediment augmentation plan to approximately satisfy the downstream sediment deficit.

Term 24(b)(3) – Assess potential instream or streamside habitat restoration in relation to flow

CDFW COMMENT #22: The Term 24(b)(3) study plan description focuses on three potential habitat restoration actions:

1) spawning gravel augmentation in the Lower Santa Ynez River and Hilton Creek;
2) addition of large woody debris (LWD) or boulder clusters in the Lower Santa Ynez River and large tributaries; and,
3) installation of cattle exclusion fending in the Salsipuedes/El Jaro watershed.

Because the scope, scale and exact locations of these habitat restoration measures is not specified it is not clear how the implementation of these actions will to be assessed. CDFW recommends the Term 24(b)(3) study plan provide more specificity regarding these potential habitat restoration actions. Examples include; clarify the apparent inconsistencies regarding proposed gravel augmentation quantities as specified in Table 1 of the Lower Santa Ynez River Habitat Enhancement Plan (i.e., 200 tons per year, 2,800 pounds per year, versus 1,500 cubic yards per year); describe the prospective sizes of LWD and boulders to be installed relative to site-specific hydraulic and hydrologic conditions (e.g., channel width and slope, and discharge magnitude); clarify whether the proposed fencing excludes cattle from one or both sides of the river; clarify the location of fence endpoints and stream crossings; and, clarify the location of related cattle-watering facilities.

CDFW COMMENT #23: CDFW recommends the Term 24(b)(3) study plan identify gravel and cobble dispersal mechanisms, including active placement to restore bars and riffles; active injection during high river discharge events; and, strategic stockpiling for passive dispersal.

CDFW COMMENT #24: CDFW recommends the Term 24(b)(3) study plan identify the sources of augmented gravel.

CDFW COMMENT #25: CDFW recommends the Term 24(b)(3) study plan include a detailed monitoring plan that will quantify geomorphic and habitat responses in the river resulting from implementation of gravel augmentation.

CDFW COMMENT #26: CDFW recommends USBR include a discussion of the role of LWD in forming steelhead habitat in a Southern California river in the Term 24(b)(3) study plan. For more information, please see Thompson *et al.* (2007):

> *Thompson L. C., J. L. Voss, R. E. Larsen, W. D. Tietje, R. A. Cooper, and Peter B. Moyle. 2007. Role of Hardwood in Forming Habitat for Southern California Steelhead. General Technical Report PSW-GTR-19. Cooperative Extension, Integrated Hardwood Range Management Program, University of California, Berkeley. Available online at: https://www.fs.fed.us/psw/publications/documents/psw_gtr217/psw_gtr217_307.pdf*

CDFW COMMENT #27: In CDFW's previously submitted comment letters (see Attachment A-CDFW Comment Letters), CDFW stated that a number of studies have already been completed to assess and identify habitat in need of instream enhancements. CDFW recommends the Term 24(b)(3) study plan refer to the following studies for instream habitat enhancement:

> *Stoecker Ecological. 2004. Steelhead Migration Barrier Inventory and Recovery Opportunities for the Santa Ynez River, California. Available online at: http://stoeckerecological.com/reports/SantaYnezReport.PDF*
>
> *Block, H. and A. Francis. 2013. Santa Ynez River Watershed Report Final Report, May, 2013. Available online at: https://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/santa_ynez/nutrient/sy_watershed_report_may2013.pdf*

Term 24(b)(4) – Evaluate water quality issues that may impact steelhead

CDFW COMMENT #28: The assessment of water quality issues in the Term 24(b)(4) study plan is missing nutrient loading, a water temperature model, and details regarding specific methods and locations at which water quality parameters would be measured.

CDFW COMMENT #29: CDFW recommends the Term 24(b)(4) study plan evaluate water quality issues which may impact steelhead including, but not limited to, elevated temperatures, low dissolved oxygen, nutrient loading, and sediment transport. The Term 24(b)(4) study plan should also include potential measures to address these issues.

CDFW COMMENT #30: A water temperature model should be developed in the Term 24(b)(4) study plan to assess what flows are needed to maintain suitable water temperatures for steelhead from Bradbury Dam to the estuary.

CDFW COMMENT #31: The Term 24(b)(4) study plan should include the specific methods (including frequency, timing, and locations) at which the water quality parameters (water

temperature, dissolved oxygen, and fine sediments) would be measured. The Term 24(b)(4) study plan should also include standards used to evaluate the suitability of these water quality conditions to support all life stages of steelhead. Evaluation of existing water quality monitoring data should include records from all National Pollution District Elimination System (NPDES) for point waste discharges to the Santa Ynez River, data from the Total Maximum Daily Load (TMDL) studies, and standards for no-point waste discharges to the Santa Ynez River.

CDFW COMMENT #32: Additionally, the Term 24(b)(4) study plan for Term 24(b)(4) should address the expected effects of discharging State Water Project water into the Santa Ynez River on steelhead and designated critical habitat, including, but not limited, to juvenile steelhead olfactory-imprinting and rearing habitat conditions (e.g., water quality).

Term 24(b)(5) – Evaluate operational changes to Bradbury Dam that could improve steelhead conditions

CDFW COMMENT #33: The SWRCB's Order WR 2019-0148 now applies to operation of Bradbury Dam.

CDFW COMMENT #34: In addition to the water release provisions related to water supply (including groundwater recharge), the evaluation in the Term 24(b)(5) study plan should include flood control operations. the Term 24(b)(5) study plan should evaluate timing rate (cfs), and location of water that will be released into Hilton Creek under each operational scenario at Bradbury Dam. A review of NMFS' November 28, 2016, draft biological opinion for operation and maintenance of Bradbury Dam may assist USBR in finalizing this component of the Term 24(b)(5) study plan (NMFS 2016):

> *National Marine Fisheries Service. 2016. Draft Endangered Species Act Section 7(a)(12) Biological Opinion for the Operation and Maintenance of the Cachuma Project. November 28, 2016. Copy Available Upon Request.*

Term 24(b)(6) – Evaluate whether timing of 89-18 Water Rights releases should be revised

CDFW COMMENT #35: The Term 24(b)(6) study plan should include provisions for determining the effects of water releases on steelhead adult and juveniles. This should be done by setting up trapping or tagging and passive integrated transponder (PIT) tag arrays to identify movement of fish following water releases that occur outside of the normal rain cycle (e.g. late summer).

CDFW COMMENT #36: The Term 24(b)(6) study plan does not fully described the water releases from Bradbury Dam necessary to support downstream water rights in the Santa Ynez River (i.e., Order WR 89-18) and associated alluvial groundwater pumping.

CDFW recommends that Bradbury Dam water releases and associated alluvial groundwater pumping be fully described and related to the water operations stipulated in the SWRCB's Order WR 2019-0148. Specifically, this should include the evaluation of the effects of water releases on designated critical habitat for endangered steelhead. For this reason, the Term 24(b)(6) study plan should include an updated description that clearly and completely describes

the expected consequences of the authorized releases on freshwater rearing areas, freshwater spawning areas, and freshwater migration corridors.

Term 24(c)(1) – Evaluate effect of flows on habitat conditions to reduce predation and proliferation of nonnative species

CDFW COMMENT #37: The Draft Plan indicates that the Instream Flow Study identified above in Term 24(b) (i.e., IFIM) would be used to evaluate 1) habitat conditions for bass and other non-native species; and, 2) develop measures to curtail the proliferation on non-native species to reduce non-native populations.

CDFW recommends instead of the USFWS IFIM methodology for USBR to use the standard operating procedure for critical riffle analysis using CDFW's methodology (CDFW 2017a) be one appropriate method to assess habitat conditions for the non-migratory non-native species, and could be used in conjunction with the approach described above for the native, migratory steelhead of the Santa Ynez River.

CDFW COMMENT #38: CDFW recommends flows into the Lower Santa Ynez River associated with Lake Cachuma reservoir spills of Bradbury Dam should be also be evaluated.

Term 24(c)(2) – Evaluate Measures to prevent introduction/reintroduction of invasive species

CDFW COMMENT #39: The plan should evaluate methods to stop the release of non-native fish and invertebrates from Bradbury Dam including methods employed at Grizzly Valley Dam on Lake Davis.

CDFW COMMENT #40: This component identifies the principal sources of non-native species into the Lower Santa Ynez River (including Cachuma Reservoir), but does not acknowledge the populations of non-native fish and invertebrate species within the mainstem of the upper Santa Ynez River. As noted previously, the SWRCB has repeatedly indicated, the SWRCB's interest in and jurisdiction over, the public trust interests in the steelhead (and other public trust resources) of the Santa Ynez River, is not limited to the Lower Santa Ynez River, but also extends above Bradbury Dam.

CDFW COMMENT #41: CDFW recommends that measures to control non-native aquatic fish and invertebrate species must address all their sources to be effective. Prevention and control measures (including public education) must address the entire Santa Ynez River. Best management practices for the control of non-native include *using "large mesh" seines rather than "small mesh" seines to minimize adverse impacts to steelhead.*

Term 24(c)(3) – Evaluate effect of beaver dams on passage opportunities and distribution of steelhead

CDFW COMMENT #42: The Term 24(c)(3) study plan should include an evaluation of growth rates of steelhead found in beaver ponds vs. outside of beaver ponds. The study of invasive fish presence should also be included as part of this section.

CDFW COMMENT #43: Native beavers are not an invasive species that require additional studies in the Final Draft Order. Beavers have been a part of the Santa Ynez River ecosystem for the past 76 years (prior to construction of Bradbury Dam). Beaver dams have been shown to create holding habitat and benefit growths of salmonids. Additionally, beavers attenuate stream flows and provide instream complexity that is often missing in urban or agricultural areas. Studies regarding invasive fish species should be a priority for USBR.

CDFW COMMENT #44: CDFW recommends less attention on beaver studies and more resources directed to the non-native predatory species studies.

Term 24(c)(4) – Identify measures to reduce impacts on steelhead from beavers

CDFW COMMENT #45: Contrary to USBR's concerns of beavers, steelhead are not impacted by beavers. Lawsuits have stemmed from this issue. For example, on May 30, 2019 the Center for Biological Diversity filed a 60-Day Notice of Intent to Sue against the Wildlife Services Program (within the U.S. Department of Agriculture Animal and Plant Health Inspection Service), the USFWS and NMFS because they were in violation of Section 7 of the Endangered Species Act (FESA), 16 U.S.C. 1536, and the ESA 's consultation regulations, 50 C.C.R. Part 402. This is because programs to kill hundreds of beavers in California continued to do so without analyzing the impacts to endangered wildlife that use habitat created by beavers such as steelhead, tidewater goby and salmon. On July 30, 2019 the USFWS (Adkins 2019ab) agreed to complete an analysis of its "beaver damage management program" and will stop killing beavers in California's "critical habitats" of salmon and steelhead and several other endangered species until more research is performed.

Bouwes et al. (2016) completed a twenty-year study on how beaver dams and beaver dam analogs (BDAs) impact steelhead in the Columbia River Basin. Much of their data indicates a positive response towards increasing the quantity and quality of habitat needed by steelhead and more importantly "that neither beaver dams nor BDAs, are barriers to spawner or juvenile movement" (Bouwes et al. 2016; Pollock et al. 2012).

CDFW COMMENT #46: CDFW recommends that USBR review the following references to recognize the benefits of beaver dams:

Adkins, Collette L. 2019a. Notification of Violations of the Endangered Species Act and its Regulations Regarding APHIS-Wildlife Services' Beaver Killing and Dam Removal in California, Press Releases May 30, 2019. Available online at: https://biologicaldiversity.org/w/news/press-releases/lawsuit-launched-to-protect-endangered-california-salmon-harmed-by-federal-beaver-killing-2019-05-30/

Adkins, Collette L. 2019b. Notification of Violations of the Endangered Species Act and its Regulations Regarding APHIS-Wildlife Services' Beaver Killing and Dam Removal in California, Press Releases July 30, 2019. Available online at: https://biologicaldiversity.org/w/news/press-releases/legal-action-forces-trump-administration-curb-killing-california-beavers-2019-07-30/

Bouwes, N et al. 2016. Ecosystem experiment reveals benefits of natural and simulated beaver dams to a threatened population of steelhead (Oncorhynchus mykiss). Sci Rep. 6, 28581; doi: 10.1038/srep28581. Available online at:

https://www.researchgate.net/publication/304782958_Ecosystem_experiment_reveals_benefits_of_natural_and_simulated_beaver_dams_to_a_threatened_population_of_steelhead_Oncorhynchus_mykiss

Pollock, M.M., J.M. Wheaton, N. Bouwes, C. Volk, N. Weber, and C.E. Jordan. 2012. Working with beaver to restore salmon habitat in the Bridge Creek intensively monitored watershed: Design rationale and hypotheses. U.S. Dept. Commer., NOAA Tech. Memo. NMFS-NWFSC-120, 47 p. Available online at: https://www.nwfsc.noaa.gov/research/divisions/fe/documents/NMFS-NWFSC-120.pdf

CDFW COMMENT #47: CDFW asserts that beaver dam do not cause detrimental effects on fish passage. CDFW recommends more attention to be focused on Bradbury Dam operational changes and timing of releases. CDFW recommends that a complete analysis of the beaver damage management program be performed, since numerous studies show beavers benefit endangered steelhead by building ponds and increasing habitat for wildlife.

Figure 1. Flow Chart Depicting Interlinkages between Term 24 Studies

CDFW COMMENT #48: Operation of Bradbury Dam and WR89-19 timing play a role in the introduction of non-native fish and invertebrates into the Lower Santa Ynez River below Bradbury Dam and as such should be shown on the flow chart as having that connection.

CDFW COMMENT #49: The flow chart should also show the interconnection of the top tier studies with the Term 24(c) measures to prevent non-natives (see Attachment C- CDFW recommendations on Figure 1. Flow Chart).

Figure 2. Proposed Preliminary Scheduling, Deadlines, and Sequencing

CDFW COMMENT #50: Figure 2 identifies each study plan (i.e. Term 24(b)(4) Water Quality Study, etc.) that correlates with each Term (24) study plan. CDFW recommends USBR provide a full title to each study plan throughout the Draft Plan.

CDFW appreciates the opportunity to comment on the Draft Plan. CDFW looks forward to working with the USBR to plan and conduct crucial studies contained in the Final Order. These studies will provide critical information needed for the operation of Bradbury Dam that will achieve full public trust protection pursuant to Fish and Game Code section and the Public Trust Doctrine.

If you have questions regarding this letter and further coordination on these issues, please contact Mary Ngo, Senior Environmental Scientist (Specialist) at (562) 342-2140 and Mary.Ngo@wildlife.ca.gov.

Sincerely,

Erinn Wilson
Environmental Program Manager
South Coast Region

Enclosures:
ATTACHMENT A- CDFW Comment Letters
ATTACHMENT B- CDFW Engineering Comments
ATTACHMENT C- CDFW recommendations on Figure 1. Flow Chart

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State of California – Natural Resources Agency
DEPARTMENT OF FISH AND WILDLIFE
Office of The General Counsel
1416 Ninth Street, Room 1341
Sacramento, CA 95814
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EDMUND G. BROWN JR., Governor
CHARLTON H. BONHAM, Director

Public Comment
Cachuma Project Draft Order
Deadline: 12/9/16 12:00 noon

December 9, 2016

Jeanine Townsend
Clerk to the Board
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100

VIA EMAIL

Re: California Department of Fish and Wildlife (CDFW) Comments on Draft Order Amending the Bureau of Reclamation's Water Rights for the Cachuma Project (Draft Order)

Dear Ms. Townsend:

Enclosed are the general and specific comments of CDFW regarding the Draft Order. CDFW appreciates this opportunity to comment on the Draft Order and urges the State Water Resources Control Board (SWRCB) to adopt an Order amending the Bureau of Reclamation's (Bureau) water rights permits for the Cachuma Project without further delay or additional evidentiary hearings at this time.

CDFW's specific comments to the Ordering Sections of the Draft Order are attached as Attachment 1 to this letter.

CDFW participated in the evidentiary hearings in the Phase 2 of the SWRCB proceedings. As stated in our Closing Statement at the end of the evidentiary hearings *twelve years ago*, this Draft Order is a critical step in the SWRCB's administration of the Bureau's water rights permits for the Cachuma Project on the Santa Ynez River. *And*, the Draft Order should only be considered a first step in an ongoing adaptive management strategy. The Draft Order only requires flow supplementation in in wet and above normal water years. The slightly higher flows in only two water year types does not fulfill the SWRCB's obligation under the Public Trust Doctrine or Fish and Game Code section 5937 to keep fish in good condition. Instead, much of the success of the Draft Order will be determined by future studies, ongoing monitoring of the effectiveness of the terms and conditions in the Order and an ability to adapt to what that monitoring reveals about its effectiveness. The SWRCB must require studies of the terms and conditions of the Order, regular monitoring of the conditions in the riverand the effectiveness of the Order in mitigating impacts to the steelhead fishery and other public trust resources, and must reopen these permits in the near term future if the studies or monitoring demonstrate a need for an alternative flow release schedule or other non-flow conditions necessary to fully discharge its duty under the Public Trust Doctrine.

Additionally, it is absolutely vital that the SWRCB order the immediate commencement of a proper study of the feasibility of providing passage for steelhead around Bradbury Dam. The Draft Order did not clearly specify a time period in which a fish passage study must be commenced and when it must be completed. Similarly, the Draft Order allowed the Bureau to forego implementation of any tributary passage barrier and habitat restoration efforts in the revised project description. Additionally, the Draft Order allowed for *all other* studies, crucial to the success of determining what must be done to mitigate for the ruinous effect that the construction of Bradbury Dam has had on a formerly magnificent run of steelhead trout (*(Oncorhynchus mykiss)*, to be deferred pending the completion of the fish passage study, which could drag on for a decade or longer, without a specified end date. Deferring the start of *all other* studies is not biologically defensible or acceptable and tributary passage impediments must continue to be addressed while the feasibility of fish passage over or around Bradbury Dam is evaluated. The studies in the Draft Order must be done concurrently in order to better understand the effects of the terms and conditions of the Draft Order and to adaptively manage in the future. Again, the Draft Order is a step in the right direction of protecting public trust resources, but is not the final step. CDFW appreciates the SWRCB taking that step in better protecting public trust resources in the Santa Ynez River. Also, the studies required by the Draft Order will help inform the next step toward adequate protection of those public trust resources.

Because the Draft Order relies heavily on studies that will be done in the future by the Bureau in order to "improve the state of knowledge concerning the measures necessary to protect the steelhead fishery", many of CDFW's specific comments on Attachment 1 relate to the method and timing of "consultation" with CDFW. Improving the state of knowledge requires that studies be done in a scientifically justified way, with advance and ongoing input from CDFW and the National Marine Fisheries Service (NMFS). CDFW believes that its proposed edits to Section 11 of the Draft Order are necessary to producing the information that is critical to the success of further defining the next steps to be taken toward adequate protection of the steelhead fishery.

The Draft Order also excused the Bureau from implementing barrier fixes in tributaries below Bradbury Dam for steelhead passage, which would conflict with the requirements in the 2000 NMFS Biological Opinion. CDFW specific comments to Draft Order section 8(b) are designed to require improvements in downstream tributaries. It will take several years to complete the proposed fish passage study, as well as implement fish passage around Bradbury Dam, if found to be feasible. In the intervening years, steelhead still need access to the spawning, rearing and summer holding habitat in the principal tributaries of Salsipuedes, El Jaro, Quiota and Hilton Creeks. The SWRCB should require the Bureau to remove or modify several existing barriers in these tributaries, as these tributaries are currently maintaining the population within the Santa Ynez watershed.

In its Specific Comments, CDFW also recommends the deletion of Section 9 (c). Section 9(b) addresses instances in which CDFW or NMFS determines flows would harm the fishery and provides that in such instances, the Executive Director may reduce or terminate such flows. Proposed Section 9 (c) is duplicative and conflicting with Section 9 (b) in that it unilaterally allows Member Units to make an unspecified demonstration of harm to the fishery, without the procedural steps outlined in 9 (b). Section 9 (c) should be deleted to avoid unnecessary confusion and conflict with Section 9(b).

CDFW also recommends deletion of an element of a study described in Section 11(b) regarding beavers. Beavers have been a part of the Santa Ynez River ecosystem for the past 76 years (prior to construction of Bradbury Dam). Beaver dams have been shown to create holding habitat and benefit growth of salmonids. Additionally, beavers attenuate stream flows and provide instream complexity that is often missing in urban or agricultural area. Studies regarding invasive species should be a priority, and beavers here are not an invasive species that require additional studies in the Draft Order.

CDFW also encourages the SWRCB to increase its emphasis on monitoring in the Draft Order. Rather than a subsection, CDFW, in Attachment 1, recommends that monitoring be given its own section and be acknowledged for the important role that monitoring will take in this step toward improving the state of knowledge concerning the measures necessary to protect the steelhead fishery in the Santa Ynez River. A steelhead monitoring plan needs to assess the population status and trend for the Santa Ynez steelhead population. The plan should follow the California Coastal Salmonid Monitoring Plan (Adams et al. 2011) and provide data that will determine the viability of the steelhead population. The California Coastal Salmonid Monitoring Plan was developed by the Department of Fish and Wildlife and the National Oceanic and Atmospheric Administration's Science Centerand is being used by the Department and its partners to monitor coastal salmon and steelhead populations within the state. Toward that end, the Department has provided funding to various non-profit groups to provide training for entities conducting salmonid monitoring in the state. The California Coastal Salmonid Monitoring Plan provides standard protocols for assessing and monitoring populations of salmonids, and allows for consolidation of data from multiple sources for management purposes. The use of the California Coastal Salmonid Monitoring Plan in this Order will build on the existing COMB project as well as be able to combine their data, collected over the past 10 years, in trend analysis with new data. The use of the California Coastal Salmonid Monitoring Planhere will further cement the collaborative nature of the partnership that has been in effective of the past 12 years between CDFW, the Bureau, NMFS and the member units. It will also allow CDFW to more actively participate in survey design, on the ground data collection, and data analyses.

CDFW appreciates the opportunity to comment on the Draft Order, and acknowledges this important step the SWRCB is taking in adopting the long awaited changes to the Bureau's permits to operate the Cachuma Project. CDFW looks forward to working with

the Bureau, NMFS, the Member Units, and the SWRCB as these parties go forward and implement the interim conditions in the Draft Order, plan and conduct crucial studies contained in the Draft Order, and ultimately determine more permanent conditions for operation of the Cachuma Project that will achieve full public trust protection pursuant to Fish and Game Code section 5937 and the Public Trust Doctrine.

Sincerely,

Nancee M. Murray
Attorney IV
Office of the General Counsel

cc: Cachuma Project Evidentiary Hearings Service List (updated 09/07/2016)

Section of Draft Order	***Revisions***
11.8	The first sentence should be revised to read: ...set forth at pages 71-72, and the Terms and Conditions, set forth at pages 72-82...
11.8b	The language should be revised to read: Nothwithstanding the foregoing, rightholder shall be required to implement tributary passage impediment and barrier fixes as described herein Quiota Creek (four road crossings) and Hilton Creek (Highway 154).
11.8c	The language should be revised to read: The State Water Board reserves authority to modify this term based on any major modification to the 2000 Biological Opinion. Any modification to this term shall be made in accordance with section 780 of title 23 of the California Code of Regulations.
11.9	New language should be added below Table 2: During Below Normal, Dry and Critical Years, rightholder shall release or bypass water in accordance with the 2000 Biological Opinion, or any revised Biological Opinion that may be issued by NMFS.
11.9c	The following language should be deleted: ~~The Executive Director may terminate the requirement to meet the Table 2 Flows, or may allow a reduction in the flows required, if CDFW, NMFS, rightholder, or Member Units demonstrate to the Executive Director's satisfaction that the flows will not benefit the fishery or are likely to harm the fishery~~.
11.9e	The first sentence should be revised to read: If CDFW or NMFS directs a change to the schedule of Table 2 Flows pursuant Paragraph 9d, but...
11.9g	A new subsection should be added as Section 9g and should read as follows: If after 6 years after implementation of Table 1 and 2 the steelhead population has not reached the minimum requirements outlined below, the Board will reopen Permits 11308 and 11310 to determine what alternative flow releases are necessary to comply with the Public Trust Doctrine and Fish and Game Code 5937. For the six year period: 1) With less than three wet or above average water year types (and when the lagoon is open/passable), the average returning adult spawners must be nine and the average number of outmigrating smolts must be at least 12,000. 2) With three or greater wet or above average water year types (and when the lagoon is open/passable), the average returning adult spawners must be at least fifteen and the average number of outmigrating smolts must be at least 18,000.
11.11	The first sentence should be revised to read: To determine the measures necessary to protect the public trust resources of the Santa Ynez River, the rightholder shall conduct the following studies after consultation with CDFW and NMFS. New language should be added after the first paragraph of Section 11 to read as follows: For all draft and final reports and studies required by this Paragraph and Order, the rightholder shall consult with CDFW and NMFS. For the purpose of this Order, consultation shall include, but is not limited to: within 30 business days of adoption of this order, the rightholder shall contact and schedule ongoing and regular consultation

	meetings with CDFW and NMFS. Upon completion of any study plan component (draft or final), the rightholder shall transmit the study plan to CDFW and NMFS. The rightholder shall provide CDFW and NMFS with at least a 30 business day comment period on the study plan prior to submittal to the Deputy Director. This 30 business day comment period shall apply to any draft, final or revised study plan and any draft, final or revised report or submission to the Deputy Director that may add to the record. Rightholder must include in any study plan submission to the Deputy Director, CDFW or NMFS comments and provide an explanation of how the document information was changed based on those comments or provide an explanation of the rightholder's reasons for not incorporating changes based on comments from CDFW and/or NMFS. At the first of these consultation meetings, the rightholder, CDFW and NMFS shall create a detailed study plan schedule. There are multiple components to the study plan schedule that will require individual studies resulting in data necessary to evaluate fish in good condition. After consultation with CDFW and NMFS, the rightholder must submit a study plan schedule to the Deputy Director within 120 business days from the date of this Order. In addition to the regular ongoing meetings, the rightholder shall hold an annual meeting with CDFW and NMFS during the period of time that studies described in this Order are being conducted. The annual meeting will be held in July, unless a different date is mutually agreed upon in writing. At the annual meeting, the rightholder must present data collected in the previous year, report progress on each study identified in the study plan schedule, and report projected work and schedule for the following year. All studies and reports described in this Order, unless specifically noted otherwise, must be completed within 3 years from the date of this Order.
11.11b(1)	The following language should be deleted: ~~Based on the significant potential benefit of providing passage around Bradbury Dam, it may be possible to defer the remaining studies pending completion of the passage study. If passage is feasible and likely to achieve good condition of the steelhead fishery, the remaining study requirements may continue to be deferred pending implementation of measures that provide passage around Bradbury Dam and monitoring to determine whether good condition of the fishery is likely to be achieved.~~
11.11b(2)	The language should be revised to read: Rightholder shall develop and conduct an Instream Flow Incremental Methodology (IFIM) study. In addition to the IFIM study, rightholder shall 1) evaluate water quality, including but not limited to temperature, dissolved oxygen, nutrient loading and sediment; and 2) an evaluation of channel morphology and sediment transfer, including but not limited to stream bank stability, incision rates, and perched tributaries. The study shall evaluate channel incision (including effects on tributary access) due to the impoundment of sediment behind Bradbury Dam, as well as the direct and indirect effects on channel morphology, fish and wildlife, and appropriate beneficial uses. The evaluation shall include a

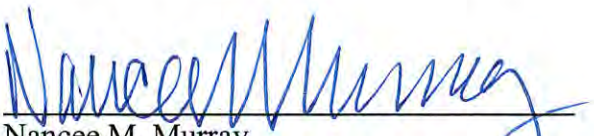
	recommendation and timeline to remediate direct and indirect impacts from the impoundment of sediment behind Bradbury Dam, as well as potential operational changes to facilitate sediment movement through or around the dam, and improve or sustain water quality levels. The studies required in this subsection will help to determine flows and non-flow conditions necessary to keep the Santa Ynez River steelhead fishery in good condition at the individual, population and community level.
11.11b(3)	The second sentence should be deleted as follows: ~~In addition, the study shall determine the effects of beaver dams on passage opportunities and distribution of steelhead and measures that could be implemented to reduce the impacts on steelhead in the river.~~
11.11b(4)	The language should be revised to read: ...Rightholder shall conduct a study that evaluates stream and streamside habitat restoration and habitat improvements that could be completed to improve steelhead conditions in the lower Santa Ynez River watershed in addition to the Table 2 Flows, including but not limited to fixing impediments and barriers to passage or providing passage upstream and downstream of Bradbury Dam.
11.11c	Add the following language to the first sentence: ...4) <u>timelines for submitting drafts to CDFW and NMFS for comment</u>... and 5) the proposed deadlines for submitting the completed reports to the Deputy Director that describe the studies and their results. The following language should be deleted: ~~Rightholder shall consult with CDFW and NMFS regarding the development and scope of the study plan as well as each individual study. Within 180 days from the date of this order, rightholder shall submit a study plan to the Deputy Director for the Deputy Director's review and approval. The Deputy Director may direct the rightholder to make any changes to the study plan necessary to ensure a timely and meaningful evaluation of the measures necessary to protect public trust resources in the Santa Ynez River. In addition, The Deputy Director may require the rightholder to conduct the studies in phases, or to refine or augment the studies based on the results of an earlier phase. Righholder shall make any changes to the study plan that the Deputy Director requires within the period that the Deputy Director specifies and shall conduct and report on the studies in accordance with the approved study plan. The Deputy Director may require updates and revisions to the study plan as studies are completed and new information is available.~~
11.12	The language should be revised to read: Right holder shall: Maintain a continuous record of the daily instream flows and flow depths in the Santa Ynez River at Highway 154 and at Alisal Road, Salsipuedes Creek, and other sites that the Deputy Director deems suitable, sufficient to document compliance with the terms of this permit. The continuous record of the daily stream flows and flow depths shall be made available <u>daily</u> on a publicly accessible website. The following language should be deleted: ~~2) Implement the monitoring program described in the revised Biological Assessment~~

	~~(2000) to evaluate steelhead and their habitat within the lower Santa Ynez River. The monitoring program shall be implemented regardless of which flow requirements are in effect. The Deputy Director may amend the monitoring requirements to require additional monitoring or refine existing requirements.~~
11.13	A new section 13 should be added to the Order that specifically addresses the monitoring program: The new section 13 should read as follows: Implement the monitoring program described in the revised Biological Assessment (2000) with the inclusion of components from the CDFW Coastal Monitoring Program (Adams et. al. 2011) necessary to develop at least one life cycle monitoring station to evaluate steelhead and their habitat within the lower Santa Ynez River. This includes biweekly red surveys for steelhead during the winter spawning season as well as the development of a steelhead movement study during summer and fall. A PIT tag study must also be done to assess freshwater productivity. Smolt production must be evaluated by mark – recapture at the weir traps. The rightholder will establish a Biological Advisory Committee (BAC) composed of the rightholder, CDFW, NMFS and USFWS. The function of the BAC will be to advise the rightholder on implementation of the monitoring program. The monitoring program shall be implemented regardless of which flow requirements are in effect. The BAC will meet annually in July to review all steelhead and habitat monitoring data collected in the previous twelve month period, the summary analysis and trend for all previous year data collections as well as discuss the upcoming year's monitoring studies. Additional meetings will be scheduled based upon the need to evaluate new information. The Deputy Director may amend the monitoring requirements to require additional monitoring or refine existing requirements.

CERTIFICATE OF SERVICE

I hereby certify that I have on this day electronically filed the foregoing California Department of Fish and Wildlife's Comments on the Draft Order Amending the Bureau of Reclamations Water Rights for the Cachuma Project with the State Water Resources Control Board (CDFW Comments). I have also electronically filed the same CDFW Comments to the Cachuma Project Evidentiary Hearings Service List, last updated on 09/07/2016.

Dated this 9th day of December, 2016



Nancee M. Murray
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

May 29, 2019

Ms. Jeanine Townsend
Clerk of the Board
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100
commentletters@waterboards.ca.gov

Subject: California Department of Fish and Wildlife (CDFW) Comments on Revised Draft Order Amending the Bureau of Reclamation's Water Rights Permits 11308 and 11310 for the Cachuma Project (Revised Draft Order)

Dear Ms. Townsend:

Enclosed are CDFW comments regarding the Revised Draft Order amending the Bureau of Reclamation's (Bureau) Water Rights Permits 11308 and 11310 for the Cachuma Project (Revised Draft Order). CDFW appreciates this opportunity to comment on the Revised Draft Order and urges the State Water Resources Control Board (SWRCB) to adopt a Final Order amending the Bureau's water rights permits for the Cachuma Project without further delay or additional evidentiary hearings at this time.

CDFW appreciates SWRCB incorporating several of our comments from our December 9, 2016 comment letter. The Revised Draft Order takes steps forward to improve protection of public trust resources in the Santa Ynez River. CDFW recommends that SWRCB incorporate the remaining CDFW comments in the Final Order. These additional revisions and clarifications of the terms are needed for the SWRCB to fully discharge its duty under the Public Trust Doctrine. CDFW's comments to the Ordering Sections of the Revised Draft Order are attached as Attachment 1 to this letter.

As trustee for the state's fish and wildlife resources, CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable population of such species. In that capacity, CDFW administers California Endangered Species Act (CESA) and other provisions of the California Fish and Game Code that afford protection to the state's fish and wildlife resources.

It is CDFW's goal and responsibility to protect and maintain viable populations of fish and wildlife resources throughout the state. Species and watershed protection, providing fishery access to headwater reaches, and providing adequate instream flows for all life stages of fishery resources are focal points of CDFW's efforts to retain native populations of fish and wildlife.

The Revised Draft Order only requires flow supplementation in wet and above normal years. The wet and above normal year flows do not fulfill the SWRCB's obligation under the Public Trust Doctrine or Fish and Game Code section 5937 to keep fish in good condition. CDFW recommends that the Revised Draft Order direct the release or bypass of water during below normal, dry, and critical years in accordance with the 2000 Biological Opinion or any revised

Biological Opinion that may be issued by National Marine Fisheries Service (NMFS). CDFW also recommends that Section 5.3.3.5. (pg. 89-90) include dry and normal rain years in the Revised Draft Order to avoid impacts to steelhead from lack of fish passage and access to habitat above Bradbury Dam.

The Revised Draft Order allows the Bureau to forego implementation of any tributary passage barrier and habitat restoration efforts and excused (Term 15.b. pg.133) the Bureau from implementing barrier fixes in tributaries below Bradbury Dam for steelhead passage that would conflict with the requirements in the 2000 NMFS Biological Opinion. CDFW's specific comments to the Revised Draft Order Term 15.b. (Pg. 133) are designed to require improvements in downstream tributaries.

As a result of extended drought and wildfires, steelhead in southern California have been severely impacted in the past 9 years. As stated in the FEIR, over-summering rearing habitat, water quality, the amount of physical space available, and passage opportunities are limiting factors for steelhead populations in the Santa Ynez River. (FEIR, Vol. II, p. 4.7-45, FEIR, Vol. III, Appendix C, 1999 Biological Assessment, p. 2-34; MU-226, p. 9.) Without access to habitat above Bradbury Dam, at a minimum, more habitat will need to be provided below Bradbury Dam to improve the steelhead population's condition. CDFW recommends that Term 15.c. require the implementation of habitat restoration projects identified in readily available public documents (i.e., Steelhead Migration Barrier Inventory and Recovery Opportunities for the Santa Ynez River, California 2004[1], Santa Ynez River Watershed Report Final Report: May, 2013[2]) within two years of the Final Order.

CDFW recommends that the SWRCB require the Bureau to restore passage upstream of Bradbury Dam to mitigate for steelhead population decline and impacts associated with inaccessible upstream steelhead habitat that can support essential life history functions to reduce extirpation in the Santa Ynez River watershed.

CDFW recommends updating Table A (pg. 25) to include foothill yellow-legged frog (*Rana boylii*) a species that was designated as a state candidate for listing on June 21, 2017[3]. During CESA candidacy, a species is afforded protections as a listed species and "take[4]" is prohibited unless authorized by CDFW pursuant to Fish and Game Code section 2080.1, 2081, subdivision (a) or (b), 2089.6, or 2835, or by the Commission pursuant to Fish and Game Code section 2084.

Term 24 (c) should be amended to delete the element regarding beavers. Beavers have been a part of the Santa Ynez River ecosystem for the past 76 years (prior to construction of Bradbury Dam). Beaver dams have been shown to create holding habitat and benefit growths of salmonids. Additionally, beavers attenuate stream flows and provide instream complexity

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[1] Stoecker, M.W. 2004. Steelhead Migration Barrier Inventory and Recovery Opportunities for the Santa Ynez River, Ca. http://stoeckerecological.com/reports/SantaYnezReport.PDF

[2] Block, H. and Francis,A. 2013. Pacific State Marine Fisheries Commission and California Department of Fish and Wildlife. Santa Ynez River Watershed Report: May 2013 https://www.waterboards.ca.gov/centralcoast/water_issues/programs/tmdl/docs/santa_ynez/nutrient/sy_watershed_report_may2013.pdf

[3] California Department of Fish and Wildlife. Considerations for Conserving the Foothill Yellow-Legged Frog https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=157562&inline

[4] California Fish and Game Code. Pursuant to Fish and Game code section 86, "'take'" means hunt, pursue, catch, capture, or kill or attempt to hunt, pursue, catch, capture, or kill."

that is often missing in urban or agricultural areas. Studies regarding invasive fish species should be a priority for the Bureau, and beavers here are not an invasive species that require additional studies in the Revised Draft Order.

CDFW recommends that a detailed description of a consistent and repeatable monitoring methodology be included in the monitoring plan. The methodology should be able to accurately characterize instream and riparian habitats and distinguish between steelhead, rainbow trout, smolt, migrant fish, and resident fish. A steelhead monitoring, and adaptive management plan needs to assess the population status and trend for the Santa Ynez River steelhead population. The plan should follow the 2011 California Coastal Salmonid Population Monitoring Plan[5] and provide data that will determine the viability of the steelhead population. The 2011 California Coastal Salmonid Population Monitoring Plan was based on Fish Bulletin 180[3] and has identified appropriate sampling protocols that were developed by CDFW and NMFS which includes recent scientific studies that have not been identified in the 2000 Biological Opinion.

The Revised Draft Order states that there is no evidence of record that the City of Santa Barbara's desalination facility is in operation (pg. 86 and 114). The City of Santa Barbara's desalination facility has been in operation since 2017 and has a potential capacity of 10,000 acre-feet a year (AFY), but currently produces 3,125 AFY[6]. CDFW recommends that the SWRCB take official notice of the existence and operation of the City of Santa Barbara's desalination facility and that the final order reflect the desalination facility's 10,000 AFY capacity in the water supply and impacts analysis.

CDFW appreciates the opportunity to comment on the Revised Draft Order and acknowledges this important step the SWRCB is taking in adopting the long-awaited changes to the Bureau's permits to operate the Cachuma Project. CDFW looks forward to working with the Bureau, NMFS, the City of Santa Barbara, Goleta Water District, Montecito Water District, Carpinteria Valley Water District, and the Santa Ynez River Water Conservation District, Improvement District No. 1 (the Member Units), and the SWRCB as these parties go forward and implement the interim conditions in the Revised Draft Order, plan and conduct crucial studies contained in the Draft Order, and ultimately determine more permanent conditions for operation for the Cachuma Project that will achieve full public trust protection pursuant to Fish and Game Code section and the Public Trust Doctrine.

If you have questions regarding this letter and further coordination on these issues, please contact Mary Ngo at (562) 342-2140 and Mary.Ngo@wildlife.ca.gov.

Sincerely,

Erinn Wilson
Environmental Program Manager

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[5] Adams, P.B., Boydstun, L.B, Gallagher, S.P., Lacy, M.K., McDonald, T., Shaffer, K.E. 2011. California Coastal Salmonid Population Monitoring: Strategy, Design, and Methods. https://www.calfish.org/ProgramsData/ConservationandManagement/CaliforniaCoastalMonitoring.aspx and https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=30284

[6] City of Santa Barbara https://www.santabarbaraca.gov/gov/depts/pw/resources/system/sources/desalination/default.asp

cc: Cachuma Project Evidentiary Hearings Service List (updated 03/26/2019)

ec: CDFW
Erinn Wilson, EPMI (Los Alamitos)
Randy Rodriguez, SES-Supervisory (Los Alamitos)
Mary Larson, SES-Supervisory (Los Alamitos)
Mary Ngo, SES-Specialist (Los Alamitos)
Nancee Murray, Attorney IV (Sacramento)

Section 11 of Revised Draft Order	***Requested Revisions***
15, Pg. 132	The language should be revised to read: Except as otherwise provided in this term and in term 16 below, right holder shall operate and maintain the Cachuma Project and implement conservation measures including but not limited to those described in Revised Section 3 (Proposed Project) of the Biological Assessment for Cachuma Project Operations and the Lower Santa Ynez River, June 2000, and right holder shall comply with all of the Reasonable and Prudent Measures 5 and 7 through 13, set forth at page 68, and the Terms and Conditions, set forth at pages 70–78, in the National Marine Fisheries Service's (NMFS) Biological Opinion: U.S. Bureau of Reclamation operation and maintenance of the Cachuma Project on the Lower Santa Ynez River in Santa Barbara County, California, September 2000 (2000 Biological Opinion). To prevent any conflicting requirements upon issuance of any new Biological Opinion, the State Water Board's Executive Director (Executive Director) may modify this term upon request of right holder after receiving the approval of NMFS. Any modification to this term shall be made in accordance with section 780 of title 23 of the California Code of Regulations <u>and in compliance with any new Biological Opinion</u>.
15, Pg. 132-133	Previous language should be added back into Term in the Revised Draft Order and should be updated to read: <u>The State Water Board reserves authority to modify this term based on any modification to the 2000 Biological Opinion or any revised or subsequent Biological Opinion that may be issued by NMFS.</u>
15.c., Pg. 133	The language should be revised to read: Right holder<u>, in coordination with NMFS and CDFW,</u> shall proceed with rescue efforts within a period necessary to prevent steelhead mortality following any flow interruption of the Hilton Creek Watering System. Right holder shall post all flow interruptions of the Hilton Creek Watering System and rescue efforts on a publicly accessible website. <u>Right holder shall begin implementation of habitat restoration projects identified in readily available public documents (i.e. Steelhead Migration Barrier Inventory and Recovery Opportunities for the Santa Ynez River, California 2004, Santa Ynez River Watershed Report Final Report: May, 2013) within two years of the order.</u>
16.b., Pg. 134	New language should be added below Table 2: <u>During Below Normal, Dry and Critical Years, right holder shall release or bypass water in accordance with the 2000 Biological Opinion, or any revised or subsequent Biological Opinion that may be issued by NMFS.</u>

16.g., Pg. 135	A new paragraph should be added as Term 16.g. and should read as follows: If after 6 years after implementation of Table 1 and Table 2 the steelhead population has not reached the minimum requirements outlined below, the Board will reopen Permits 11308 and 11310 to determine what alternative flow releases are necessary to comply with the Public Trust Doctrine and Fish and Game Code 5937. For the six-year period: 1) With less than three wet or above average water year types (and when the lagoon is open/passable), the average returning adult spawners must be nine and the average number of out-migrating smolts must be at least 12,000. 2) With three or greater wet or above average water year types (and when the lagoon is open/passable), the average returning adult spawners must be at least fifteen and the average number of out-migrating smolts must be at least 18,000.
17, Pg. 136-137	Three new paragraphs should be added after Term 17.1 to read as follows: At the first of these consultation meeting, the right holder, CDFW and NMFS shall create a detailed study plan schedule. There are multiple components to the study plan schedule that will require individual studies resulting in data necessary to evaluate fish in good condition. After consultation with CDFW and NMFS, the right holder must submit a study plan schedule to the Deputy Director within 120 business days from the date of this Order. All studies and reports described in this Order, unless specifically noted otherwise, must be completed within 3 years from the date of this Order.
17.(5), Pg. 136-137	The language should be revised to read: In addition to the regular ongoing meetings, right holder shall establish a Biological Advisory Committee (BAC) composed of the right holder, CDFW, NMFS and USFWS and shall hold an annual meeting ~~during each year that studies described in this Order are being conducted~~. The function of the BAC will be to advise the right holder on the studies and on implementation of the monitoring program. The annual meeting will be held in July, unless a different date is mutually agreed upon in writing. At the annual meeting, right holder must present data collected in the previous year and report progress on each study identified in the approved study plan and compliance with this Order. Each meeting also shall consist of reviewing all steelhead and habitat monitoring data collected in the previous twelve-month period, the summary analysis and trend for all previous year data collections as well as discussing the upcoming year's monitoring studies. Additional meetings shall be scheduled based upon the need to evaluate new information.
24.b.(2),	The language should be revised to read:

Pg. 140	Assess the flow conditions necessary to ensure hydrologic connectivity and opportunities for movement between the habitats needed by each stage of the steelhead life cycle, including tributary access, and appropriate channel morphology and sediment transfer, including, but not limited to, stream bank stability, channel incision rates, and perched tributaries that will provide sufficient habitat to keep steelhead in good condition;
24.b.(3), Pg. 140	Term 24.b.(3) should be deleted. A number of studies have already been completed to assess the habitat which has identified needed instream enhancements. The Revised Draft Order should require coordination with CDFW and NMFS and refer to the following studies for implementation: Steelhead Migration Barrier Inventory and Recovery Opportunities for the Santa Ynez River, California (2004) and Santa Ynez River Watershed Report Final Report: May, 2013.
24.b.(4), Pg. 140	The language should be revised to read: Evaluate water quality issues that may impact steelhead including, but not limited to, elevated temperatures, low dissolved oxygen, nutrient loading, and sediment transport and potential measures to address these issues;
24.b.(1) to 24.b.(6), Pg. 140-141	A new subparagraph should be added in Term 24.b to read as follows: Evaluate channel incision (including effects on tributary access) due to the impoundment of sediment behind Bradbury Dam, as well as the direct and indirect effects on channel morphology, fish and wildlife, and appropriate beneficial uses. The evaluation shall include a recommendation and timeline to remediate direct and indirect impacts from the impoundment of sediment behind Bradbury Dam, as well as potential operational changes to facilitate sediment movement through or around the dam, and improve or sustain water quality levels.
24.c., Pg. 141	The third sentence should be deleted as follows: Study and evaluate the effects of predation, particularly by piscivorous (fish-eating) fish, and nonnative species on steelhead in the Santa Ynez River, and measures that could be implemented to reduce the impacts of those species on steelhead in the river. The study shall specifically evaluate the effects of flows, including but not limited to Table 2 Flows, on supporting habitat conditions that reduce predation and the proliferation of nonnative fish species, as well as reasonable measures to prevent the introduction or reintroduction of invasive fish species. ~~In addition, the study shall determine the effects of beaver dams on passage opportunities and distribution of steelhead and measures that could be implemented to reduce any impacts on steelhead in the river from beavers.~~
26, Pg. 141	The language should be revised to read:

	Right holder shall implement the monitoring program described in the 2000 Revised Biological Assessment or any revised or subsequent Biological Opinion that may be issued by NMFS with consideration of other existing monitoring programs including the California Coastal Salmonid Monitoring Plan to develop at least one life cycle monitoring station to evaluate steelhead and their habitat within the lower Santa Ynez River. This includes biweekly redd (nest) surveys for steelhead during the winter spawning season as well as the development of a steelhead movement study during summer and fall. A passive integrated transponder (PIT) tag study must also be done to assess freshwater productivity. Smolt production must be evaluated by mark – recapture at the weir traps. The monitoring program shall be implemented regardless of which flow requirements are in effect. The Deputy Director may amend the monitoring requirements to require additional monitoring or refine existing requirements.

Cachuma Project Evidentiary Hearing

UPDATED SERVICE LIST
(March 26, 2019)
Corrected for typographical errors

The parties whose email addresses are listed below agreed to accept electronic service, pursuant to the rules specified in the hearing notice.

Cachuma Conservation Release Board Mr. Kevin O'Brien Downey Brand LLP 621 Capitol Mall, Floor 18 Sacramento, CA 95814 kobrien@downeybrand.com nbigley@downeybrand.com pcantle@ccrb-board.org *updated 02/25/2019*	City of Solvang Mr. Christopher L. Campbell Baker, Manock & Jensen 5260 N. Palm Avenue, Suite 421 Fresno, CA 93704 ccampbell@bakermanock.com *updated 07/29/2011*
Santa Ynez River Water Conservation District, Improvement District No. 1 Mr. Paeter Garcia 3622 Sagunto St. Santa Ynez, CA 93460 pgarcia@syrwd.org Mr. Steve M. Anderson Best Best & Krieger LLP 3390 University Avenue, 5th Floor Riverside, CA 92501 steve.anderson@bbklaw.com *updated 03/09/2018*	City of Lompoc Mr. Nicholas A. Jacobs Somach, Simmons & Dunn 500 Capitol Mall Suite 1000 Sacramento CA 95814 njacobs@somachlaw.com *updated 01/06/2014*
Santa Ynez River Water Conservation District Mr. Steven M. Torigiani Law Offices of Young Wooldridge, LLP 1800 30th Street, 4th Floor Bakersfield, CA 93301 storigiani@youngwooldridge.com *updated 02/26/19*	California Trout, Inc. Ms. Linda Krop Ms. Maggie Hall Ms. Tara Messing Environmental Defense Center 906 Garden Street Santa Barbara, CA 93101 lkrop@environmentaldefensecenter.org mhall@environmentaldefensecenter.org tmessing@environmentaldefensecenter.org *updated 03/08/2018*

Cachuma Project Evidentiary Hearing

UPDATED SERVICE LIST
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County of Santa Barbara Mr. Michael C. Ghizzoni, County Counsel Ms. Johannah Hartley, Deputy 105 E. Anapamu Street Santa Barbara, CA 93101 jhartley@co.santa-barbara.ca.us *updated 03/09/2018*	U.S Bureau of Reclamation Ms. Amy Aufdemberge 2800 Cottage Way, Room E-1712 Sacramento, CA 95825 Fax (916) 978-5694 AMY.AUFDEMBERGE@sol.doi.gov *updated 08/12/16*
California Department of Fish and Wildlife Ms. Nancee Murray Senior Staff Counsel 1416 Ninth Street, 12th Floor Sacramento, CA 95814 Nancee.Murray@wildlife.ca.gov *updated 08/15/2016*	Bureau of Reclamation, Mid-Pacific Region Mr. Michael Jackson Area Manager South-Central California Area Office 1243 N Street Fresno, CA 93721-1813 mjackson@usbr.gov
Montecito Water District Mr. Robert E. Donlan Ellison, Schneider & Harris L.L.P. 2600 Capitol Avenue, Suite 400 Sacramento, CA 95816 red@eslawfirm.com	Santa Barbara County CEO's Office Ms. Terri Maus-Nisich, Assistant CEO 105 E. Anapuma Street, 4th Floor Santa Barbara, CA 93101 tmaus@co.santa-barbara.ca.us *updated 09/07/2016*

The parties listed below did not agree to accept electronic service, pursuant to the rules specified by this hearing notice.

NOAA Office of General Counsel Southwest Region Mr. Dan Hytrek 501 West Ocean Blvd., Suite 4470 Long Beach, CA 90802-4213 Dan.Hytrek@noaa.gov *updated 05/13/2011*	

State of California – Natural Resources Agency
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GAVIN NEWSOM, Governor
CHARLTON H. BONHAM, Director

September 13, 2019

Ms. Jeanine Townsend
Clerk of the Board
State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100
commentletters@waterboards.ca.gov

Subject: California Department of Fish and Wildlife (CDFW) Comments on Final Draft Order Amending the Bureau of Reclamation's Water Rights Permits 11308 and 11310 for the Cachuma Project (Final Draft Order)

Dear Ms. Townsend:

CDFW appreciates this opportunity to comment on the Proposed Resolution and encourages the State Water Resources Control Board (SWRCB) to adopt the Final Draft Order amending the Bureau's water rights permits for the Cachuma Project on September 17, 2019 without further delay or additional evidentiary hearings at this time.

CDFW appreciates that the Final Draft Order takes steps forward to improve protection of public trust resources in the Santa Ynez River with modifications to various draft orders to require fish passage feasibility studies to pass around or over Bradbury Dam. We appreciate the steps towards the improved flow releases for above normal and wet and also releases for summer habitat maintenance. However, CDFW has concerns that it doesn't address normal and dry year releases and doesn't address free passage of adult steelhead from the ocean and their subsequent return and that of smolt passing to the ocean is still restricted by the current proposed flow regime.

As trustee for the state's fish and wildlife resources, CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable population of such species. In that capacity, CDFW administers California Endangered Species Act (CESA) and other provisions of the California Fish and Game Code that afford protection to the state's fish and wildlife resources.

It is CDFW's goal and responsibility to protect and maintain viable populations of fish and wildlife resources throughout the state. Species and watershed protection, providing fishery access to headwater reaches, and providing adequate instream flows for all life stages of fishery resources are focal points of CDFW's efforts to retain native populations of fish and wildlife.

CDFW requests that CDFW's following comments on the Table 2 Flows in the Final Draft Order be formally recorded.

- CDFW has provided recommendations in previous draft orders to direct the release or bypass of water during below normal, dry, and critical years in accordance with the 2000 Biological Opinion or any revised Biological Opinion that may be issued by

National Marine Fisheries Service (NMFS). The Final Draft Order only requires flow supplementation in wet and above normal years. The wet and above normal year flows do not fulfill the SWRCB's obligation under the Public Trust Doctrine or Fish and Game Code section 5937 to keep fish in good condition. CDFW has provided recommendations that the Final Draft Order include dry and normal rain years to avoid impacts to steelhead from lack of fish passage and access to habitat above Bradbury Dam.

- Beavers have been a part of the Santa Ynez River ecosystem for the past 76 years (prior to construction of Bradbury Dam). Beaver dams have been shown to create holding habitat and benefit growths of salmonids. Additionally, beavers attenuate stream flows and provide instream complexity that is often missing in urban or agricultural areas. Studies regarding invasive fish species should be a priority for the Bureau, and beavers here are not an invasive species that require additional studies in the Final Draft Order

CDFW appreciates the opportunity to comment on the Final Draft Order and acknowledges this important step the SWRCB is taking in adopting the long-awaited changes to the Bureau's permits to operate the Cachuma Project. CDFW looks forward to working with the Bureau, NMFS, the City of Santa Barbara, Goleta Water District, Montecito Water District, Carpinteria Valley Water District, and the Santa Ynez River Water Conservation District, Improvement District No. 1 (the Member Units), and the SWRCB as these parties go forward to plan and conduct crucial studies contained in the Draft Order, and ultimately determine more permanent conditions for operation for the Cachuma Project that will achieve full public trust protection pursuant to Fish and Game Code section and the Public Trust Doctrine.

If you have questions regarding this letter and further coordination on these issues, please contact Mary Ngo at (562) 342-2140 and Mary.Ngo@wildlife.ca.gov.

Sincerely,

Erinn Wilson
Environmental Program Manager

cc: Cachuma Project Evidentiary Hearings Service List (updated 06/10/2019)

ec: CDFW
Mary Larson, SES-Supervisory (Los Alamitos)
Mary Ngo, SES-Specialist (Los Alamitos)
Nancee Murray, Attorney IV (Sacramento)

ATTACHMENT B- CDFW Engineering Comments

CDFW Engineering Comments on Jan 2020 BOR draft plan:

Study plans should be developed and submitted to NMFS and CDFW for review and approval prior to initiation of the studies. See CDFW (2017a) for an example of the appropriate level of detail that should be included in the study plans.

Term 24(b)(1):

1. The role of streamflow in the life history of anadromous *O. mykiss* is complex, but can be divided into two basic categories: 1) creation and maintenance of essential freshwater habitat, principally for spawning and rearing, and 2) providing opportunities for migratory behavior (both seasonal upstream migration and downstream emigration) of both adults and juveniles in moving between the marine and freshwater habitats.
2. The draft plan proposes to use the Instream Flow Incremental Methodology (IFIM) developed by the U.S. Fish and Wildlife Service to identify and evaluate appropriate flow conditions for adult and juvenile steelhead in the lower Santa Ynez River. This methodology is a standard method for determining instream flow needs for fish and wildlife, but was not intended to assess the flow requirements for anadromous fishes whose life cycle involves moving long distances between the freshwater and marine environment, and is therefore not an appropriate or adequate methodology to satisfy Term 24(b)(1).
3. The magnitude of upstream and downstream passage flows should be assessed using the methods in CDFW (2017b). In this regard, the previously conducted instream flow studies evaluating migration flow requirements are not consistent with the methods in CDFW (2017b), and thus the results of these studies should not be used to evaluate the magnitude of migration flow requirements.
4. The timing and duration of upstream and downstream passage flows should be assessed using the methods in Booth et al. (2013).
5. Flows needed for upstream passage should take into account both physical conditions at critical riffles and compensation for surface-flow loss through percolation.
6. Fry and juvenile rearing habitat should be quantified using the methods in Harrison et al. (2017).
7. The instream flow study should be conducted consistent with the standards in USFWS (2011).

Term 24(b)(2.1):

1. The draft plan only covers connectivity in the Lower Santa Ynez River (mainstem and "key" tributaries), and does not specific what is entailed by connectivity, particularly as it relates to the migration of both adult and juvenile steelhead. Improved steelhead passage opportunities for both smolt and adult should not be limited to the Lower Santa Ynez River. As the SWRCB has repeatedly indicated, the Board's interest in and jurisdiction over the public trust interests in the steelhead (and other public trust resources) of the Santa Ynez River is not limited to the Lower Santa Ynez River, but also extends above Bradbury Dam.
2. An instream flow study to identify a flow regime that supports the migratory behavior and ecology of adult and juvenile steelhead in their freshwater habitats should expressly recognize and take into an account a number of factors in its analysis; these include, but are not limited the following:

A) In semi-arid regions, rainfall events can trigger periods of elevated discharge that serve as the primary environmental cue for migration of steelhead into, within, and out of a watershed. As such, the elevated discharge promotes migration opportunities for this species that would otherwise not exist; water depth across a channel section alone is not a sufficient measure of the adequacy of a flow to promote and facilitate migration of either adult or juvenile steelhead.
B) Streams in southern California watersheds can experience high runoff of short duration, and peak counts or observation of steelhead migrants coincide with elevated discharge steelhead. This underscores the functional value and importance of periods of elevated discharge for migration of steelhead in rivers such as the Santa Ynez River that are characterized by a naturally “flashy” discharge.
C) Steelhead show positive rheotaxis (facing into a current) that provides important cues for fish negotiating its way upstream. Steelhead can also more easily navigate streams at higher rather than lower discharge because of the increased number of pathways through a complex channel morphology that higher flows provide.
D) Steelhead do not enter and subsequently migrate upstream as a single "run," but rather enter river systems in "waves," with each rainfall-induced discharge event prompting additional steelhead to enter a river, and in-river adults to migrate farther upstream, ultimately to the upper spawning reaches. This behavior reflects an evolutionary adaptation to the rainfall and runoff pattern of southern California watersheds, and underscores the ecological importance of repeated rainfall events and migratory opportunities to promote movement of fish throughout the watershed. This pattern of migration also promotes biological diversity by allowing fish to occupy and utilize a variety of steelhead habitat types.

Term 24(b)(2.2):

1. The forces of streamflow operating on the geomorphic setting, in conjunction with vegetative cover, is principally responsible for creating a wide variety of habitats used by steelhead to complete the freshwater phase of their life cycle. The creation of basic stream channel morphologic features (pools, runs, glides, undercut banks, gravel bars, *etc*.), and lagoon sandbar formation and breaching are all important functions of streamflow. Other critical functions of streamflow include the flushing of fine sediments from spawning and rearing habitats, distribution of nutrients, recruitment and sorting of spawning gravels and large woody debris, and the maintenance of riparian vegetation.
2. The mainstem of the Santa Ynez River generally consists of two different channel types: cobble bedded and sand bedded dominated channels. The tributaries to the mainstem of the Santa Ynez River include cobble and boulder, and step pool dominated channels. Upstream from Bradbury Dam/Lake Cachuma the river is confined by valley walls, the channel is cobble bedded and bed features are influenced by bedrock exposures. Downstream from Bradbury Dam, beginning near Solvang, the river channel is predominantly sand bedded and the river valley includes floodplains of various heights and widths. Over a variable zone there is a transition between these two different channel types from a confined course bedded stream to an unconfined fine bedded stream. The distinct geomorphology of these three reaches provides for distinct steelhead habitats and distinct management opportunities. The tributaries

downstream of Bradbury Dam tend to have lower gradients in their lower reaches than do tributaries above Bradbury Dam, and have less well developed step and cobble and boulder dominated channels.

3. Bradbury Dam and Cachuma Reservoir attenuates annual flood flows and large flood releases are less frequent since completion of Bradbury Dam in 1953. Alluvial stream channel morphology is the result of flood flows within 1-5 year recurrence intervals. Reduced frequency and/or magnitude of channel forming flows has resulted in changes to channel size and shape. Interactions between natural hydrologic cycles, flood flow regulation, sediment regulation, riparian vegetation and shallow groundwater processes, and channel manipulation all complicate the response of channels downstream from Bradbury Dam.
4. The study should evaluate the magnitude, duration and frequency of high flows needed to moderate the effects of beaver dams and encroachment of vegetation in the active river channel, and to establish and maintain pools for juvenile steelhead rearing.
5. The study should estimate the volume and spatial distribution of sediment deficiency, including particle-size disparity, and sediment transport capacity in the Santa Ynez River below Bradbury Dam.
6. The approach that CDFW utilizes when identifying appropriate streamflow regime for steelhead in southern California involves quantitatively estimating the unimpaired pattern (*i.e.,* timing, frequency, duration, and rate-of-change) and magnitude of streamflow in the watershed. Specific quantitative data are drawn from USGS gauging stations, and if necessary, supplemented by models using appropriate rainfall/runoff coefficients; these data form the basis for identifying an appropriate of the streamflow regime. The advantage of this approach involves using the knowledge of the natural or pre-impact pattern and magnitude of streamflow, and therefore the streamflow characteristics and conditions that determined the evolution of the species' essential life history traits, as well as the individual population's abundance, distribution, and population growth rates. Thus, the unimpaired pattern and magnitude of streamflow can be used for promoting viability of a population in an individual watershed.
7. Channel changes, due to flow regulation and/or sediment trapping, precede changes in fish habitat, and must be understood to effectively management flows for fish passage and other life history phases. In order to maximize migratory conditions, the following information should be developed as part of the Study Plan for Term 24(b)(2.2):
    A) Storage in Cachuma Reservoir has diminished over the past 60+ years because the reservoir is an effective trap for all bed material and portions of the finer grained sediment load. The channel downstream has been deprived of bedload material for some distance downstream of Bradbury Dam until tributary inputs contributes to the sediment deficit.
    B) Investigate changes in channel geometry since completion of Bradbury Dam. Relate to fish habitat changes. Determine how channel and fish habitat might be improved through incrementally reinstating historic channel forming flow regime, as baseline for assessing management alternatives. Determine the distance downstream from Bradbury Dam where tributary inputs of bed material achieve approximate equilibrium with regulated sediment transport capacity. Assess the potential to improve fish habitat by managing releases to shift the equilibrium point upstream or downstream. Prepare a sediment augmentation plan to approximately satisfy the downstream sediment deficit.

C) Flood flow regulation can cause tributary confluences to aggrade downstream from large impoundments such as Bradbury Dam. The reduced frequency and/or magnitude of effective sediment transporting flows can result in localized sediment accumulations in streams that are generally degrading.
D) Flood flow regulation can cause tributary confluences to aggrade downstream from large impoundments such as Bradbury Dam. The reduced frequency and/or magnitude of effective sediment transporting flows can result in localized sediment accumulations in streams that are generally degrading.

Term 24(b)(3):

1. The draft plan focuses on three potential habitat restoration actions: spawning gravel augmentation in the Lower Santa Ynez River and Hilton Creek; addition of large woody debris or boulder clusters in the Lower Santa Ynez River and larger tributaries; and installation of cattle exclusion fending in the Salsipuedes/El Jaro watershed.
2. Because the scope, scale and exact locations of these habitat restoration measures is not specified it is not clear how these measures are to be assessed. The Study Plan should provide more specificity regarding these potential habitat restoration actions. For example, the clarify the apparent inconsistencies regarding proposed gravel augmentation as specified in Table 1 of the Lower Santa Ynez River Habitat Enhancement Plan (*i.e*., 200 tons per year, 2,800 pounds per year, versus 1,500 cubic yards per year); describe the prospective sizes of LWD and boulders to be installed relative to site-specific hydraulic and hydrologic conditions (*e.g*., channel width and slope, and discharge magnitude); and whether the proposed fencing excludes cattle from one or both sides of the stream and the design of fence endpoints and stream crossings, and related cattle-watering facilities.
3. The study should identify gravel dispersal mechanisms, including active placement to restore bars and riffles, active injection during high river discharge events, and strategic stockpiling for passive dispersal.
4. The study should identify gravel sources to be used.
5. Effectiveness monitoring is needed to quantify geomorphic and habitat responses in the river resulting from implementation of gravel augmentation.
6. For a discussion of the role of large woody debris in forming habitat in a southern California steelhead river, see Thompson *et al*. 2007.

Term 24(b)(4):

1. A water temperature model should be developed to assess what flows are needed to maintain suitable water temperatures for steelhead from Bradbury Dam to the estuary.
2. The Study Plan should include the specific methods (including frequency and timing) and locations at which the water quality parameters (water temperature, dissolved oxygen, and fine sediments) would be measured, as well as the standards that would be used to evaluate the suitability of these water quality conditions to support all life stages of steelhead trout. Evaluation of existing water quality monitoring data should include records from all National Pollution District Elimination System (NPDES) for point waste discharges to the Santa Ynez River,

as well at data from the Total Maximum Daily (TMDL) studies and standards for no-point waste discharges to the Santa Ynez River.

3. Additionally, the Study Plan should address the expected effects of discharging State Water Project water into the Santa Ynez River on steelhead and designated critical habitat, including but not limited to juvenile steelhead olfactory-imprinting and rearing habitat conditions (*e.g.*, water quality).

Term 24(b)(5):

1. The Board's Order WR 2019-0148 now applies to operation of the Cachuma Project. In addition to the water release provisions related to water supply (including groundwater recharge), the evaluation should also include flood control operations. Also, the timing and rate (cfs) and location of water that will be released into Hilton Creek under each operational scenario of the Cachuma Project should be evaluated. A review of NMFS' November 28, 2016, draft biological opinion for operation and maintenance of the Cachuma Project may assist Reclamation finalizing this component of the Study Plan (NMFS 2016).

Term 24(b)(6):

1. The water releases from Bradbury Dam to support downstream water rights in the Santa Ynez River (*i.e.*, Order WR 89-18) and associated alluvial groundwater pumping should be fully described and related to the water operations stipulated in the Board's Order WR 2019-0148. Specifically, the effects of water releases on designated critical habitat for endangered steelhead should be evaluated. For this reason, the Study Plan should include an updated description that clearly and completely describes the expected consequences of the authorized releases on freshwater rearing areas, freshwater spawning areas, and freshwater migration corridors.

Term 24(c)(1):

1. The draft plan indicates that the Instream Flow Study identified above in Term 24(b) (*i.e.*, IFIM) would be used to evaluate habitat conditions for bass and other non-native species and develop measures to curtail the proliferation on non-native species to reduce non-native populations. The IFIM methodology would be one appropriate method to assess habitat conditions for the non-migratory non-native species, and therefore could be used in conjunction with the approach described above for the native, migratory steelhead of the Santa Ynez River.
2. Additionally, flows into the Lower Santa Ynez River associated with spills of Bradbury Dam should be also be evaluated.

Term 24(c)(2):

1. This component identifies the principal sources of non-native species into the Lower Santa Ynez River (including Cachuma Reservoir), but does not acknowledge the populations of non-native species within the mainstem of the upper Santa Ynez River. As noted previously, the SWRCB has

repeatedly indicated, the Board's interest in and jurisdiction over the public trust interests in the steelhead (and other public trust resources) of the Santa Ynez River is not limited to the Lower Santa Ynez River, but also extends above Bradbury Dam.

2. Measures to control non-native species must address all their sources to be effective; consequently, prevention and control measures (including public education) must address the upper and well as the lower reaches of the Santa Ynez River. Best management practices for the control of non-native include using "large mesh" seines rather than "small mesh" seines to minimize adverse impacts to *O. mykiss*.

References

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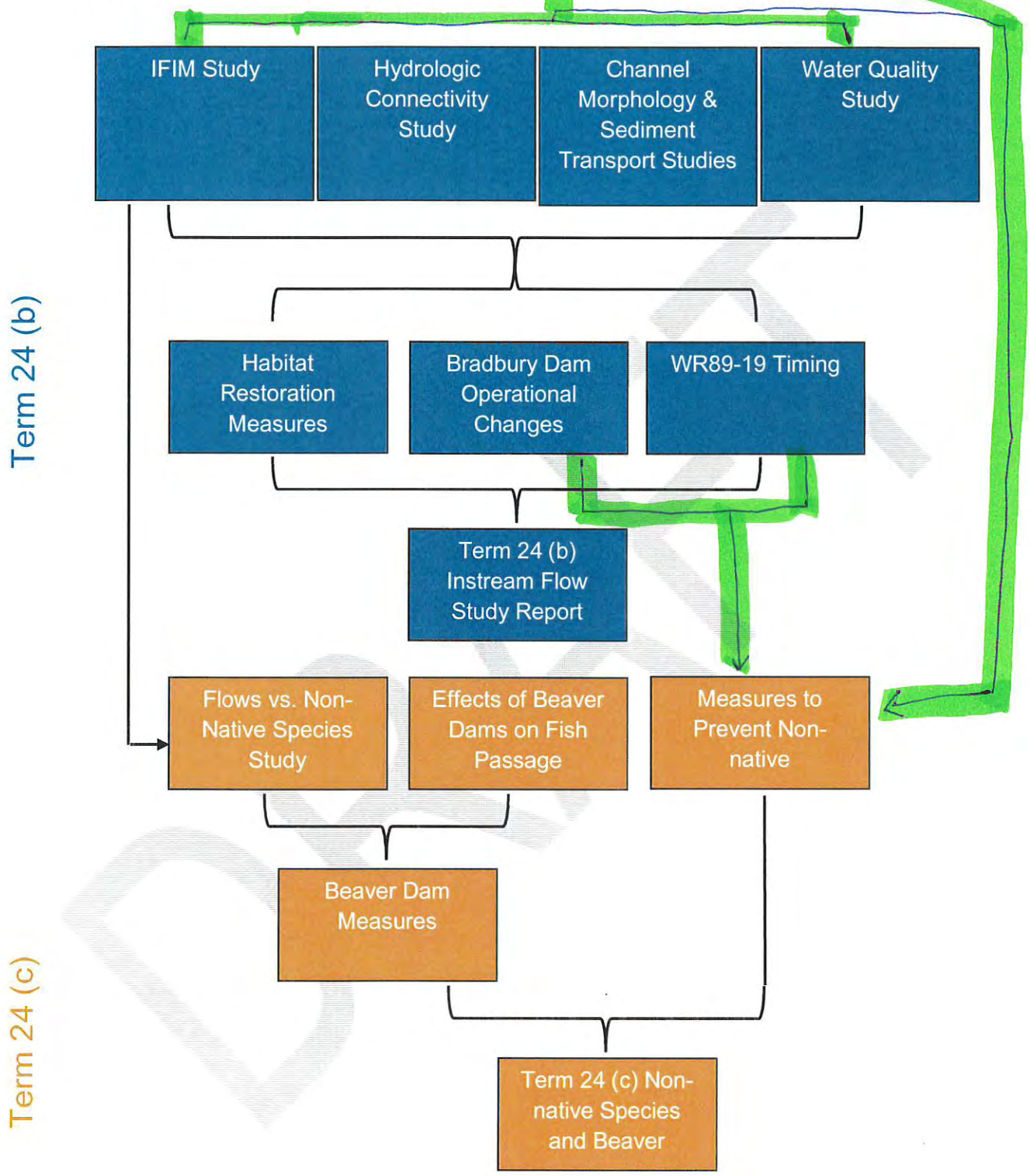
ATTACHMENT C- CDFW recommendations on Figure 1. Flow Chart

Figure 1. Flow Chart Depicting Interlinkages between Term 24 Studies



CDFW's Comments on USBR's Annual Compliance Report for Water Year 2020 Plan for Term 27 of Water Rights Order WR-2019-0148

ATTACHMENT B - Cachuma Project Evidentiary Hearings
Service List (updated June 10, 2019)

Cachuma Project Evidentiary Hearing

UPDATED SERVICE LIST
(June 10, 2019)

The parties whose email addresses are listed below agreed to accept electronic service, pursuant to the rules specified in the hearing notice.

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Santa Ynez River Water Conservation District, Improvement District No. 1 Mr. Paeter Garcia 3622 Sagunto St. Santa Ynez, CA 93460 pgarcia@syrwd.org Mr. Steve M. Anderson Best Best & Krieger LLP 3390 University Avenue, 5th Floor Riverside, CA 92501 steve.anderson@bbklaw.com *updated 03/09/2018*	City of Lompoc Mr. Nicholas A. Jacobs Somach, Simmons & Dunn 500 Capitol Mall Suite 1000 Sacramento CA 95814 njacobs@somachlaw.com *updated 01/06/2014*
Santa Ynez River Water Conservation District Mr. Steven M. Torigiani Law Offices of Young Wooldridge, LLP 1800 30th Street, 4th Floor Bakersfield, CA 93301 storigiani@youngwooldridge.com *updated 02/26/19*	California Trout, Inc. Ms. Linda Krop Ms. Maggie Hall Ms. Tara Messing Environmental Defense Center 906 Garden Street Santa Barbara, CA 93101 lkrop@environmentaldefensecenter.org mhall@environmentaldefensecenter.org tmessing@environmentaldefensecenter.org *updated 03/08/2018*

Cachuma Project Evidentiary Hearing

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County of Santa Barbara Mr. Michael C. Ghizzoni, County Counsel Ms. Johannah Hartley, Deputy 105 E. Anapamu Street Santa Barbara, CA 93101 jhartley@co.santa-barbara.ca.us *updated 03/09/2018*	U.S Bureau of Reclamation Ms. Amy Aufdemberge 2800 Cottage Way, Room E-1712 Sacramento, CA 95825 Fax (916) 978-5694 AMY.AUFDEMBERGE@sol.doi.gov *updated 08/12/16*
California Department of Fish and Wildlife Ms. Nancee Murray Senior Staff Counsel 1416 Ninth Street, 12th Floor Sacramento, CA 95814 Nancee.Murray@wildlife.ca.gov *updated 08/15/2016*	Bureau of Reclamation, Mid-Pacific Region Mr. Michael Jackson Area Manager South-Central California Area Office 1243 N Street Fresno, CA 93721-1813 mjackson@usbr.gov
Montecito Water District Mr. Robert E. Donlan Ellison, Schneider & Harris L.L.P. 2600 Capitol Avenue, Suite 400 Sacramento, CA 95816 red@eslawfirm.com	Santa Barbara County CEO's Office Ms. Terri Maus-Nisich, Assistant CEO 105 E. Anapuma Street, 4th Floor Santa Barbara, CA 93101 tmaus@co.santa-barbara.ca.us *updated 09/07/2016*

The parties listed below did not agree to accept electronic service, pursuant to the rules specified by this hearing notice.

NOAA Office of General Counsel Southwest Region Mr. Dan Hytrek 501 West Ocean Blvd., Suite 4470 Long Beach, CA 90802-4213 Dan.Hytrek@noaa.gov *updated 05/13/2011*	