Monitoring Program 2023 Final Annual Report

Sacramento Municipal Utility District

Hydro License Implementation • June 2024

Upper American River Project

FERC Project No. 2101

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ACRONYMS AND ABBREVIATIONS

Acronym	Definition
7DMAVG	7-day moving average water temperature
Basin Plan	Water Quality Control Plan for the Central Valley Region, the Sacramento River Basin and the San Joaquin River Basin
°C	degrees Celsius
CDFW	California Department of Fish and Wildlife
DAVG	daily average water temperature
DC	direct current
DWR	California Department of Water Resources
FERC	Federal Energy Regulatory Commission
ft	feet
LWD	large woody debris
License	FERC Order Issuing New License for the Upper American River Project (FERC Project No. 2101), issued July 2014
mi	mile
Plan(s)	Bald Eagle Monitoring Plan, Amphibian and Aquatic Reptile Monitoring Plan, Bear Monitoring Plan, Large Woody Debris Monitoring Plan, and Water Temperature Monitoring Plan
Report	Annual Monitoring Report
SFAR	South Fork American River
SMUD	Sacramento Municipal Utility District
SWRCB	State Water Resources Control Board
UARP	Upper American River Project
USFS	U.S. Department of Agriculture, Forest Service
USFWS	U.S. Fish and Wildlife Service
UTM	Universal Transverse Mercator
VES	visual encounter survey

1.0 INTRODUCTION AND BACKGROUND

This Annual Monitoring Report (Report) addresses monitoring requirements set forth in Sacramento Municipal Utility District's (SMUD's) Bald Eagle Monitoring Plan, Amphibian and Aquatic Reptile Monitoring Plan, Bear Monitoring Plan, Large Woody Debris Monitoring Plan, and Water Temperature Monitoring Plan[1] (Plans). Requirements of the Plans are found in State Water Resources Control Board (SWRCB) Conditions 8 and 10 and in U.S. Department of Agriculture, Forest Service (USFS) 4(e) Conditions 31 and 35, which are provided in Appendices A and B, respectively, of the Federal Energy Regulatory Commission's (FERC's) Order Issuing New License for the Upper American River Project (UARP; FERC Project No. 2101), issued July 23, 2014 (License; FERC 2014), as well as in USFS Section 4(e) Conditions 14 and 15 for the Slab Creek Flow Facility Project License Amendment (USFS 2015). The Plans were developed in consultation with SWRCB, USFS, California Department of Fish and Wildlife (CDFW), and U.S. Fish and Wildlife Service (USFWS). This Report presents the results of implementing the Plans in 2023.

SMUD owns and operates the UARP, which is licensed by FERC. The UARP lies within El Dorado and Sacramento counties, primarily within lands of Eldorado National Forest. The UARP consists of three major storage reservoirs: Loon Lake, Union Valley, and Ice House (with a combined capacity of approximately 379,000 acre-feet), eight smaller regulating or diversion reservoirs, and eight powerhouses. The UARP also includes recreation facilities containing more than 700 campsites, 5 boat ramps, hiking paths, and bicycle trails at the reservoirs.

All minimum streamflows required by the 2014 FERC License were implemented in October 2014; therefore, Year 1 as it pertains to the Monitoring Program is 2015. Pre- and post-2014 minimum streamflow requirements (i.e., "old" License and "new" License) are provided in Appendix A.

This Report summarizes results of Monitoring Year 9 (2023). Refer to Section 1.2 of this report for information about the frequency of resource-specific monitoring efforts required by the License. Some monitoring activities have specific reporting requirements and deadlines in lieu of this Report.

For context in considering the monitoring results, the California Department of Water Resources (DWR) May Bulletin 120 forecast the 2023 water year type as Wet. The final 2023 water year type remained classified as Wet based on DWR's Full Natural Flow record for the American River at Folsom in October 2023.

[1] Results of implementing the Water Quality Monitoring Plan (SMUD 2021) are provided in the 2023 Water Quality Monitoring Report (SMUD 2024).

1.1 MONITORING SITES

Monitoring sites are depicted in Figure 1-1 through Figure 1-3 for all 2023 study locations.

1.2 MONITORING FREQUENCY

The Monitoring Program covers monitoring to be conducted during all years until a new license is issued. Table 1-1 describes the monitoring frequencies for the first 12 years of the License. As noted in Section 1.1, some monitoring activities have specific reporting requirements and deadlines in lieu of this Report.

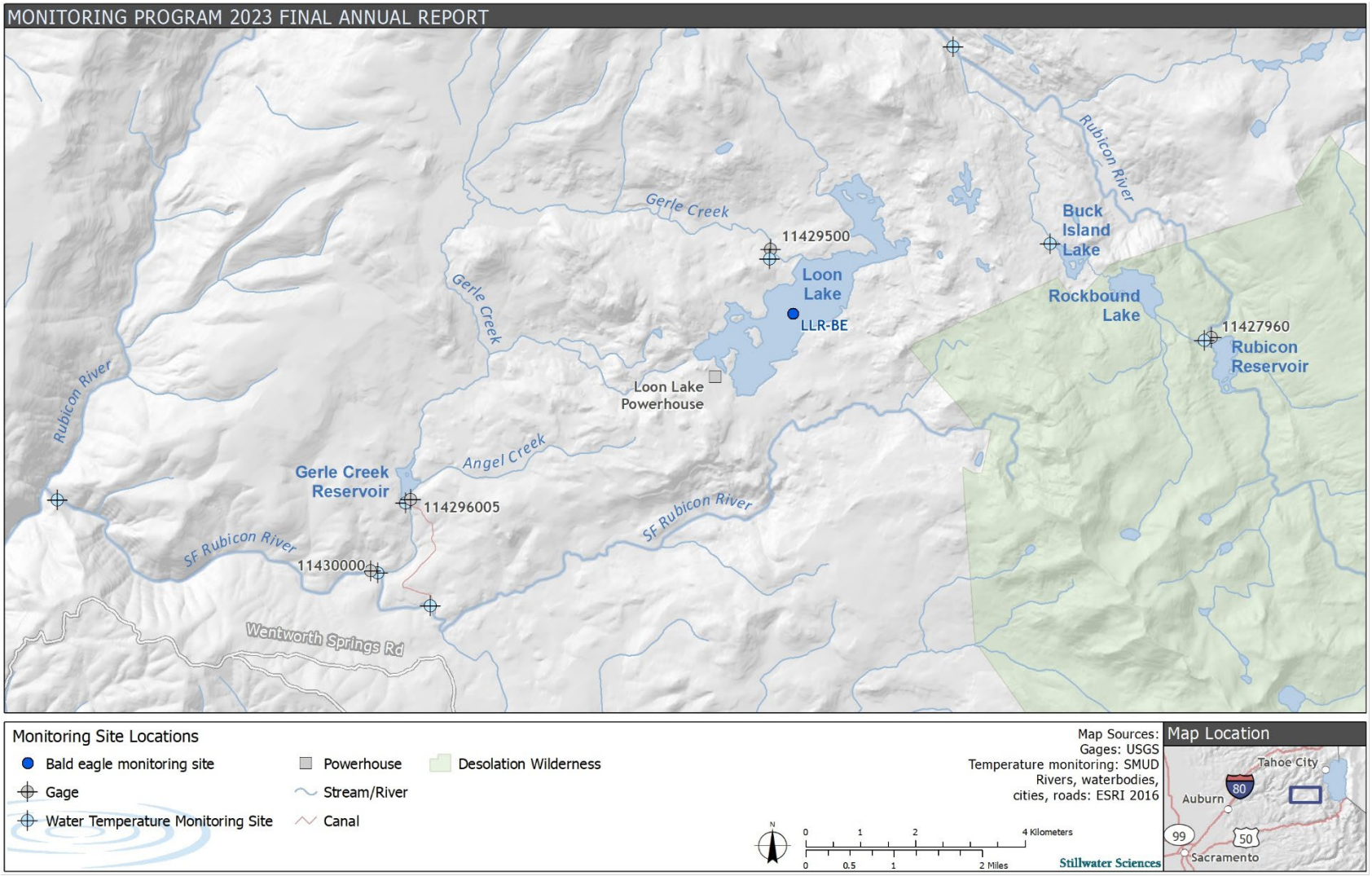

Figure 1-1. Monitoring locations downstream of Rubicon Reservoir, Rockbound Lake, Loon Lake Reservoir, and Gerle Creek Reservoir.

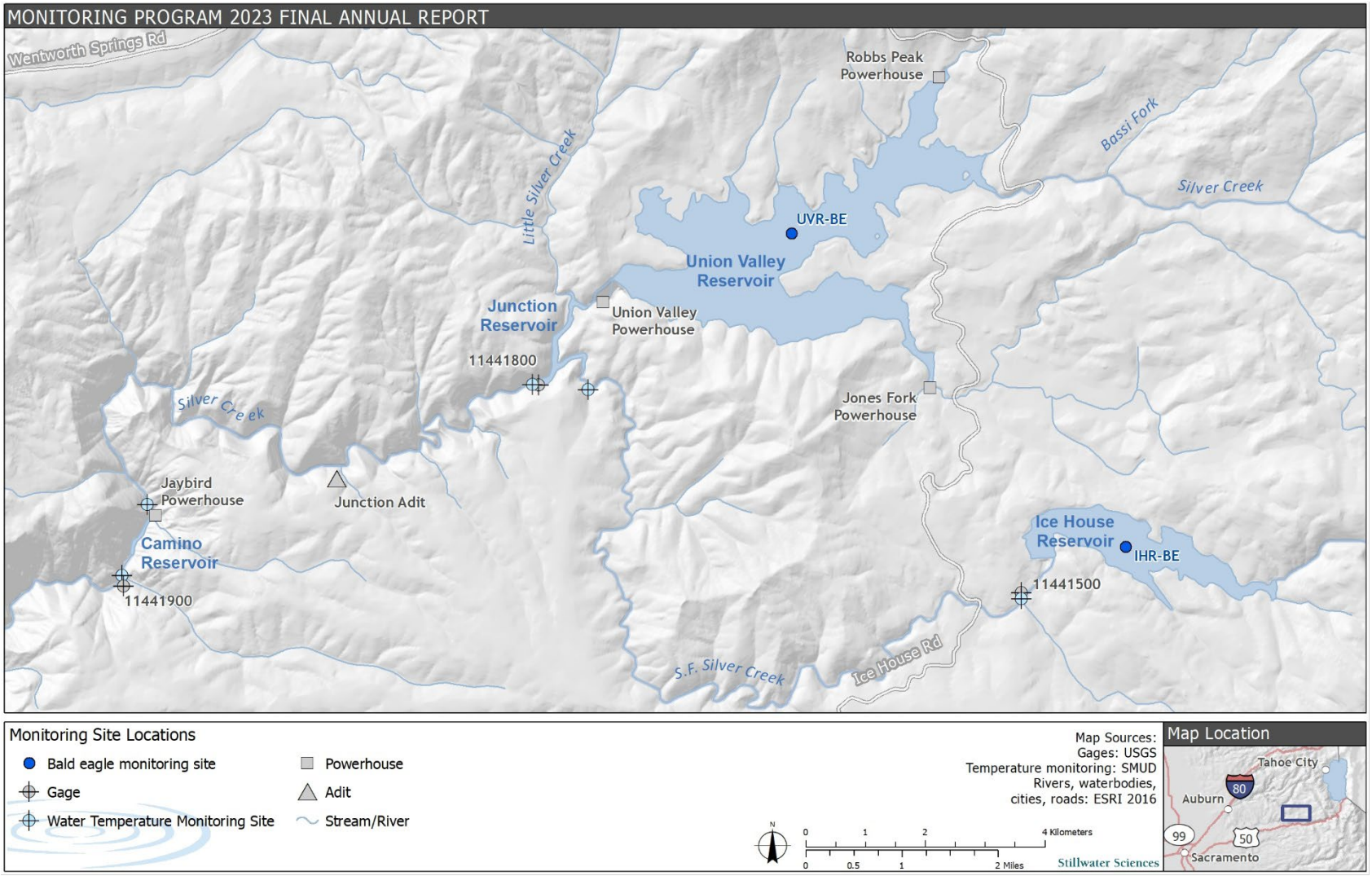

Figure 1-2. Monitoring locations downstream of Ice House Reservoir, Union Valley Reservoir, Junction Reservoir, and Camino Reservoir.

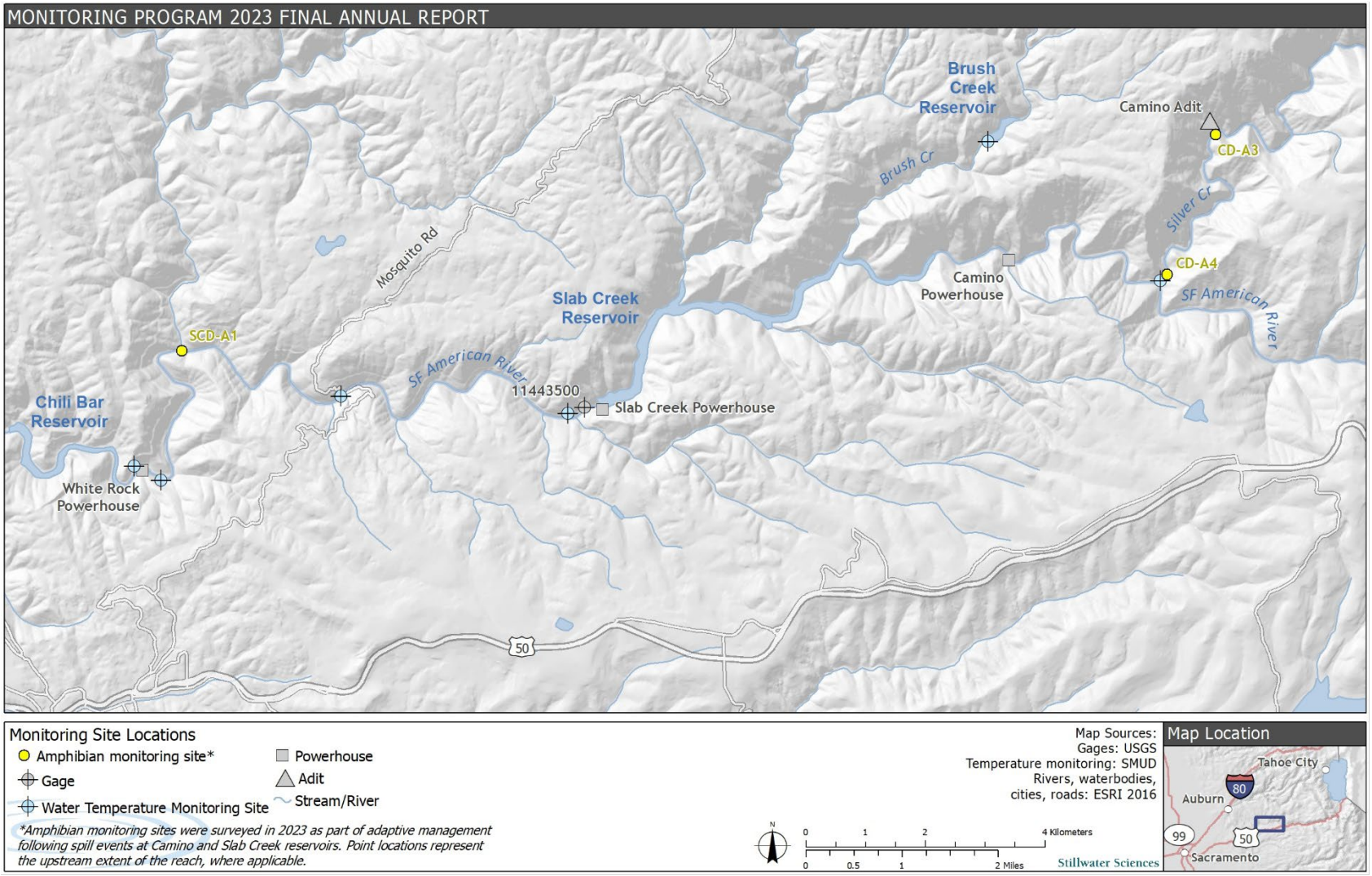

Figure 1-3. Monitoring locations downstream of Camino Reservoir (continued), Brush Creek Reservoir, and Slab Creek Reservoir.

Table 1-1. Monitoring Program Frequency First Twelve Years.

	License Monitoring Year											
	1	2	3	4	5	6	7	8	9	10	11	12
Monitoring Effort	**(2015)**	**(2016)**	**(2017)**	**(2018)**	**(2019)**	**(2020)**	**(2021)**	**(2022)**	**(2023)**	**(2024)**	**(2025)**	**(2026)**
Trout Population Monitoring					X	X				X	X	
Hardhead Population Monitoring		X	X		X	X				X	X	
Aquatic Macroinvertebrate					X	X				X	X	
Amphibian and Aquatic Reptile Monitoring (including Foothill Yellow-legged Frog) [1]		X	X	X	X	X	X			X	X	
Sierra Nevada Yellow-legged Frog (formerly Mountain Yellow-legged Frog) Monitoring					X					X		
Riparian Vegetation Monitoring					X					X		
Algae Species Identification and Monitoring		X										
Geomorphology (Sensitive Site Investigation and Mitigation Plan Development)	X	X										

Monitoring Effort	License Monitoring Year											
	1	2	3	4	5	6	7	8	9	10	11	12
	(2015)	**(2016)**	**(2017)**	**(2018)**	**(2019)**	**(2020)**	**(2021)**	**(2022)**	**(2023)**	**(2024)**	**(2025)**	**(2026)**
Geomorphology (Continuing Evaluation of Representative Channel Areas)					X					X		
Water Temperature		X	X	X	X	X	X	X	X	X	X	X
In Situ Water Quality	X	X	X	X	X	X	X	X	X	X	X	X
Bacteria Monitoring	X	X	X	X	X	X	X	X	X	X	X	X
Metals bioaccumulation		X					X					X
Water General Chemistry			X					X				
Robbs Peak Powerhouse Entrainment	X	X	X									
Bear Management Monitoring		X	X	X	X	X	X	X	X	X	X	X
Bald Eagle Monitoring		X	X	X	X	X	X	X	X	X	X	X
Large Woody Debris	X	X	X	X	X	X	X	X	X	X	X	X

[1] Amphibian and Aquatic Reptiles Monitoring began in 2016.

1.3 CONSULTATION

The draft Report was submitted to relicensing participants via a secure file transfer website on 14 March 2024. No comments on the draft Report were received.

1.4 LITERATURE CITED

FERC (Federal Energy Regulatory Commission). 2014. Federal Energy Regulatory Commission Order 148 FERC 62,070 Issuing New License for the Sacramento Municipal Utility District Upper American River Hydroelectric Project No. 2101. Issued July.

SMUD (Sacramento Municipal Utility District). 2021. Water Quality Monitoring Plan. Revision 3. Hydro License Implementation. Upper American River Project, FERC Project No. 2101. March.

SMUD. 2024. Water Quality Monitoring Report (2023). Hydro License Implementation. Upper American River Project, FERC Project No. 2101. June.

USFS (U.S. Department of Agriculture, Forest Service). 2015. Final Section 4(e) Terms and Conditions Slab Creek Application of Amendment Project, FERC No. 2101. Issued December.

2.0 BALD EAGLE

2.1 MONITORING PLAN OBJECTIVES

The primary objectives of the bald eagle (*Haliaeetus leucocephalus*) monitoring program are to document bald eagle nesting activity in the study area (see Section 1.0) and ensure that bald eagle nest sites are not adversely affected by activities related to the UARP. Results are intended to inform future bald eagle management in the UARP area (SMUD 2015).

2.2 METHODS

Bald eagle field surveys were conducted during the 2023 breeding season at Union Valley Reservoir, Ice House Reservoir, and Loon Lake Reservoir and in accordance with protocols described in the *Protocol for Evaluating Bald Eagle Habitat and Populations in California* (Jackman and Jenkins 2004), *Bald Eagle Breeding Survey Instructions* (CDFW 2017), and UARP Bald Eagle Monitoring Plan (SMUD 2015) (Table 2-1). Access at Loon Lake Reservoir was limited during much of the breeding season (February through May) due to snow and road conditions, delaying the first of three required breeding season surveys at this location until the final week of May.

Table 2-1. Bald Eagle Survey and Reproductive Status Check Dates in 2023.

Survey Type	2023 Survey Date		
	Union Valley Reservoir	Ice House Reservoir	Loon Lake Reservoir
Early Breeding Season Survey	24 March	24 March	30 May
Mid-Breeding Season Survey	30 May	29 May	23 June
Late Breeding Season Survey	22 June	22 June	13 July
Additional Reproductive Status Check	29 May, 21 June, 13 July	None	None

Nest sites documented during previous years of surveys (SMUD 2023) were revisited, and other areas with suitable habitat surrounding each reservoir were evaluated for signs of bald eagle nesting activity. Observations were made using binoculars and/or a spotting scope from boat- and land-based vantage points (Figure 2-1). Detailed information about the location, age class, activity, movement, and behavior of bald eagles was recorded, along with notes on the general level of recreation use or other noise-generating activity at each reservoir. Notable features (e.g., bald eagle perches) located during the surveys were mapped using a tablet equipped with a Global Positioning System. Incidental observations of other avian species were also recorded (Appendix B1). A summary of bald eagle observations made during field surveys using the California Bald Eagle Nesting Territory Form (CDFW 2017) was submitted to CDFW at the end of the breeding season (Appendix B2).

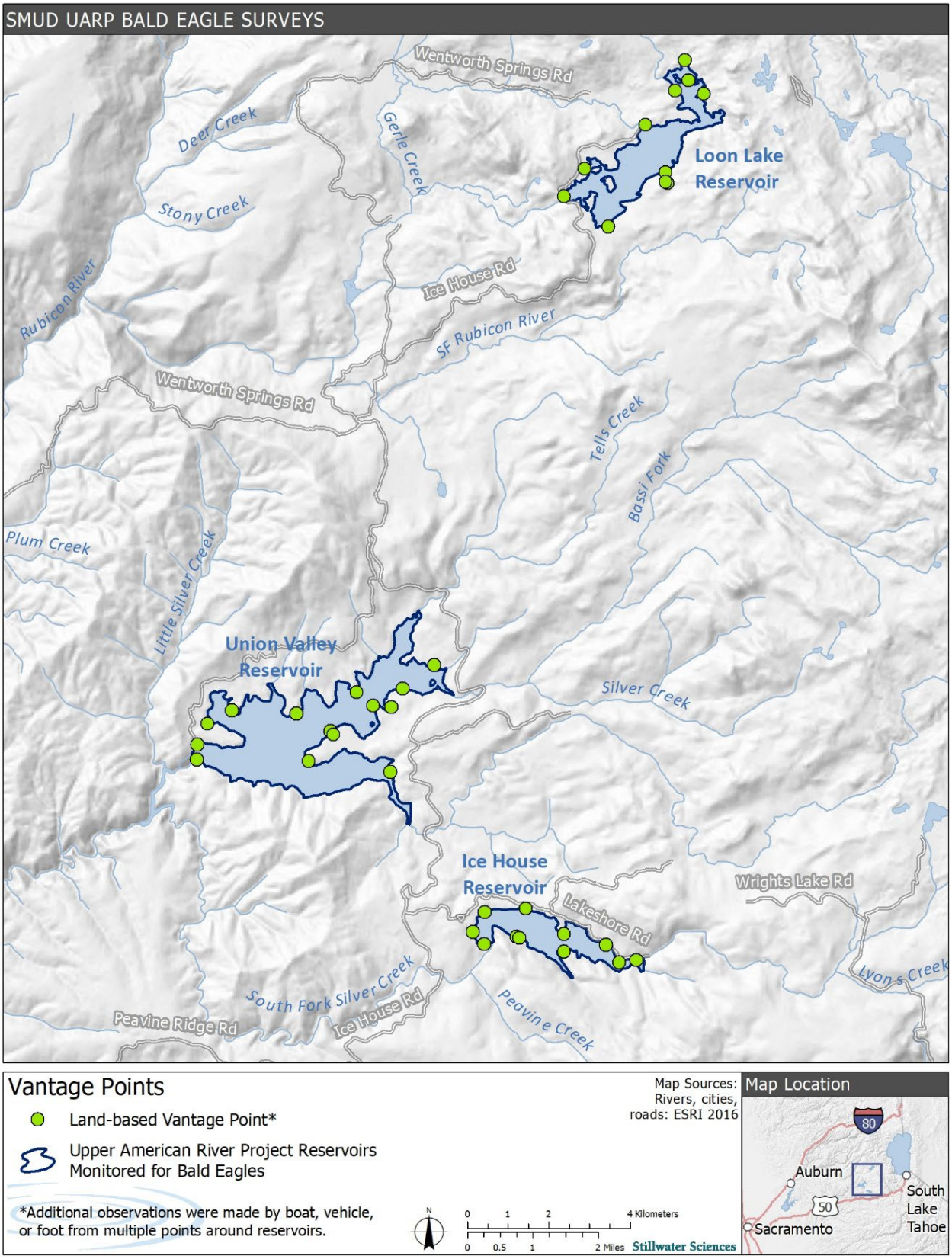

Figure 2-1. Land-based vantage points used for monitoring in the Upper American River Project bald eagle study area.

2.3 RESULTS

2.3.1 Union Valley Reservoir

Bald eagles successfully reproduced at Union Valley Reservoir in 2023 (Table 2-2, Figure 2-2). While no reproductive activity was observed during the early breeding season survey (24 March) (Figure 2-3), two nestlings were observed in the nest located in Sunset Campground during the mid-breeding season survey (30 May). Both eaglets appeared healthy and were repeatedly observed branching during the late breeding season survey (22 June) (Figure 2-4). A subsequent status check (13 July) indicated fledging. Both juveniles were absent from the nest, and one of them was observed perched above the nest as well as flying in the vicinity.

No evidence of bald eagle reproductive activity was observed elsewhere on Union Valley Reservoir in 2023. Surveyors visited the historical nest site (SMUD 2015) and nest platform on Granlee's Point but observed no bald eagle activity at either location (Figure 2-2). Based on recent anecdotal reports of bald eagle sightings, surveyors increased observation around Camino Cove Campground. While eagles were present in this area, no reproductive activity was observed. Additional detail regarding surveys and reproductive status checks conducted in 2023 at Union Valley Reservoir is provided in Appendix B2.

Table 2-2. Bald Eagle Observations during 2023 Breeding Season at Union Valley Reservoir.

Date (Time)	Number of Eagles	Age Class	Notes
03/24/23 (14:30)	1	Subadult	Subadult perched in prominent snag southeast of Union Valley Dam.
05/29/23 (15:15)	2	Nestling	Two nestlings vocalizing from, and visible in nest at Sunset Campground. Adult vocalizations heard in vicinity.
05/30/23 (06:20)	2	Nestling	Two nestlings visible in nest at Sunset Campground.
06/21/23 (20:00)	2	Juvenile	Two juveniles in nest at Sunset Campground.
06/21/23 (20:20)	2	Juvenile	One juvenile branching below nest at Sunset Campground and second juvenile vocalizing within it
06/22/23 (06:00)	2	Juvenile	Two juveniles branching above nest at Sunset Campground.
06/22/23 (11:15)	1	Adult	Adult perched in ponderosa pine (*Pinus ponderosa*) on east side of Granlee's Point, flying southeast, briefly landing in fir tree, and returning to initial perch.
06/22/23 (12:10)	1	Adult	Adult circling near SMUDEA (Power Pines) Campground, landing in prominent Douglas fir (*Pseudotsuga menziesii*) near shore, and departing over ridge to the northeast after approximately 10 minutes.
06/22/23 (14:15)	1	Adult	Adult (female) circling above Camino Cove and landing in ponderosa pine uphill from shore.
06/22/23 (14:33)	1	Adult	Adult (female) relocating to nearby perch in Douglas fir.
06/22/23 (15:10)	1	Adult	Adult (female) departing perch, flying south over West Point Peninsula.
06/22/23 (17:10)	3	Adult; Juvenile	Adult delivering food to two juveniles in nest at Sunset Campground.
7/13/23 (13:10)	1	Juvenile	Juvenile perched on and vocalizing from highest branch of the nest tree in Sunset Campground.
7/13/23 (13:40)	1	Juvenile	Juvenile departing nest tree in Sunset Campground, flying southwest.

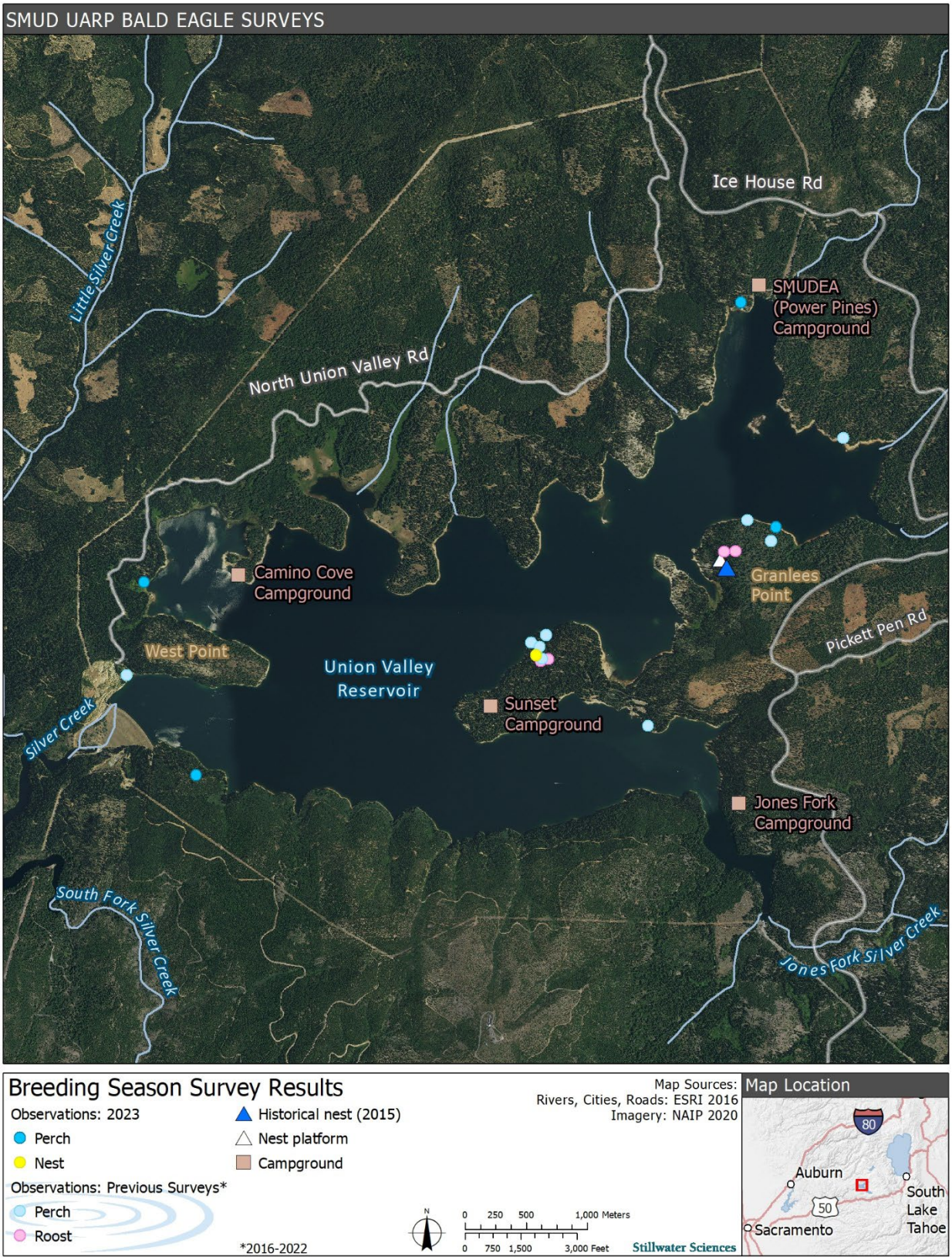

Figure 2-2. Bald eagle activity sites at Union Valley Reservoir.

Figure 2-3. Union Valley Reservoir and nest at Sunset Campground during the early breeding season survey, March 2023.

Figure 2-4. Juvenile bald eagles branching above nest at Sunset Campground, June 2023.

2.3.2 Ice House Reservoir

During the early (24 March) and mid-breeding season (29 May) surveys, bald eagles were observed on the south shore of Ice House Reservoir on and near the nest tree that was used in 2022 (SMUD 2023) (Table 2-3, Figure 2-5); however, any potential reproductive attempt was unsuccessful. Observers noted possible damage to the nest and its supporting branches during the early breeding season survey and confirmed the damage during the mid-breeding season survey, when they were able to access the south shore of the reservoir by boat and found the entire nest structure and a supporting limb on the ground (Figure 2-6). No bald eagles were observed at Ice House Reservoir during the late breeding season survey (22 June), and no evidence of reproductive activity was found elsewhere on the reservoir during the 2023 breeding season. Additional detail regarding surveys conducted in 2023 at Ice House Reservoir is provided in Appendix B2.

Table 2-3. Bald Eagle Observations during the 2023 Breeding Season Surveys at Ice House Reservoir.

Date (Time)	Number of Eagles	Age Class	Notes
03/24/23 09:50	1	Adult	Adult perched on nest tree (large broken-topped incense cedar [*Calocedrus decurrens*]) first documented on south shore of reservoir in 2022.
03/24/23 11:10	1	Adult	Adult relocating to incense cedar directly downslope of nest tree and returning to nest tree approximately 10 minutes later.
03/24/23 11:30	1	Adult	Adult flying west from nest tree into grove of trees on south shore of reservoir east of Ice House Dam.
05/29/23 07:45	1	Adult	Adult (female) perched in a Douglas fir on ridge of peninsula northeast of Ice House Dam.
05/29/23 08:08	1	Adult	Adult (female) flying east from perch, briefly stopping at dead snag west of nest tree, and landing on nest.
05/29/23 08:10	1	Adult	Adult (female) departed nest, landing in prominent incense cedar east of nest tree.
05/29/23 08:25	1	Adult	Adult (male) flying from west to east below the nest, landing in sugar pine (*Pinus lambertiana*).
05/29/23 11:20	1	Adult	Adult (female) perched in previously documented dead snag west of nest tree.

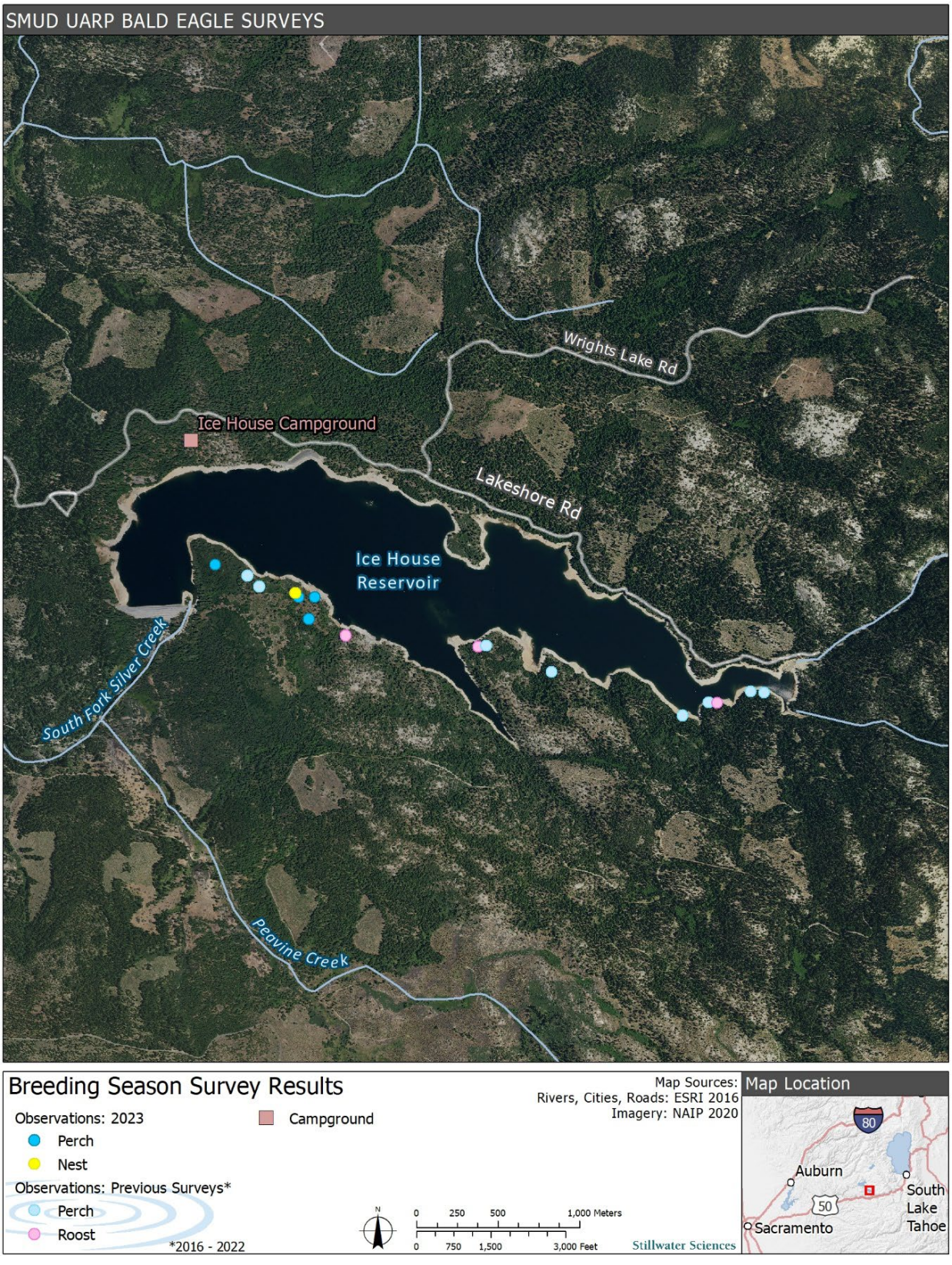

Figure 2-5. Bald eagle activity sites at Ice House Reservoir.

Figure 2-6. Remanent nest material and pieces of supporting limb at base of nest tree on Ice House Reservoir, May 2023.

2.3.3 Loon Lake Reservoir

No evidence of bald eagle reproductive activity was observed at Loon Lake Reservoir in 2023. No bald eagles were observed during the early breeding season survey (30 May). During the mid-breeding season survey (23 June), a pair of adult eagles was observed near Loon Lake Dam and on the south side of the reservoir near the former nest site that was last used in 2020 (SMUD 2021); however, no evidence of nest rebuilding was observed (Table 2-4, Figures 2-7 through 2-9). Surveyors increased observation around Pleasant Lake and the nearby inlet of Ellis Creek due to historical observations in these areas (Figure 2-10), but no eagles were documented. Additional detail regarding surveys at Loon Lake Reservoir in 2023 is provided in Appendix B2.

Table 2-4. Bald Eagle Observations during the 2023 Breeding Season Surveys at Loon Lake Reservoir.

Date (Time)	Number of Eagles	Age	Notes
06/23/23 (07:20)	1	Adult	Adult (male) flying low along south shore of reservoir, interacting with osprey (*Pandion halieatus*), and landing in dead snag downslope of inactive nest tree.
06/23/23 (07:40)	1	Adult	Adult (male) relocating to Jeffrey pine (*Pinus jeffreyi*) west of snag and downslope of inactive nest tree.
06/23/23 (08:15)	2	Adult	Adult (male) stealing fish from osprey and delivering to adult (female) perched on snag.
6/23/23 (08:18)	1	Adult	Adult (female) flying over ridgeline and out of sight with delivered food.
06/23/23 (08:50)	1	Adult	Adult (male) departed perch, flying west.
06/23/23 (09:30)	1	Adult	Adult (female) flying west along north shore of reservoir and landing in prominent Jeffrey pine east of dam near shore.
06/23/23 (10:00)	1	Adult	Adult (male) perched atop red fir (*Abies magnifica*) on ridge northwest of dam.
06/23/23 (10:10)	1	Adult	Adult (male) departing perch, flying south across reservoir, and landing in previously documented snag on south shore of reservoir.
06/23/23 (11:00)	2	Adult	Adult (female) joining adult (male) in snag on south shore of reservoir.
06/23/23 (11:12)	1	Adult	Adult (male) departing perch, flying north across dam, and landing in Jeffrey pine east of dam.
07/13/23 (10:02)	1	Sub-adult	Sub-adult (estimated third year) perched atop previously documented Jeffrey pine east of dam.

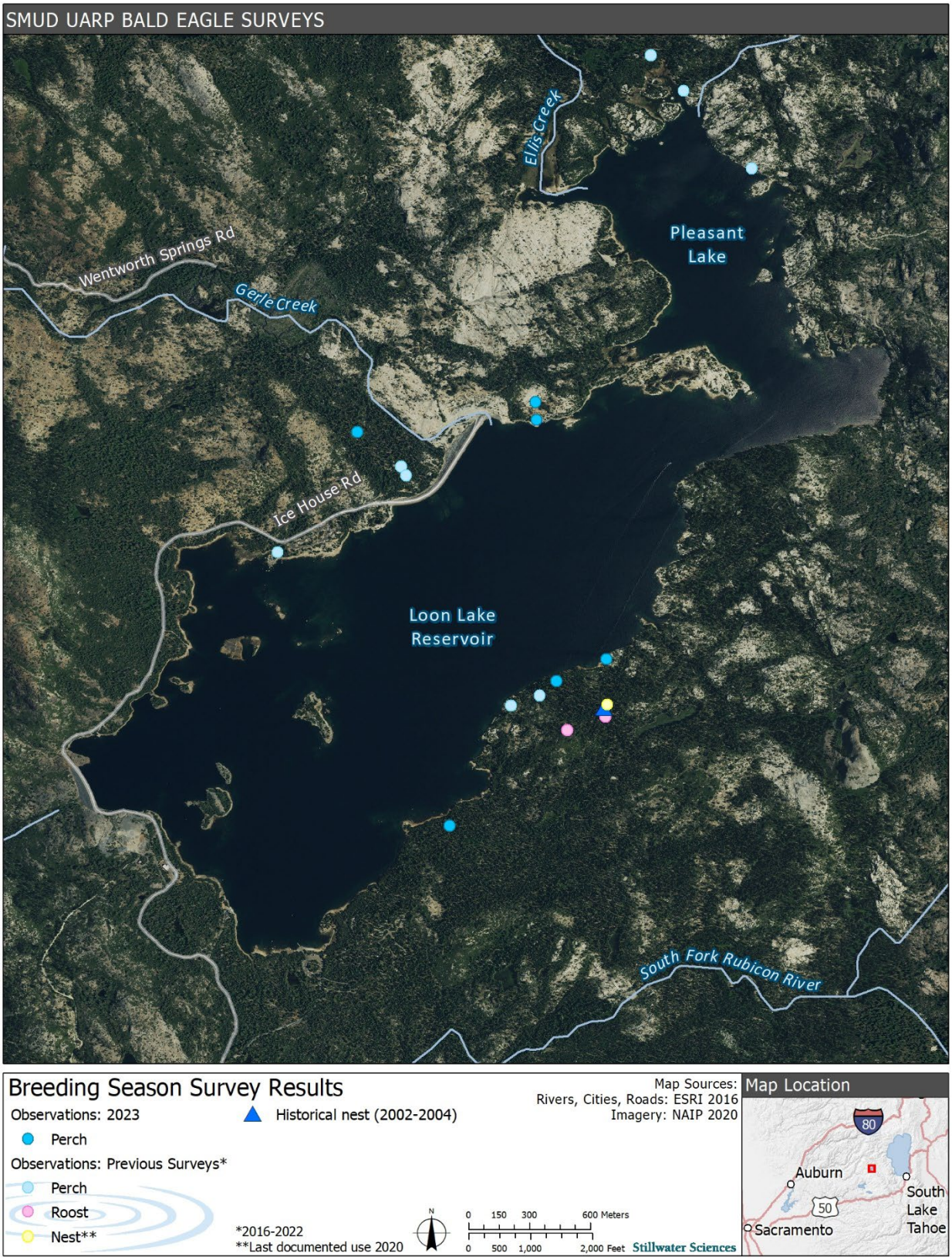

Figure 2-7. Bald eagle activity sites at Loon Lake Reservoir.

Figure 2-8. Bald eagle in perch east of Loon Lake Dam, June 2023.

Figure 2-9. Former nest location on Loon Lake Reservoir, June 2023.

Figure 2-10. Evening survey by boat in Pleasant Lake, June 2023.

2.4 DISCUSSION

2.4.1 Union Valley Reservoir

A pair of bald eagles successfully reproduced using the nest at Sunset Campground on Union Valley Reservoir during the 2023 nesting season (Section 2.3.1). The 2023 water year was Wet with cumulative precipitation in the region at approximately 150% of normal (DWR 2023a, NOAA 2023), and although inclement weather can adversely affect bald eagle nesting success, it did not do so at Union Valley Reservoir in 2023. Cumulative precipitation during the breeding season at Robbs Peak Powerhouse was 31 inches, with the majority falling between mid-February and the end of March (DWR 2023b, Station ID: RBP; Figure 1-2). Wind speed peaked at 60 miles per hour at Big Hill, approximately 1 mile south of Union Valley Reservoir, during a storm in mid-March (DWR 2023b, Station ID: BHS). Snowpack (as measured by water content) peaked at 27 inches in early April, decreased rapidly, and dissipated completely by the end of the month. Minimum air temperatures regularly dropped below freezing through mid-April, before generally rising with two brief exceptions in early May and mid-June (DWR 2023b, Station ID: RBP). Reservoir levels were favorable for bald eagle foraging during

the breeding season, remaining relatively consistent and gradually increasing from 4,839 to 4,868 feet above mean sea level (DWR 2023b, Station ID: UNV).

Recreation, construction, and other activities did not appear to disturb bald eagles during surveys at Union Valley Reservoir. Recreation on and around the reservoir was minimal during the early breeding season survey but had increased at the time of subsequent surveys. Moderate to heavy boating and campground activity, including near the nest at Sunset Campground, was noted during the mid- and late-breeding season surveys (Appendix B2). USFS closed a portion of Sunset Campground around the nest until surveyors confirmed, during a late season status check, that the juveniles had fledged (Section 2.3.1). Construction equipment used during the expansion of the bike path along the northern perimeter of the reservoir, approximately 0.75 mile from the nest at Sunset Campground, generated noise during the breeding season. During the late breeding season survey, an adult bald eagle was observed perched approximately 400 feet from the new bike path alignment where it passes north of Camino Cove.

2.4.2 Ice House Reservoir

Bald eagles continue to use the habitat surrounding Ice House Reservoir, although they did not successfully reproduce at this location in 2023 (Section 2.3.2). Severe weather may have been an influential factor, and the damage to the nest and supporting branches described in Section 2.3.2 is likely attributable to inclement conditions. Snowpack in the area (as recorded daily by water content) at Robbs Peak Powerhouse, approximately 4 miles north of Ice House Reservoir, increased gradually from 5 to 13 inches through January and most of February, then rapidly accumulated to a peak of 27 inches during a series of storms in late February and March (DWR 2023b, Station ID: RBP). In mid-March, about a week before the early breeding season survey when damage to the nest tree was noted, peak wind speed at Big Hill, approximately 2.5 miles west of Ice House Reservoir, reached 60 miles per hour. The entire surface of Ice House Reservoir was frozen and covered with snow through mid-April, and sections of the reservoir remained in this condition into early May with minimum air temperatures regularly dropping below freezing (DWR 2023b, Station ID: BHS). Snowpack (as recorded monthly by water content) at Ice House Reservoir did not dissipate entirely until early June (DWR 2023b, Station ID: IHS). Reservoir levels, which ranged from 5,416 to 5,446 above mean sea level during the breeding season (DWR 2023b, Station ID: ICH), were favorable for bald eagle foraging once the water surface was free of ice and snow.

The bald eagles appeared undisturbed by recreation and maintenance activities at Ice House Reservoir during surveys. Surveyors noted no recreation use (e.g., camping, boating, swimming) on or around the reservoir during the early breeding season survey and moderate to high recreation activity during the mid- and late breeding season surveys (Appendix B2). Maintenance activities involving noise-generating equipment at Ice House Reservoir during the 2023 breeding season included improvements to Ice House Campground on the north side of the reservoir, approximately 0.5 mile from the nest tree (Figure 2-6).

2.4.3 Loon Lake Reservoir

Surveyors observed no evidence of a reproductive attempt by bald eagles at Loon Lake Reservoir in 2023, but they documented eagles at the reservoir on multiple occasions during the mid- and late breeding season surveys (Section 2.3.3). Loon Lake Reservoir is located at high elevation (approximately 6,500 feet); therefore, the suitable bald eagle reproductive habitat around it is available during a limited season. The duration of this season varies year to year depending on weather conditions and was particularly short in 2023, which may have contributed to the lack of bald eagle breeding activity observed at this location.

As stated in Section 2.4.1, cumulative precipitation in the region reached approximately 150% of normal (DWR 2023a, NOAA 2023), and at Loon Lake Reservoir, most of this precipitation occurred during the breeding season between mid-February and early April (DWR 2023b, Station ID: LON). Snowpack (as measured by water content) at the nearby Van Vleck Gauge peaked in early April at 67 inches, just under twice the 20-year average of approximately 36 inches and the highest on record since the last Wet water year in 2019 when snowpack also peaked at 67 inches (DWR 2019 and 2023b, Station ID: VVL). Minimum air temperatures regularly dropped below freezing through the beginning of May and snowpack did not melt completely until mid-June (DWR 2023b, Station IDs: LON, VVL). Significant portions of the reservoir remained frozen and covered with snow through most of May (Figure 2-11), limiting bald eagle foraging opportunity. Reservoir levels during the breeding season were relatively consistent, ranging from 6,372 to 6,406 feet above mean sea level (DWR 2023b, Station ID: LON), and favorable for bald eagle foraging later in the season when most of the ice and snow had dissipated.

Recreation or other noise-generating activities (e.g., maintenance) at Loon Lake Reservoir in 2023 were unlikely to have affected bald eagle reproductive activity because bald eagles did not exhibit agitated behavior during surveys. Minimal recreation use on and around the reservoir during the early breeding season survey increased to moderate levels during the mid- and late breeding season surveys (Appendix B2). Maintenance activities performed by SMUD during the breeding season were routine and did not involve significant noise generation.

Figure 2-11. Loon Lake Reservoir, 19 May 2023.

2.5 LITERATURE CITED

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3.0 AMPHIBIAN AND AQUATIC REPTILE

3.1 MONITORING PLAN OBJECTIVES

The main objectives of the Amphibian and Aquatic Reptile Monitoring Plan (SMUD 2016a; Plan) are to monitor for and document the presence and distribution of sensitive amphibians and aquatic reptiles in the UARP, focused primarily on foothill yellow-legged frog (*Rana boylii*) and western pond turtle[2] (*Actinemys marmorata*), over the term of the License (FERC 2014). Monitoring is being conducted to help determine if populations of these species in Project-affected streams are increasing or decreasing in response to higher minimum streamflows required by the License conditions or other streamflow fluctuations; additional details of the objectives are presented in the Plan.

3.2 METHODS

In accordance with the Plan, no amphibian and aquatic reptile monitoring was scheduled for License Year 9 (2023; the eighth year of License implementation studies). Adaptive management monitoring, however, was triggered in 2023, as described below.

3.2.1 Adaptive Management Monitoring

Adaptive management (described in Section 5.1 of the Plan) requires SMUD to monitor (i.e., conduct a visual encounter survey [VES]) for effects on aquatic species—primarily foothill yellow-legged frog but also western pond turtle—following spill events at Camino and Slab Creek reservoirs and during flow fluctuations from Camino Dam (SMUD 2016a). To trigger adaptive management monitoring, the spills must occur after water temperatures in the Project reaches[3] exceed a 7-day moving average (7DMAVG) of 12 degrees Celsius (°C) at the associated water temperature monitoring site.

Adaptive management monitoring for amphibians and aquatic reptiles was triggered following prolonged spill events at Camino Reservoir in August 2023 and Slab Creek Reservoir in June 2023. Spills continued after 7DMAVG water temperatures exceeded 12°C in Project reaches (temperature data and adaptive management triggers for the South Fork American River [SFAR] upstream of White Rock Powerhouse and Silver Creek near the confluence of the SFAR stream gages are discussed in detail in Section 6.5). Adaptive management monitoring sites are summarized in Table 3-1.

[2] The Plan was written prior to the western pond turtle being split into two subspecies. The UARP is located within the range of the northwestern pond turtle; for consistency with the Plan, this Report will continue to use western pond turtle.

[3] "Project reach" is a term used in this Report to describe a segment of stream downstream of a dam (e.g., "Camino Dam Reach" is Silver Creek downstream of Camino Dam). Water temperature monitoring is conducted in accordance with SWRCB Condition 8.I and USFS Condition 31.9 of the License.

Table 3-1. Amphibian and Aquatic Reptile Adaptive Management Monitoring Sites, 2023.

Project Reach	Site Code	Site Description	UTM Coordinates[1]		Site Length[2]	Elevation[2,3]
			Downstream End	Upstream End		
Camino Dam Reach	CD-A3	Silver Creek below Camino Reservoir Dam (near Camino Adit)	4298484 N/ 710087 E	4298651 N/ 710236 E	735 ft/ 0.14 mi	2,336 ft
	CD-A4	Silver Creek below Camino Reservoir Dam (at confluence with South Fork American River)	4296233 N/ 709331 E	4296310 N/ 709424 E	404 ft/ 0.08 mi	2,067 ft
Slab Creek Dam Reach	SCD-A1	South Fork American River below Slab Creek Reservoir Dam	4292873 N/ 692573 E	4295022 N/ 692931 E	10,404 ft/ 2.0 mi	1,007 ft

UTM = Universal Transverse Mercator
N = Northing
E = Easting
ft = feet
mi = mile
[1] Projection: North American Datum of 1983 UTM Zone 10 North.
[2] Site lengths and elevations are calculated in geographic information systems (projection: NAD83 UTM Zone 10 North).
[3] Elevation is for the most downstream survey location at the site.

SMUD's Block of Water Plan (SMUD 2016b) describes possible requirements to monitor for foothill yellow-legged frogs if block-of-water releases are required in Wet water year types to maintain water temperatures in Silver Creek below Camino Reservoir Dam. No block-of-water releases were implemented in License Year 9; additional details can be found in the Block of Water Plan and in Section 6.5.

3.2.2 Visual Encounter Surveys

VESs for foothill yellow-legged frogs followed protocols outlined in the *Visual Encounter Survey Protocol for* Rana boylii *in Lotic Environments* (Peek et al. 2017), as well as protocols outlined in Heyer et al. (1994), Lind (1997), and Pacific Gas and Electric Company (2002a, 2002b), consistent with the survey methodology first described in the Plan (SMUD 2016a) and expanded on in the 2017 and 2018 Reports (SMUD 2018 and 2019). VESs were conducted after spill events and when surveyors were able to safely navigate study reaches downstream of dam infrastructure without risk of additional uncontrolled spill events.

Adaptive management monitoring in the Plan includes conducting a VES for evidence of damage or harm (e.g., stranding, desiccation, injury, or death) of all life stages of foothill yellow-legged frogs following a spill event. If the spill events happen during the egg mass or tadpole season for the species (i.e., between spring and summer), additional attention is paid to potentially scoured egg masses or displaced larvae.

Western pond turtles were also concurrently surveyed during all adaptive management monitoring following methods first described in the Plan (SMUD 2016a) and expanded on in the 2017 and 2018 Reports (SMUD 2018 and 2019). Because of the wider and deeper river channel at Site SCD-A1, the VES included two additional surveyors who snorkeled focusing on searching for western pond turtles.

Other amphibian and aquatic reptile species and potential predators (e.g., fish, crayfish, bullfrogs) observed during the VESs were also recorded.

3.3 RESULTS

3.3.1 Foothill Yellow-legged Frog

In 2023, VESs for adaptive management monitoring were conducted on 23 August for Site CD-A4 and 30 June for Site SCD-A1. Adaptive management monitoring could not be conducted at Site CD-A3 because the access road was damaged during the 2023 winter storms and was impassable. Table 3-2 provides survey start and end times and water and air temperatures recorded during each VES. Representative photos of monitoring sites are included in Section 3.1.1.

Table 3-2. Visual Encounter Survey Conditions, 2023.

Site Code	Survey Date (2023)	Time (24-hours)		Temperature Ranges (°C)	
		Start Time	End Time	Water	Air
CD-A4	8/23	950	1025	17.8–18.1	20.3–23.2
SCD-A1	6/30	945	1520	17–19	25–36

°C = degrees Celsius

No foothill yellow-legged frogs were observed in 2023.

Habitat conditions at Sites CD-A4 and SCD-A1 were similar to conditions observed during previous monitoring years (SMUD 2018, 2019, 2020, 2021, 2022 [Site SCD-A1 only]). Historically high snowpack and associated runoff in 2023 (DWR 2023) did not have noticeable effects on the riparian vegetation at either site. Representative photographs of Sites CD-A4 and SCD-A1, including areas of suitable foothill yellow-legged frog habitat, are shown in Figure 3-1 through Figure 3-4.

Figure 3-1. Representative photo of Site CD-A4, highlighting suitable foothill yellow-legged frog habitat, 23 August 2023.

Figure 3-2. Representative photo of Site CD-A4, highlighting suitable foothill yellow-legged frog habitat, 23 August 2023.

Figure 3-3. Representative photo of Site SCD-A1, 30 June 2023.

Figure 3-4. Representative photo of Site SCD-A1, highlighting suitable foothill yellow-legged frog habitat, 30 June 2023.

3.3.2 Western Pond Turtle

One adult western pond turtle was observed, but not captured, underwater on a cobble bank during the snorkeling survey at Site SCD-A1 in 2023 (Figure 3-5). The turtle was observed approximately 1 meter deep in a pool that had a sparse overhead riparian canopy (10% canopy cover) dominated by western sycamores (*Platanus racemosa*) and willows (*Salix* spp.).

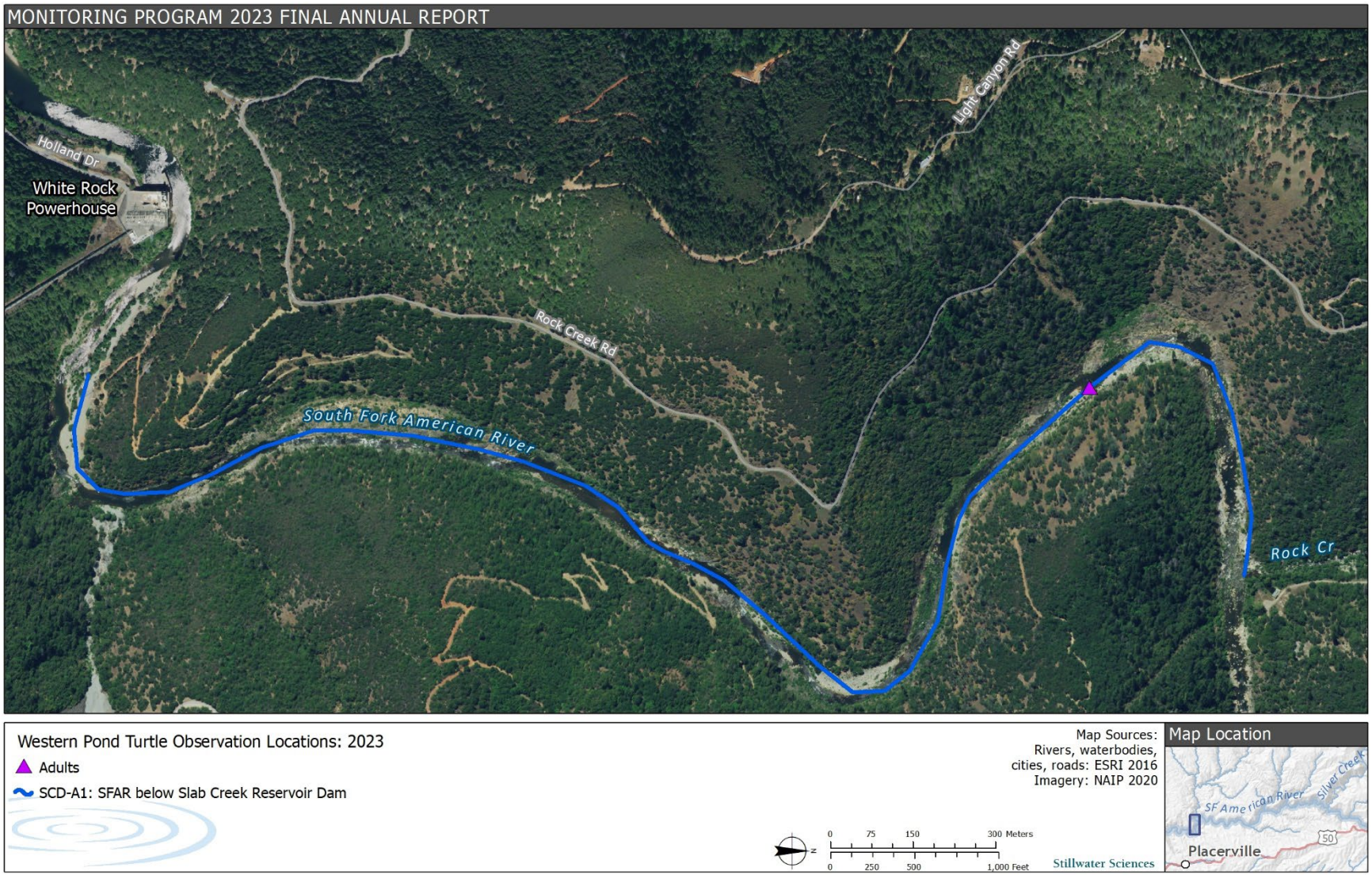

Figure 3-5. Western pond turtle observation at Site SCD-A1 in 2023.

3.3.3 Non-Target Amphibian and Aquatic Reptile Species

Two non-target amphibian or aquatic reptile species were observed during VESs, as summarized in Table 3-3 by species and life stage. An American bullfrog (*Lithobates catesbeianus*) adult was observed in a backwater pool at Site SCD-A1; this species is non-native, invasive, and known to negatively interact with native herpetofauna, including foothill yellow-legged frogs and western pond turtles.

Table 3-3. Additional Aquatic Herpetofauna Species Observed during Visual Encounter Surveys, by Site Code and Life Stage, 2023.

Species Common Name[1] (*Scientific name*)	Site Code	Life Stage	
		Larvae	Juvenile/ Adult
Western toad (*Anaxyrus boreas*)	SCD-A1	X	
American bullfrog (Lithobates catesbeianus)	SCD-A1		X

X = Observed

[1] Incidental sightings of common terrestrial lizards (e.g., western fence lizard [*Sceloporus occidentalis*]) are not included.

3.4 DISCUSSION

During 2023 adaptive management monitoring, there was no evidence of damage or harm (e.g., stranding, desiccation, injury, death) of any life stage of foothill yellow-legged frog because no life stages of foothill yellow-legged frog were observed at either Site SCD-A1 or Site CD-A4. Since post-License monitoring began in 2016, foothill yellow-legged frogs have been infrequently observed at Site CD-A4 (i.e., one tadpole in 2019 and several young-of-year frogs in 2018 and 2019 [SMUD 2019 and 2020]), and no foothill yellow-legged frogs have been observed in post-License monitoring years at Site SCD-A1.

One western pond turtle was observed at Site SCD-A1 during adaptive management monitoring in 2023. Western pond turtles have been observed throughout this reach in five past monitoring years (SMUD 2021 and 2022), and their continued presence indicates that this reach continues to provide suitable aquatic habitat.

3.5 LITERATURE CITED

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SMUD. 2022. Monitoring Program 2021 Final Annual Report. Sacramento Municipal Utility District Hydro License Implementation. June 2022. Upper American River Project, FERC Project No. 2101.

4.0 BEAR MANAGEMENT MONITORING

This Bear-Human Interaction Monitoring Report addresses monitoring set forth in Condition Number 31 of Appendix B of USFS Section 4(e) conditions of the new License issuance order (FERC 2014) for the UARP, owned and operated by SMUD.

In consultation with stakeholders and the resource agencies, SMUD developed a Bear-Human Interaction Monitoring Plan (Plan; SMUD 2015). The monitoring described by this Plan will be used to determine if the measures (primarily installation of bear-proof food and trash lockers, and public education) implemented by the resource agencies are successful in decreasing the number of bear incidents in the UARP. Additionally, the monitoring will help inform resource managers where there are still problems that may need to be addressed with additional bear management measures. Results of bear-human interaction monitoring conducted during the 2023 recreation season are provided in this report.

4.1 MONITORING PLAN OBJECTIVES

The primary objectives and rationale for the bear management monitoring program, as described in the Plan are:

> Monitor effectiveness of measures related to bear management using a method acceptable to [US]FS, [US]FWS, and CDFG [California Department of Fish and Game].

This monitoring will help determine if bear management measures used to keep bear populations away from recreation sites within the UARP are effective. As described in Settlement Agreement Article 1-6.10:

> If, over a 5-year period, monitoring indicates that the number of bear/human interaction incidents does not decline or decrease in severity, the licensee shall work with FS, FWS, and CDFG to identify and implement additional measures necessary to reduce such problems.

Additionally, the results of this monitoring may be useful to SMUD and USFS when planning and prioritizing locations to install bear-proof food lockers.

4.2 STUDY AREA AND SAMPLING LOCATIONS

As has been done since the program began in 2016, monitoring was carried out at developed, UARP-related, recreation facilities within the study area (Figure 4-1, Table 4-1). These included both day-use and overnight facilities, hosted and un-hosted.

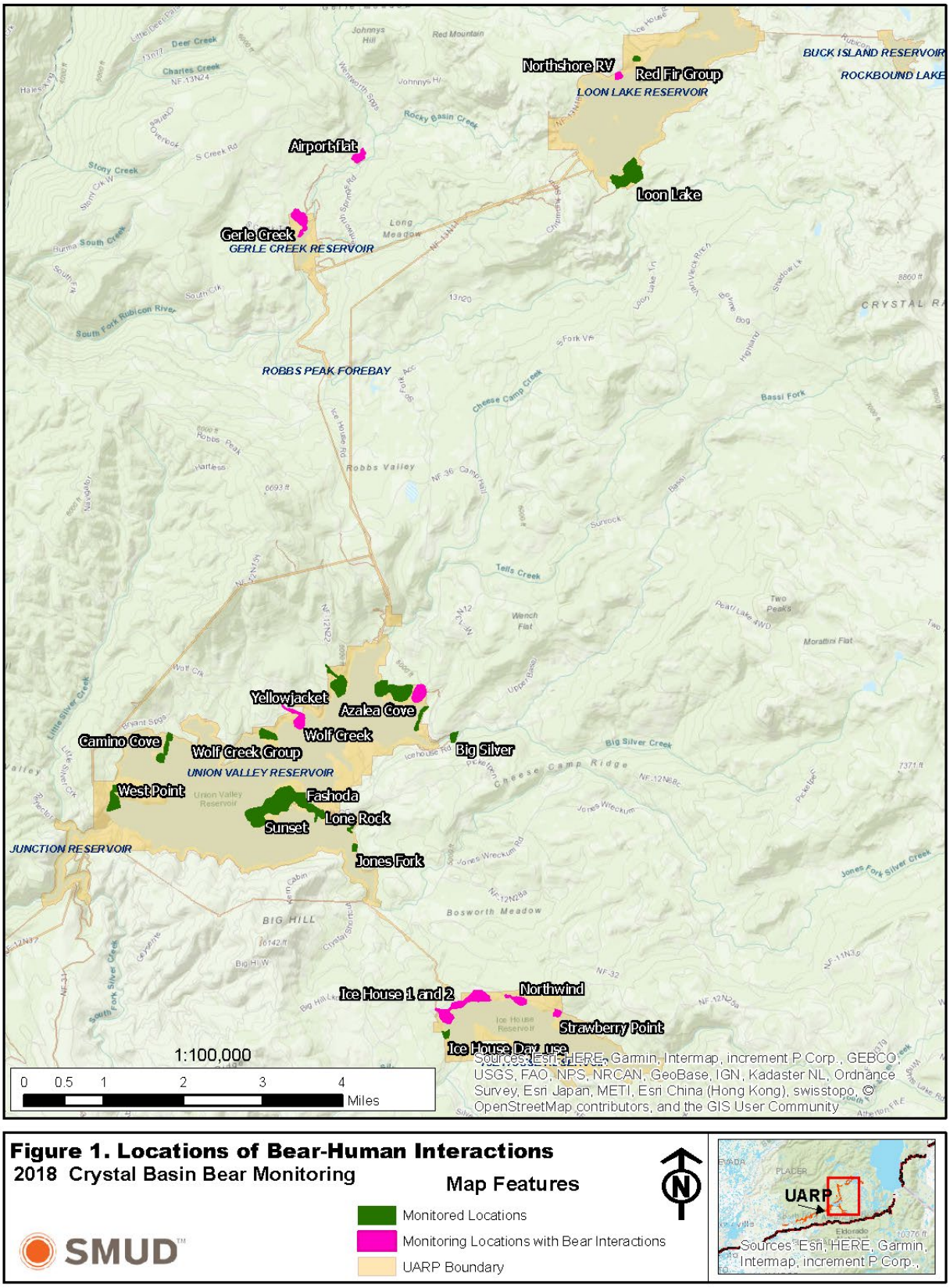

Figure 4-1. Bear-human interaction monitoring locations.

Table 4-1. Sites associated with the Upper American River Project Bear-Human Interaction 2022 Monitoring Program.

Facility	Existing Lockers/ Trash	Hosted Site	Monitored	Comment
Northshore CG	Y	Y	Y	Host supplied with forms
Loon Lake Family CG; Boat Launch RV CG; Equestrian CG; Group CG; and Equestrian Group CG	Y	Y	Y	Host administering multiple Loon Lake facilities was responsible for collecting forms
Red Fir CG	Y	N	Y	Monitoring form box installed
Pleasant Boat-in CG	Y	N	N	Monitoring Box not deployed here due to access challenge
Airport Flat CG	Y	N	Y	Monitoring form box installed
Gerle Creek CG	Y	Y	Y	Host supplied with forms
Sunset Family CG	Y	Y	Y	Host supplied with forms
Fashoda CG	Y	Y	Y	Host supplied with forms
West Point CG	Y	Y	Y	Host supplied with forms
Yellowjacket CG	Y	Y	Y	Host supplied with forms
Wench Family and Group CG	Y	Y	Y	Host supplied with forms
Wolf Creek Family CG	Y	Y	Y	Host supplied with forms
Wolf Creek Group CG	Y	Y	Y	Host supplied with forms
Azalea Cove CG	Y	N	Y	Monitoring form box installed
Big Silver Group CG	Y	N	Y	Monitoring form box installed
Camino Cove CG	Y	N	N	CG closed for season due to construction
Jones Fork CG	Y	N	Y	Monitoring form box installed

Facility	Existing Lockers/ Trash	Hosted Site	Monitored	Comment
Lone Rock CG	Y	N	Y	Monitoring form box installed
Ice House Family CG	Y	Y	Y	Host supplied with forms
Northwind CG	Y	N	Y	Monitoring form box installed
Strawberry Point CG	Y	N	Y	Monitoring form box installed
Day-Use Areas				
Angel Creek	Y	N	Y	Monitoring form box installed
Gerle Creek	Y	Y	Y	Host supplied with forms
Ice House	Y	Y	Y	Host supplied with forms
Fashoda	Y	Y	Y	Host supplied with forms
Jones Fork Bike Trailhead	N	N	Y	Monitoring form box installed at CG
Big Silver Bike Trailhead	N	N	Y	Monitoring form box installed at CG
Wench Creek Bike Trailhead	Y	Y	Y	Host supplied with forms
Loon Lake – Desolation Wilderness	N	N	Y	Monitoring form box installed at trailhead
Silver Creek Day Use	Y	N	N	New site; monitoring form box to be installed

CG = campground

4.3 METHODS

The methods of this monitoring program are outlined in the Plan prepared by SMUD in consultation with USFS and CDFW in 2015. SMUD has prepared a form to be used to collect standardized data. The form is supplied to USFS at the outset of each recreation season, and USFS distributes the forms to campground hosts and to form boxes supplied by SMUD for non-hosted sites. Signage that describes the monitoring program is supplied by SMUD and is posted at monitored locations throughout the Crystal Basin. USFS collects forms from the boxes and from the hosts throughout the season and provides them to SMUD at the end of the season

for reporting purposes. Data are provided by the visiting public, USFS staff, or campground hosts who have interviewed campers. SMUD staff communicate with USFS staff throughout the season to ensure supplies of forms are sufficient.

4.4 RESULTS AND DISCUSSION

At the annual kickoff meeting with USFS staff and the recreation concessionaire in 2023, USFS discussed the bear monitoring program and asked for the help of the concessionaire staff at hosted campgrounds to distribute forms and collect information from campers. This meeting is typically a great opportunity to tell all the parties involved in helping collect data about the program and how they are critical to its success. As seen in Table 4-1, most of the facilities were open throughout the 2023 recreation season except for a closure related to construction of a bike trail along the north shore of Union Valley Reservoir. In 2023 USFS staff stocked the monitoring form boxes and collected forms throughout the year. The concessionaire camp hosts were also supplied with forms which were collected at the end of the season by USFS staff.

SMUD received six completed forms with two incidents reported on a single form at Wench Creek Group Campground, for a total of seven reported incidents (Appendix C1) from USFS for the 2023 recreation season. The results of which are summarized in the table located in Appendix C2. Completed report forms came from the following designated monitoring sites: Wench Creek Group Campground (1), Jones Fork (1), Northwind (1), Sunset (2), and Wolf Creek Group Campground (1).

Since monitoring started in 2016, the number of reported incidents has fluctuated from a high of 43 in 2017 to 7 in 2023. Reported incidents have come from across the Crystal Basin. Locations of bear interactions appear to fluctuate every year, with new hot spots developing at different locations. Many of the bears described in the interactions seem to be habituated to humans and are not easily deterred, particularly when there are numerous incidents in one area. All campground locations in the monitoring program have bear-resistant trash and food storage containers, and most day-use areas have bear-resistant trash containers (Table 4-1).

In 2023 there were bear interactions at five different areas across the Crystal Basin (Appendix C2). All the sites have bear-proof food storage lockers and trash receptacles. At least five of the seven incidents involved food stored outside of the bear lockers; in one instance the bear was rewarded with food before moving on (Appendix C2). The other incidents involved bears attracted to food odor and trash that did not seem bothered by noise campers made to scare them off. The most incidents occurred at Sunset Campground and Wench Creek Group Campground. At each campground, two incidents were reported within a day of each other and were likely the same bear at each campground given the descriptions in the forms. One ice chest was reported as damaged from the bear incidents in 2023. As indicated in previous reports, continuing efforts at education and enforcement are always needed so that visitors understand that ***all food, trash, or scented***

products need to be stored in bear-proof food lockers or trash receptacles. This message needs to be continually reinforced by USFS and its concessionaire hosts. Based on observations and the monitoring results to-date, SMUD makes the following recommendations and suggestions:

1. SMUD, CDFW, and USFS should continue to present information on the monitoring program to the concessionaire's campground hosts during an annual meeting and emphasize the importance of proper food storage.
2. SMUD and USFS should meet briefly once toward the middle of the recreation season to discuss the need for more forms, cooperation of concessionaire staff, how often boxes are being checked, and whether signage is adequate, among other things.
3. USFS should continue to emphasize the need for concessionaire staff to talk to the public about proper food storage and make regular rounds to see if food is being left out. Consider providing a handout about proper food storage that could be given to all campers.
4. USFS could consider having all guests that make reservations online for campsites sign an acknowledgment regarding complying with food storage.

SMUD will continue to provide the results of the monitoring to USFS and CDFW, and any management decisions or actions will be at the discretion of those agencies with jurisdiction over the resource. SMUD may assist in any management decisions, as appropriate.

4.5 UPCOMING SURVEY PLANS

In accordance with the Plan, monitoring will continue to occur annually during the recreation season (approximately Memorial Day through the end of September). In 2024, SMUD, with the help of USFS, will ensure that each site, including hosted sites, has adequate signage to educate the public about bears and inform visitors of the monitoring program. If requested by USFS, SMUD will attend the annual kick-off meeting with the recreation concessionaire to present the details of the monitoring program. SMUD will also provide USFS additional forms to be handed out to the concessionaire during this meeting. For the monitoring to be effective, it will be imperative to make sure the visiting public knows about the monitoring program and their need to fill out forms following any incidents. It is equally important that all sites have forms available throughout the year and that all forms are collected and returned to SMUD at the close of the season.

4.6 LITERATURE CITED

FERC (Federal Energy Regulatory Commission). 2014. Federal Energy Regulatory Commission Order 148 FERC 62,070 Issuing New License for the Sacramento Municipal Utility District Upper American River Hydroelectric Project No. 2101. Issued July 23, 2014.

SMUD (Sacramento Municipal Utility District). 2015. Bear-Human Interaction Monitoring Plan. Hydro License Implementation for the Upper American River Project (FERC Project No. 2101).

5.0 LARGE WOODY DEBRIS

The large New Year's storm event beginning on 31 December 2022 initiated large woody debris (LWD) movement over the spillway of Slab Creek Dam and continued for several days. The log boom was released during this event but was damaged beyond repair and was not replaced until just prior to the March 2023 recreation streamflows. All LWD was allowed to pass during spill events within this period, regardless of size. No LWD met the size criteria for passage at Robbs Peak Forebay, or Junction or Camino reservoirs in 2023.

6.0 WATER TEMPERATURE

The Water Temperature Monitoring Plan (Plan) was developed in consultation with the SWRCB, USFS, CDFW, and USFWS. FERC approved the monitoring plan on 30 September 2015 (SMUD 2015).

6.1 MONITORING PLAN OBJECTIVES

The primary objectives and rationale for the water temperature monitoring program, as described in the Plan, are as follows:

> "Annual water temperature monitoring at specified stream sites will provide information needed to determine whether cold freshwater resource objectives are being met and will provide an evaluation of breeding conditions for sensitive amphibian species. Stream temperature monitoring results will also be used to determine whether water temperature profiles within the reservoirs are needed to better understand cold water availability. An adaptive approach to water temperature monitoring will allow the removal of specific monitoring sites if results indicate water temperatures are adequate at those specific locations" (Condition 8.I.).

This monitoring will help determine if water temperatures in UARP waters meet the beneficial use of cold freshwater habitat in the Water Quality Control Plan for the Central Valley Region, the Sacramento River Basin and the San Joaquin River Basin (Basin Plan) (CVRWQCB 1998) and other identified habitat and species needs. If such a study is inconclusive, reservoir temperature profile monitoring may be required to assist in the decision-making process. Currently, the Plan requires water temperature monitoring in stream reaches throughout the duration of the License term or until "the Licensee can demonstrate to the satisfaction of the Deputy Director that operation of the UARP reasonably protects the cold freshwater habitat beneficial use at any site for which the Licensee seeks modification to the temperature monitoring requirement."

These data are also used to direct the following License requirements:

- Adaptive management decisions regarding initiation of foothill yellow-legged frog breeding,
- Cancellation of recreational boating releases due to foothill yellow-legged frog breeding,
- Temperature monitoring related to the "block of water" releases on Silver Creek,
- Response of aquatic resources to spill events and pulse flows after thresholds have been reached, and
- Requirement of the Basin Plan that "at no time or place shall the temperature of COLD [cold freshwater habitat] or WARM [warm freshwater habitat] intrastate

waters be increased more than 5°F [degrees Fahrenheit] above the natural receiving water temperature."

6.2 METHODS

6.2.1 Study Area and Sampling Locations

Continuous water temperature monitoring of stream reaches occurred in 2023 at 19 sites throughout the UARP area using fixed stations or dataloggers. In general, these sites measured water temperatures in diverted stream reaches downstream of UARP reservoirs. Table 6-1 describes the locations and characteristics of each site. Final site development at a local scale was determined using proximity to release point, presence of isothermal water column, logistics, and channel morphology. Figures 1-1 through 1-3 depict the monitoring site locations relative to the UARP and primary streams and rivers.

Table 6-1. Upper American River Project Water Temperature Monitoring Site Locations.

Site Name	Site Description	UTM (NAD 83)		Sensor Type	Data	Threshold	Complete
		Easting	Northing				
RR5	Rubicon River immediately below Rubicon Reservoir Dam	740501	4319200	CS450L	Telemetry	None	Yes
LRR3	Little Rubicon River immediately below Buck Island Reservoir Dam	737558	4320907	CS450L	Telemetry	None	Yes
RR1	Rubicon River below confluence of Little Rubicon River at the Project boundary	736593	4323887	Onset data-logger	Manual	None	Yes
GC7	Gerle Creek immediately below Loon Lake Reservoir Dam	732455	4320776	CS450L	Telemetry	None	Yes
GC8	Gerle Creek immediately below Gerle Creek Reservoir Dam	725745	4316219	CS107 or CS450L	Telemetry	None	Yes

Site Name	Site Description	UTM (NAD 83)		Sensor Type	Data	Threshold	Complete
		Easting	Northing				
SFRR5	South Fork Rubicon River immediately below Robbs Peak Reservoir Dam	726202	4314316	CS450L	Fiber Optic Network	None	Yes
SFRR6	South Fork Rubicon River below confluence of Gerle Creek at the Project boundary	725256	4314907	CS450L	Telemetry	None	Yes
SFRR7	South Fork Rubicon River immediately upstream of the confluence with the Rubicon River	719438	4316236	Onset data-logger	Manual	None	Yes
SFSC7	South Fork Silver Creek immediately below Ice House Reservoir Dam	728745	4299871	CS450L	Telemetry	None	Yes
SFSC8	South Fork Silver Creek immediately upstream of Junction Reservoir	721498	4303358	CS450L	Telemetry	7DMAVG	Yes
SC5	Silver Creek immediately below Junction Reservoir Dam	720466	4303467	CS 450L	Fiber Optic Network	None	Yes
SC6	Silver Creek immediately above Camino Reservoir Dam	714119	4301407	CS450L	Telemetry	DAVG	Yes
SC7	Silver Creek immediately below Camino Reservoir Dam	713631	4300155	CS450L	Fiber Optic Network	None	Yes

Site Name	Site Description	UTM (NAD 83)		Sensor Type	Data	Threshold	Complete
		Easting	Northing				
SC8	Silver Creek immediately upstream of the South Fork American River	709310	4296208	CS450L	Telemetry	DAVG	Yes
BC4	Brush Creek immediately below Brush Creek Reservoir Dam	706407	4298536	CS451	Fiber Optic Network	None	Yes
SFAR13	South Fork American River immediately below Slab Creek Reservoir Dam	699644	4294054	CS450L	Fiber Optic Network	None	Yes
SFAR7	South Fork American River at Mosquito Road Bridge	695572	4294304	Onset Data-logger	Manual	None	No[1]
SFAR15	South Fork American River approximately 0.5 mile upstream of White Rock Powerhouse	692576	4292875	CS450L	Telemetry	7DMAVG	Yes
SFAR16	South Fork American River to record White Rock Powerhouse discharge temps	692212	4293046	CS450L	Fiber Optic Network	None	Yes

7DMAVG = 7-day moving average
DAVG = daily average
NAD 83 = North American Datum 1983
UTM = Universal Transverse Mercator
[1] Dataloggers not recovered; see Section 6.2.4.

6.2.2 Temperature Data at Fixed Stations

Sixteen of the nineteen sites were monitored for water temperature using fixed stations. Monitoring compliance at these sites was accomplished using gaging stations located at weirs, stilling wells, or powerhouse tailraces. Each fixed station site used a Campbell Scientific datalogger and a redundant pair of temperature sensors. Sensor cables were contained inside conduit, and the sensors were placed as close as possible to the stream thalweg where water is well mixed. A solar shield helped prevent exposure to

direct sunlight. Depending on the site, power was supplied either by photovoltaic panels and direct current (DC) batteries or by an existing power supply. Data transfer occurred through radio telemetry or fiber optic network. At the fixed stations, temperature readings were collected at 15-minute intervals and telemetered to SMUD's License Implementation database, where the data were summarized to hourly means and calculated to daily statistics.

Computation of daily minimum, maximum, average, and 7DMAVG values are automated in real time for fixed station sites in the SMUD License Implementation database. SMUD staff are notified when thresholds are exceeded at sites associated with trigger thresholds (Table 6-1).

6.2.3 Temperature Data at Datalogger Stations

Simple, non-permanent, calibrated temperature dataloggers (Onset HOBO® Water Temperature Pro V2) were deployed prior to 15 March 2023 at the remaining three sites ("manual" sites in Table 6-1). The sensors were inserted into perforated metal-framed housings that allowed for adequate water movement throughout.

Each housing was secured to large boulders or bedrock using hardened 3/8-inch chain and placed to ensure that the sensor remained submerged and was not exposed to direct sunlight (Figure 6-1). Two dataloggers were installed at each site to protect against data loss in the event of equipment failure or drift. Dataloggers were deployed in habitat strata where the water was well mixed, typically at the head of a pool just below a riffle input. Table 6-2 describes the equipment specifications for all sensors selected for water temperature monitoring.

Hourly data from HOBO loggers were manually downloaded using Onset Computer Corporation's HOBOware software upon retrieval at the end of the monitoring period.
Variances and Problems Encountered

The two temperature dataloggers deployed at Site SFAR7 (SFAR at Mosquito Road Bridge) were not recovered. The loggers, as well as the sensor housing, were dislodged and lost during high flow.

Figure 6-1. Water temperature datalogger housing, Rubicon River below confluence of Little Rubicon River.

Table 6-2. Specifications for Monitoring Equipment.

Sampling Equipment	Accuracy	Range	Calibration Interval
Campbell Scientific 107L	<±0.2°C from 0°to 50°C	-35° to +50°C	Annual
Campbell Scientific 450L	±0.2°C from 0°to 50°C	0° to 60°C	Biennial
Onset Computer Corp. HOBO®	±0.2°C from 0° to 50°C	-40° to 50°C	Annual

°C = degrees Celsius

6.3 QUALITY ASSURANCE/QUALITY CONTROL

Raw data from fixed stations were reviewed on a routine basis. Temperature trends inspected include physical range limits, practical range limits, and rates of temperature change. Data obtained from the fixed stations were checked for validity using procedures that run every 24 hours following data download. A report was generated and sent to pertinent SMUD staff via email for any suspected erroneous data. The same procedures were run manually following download from the data loggers. Erroneous temperature values were adjusted manually; however, the original raw data were maintained in the database.

This review, along with graphical analysis and routine equipment inspection, ensured that sensors were functioning and recording properly throughout the monitoring period, allowing for a timely response at fixed stations if the need arose. Any equipment malfunction that required a field visit was addressed during normal business hours, under safe conditions. Repairs were made in as timely a manner as possible.

6.4 DECISION-MAKING THRESHOLDS

SMUD uses real-time water temperature information in an effort to protect endangered species and cold freshwater habitat. The following 12°C 7DMAVG temperature trigger thresholds may eventually be adjusted on a site-specific basis if data from the foothill yellow-legged frog monitoring support such a change. In particular, SMUD will:

- Use water temperature thresholds to protect foothill yellow-legged frog breeding activities by canceling recreation streamflows in the following reaches when the 7DMAVG exceeds 12°C at:
  - South Fork Silver Creek below Ice House Dam (if foothill yellow-legged frogs are found in this reach).
  - SFAR below Slab Creek Reservoir.
- Monitor for effects on aquatic resources following spills that occur at Camino and Slab Creek reservoirs when the 7DMAVG exceeds 12°C.
- Monitor other temperature thresholds to protect the cold freshwater habitat requirements on Silver Creek, as described in the 401 certification (SWRCB2013). This monitoring involves informing the release of an additional “block of water” during Wet water year types when the daily average temperature (DAVG) exceeds 20°C.
- Compare water temperature trends over time with other annual climatic conditions collected by SMUD to assist in determining whether the UARP is protecting the Basin Plan beneficial use of cold freshwater habitat (CVRWQCB 1998).

6.5 ADAPTIVE MANAGEMENT

Thresholds connected to various UARP adaptive management conditions were crossed at three sites during the monitoring period (Table 6-3), triggering adaptive management actions.

Table 6-3. Water Temperature Threshold Exceedances.

Site Name	Site Description	Threshold	Dates of Threshold Exceedance
SFSC8	South Fork Silver Creek immediately upstream of Junction Reservoir	7DMAVG, 12°C	June 30–September 24
SC8	Silver Creek immediately upstream of South Fork American River confluence	DAVG, 20°C	August 7–9, August 12–16, August 19, August 25
		7DMAVG, 12°C	June 25–October 15
SFAR15	South Fork American River approximately 0.5 mile upstream of White Rock	7DMAVG, 12°C	June 2–October 15

7DMAVG = 7-day moving average
DAVG = daily average

For water temperature monitoring at Slab Creek Dam (SFAR13), no spills occurred after the 7DMAVG exceeded the 12°C threshold on 23 June. For water temperature monitoring at Silver Creek at Camino Gaging Station (SC7), no spills occurred after the 7DMAVG reached the 12°C threshold on 17 August.

At South Fork Silver Creek immediately upstream of Junction Reservoir (SFSC8), the temperature threshold trigger site for South Fork Silver Creek below Ice House Dam, the 7DMAVG exceeded the 12°C threshold on June 30 and remained above the threshold through September 24. The threshold exceedance did not trigger cancellation of recreational streamflows because boating releases in this reach concluded on 25 June 2023, prior to the exceedance.

At Silver Creek immediately above Camino Reservoir Dam (SC6), the DAVG did not exceed the 20°C threshold during the monitoring period.

At Silver Creek immediately upstream of the SFAR confluence (SC8), the DAVG exceeded the 20°C threshold four times in the period between 7 August and 25 August. The duration of the exceedances was 4 days or less. Because 2023 was a Wet water year type, these exceedances would normally trigger a “block of water” release. No changes to minimum instream flow in Silver Creek downstream of Camino Reservoir were made in response to the 12–16 August exceedance; the DAVG dropped below the 20°C threshold prior to executing the increased minimum instream flow releases, as described in the Block of Water Plan (SMUD 2016). No releases were made for the

other three exceedances because the DAVG dropped below the 20°C threshold before or on the first business day following the start of each exceedance. The 7DMAVG at SC8 exceeded the 12°C threshold on 25 June; any spills following the threshold exceedance triggered adaptive management monitoring for amphibians and aquatic reptiles (as discussed in Section 3.2.1).

At the SFAR approximately 0.5 mile upstream of White Rock (SFAR15), the temperature threshold trigger site for SFAR below Slab Creek Reservoir, the 7DMAVG exceeded the 12°C threshold on 2 June and remained above the threshold for the remainder of the monitoring period. Any spills following this temperature exceedance triggered adaptive management monitoring for amphibians and aquatic reptiles (as discussed in Section 3.2.1). The threshold exceedance did not trigger cancellation of recreational streamflows because boating releases in this reach concluded on 23 April 2023, prior to the exceedance.

6.6 RESULTS

Daily water temperature statistics are presented graphically in Appendix D. Hourly data will be made available upon request.

6.7 LITERATURE CITED

CVRWQCB (Central Valley Regional Water Quality Control Board). 1998. Water Quality Control Plan (Basin Plan) for the Central Valley Region, the Sacramento River Basin and the San Joaquin River Basin. Published by the California Regional Water Quality Control Board, Central Valley Region and the State Water Resources Control Board, Sacramento, CA.

SMUD (Sacramento Municipal Utility District). 2015. Temperature Monitoring Plan for the Upper American River Project. Sacramento, CA.

SMUD. 2016. Block of Water Plan for the Upper American River Project. Sacramento, CA.

SWRCB (State Water Resources Control Board). 2013. Water Quality Certification for the Upper American River Project. FERC Project No. 2101. State Water Resources Control Board. Sacramento, CA.

APPENDIX A

Pre- and Post-License Minimum Streamflow Requirements for the Upper American River Project (FERC P-2101)

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Table A1-1. Summary of minimum streamflow requirements prior to the 2014 UARP FERC license.

USGS Gaging Station	TYPE 1: Years when less than 1 million acre-ft annual inflow is forecasted for Folsom Reservoir	FERC Article 29 Ref.	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Comments
11427960	Rubicon River Below Rubicon Dam	(a)	6	6	6	6	6	6	6	6	6	6	6	6	See Note 1
11428400	Little Rubicon River Below Buck Island Dam	(b)	1	1	1	1	1	1	1	1	1	1	1	1	See Note 2
11429500	Gerle Creek below Loon Lake Dam	(c)	8	8	8	8	8	8	8	8	8	8	8	8	
11430000	South Fork Rubicon River below Robbs Peak Dam	(d) (g)	1	1	1	1	1	1	1	1	1	1	1	1	See Notes 3,8
11430000	Gerle Creek below Gerle Creek Dam	(d) (g)	4	4	4	4	4	4	4	4	4	4	4	4	See Notes 3,8
11441500	South Fork Silver Creek below Ice House Dam	(e) (g)	5	5	5	5	5	5	5	5	5	5	5	5	See Note 4
11441800	Silver Creek below Junction Dam	(f) (g)	5	5	5	5	5	5	5	5	5	5	5	5	See Note 3
11441900	Silver Creek below Camino Dam	(g)	5	5	5	5	5	5	5	5	5	5	5	5	See Note 3
11442700	Brush Creek below Brush Creek Dam	(I)	2	4	4	4	4	4	4	4	2	2	2	2	See Notes 5, 6
1143500	South Fork American River below Slab Creek Dam	(h)	36	36/10	10	10	10	10	10	10	36	36	36	36	See Notes 6, 7
USGS Gaging Station	**TYPE 2: Years when 1.0-1.499 million acre-ft annual inflow is forecasted for Folsom Reservoir**	**FERC Article 29 Ref.**	**OCT**	**NOV**	**DEC**	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**Comments**
11427960	Rubicon River Below Rubicon Dam	(a)	6	6	6	6	6	6	6	6	6	6	6	6	See Note 1
11428400	Little Rubicon River Below Buck Island Dam	(b)	1	1	1	1	1	1	1	1	1	1	1	1	See Note 2
11429500	Gerle Creek below Loon Lake Dam	(c)	8	8	8	8	8	8	8	8	8	8	8	8	
11430000	South Fork Rubicon River below Robbs Peak Dam	(d) (g)	1	1	1	1	1	1	1	1	1	1	1	1	See Notes 3,8

USGS Gaging Station	TYPE 1: Years when less than 1 million acre-ft annual inflow is forecasted for Folsom Reservoir	FERC Article 29 Ref.	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	Comments
11430000	Gerle Creek below Gerle Creek Dam	(d) (g)	4	4	4	4	4	4	4	4	4	4	4	4	See Notes 3,8
11441500	South Fork Silver Creek below Ice House Dam	(e) (g)	5	5	5	5	5	5	5	5	5	5	5	5	See Note 4
11441800	Silver Creek below Junction Dam	(f) (g)	10	6	6	6	6	6	6	10	10	10	10	10	See Note 3
11441900	Silver Creek below Camino Dam	(g)	10	6	6	6	6	6	6	10	10	10	10	10	See Note 3
11442700	Brush Creek below Brush Creek Dam	(i)	2	4	4	4	4	4	4	4	2	2	2	2	See Notes 5, 6
11443500	South Fork American River below Slab Creek Dam	(h)	36	36/10	10	10	10	10	10	10	36	36	36	36	See Notes 6,7

Notes:

1. 6 cfs or the natural flow, whichever is less, plus storage provided by stream flow maintenance dams of CDFG in Lakes Clyde, Schmidell, Lois, and Middle Velma.
2. 1 cfs at all times in addition to the storage releases from stream flow maintenance dams of CDFG in Rockbound and Highland Lakes as determined by that dept.
3. Requirements are based on the 4/1 CDWR Bulletin 120 forecasted "Water Year Unimpaired Runoff" for the Folsom Reservoir (which is deemed to be the same as American River at Fair Oaks).
4. Requirements are based on the CDWR Bulletin 120 forecasted "Water Year Unimpaired Runoff" to Folsom Reservoir, beginning with the 4/1 bulletin and applying in turn the 5/1 bulletin as it is issued.

   The 5/1 bulletin shall apply until 4/1 bulletin of the succeeding year is issued.
5. Requirements are as specified or natural flow, whichever is less.
6. Based on the CDWR Bulletin 120 forecasted "Water Year Unimpaired Runoff" to Folsom Reservoir, beginning with the 3/1 bulletin and applying in turn the 4/1 & 5/1 bulletins as they are issued.

   The 5/1 bulletin shall apply until 3/1 bulletin of the succeeding year is issued.
7. From November 1–November 15, releases are 10 cfs. From November 16–November 30, releases are 4 cfs.
8. Combined releases should be either 10 cfs or 5 cfs (distributed as noted in this chart), measured on the South Fork Rubicon River below the mouth of Gerle Creek.

Table A1-2. Summary of minimum streamflow requirements included in the current 2014 UARP FERC license.

USGS Gaging Station	Above Normal years when 2.6 to 3.5 MAF water year unimpaired inflow was forecast for Folsom Lake	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Comments
11427690	Rubicon Dam	6*	6*	15	20	35	15	6*	6*	6*	6*	6*	6*	
11428400	Buck Island Dam	1*	1*	3	5	8	3	1*	1*	1*	1*	1*	1*	
11429500	Loon Lake Dam	23	27	37	49	49	27	27	17	17	20	20	22	
	Gerle Creek Dam	6	6	9	9	15	15	15	12	10	10	6	6	See Note 4
	Robbs Peak Dam	7	8	9	10	13	13	13	11	6	3	3	4	See Note 4
11441500	Ice House Dam	18	18	24	41	68	46	30	15	15	15	8	11	
11441800	Junction Dam	20	20	25	42	68	59	35	18	18	15	20	20	
11441900	Camino Dam	20	20	25	42	68	59	35	18	18	15	20	20	
11442700	Brush Creek Dam	9*	9*	9*	9*	9*	9*	5*	4*	3*	4*	9*	9*	
11443500	Slab Creek Dam	80	80	110-130-150-180	188-197-213-222	229-236-247-263	228-193-158-123	90	70	70	80	80	80	See Note 2
11427690	Rubicon Dam	6*	6*	15	20	35	15	6*	6*	6*	6*	6*	6*	
11428400	Buck Island Dam	1*	1*	3	5	8	3	1*	1*	1*	1*	1*	1*	
11429500	Loon Lake Dam	28	32	44	58	58	32	32	20	20	23	23	26	
	Gerle Creek Dam	6	6	9	9	15	15	15	12	10	10	6	6	See Note 4
	Robbs Peak Dam	7	8	9	10	13	13	13	11	6	3	3	4	See Note 4
11441500	Ice House Dam	18	18	24	41	68	46	30	15	15	15	8	11	
11441800	Junction Dam	20	20	25	42	68	59	35	18	18	15	20	20	
11441900	Camino Dam	20	20	25	42	68	59	35	18	18	15	20	20	

USGS Gaging Station	Above Normal years when 2.6 to 3.5 MAF water year unimpaired inflow was forecast for Folsom Lake	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Comments
11442700	Brush Creek Dam	10*	10*	10*	10*	10*	9*	5*	4*	3*	4*	9*	10*	
11443500	Slab Creek Dam	90	90	110-130-150-180	188-197-213-222	229-236-247-263	228-193-158-123	90	70	70	90	90	90	See Note 2

* Or natural inflow if less, but in all cases not less than 1 cfs

Notes

1. The water year total volume of unimpaired inflow to Folsom Lake is used to determine the water year. The California DWR makes forecasts of this volume, in units of thousands of acre-feet (TAF). One million acre feet (MAF) equal 1,000 TAF. DWR publishes Bulletin 120 or posts the forecast on its web site several days after February 1, March 1, April 1, and May 1 each year. The value forecasted in May applies until mid-October. DWR also computes the actual water year unimpaired inflow and post this value on its web site in mid-October. The value posted in October applies until the subsequent February 1 forecast is published.
2. Flows listed for Slab Creek Dam apply during the first five years of the license.
3. MAF denotes million acre-feet. Bulletin 120 gives forecasts in TAF, thousand acre-feet. 1,000 TAF = 1 MAF
4. New USGS gages to be installed in 2008 or 2009

APPENDIX B1

Incidental Observations of Avian Species in the Study Area (2016–2023)

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Table B1-1. Incidental Observations of Avian Species in the Study Area (2016–2023)

Common Name	Scientific Name
Canada Goose	*Branta canadensis*
Cinnamon Teal	*Spatula cyanoptera*
Mallard	*Anas platyrhynchos*
Bufflehead	*Bucephala albeola*
Common Merganser	*Mergus merganser*
Mountain Quail	*Oreortyx pictus*
Pied-billed Grebe	*Podilymbus podiceps*
Red-necked Grebe	*Podiceps grisegena*
Eared Grebe	*Podiceps nigricollis*
Western Grebe	*Aechmophorus occidentalis*
Band-tailed Pigeon	*Patagioenas fasciata*
Mourning Dove	*Zenaida macroura*
Common Nighthawk	*Chordeiles minor*
Vaux's Swift	*Chaetura vauxi*
Killdeer	*Charadrius vociferus*
Spotted Sandpiper	*Actitis macularius*
California Gull	*Larus californicus*
Common Loon	*Gavia immer*
Double-crested Cormorant	*Nannopterum auritum*
Great Blue Heron	*Ardea herodias*
Turkey Vulture	*Cathartes aura*
Osprey	*Pandion haliaetus*
Sharp-shinned Hawk	*Accipiter striatus*
Cooper's Hawk	*Accipiter cooperii*
American Goshawk	*Accipiter atricapillus*
Red-tailed Hawk	*Buteo jamaicensis*
Great Horned Owl	*Bubo virginianus*
California Spotted Owl	*Strix occidentalis occidentalis*
Red-breasted Sapsucker	*Sphyrapicus ruber*
Downy Woodpecker	*Dryobates pubescens*
Hairy Woodpecker	*Dryobates villosus*
White-headed Woodpecker	*Dryobates albolarvatus*
Northern Flicker	*Colaptes auratus*
Pileated Woodpecker	*Dryocopus pileatus*
American Kestrel	*Falco sparverius*
Peregrine Falcon	*Falco peregrinus*
Olive-sided Flycatcher	*Contopus cooperi*
Western Wood-Pewee	*Contopus sordidulus*
Dusky Flycatcher	*Empidonax oberholseri*
Western Flycatcher	*Empidonax difficilis*
Black Phoebe	*Sayornis nigricans*
Cassin's Vireo	*Vireo cassinii*
Warbling Vireo	*Vireo gilvus*

Common Name	Scientific Name
Steller's Jay	*Cyanocitta stelleri*
Clark's Nutcracker	*Nucifraga columbiana*
American Crow	*Corvus brachyrhynchos*
Common Raven	*Corvus corax*
Mountain Chickadee	*Poecile gambeli*
Tree Swallow	*Tachycineta bicolor*
Violet-green Swallow	*Tachycineta thalassina*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Barn Swallow	*Hirundo rustica*
Bushtit	*Psaltriparus minimus*
Golden-crowned Kinglet	*Regulus satrapa*
Red-breasted Nuthatch	*Sitta canadensis*
White-breasted Nuthatch	*Sitta carolinensis*
Brown Creeper	*Certhia americana*
Rock Wren	*Salpinctes obsoletus*
American Dipper	*Cinclus mexicanus*
Mountain Bluebird	*Sialia currucoides*
Townsend's Solitaire	*Myadestes townsendi*
Hermit Thrush	*Catharus guttatus*
American Robin	*Turdus migratorius*
Evening Grosbeak	*Coccothraustes vespertinus*
Purple Finch	*Haemorhous purpureus*
Cassin's Finch	*Haemorhous cassinii*
Pine Siskin	*Spinus pinus*
Chipping Sparrow	*Spizella passerina*
Fox Sparrow	*Passerella iliaca*
Dark-eyed Junco	*Junco hyemalis*
California Towhee	*Melozone crissalis*
Rufous-crowned Sparrow	*Aimophila ruficeps*
Green-tailed Towhee	*Pipilo chlorurus*
Spotted Towhee	*Pipilo maculatus*
Red-winged Blackbird	*Agelaius phoeniceus*
Brown-headed Cowbird	*Molothrus ater*
Brewer's Blackbird	*Euphagus cyanocephalus*
Orange-crowned Warbler	*Leiothlypis celata*
Nashville Warbler	*Leiothlypis ruficapilla*
MacGillivray's Warbler	*Geothlypis tolmiei*
Yellow Warbler	*Setophaga petechia*
Yellow-rumped Warbler	*Setophaga coronata*
Hermit Warbler	*Setophaga occidentalis*
Wilson's Warbler	*Cardellina pusilla*
Western Tanager	*Piranga ludoviciana*
Black-headed Grosbeak	*Pheucticus melanocephalus*

APPENDIX B2

Bald Eagle Nesting Survey Forms

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STATE OF CALIFORNIA THE
RESOURCE AGENCY
DEPARTMENT OF FISH AND GAME

BALD EAGLE BREEDING SURVEY INSTRUCTIONS

The breeding season of bald eagles in California extends primarily from February through July. Each year cooperating agencies, organizations, and private individuals participate in a statewide monitoring program to document nesting activities at each nesting territory. In 1997, 160 recently active breeding territories were surveyed, and the number increases yearly.

Annual breeding season surveys are an important part of the population recovery effort. Survey information is used by resource agencies to aid breeding territory management or protection activities. Additionally, population status and trends must be monitored annually to provide the data needed for assessing population recovery.

Specific assignments and scheduling of observer time are usually handled at the agency district or regional office level. In general, agencies are responsible for surveys or territories on or near their own lands, with Department of Fish and Game also surveying on private lands. Field personnel should coordinate with other agencies or volunteers to avoid duplication of effort or to arrange for survey help.

The bald eagle breeding population is increasing annually. So, it is important that suspected new nesting territories be adequately checked, especially early in the breeding season.

Territories should be checked at least three times during the nesting season, although more frequent checking is preferred. Emphasis should be placed on checking during incubation and early nesting periods.

1. **Early March (early incubation)** – Territories in northern California should be checked in the first half of March, if possible, or as soon thereafter as road or weather conditions allow. The purpose of the first check is to determine whether a territory is occupied (record presence of adults, courtship behavior, evidence of nest repair or construction, incubation).
2. **Late April or early May (early nesting period)** – This check is needed to confirm that a territory is unoccupied, or if occupied in March, to determine whether the breeding pair is still tending the nest (incubating eggs or tending young nestlings).
3. **Mid-June (late nesting period)** – The main purpose of this check is to determine how many nestlings are approaching fledgling age.

Survey dates maybe modified from these recommended time periods if the territories can be checked more frequently or if particular breeding pairs are known to begin nesting especially early or late in the season.

We recommend that observers report the stage of development of nestlings in accordance with An Illustrated Guide for Identifying Developmental Stages of Bald Eagle Nestlings in the Field, by G.P. Carpenter (April 1990). This booklet is available from the San Francisco Zoological Society, Sloat Blvd. At the Pacific Ocean, San Francisco, CA 94132 (415-753-7080).

SUBMITTAL OF SURVEY FORMS

Please report observations on the **CALIFORNIA BALD EALGE NESTING TERRITORY FORM.** Please mail all

completed forms by September 1 of the survey year to:

California Department of Fish and Game
Wildlife Branch
1812 Ninth St.
Sacramento, CA 95814
ATTN: Shannon Skalos

Forms will be maintained in Department files and annual survey results will be compiled on the basis of these reports. If you have any questions, please contact Shannon Skalos at the above address or at sskalos@dfg.ca.gov. Electronic forms can be found at http://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html.

California Department of Fish and Game
CALIFORNIA BALD EAGLE NESTING

TERRITORY SURVEY FORM

Territory Code: UVR

County: El Dorado **Survey Year:** 2023

Property Owner: USFS **If USFS:** Eldorado National Forest

Name (or general location of territory): Union Valley Reservoir

Name of nearest water body: Union Valley Reservoir

Location of Nest Site:

UTM E: 725334 **UTM N**: 4305602 **Zone:** 10S

No. of nests in territory - **Intact:** 1 **Remnant:** 0

Nest Tree: Species: Ponderosa Pine **Year Last Used:** 2022

NOTE: Please attach a map showing the location of any newly documented nest tree.

Describe tree and nest condition and size and add other remarks: Dominant Ponderosa pine located NW of site #19 in Sunset Campground with nest in good condition.

For each visit to a territory, note, in detail, the times, number and age of birds, behavior of birds (lying, perching, etc.), evidence of nesting (nest maintenance, courtship, incubation posture), disturbances, and other pertinent information:

Observers	Date (Time)	Observations/Notes
Cooper Walton Emily Applequist	03.24.23 (10:00 to 15:10)	**Early Breeding Season Survey:** • Significant snow accumulation requiring 4WD and snowshoes for access. • 10:00–11:00: Biologists snowshoed to Sunset Peninsula, surveying for BAEA activity in the vicinity. • 11:00–12:00: No evidence of activity at Sunset Campground nest; nest covered in fresh snow. • 12:00–12:30: Biologists surveyed reservoir from N shore of Sunset Peninsula. • 13:00–15:20: Biologists surveyed from Union Valley Dam and boat ramp. • 14:30: Subadult BAEA in previously documented perch (prominent snag with multiple branches) SE of dam. • Recreational activity low (~2 boats); no BAEA disturbance observed; approximately 6 inches of fresh snow.
Steven Wood Krista Orr	03.24.23 (14:30 to 15:20)	

Observers	Date (Time)	Observations/Notes
Krista Orr Steven Wood	05.29.23 (15:15 to 16:00) 05.30.23 (06:20 to 06:45; 13:40 to 15:15)	**Mid-Breeding Season Survey:** **05.29.23** • 15:15: BAEA nestling vocalizations originating from Sunset Campground nest; adult BAEA vocalizations in vicinity. • 15:20–15:30: BAEA nestling (approximate age 3–4 weeks) in nest. • 16:00: Additional BAEA nestling of similar age in visible in nest. **05.30.23** • 06:20–06:45: Two BAEA nestlings visible in nest, vocalizing. • 13:40–14:50: Biologists surveyed from multiple vantage points accessible from North Union Valley Road. • 14:50–15:15: Biologists observed from Union Valley Dam and boat launch. • No additional BAEA activity. • Recreational activity moderate (campsites mostly full, ~3 fishing boats); no BAEA disturbance observed.
Cooper Walton Steven Wood	05.30.23 (06:20 to 06:45; 13:40 to 15:15)	

Observers	Date (Time)	Observations/Notes
Krista Orr Cooper Walton Steven Wood Annabelle Howe	06.21.23 (20:00 to 21:30) 06.22.23 (04:35 to 21:30)	**Late Breeding Season Survey:** **06.21.23** • 20:00: Two juvenile BAEA observed on nest at Sunset Campground. • 20:22: One juvenile BAEA observed branching below nest. • 20:53: Vocalizations heard from juvenile BAEA on nest. **06.22.23** • 04:30–05:40: Repeated juvenile and adult BAEA vocalizations. • 06:00–08:30: Two juvenile BAEA at nest, branching and preening; adult BAEA not observed. • 10:00–16:30: Biologists surveyed suitable BAEA habitat surrounding reservoir from boat and multiple shoreline vantagepoints. • 11:15: BAEA adult in perch (Ponderosa pine) on E side of Granlee's Point, flew SE and briefly landed in perch (fir spp.); observed again in previous pine perch at 12:15. • 12:10: Adult BAEA circling near the Smudea Campground, eventually landing in perch (prominent fir spp.) near shore. • 12:17: Adult BAEA left perch and continued to ride thermals before flying over ridge to NE. • 14:15: Adult BAEA circling above Camino Cove, landed in perch (Ponderosa pine) uphill from shore, remained for 5 minutes and then relocated to a stump at water's edge. • 14:33: Adult BAEA relocated to new perch (fir spp.) just above stump. • 15:10: Adult BAEA departed perch, flying S over West Point Peninsula. • 17:10 Adult BAEA delivering food to juvenile BAEAs in Sunset Campground nest. • Recreational activity high (full campgrounds and day use areas, ~10 fishing boats); no BAEA disturbance observed.

Observers	Date (Time)	Observations/Notes
Cooper Walton Annabelle Howe	07.13.23 (13:10 to 13:45)	**Additional reproductive status check:** • 13:10: Juvenile BAEA perched on highest branch of nest tree, vocalizing consistently. • 13:40: Juvenile BAEA flew SW away from nest tree, confirming fledging. • Second juvenile BAEA not observed but likely fledged based on late breeding season observations and incidental reports. • Recreational activity moderate to high (Day use areas full, Sunset campground loop closed, ~10 fishing boats); no BAEA disturbance observed.

SUMMARY:

A. Successful Nestlings: 2 **No. of young known fledged:** 1 **or probably fledged:** 1

B. If no fledglings were produced this season please answer the following:

How many adults seen in the territory?

Was there evidence of nest repair or construction?

Were adults seen in the nest?

Were adults in incubating posture?

Number of nestlings observed?

Failed during incubation or nesting stage?

Other remarks: Successful nesting in 2016 and 2017 with two fledged juveniles in each year; failed attempt in 2018 (courtship and nesting building observed in early breeding season, but no activity during subsequent visits); failed attempts in years 2019–2022 (nest building and/or adult in incubation posture observed), but no subsequent reproductive activity recorded.

Observer Contact Information:
Surveys conducted by Stillwater Sciences, contractors for the Sacramento Municipal Utility District. For additional information contact Darold Perry, SMUD Supervisor – Hydro License Implementation (Darold.Perry@smud.org).

STATE OF CALIFORNIA THE
RESOURCE AGENCY
DEPARTMENT OF FISH AND GAME

BALD EAGLE BREEDING SURVEY INSTRUCTIONS

The breeding season of bald eagles in California extends primarily from February through July. Each year cooperating agencies, organizations, and private individuals participate in a statewide monitoring program to document nesting activities at each nesting territory. In 1997, 160 recently active breeding territories were surveyed, and the number increases yearly.

Annual breeding season surveys are an important part of the population recovery effort. Survey information is used by resource agencies to aid breeding territory management or protection activities. Additionally, population status and trends must be monitored annually to provide the data needed for assessing population recovery.

Specific assignments and scheduling of observer time are usually handled at the agency district or regional office level. In general, agencies are responsible for surveys or territories on or near their own lands, with Department of Fish and Game also surveying on private lands. Field personnel should coordinate with other agencies or volunteers to avoid duplication of effort or to arrange for survey help.

The bald eagle breeding population is increasing annually. So, it is important that suspected new nesting territories be adequately checked, especially early in the breeding season.

Territories should be checked at least three times during the nesting season, although more frequent checking is preferred. Emphasis should be placed on checking during incubation and early nesting periods.

1. **Early March (early incubation)** – Territories in northern California should be checked in the first half of March, if possible, or as soon thereafter as road or weather conditions allow. The purpose of the first check is to determine whether a territory is occupied (record presence of adults, courtship behavior, evidence of nest repair or construction, incubation).
2. **Late April or early May (early nesting period)** – This check is needed to confirm that a territory is unoccupied, or if occupied in March, to determine whether the breeding pair is still tending the nest (incubating eggs or tending young nestlings).
3. **Mid-June (late nesting period)** – The main purpose of this check is to determine how many nestlings are approaching fledgling age.

Survey dates maybe modified from these recommended time periods if the territories can be checked more frequently or if particular breeding pairs are known to begin nesting especially early or late in the season.

We recommend that observers report the stage of development of nestlings in accordance with An Illustrated Guide for Identifying Developmental Stages of Bald Eagle Nestlings in the Field, by G.P. Carpenter (April 1990). This booklet is available from the San Francisco Zoological Society, Sloat Blvd. At the Pacific Ocean, San Francisco, CA 94132 (415-753-7080).

SUBMITTAL OF SURVEY FORMS

Please report observations on the **CALIFORNIA BALD EAGLE NESTING TERRITORY FORM**. Please mail all

completed forms by September 1 of the survey year to:

California Department of Fish and Game
Wildlife Branch
1812 Ninth St.
Sacramento, CA 95814
ATTN: Shannon Skalos

Forms will be maintained in Department files and annual survey results will be compiled on the basis of these reports. If you have any questions, please contact Shannon Skalos at the above address or at sskalos@dfg.ca.gov. Electronic forms can be found at http://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html.

California Department of Fish and Game
CALIFORNIA BALD EAGLE NESTING

TERRITORY SURVEY FORM

Territory Code: IHR

County: El Dorado **Survey Year:** 2023

Property Owner: USFS **If USFS:** Eldorado National Forest

Name (or general location of territory): Ice House Reservoir

Name of nearest water body: Ice House Reservoir

Location of Nest Site:

UTM E: 729950 **UTM N**: 4300602 **Zone:** 10S

No. of nests in territory - **Intact:** 1 **Remnant:** 0

Nest Tree: Species: Incense Cedar **Year Last Used:** 2022

NOTE: Please attach a map showing the location of any newly documented nest tree.

Describe tree and nest condition and size and add other remarks: Large incense cedar with broken top, (nest just below the remaining snag), nest moderately degraded since 2022.

For each visit to a territory, note, in detail, the times, number and age of birds, behavior of birds (lying, perching, etc.), evidence of nesting (nest maintenance, courtship, incubation posture), disturbances, and other pertinent information:

Observers	Date	Observations/Notes
Krista Orr Steven Wood	03.24.23 (09:45 to 13:45)	**Early Breeding Season Survey:** • Significant snow accumulation requiring 4WD and snowshoes for access. • 09:45–1200: Biologists surveyed from boat launch and other accessible vantage points. • 9:50: Adult BAEA perched in previously documented nest tree (incense cedar) on S side of reservoir. • 11:10: Adult BAEA relocated to perch (incense cedar) directly downslope from previous perch. • 11:20: Adult BAEA returned to nest tree; nest structure not entirely visible through scope, possibly damaged. • 11:30: Adult BAEA flew W out of sight into grove of trees on S shore, just E of Ice House Dam. • 12:00–13:45: Surveyors snowshoed to Auxiliary Dam, observing no further BAEA activity. • No recreational activity; no BAEA disturbance observed; reservoir entirely frozen with approximately 6 inches of fresh snow.

Observers	Date	Observations/Notes
Krista Orr Steve Wood	05.29.23 (06:20 to 14:45)	**<u>Mid-Breeding Season Survey</u>:** • 06:30–10:30: Biologists surveyed from Auxiliary Dam. • 07:45: Adult BAEA (female) in perch (Douglas fir) on peninsula E of Ice House Dam. • 08:08: Adult BAEA (female) flew E and landed in perch (dead snag) E of nest tree. • 08:10: Adult BAEA (female) flew from perch and landed on nest, remaining for roughly two minutes before flying farther E and landing in perch (prominent incense cedar) E of nest tree. • 08:25: Adult BAEA (male) flew from W to E along S shore below nest, landing in perch (sugar pine) near shore. • 10:30–14:45: Biologists launched boat, observed from boat and S shore near nest tree. • 11:20: Adult BAEA (female) in previously documented perch W of nest tree; large branch previously supporting nest and significant nest material observed below nest tree. • Recreational activity moderate (campgrounds full, 8–10 kayaks, ~3 SUPs, ~4 fishing boats); no BAEA disturbance observed.
Krista Orr Annabelle Howe	06.22.23 (13:30 to 17:30)	**<u>Late Season Breeding Survey</u>:** • 13:30–14:30: Biologists surveyed from vantage points near Ice House Dam and along auxiliary dam. • 14:45–17:30: Biologists surveyed from numerous vantage points, with no BAEA observations near the nest tree or elsewhere around the reservoir. • Recreational activity moderate to high (campgrounds full, ~3 fishing boats, ~10 SUPs, and several groups of swimmers); no BAEA disturbance observed.

SUMMARY:

A. Successful Nestlings: 0 No. of young known fledged: 0 **or probably fledged: 0**

B. If no fledglings were produced this season please answer the following:

How many adults seen in the territory? 2

Was there evidence of nest repair or construction? Y

Were adults seen in the nest? Y

Were adults in incubating posture? N

Number of nestlings observed? 0

Failed during incubation or nesting stage? Unknown, possibly incubation.

Other remarks: Successful attempt with single fledgling in 2022.

Observer Contact Information:

Surveys conducted by Stillwater Sciences, contractors for the Sacramento Municipal Utility District (SMUD). For additional information contact Darold Perry, SMUD Hydro License Implementation Supervisor at Darold.Perry@smud.org.

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STATE OF CALIFORNIA THE
RESOURCE AGENCY
DEPARTMENT OF FISH AND GAME

BALD EAGLE BREEDING SURVEY INSTRUCTIONS

The breeding season of bald eagles in California extends primarily from February through July. Each year cooperating agencies, organizations, and private individuals participate in a statewide monitoring program to document nesting activities at each nesting territory. In 1997, 160 recently active breeding territories were surveyed, and the number increases yearly.

Annual breeding season surveys are an important part of the population recovery effort. Survey information is used by resource agencies to aid breeding territory management or protection activities. Additionally, population status and trends must be monitored annually to provide the data needed for assessing population recovery.

Specific assignments and scheduling of observer time are usually handled at the agency district or regional office level. In general, agencies are responsible for surveys or territories on or near their own lands, with Department of Fish and Game also surveying on private lands. Field personnel should coordinate with other agencies or volunteers to avoid duplication of effort or to arrange for survey help.

The bald eagle breeding population is increasing annually. So, it is important that suspected new nesting territories be adequately checked, especially early in the breeding season.

Territories should be checked at least three times during the nesting season, although more frequent checking is preferred. Emphasis should be placed on checking during incubation and early nesting periods.

1. **Early March (early incubation)** – Territories in northern California should be checked in the first half of March, if possible, or as soon thereafter as road or weather conditions allow. The purpose of the first check is to determine whether a territory is occupied (record presence of adults, courtship behavior, evidence of nest repair or construction, incubation).
2. **Late April or early May (early nesting period)** – This check is needed to confirm that a territory is unoccupied, or if occupied in March, to determine whether the breeding pair is still tending the nest (incubating eggs or tending young nestlings).
3. **Mid-June (late nesting period)** – The main purpose of this check is to determine how many nestlings are approaching fledgling age.

Survey dates may be modified from these recommended time periods if the territories can be checked more frequently or if particular breeding pairs are known to begin nesting especially early or late in the season.

We recommend that observers report the stage of development of nestlings in accordance with An Illustrated Guide for Identifying Developmental Stages of Bald Eagle Nestlings in the Field, by G.P. Carpenter (April 1990). This booklet is available from the San Francisco Zoological Society, Sloat Blvd. At the Pacific Ocean, San Francisco, CA 94132 (415-753-7080).

SUBMITTAL OF SURVEY FORMS

Please report observations on the **CALIFORNIA BALD EALGE NESTING TERRITORY FORM**. Please mail all

completed forms by September 1 of the survey year to:

California Department of Fish and Game
Wildlife Branch
1812 Ninth St.
Sacramento, CA 95814
ATTN: Shannon Skalos

Forms will be maintained in Department files and annual survey results will be compiled on the basis of these reports. If you have any questions, please contact Shannon Skalos at the above address or at sskalos@dfg.ca.gov. Electronic forms can be found at http://www.dfg.ca.gov/wildlife/nongame/survey_monitor.html.

California Department of Fish and Game
CALIFORNIA BALD EAGLE NESTING

TERRITORY SURVEY FORM

Territory Code: LLR

County: El Dorado **Survey Year:** 2023

Property Owner: USFS **If USFS:** Eldorado National Forest

Name (or general location of territory): Loon Lake Reservoir

Name of nearest water body: Loon Lake Reservoir

Location of Nest Site:

UTM E: 733613 **UTM N**: 4319278 **Zone:** 10S

No. of nests in territory - **Intact:** _____ **Remnant:** 1

Nest Tree: Species: Jeffrey Pine **Year Last Used:** 2020

NOTE: Please attach a map showing the location of any newly documented nest tree.

Describe tree and nest condition and size and add other remarks: Nest in dominant Jeffrey pine on south side of reservoir that used in 2018 and 2020 was likely blown out by high winds in 2021. No evidence of attempted rebuilding observed during 2023 surveys, although bald eagles seen in vicinity.

For each visit to a territory, note, in detail, the times, number and age of birds, behavior of birds (lying, perching, etc.), evidence of nesting (nest maintenance, courtship, incubation posture), disturbances, and other pertinent information:

Observers	Date	Observations/Notes
Steven Wood Cooper Walton	05.30.23 (07:30 to 13:15)	**Early Breeding Season Survey:** • NE end of Loon Lake (Pleasant Cove) covered in large sheets of ice. • 07:35–08:30: Biologists surveyed from spillway. • 08:30–09:10: Biologists launched boat, surveying main body of Loon Lake and backside (Pleasant Cove) where accessible. • 09:10–11:20: Biologists surveyed from inlet of Ellis Creek. • 11:20–12:30: Biologists surveyed S side of reservoir from boat. • 12:40–1:15: Biologists landed boat and surveyed from spillway. • No BAEA observations during survey. • Recreational activity low (~2 kayaks, all campgrounds closed, 4–5 jeepers).

Observers	Date	Observations/Notes
Annabelle Howe Cooper Walton	06.22.23 (19:30 to 21:00)	**Mid-Breeding Season Survey:** **6.22.23:** • 19:30–21:00: Biologists boated to Pleasant Cove Campground surveying along the way (no BAEA observed). **6.23.23:** • 05:45–12:30: Biologists surveyed from boat launched from Pleasant Cove Campground, south shore of reservoir, Loon Lake Dam, and spillway. • 07:20 Adult BAEA (male) flying low along S shoreline, interacting with osprey, and landing in perch (dead snag) downslope of inactive nest tree. • 07:40: Adult BAEA (male) relocated to foraging perch (pine spp.) west of snag and downslope of inactive nest tree. • 08:15 Adult BAEA (male), stole fish from osprey and delivered to adult BAEA (female) perched on snag, who flew SE and then N out of sight. • 08:30 Biologist inspected historical nest tree; no signs of nest rebuilding, but significant whitewash below tree. • 08:50: Adult BAEA (male) departing foraging perch (snag), flying W. • 09:30: Adult BAEA (female) flying W along N shore, landing in perch (prominent Jeffrey pine) E of spillway, close to water's edge. • 10:00 Adult BAEA atop perch (fir with forked top) on hill NW spillway. • 10:10: Adult BAEA departed perch and flew S across reservoir, landing in previously documented perch along water's edge on S side of reservoir. • 11:00 Adult BAEA (female) landed in same perch. • 11:12 Adult BAEA (male) departed perch and flew N across reservoir, landing in dominant Jeffrey pine (with flat top) E of spillway. • Recreational activity: low to moderate (~3 fishing boats and ~10–15 jeepers, campgrounds not yet open); no BAEA disturbance observed.
Steven Wood Krista Orr Annabelle Howe Cooper Walton	6.23.23 (05:45 to 12:30)	

Observers	Date	Observations/Notes
Cooper Walton Annabelle Howe	07.13.23 (06:10 to 12:00)	**Late Breeding Season Survey:** • 06:10–12:00: Biologists observed from spillway, launching boat, and observing main body of reservoir and along N shore to Pleasant Cove on NE end of Loon Lake. • 10:02: Subadult BAEA (estimated 3rd year) in previously documented perch (Jeffrey pine with flat top) on N side of reservoir, E of spillway. • No further BAEA activity observed. • Recreational activity moderate (~4 fishing boats, ~15 jeepers, group of ~10 hikers, both campsites partially full); no BAEA disturbance observed.

SUMMARY:

A. Successful Nestings: 0 **No. of young known fledged:** 0 **or probably fledged:** N/A

B. If no fledglings were produced this season please answer the following:

How many adults seen in the territory? 2

Was there evidence of nest repair or construction? No

Were adults seen in the nest? No

Were adults in incubating posture? No

Number of nestlings surveyed. 0

Failed during incubation or nesting stage? N/A

Other remarks: No sign of nest repair or nesting attempts observed.

Observer Contact Information:

Surveys conducted by Stillwater Sciences, contractors for the Sacramento Municipal Utility District. For additional information contact Darold Perry, SMUD Supervisor – Hydro License Implementation (Darold.Perry@smud.org).

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APPENDIX C1

Bear Encounter Forms

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For office use only:

Report collected by: Adam Kay (USFS/camp host)

Date: 08-19-23

BEAR ENCOUNTER FORM

Bear Management Monitoring
Crystal Basin Recreation Area

Use a separate form for each individual incident. *For example, if the same bear enters two campsites while people are present, a person from each campsite should report the specifics of their encounter. Give completed forms to campground hosts. If your recreation site has no host, forms should be placed in the appropriate receptacle at the site or dropped off at the Crystal Basin Information Station on Ice House Road between Ice House Reservoir and Union Valley Reservoir.*

1. Person(s) involved:

Name: Unknown

2. Describe yourself:

a. Visitor

b. Camp host

(c) USFS employee

d. Contractor

e. Other _____

3. Visitor activity:

(a.) Camping – developed campground

b. Camping – undeveloped campsite/wilderness

c. Day use area

d. Hiking on maintained trail

e. Other _____

4. Group size: Unknown
(number of people who encountered the bear)

5. Time of encounter: Month: 08 Day: 17 Year: 23 Time: 9:30 am/(pm)

6. Location of encounter:

a. Airport Flat campground
b. Angel Creek day use area
c. Azalea Cove campground
d. Big Silver group campground
e. Camino Cove campground
f. Fashoda campground
g. Gerle Creek campground complex
h. Ice House campground/ boat launch/day use area
i. Jones Fork campground
j. Junction Reservoir boat launch
k. Lone Rock campground
l. Loon Lake campground/boat ramp
m. Loon Lake chalet
n. Northshore campground
o. Northshore RV campground
p. Pleasant campground
q. Red Fir group campground
r. Strawberry Point campground
s. Sunset campground/boat launch
t. Union Valley bike trail
u. Wench Creek campground
v. Wench Creek group campground
w. West Point campground/boat launch
x. Wolf Creek campground
y. Wolf Creek group campground
z. Yellowjacket campground/boat launch
Other Northwind

7. Number and description of bears (how many, what color, size, adult or cub, sex?):

One Adult

8. What was the bear doing when you first saw it?

Bear was said to be hanging around the site

9. Did you react to the bear?

The visitor made loud noises and honked horn

10. How did the bear react to your response?

Stuck around for a while then left.

11. Was human food present?

(a.) Some food/trash NOT in bear resistant container -1 Ice chest
b. All food/trash in bear resistant container
c. No food present/ordor only
d. Food hung in tree
e. Some food in vehicle
f. Unknown

12. Did the bear eat any human food?

(a.) No b. Yes (what?) _____
c. Unknown

13. Did the bear damage property?

(a.) No b. Yes (list property and estimate costs) _____

14. Did the bear(s) harm anyone?

(a.) No b. Yes* (describe) _____

15. Details of bear-human interaction (optional):

Family / Group was sitting outside and bear came through.

* If there was a physical encounter with the bear or a bear was harmed in the incident, please report to the USFS Ranger and California Department of Fish and Wildlife.

KEEP ME WILD

For office use only:

Report collected by: _____ (USFS/camp host)

Date: _____

KEEP ME WILD

BEAR ENCOUNTER FORM

Bear Management Monitoring
Crystal Basin Recreation Area

Use a separate form for each individual incident. *For example, if the same bear enters two campsites while people are present, a person from each campsite should report the specifics of their encounter. Give completed forms to campground hosts. If your recreation site has no host, forms should be placed in the appropriate receptacle at the site or dropped off at the Crystal Basin Information Station on Ice House Road between Ice House Reservoir and Union Valley Reservoir.*

1. Person(s) involved:

Name: _____

2. Describe yourself:

a. Visitor

b. Camp host

c. USFS employee

d. Contractor

e. Other _____

3. Visitor activity:

a. Camping – developed campground

b. Camping – undeveloped campsite/wilderness

c. Day use area

d. Hiking on maintained trail

e. Other _____

4. Group size: 2-5
(number of people who encountered the bear)

5. Time of encounter: Month: 7 (7) Day: 9 (11) Year: 23 (23) Time: 1000 (9:40) am/pm (PM)

6. Location of encounter:

a. Airport Flat campground
b. Angel Creek day use area
c. Azalea Cove campground
d. Big Silver group campground
e. Camino Cove campground
f. Fashoda campground
g. Gerle Creek campground complex
h. Ice House campground/ boat launch/day use area
i. Jones Fork campground
j. Junction Reservoir boat launch
k. Lone Rock campground
l. Loon Lake campground/boat ramp
m. Loon Lake chalet
n. Northshore campground
o. Northshore RV campground
p. Pleasant campground
q. Red Fir group campground
r. Strawberry Point campground
s. Sunset campground/boat launch
t. Union Valley bike trail
u. Wench Creek campground
v. Wench Creek group campground 1
w. West Point campground/boat launch
x. Wolf Creek campground
y. Wolf Creek group campground
z. Yellowjacket campground/boat launch
Other _____

7. Number and description of bears (how many, what color, size, adult or cub, sex?):

1 adult black

8. What was the bear doing when you first saw it?

Tipped Dumpster

9. Did you react to the bear?

Made noise

10. How did the bear react to your response?

Didn't seem bothered even walked toward

11. Was human food present?

a. Some food/trash NOT in bear resistant container
b. All food/trash in bear resistant container
c. No food present/ordor only
d. Food hung in tree
e. Unknown
f. Some food in vehicle

12. Did the bear eat any human food?

a. No b. Yes (what?)
c. Unknown _____

13. Did the bear damage property?

a. No b. Yes (list property and estimate costs) _____

14. Did the bear(s) harm anyone?

a. No b. Yes* (describe)_____

15. Details of bear-human interaction (optional):

* If there was a physical encounter with the bear or a bear was harmed in the incident, please report to the USFS Ranger and California Department of Fish and Wildlife.

For office use only:

Report collected by: _____ (USFS/camp host)

Date: 7/14/23

BEAR ENCOUNTER FORM

Bear Management Monitoring
Crystal Basin Recreation Area

Use a separate form for each individual incident. *For example, if the same bear enters two campsites while people are present, a person from each campsite should report the specifics of their encounter. Give completed forms to campground hosts. If your recreation site has no host, forms should be placed in the appropriate receptacle at the site or dropped off at the Crystal Basin Information Station on Ice House Road between Ice House Reservoir and Union Valley Reservoir.*

1. Person(s) involved:

Name: _____

2. Describe yourself:

(a) a. Visitor

b. Camp host

c. USFS employee

d. Contractor

e. Other _____

3. Visitor activity:

(a) a. Camping – developed campground

b. Camping – undeveloped campsite/wilderness

c. Day use area

d. Hiking on maintained trail

e. Other _____

4. Group size: 3-4
(number of people who encountered the bear)

5. Time of encounter: Month: 7 Day: 14 Year: 2023 Time: 4:30 (am)/pm

6. Location of encounter:

a. Airport Flat campground
b. Angel Creek day use area
c. Azalea Cove campground
d. Big Silver group campground
e. Camino Cove campground
f. Fashoda campground
g. Gerle Creek campground complex
h. Ice House campground/ boat launch/day use area
i. Jones Fork campground
j. Junction Reservoir boat launch
k. Lone Rock campground
l. Loon Lake campground/boat ramp
m. Loon Lake chalet
n. Northshore campground
o. Northshore RV campground
p. Pleasant campground
q. Red Fir group campground
r. Strawberry Point campground
s. Sunset campground/boat launch
t. Union Valley bike trail
u. Wench Creek campground
v. Wench Creek group campground
w. West Point campground/boat launch
x. Wolf Creek campground
y. Wolf Creek group campground
z. Yellowjacket campground/boat launch
Other _____

7. Number and description of bears (how many, what color, size, adult or cub, sex?):

1 BLACK ADULT

8. What was the bear doing when you first saw it?

RUNNING FROM CAMP 1, WENT THROUGH CAMP 2 TO BIKE PATH

9. Did you react to the bear?

NO

10. How did the bear react to your response?

RAN PAST

11. Was human food present?

a. Some food/trash NOT in bear resistant container
b. All food/trash in bear resistant container
c. No food present/ordor only
d. Food hung in tree
e. Unknown
f. Some food in vehicle

12. Did the bear eat any human food?

a. No b. Yes (what?)
c. Unknown _____

13. Did the bear damage property?

a. No b. Yes (list property and estimate costs) _____

14. Did the bear(s) harm anyone?

a. No b. Yes* (describe)_____

15. Details of bear-human interaction (optional):

* If there was a physical encounter with the bear or a bear was harmed in the incident, please report to the USFS Ranger and California Department of Fish and Wildlife.

For office use only:

Report collected by: Adam Kay (USFS/camp host)

Date: 08-05-23

BEAR ENCOUNTER FORM

Bear Management Monitoring
Crystal Basin Recreation Area

Use a separate form for each individual incident. *For example, if the same bear enters two campsites while people are present, a person from each campsite should report the specifics of their encounter. Give completed forms to campground hosts. If your recreation site has no host, forms should be placed in the appropriate receptacle at the site or dropped off at the Crystal Basin Information Station on Ice House Road between Ice House Reservoir and Union Valley Reservoir.*

1. Person(s) involved:

Name: Visitors at Jones Fork CG

2. Describe yourself:

a. Visitor

b. Camp host

c. USFS employee

d. Contractor

e. Other _____

3. Visitor activity:

a. Camping – developed campground

b. Camping – undeveloped campsite/wilderness

c. Day use area

d. Hiking on maintained trail

e. Other _____

4. Group size: Unknown
(number of people who encountered the bear)

5. Time of encounter: Month: 08 Day: 04 Year: 23 Time: Night am/pm

6. Location of encounter:

a. Airport Flat campground
b. Angel Creek day use area
c. Azalea Cove campground
d. Big Silver group campground
e. Camino Cove campground
f. Fashoda campground
g. Gerle Creek campground complex
h. Ice House campground/ boat launch/day use area
(i.) Jones Fork campground
j. Junction Reservoir boat launch
k. Lone Rock campground
l. Loon Lake campground/boat ramp
m. Loon Lake chalet
n. Northshore campground
o. Northshore RV campground
p. Pleasant campground
q. Red Fir group campground
r. Strawberry Point campground
s. Sunset campground/boat launch
t. Union Valley bike trail
u. Wench Creek campground
v. Wench Creek group campground
w. West Point campground/boat launch
x. Wolf Creek campground
y. Wolf Creek group campground
z. Yellowjacket campground/boat launch
Other _____

7. Number and description of bears (how many, what color, size, adult or cub, sex?):

Unknown (Asleep)

8. What was the bear doing when you first saw it?

NA

9. Did you react to the bear?

NA

10. How did the bear react to your response?

NA

11. Was human food present?

(a.) Some food/trash NOT in bear resistant container
b. All food/trash in bear resistant container
c. No food present/ordor only
d. Food hung in tree
e. Some food in vehicle
f. Unknown

12. Did the bear eat any human food?

a. No b. Yes (what?) _____
(c. Unknown)

13. Did the bear damage property?

a. No b. Yes (list property and estimate costs) Unknown

14. Did the bear(s) harm anyone?

(a. No) b. Yes* (describe) _____

15. Details of bear-human interaction (optional):

Bear (likely) got into Ice chest overnight.

* If there was a physical encounter with the bear or a bear was harmed in the incident, please report to the USFS Ranger and California Department of Fish and Wildlife.

For office use only:

Report collected by: _____ (USFS/camp host)

Date: _____

BEAR ENCOUNTER FORM

Bear Management Monitoring
Crystal Basin Recreation Area

Use a separate form for each individual incident. *For example, if the same bear enters two campsites while people are present, a person from each campsite should report the specifics of their encounter. Give completed forms to campground hosts. If your recreation site has no host, forms should be placed in the appropriate receptacle at the site or dropped off at the Crystal Basin Information Station on Ice House Road between Ice House Reservoir and Union Valley Reservoir.*

1. Person(s) involved:

Name: _____

2. Describe yourself:

a. Visitor

b. Camp host

c. USFS employee

d. Contractor

e. Other _____

3. Visitor activity:

a. Camping – developed campground

b. Camping – undeveloped campsite/wilderness

c. Day use area

d. Hiking on maintained trail

e. Other _____

4. Group size: 2
(number of people who encountered the bear)

5. Time of encounter: Month: Aug Day: 22 Year: 23 Time: 12:00 am pm

6. Location of encounter:

a. Airport Flat campground
b. Angel Creek day use area
c. Azalea Cove campground
d. Big Silver group campground
e. Camino Cove campground
f. Fashoda campground
g. Gerle Creek campground complex
h. Ice House campground/ boat launch/day use area
i. Jones Fork campground
j. Junction Reservoir boat launch
k. Lone Rock campground
l. Loon Lake campground/boat ramp
m. Loon Lake chalet
n. Northshore campground
o. Northshore RV campground
p. Pleasant campground
q. Red Fir group campground
r. Strawberry Point campground
s. Sunset campground/boat launch
t. Union Valley bike trail
u. Wench Creek campground
v. Wench Creek group campground
w. West Point campground/boat launch
x. Wolf Creek campground
y. Wolf Creek group campground
z. Yellowjacket campground/boat launch
Other _____

7. Number and description of bears (how many, what color, size, adult or cub, sex?):
(1) Brown w/ Dark Legs, medium Size

8. What was the bear doing when you first saw it?
1ST encounter walking in camp
2ND encounter attacking my pet ice chest

9. Did you react to the bear?
yes, Hollering

10. How did the bear react to your response?
Indifferent, slowly moving away

11. Was human food present?

a. Some food/trash NOT in bear resistant container
b. All food/trash in bear resistant container
c. No food present/ordor only
d. Food hung in tree
e. Some food in vehicle
f. Unknown

12. Did the bear eat any human food?

a. No b. Yes (what?) _____
c. Unknown

13. Did the bear damage property?

a. No b. Yes (list property and estimate costs) (1) ice chest $100.00

14. Did the bear(s) harm anyone?

a. No b. Yes* (describe) _____

15. Details of bear-human interaction (optional):

_____
_____
_____
_____

* If there was a physical encounter with the bear or a bear was harmed in the incident, please report to the USFS Ranger and California Department of Fish and Wildlife.

KEEP ME WILD

For office use only:

Report collected by: _____ (USFS/camp host)

Date: _____

KEEP ME WILD

BEAR ENCOUNTER FORM

Bear Management Monitoring
Crystal Basin Recreation Area

Use a separate form for each individual incident. *For example, if the same bear enters two campsites while people are present, a person from each campsite should report the specifics of their encounter. Give completed forms to campground hosts. If your recreation site has no host, forms should be placed in the appropriate receptacle at the site or dropped off at the Crystal Basin Information Station on Ice House Road between Ice House Reservoir and Union Valley Reservoir.*

1. Person(s) involved:

Name: [redacted] and [redacted]

2. Describe yourself:

(a) Visitor
b. Camp host
c. USFS employee
d. Contractor
e. Other _____

3. Visitor activity:

(a) Camping – developed campground
b. Camping – undeveloped campsite/wilderness
c. Day use area
d. Hiking on maintained trail
e. Other _____

4. Group size: 2
(number of people who encountered the bear)

5. Time of encounter: Month: 8 Day: 23 Year: 2023 Time: 10:30 am/(pm)

8/22 –
8/23 – 12:45 am
2:45 am

6. Location of encounter:

a. Airport Flat campground
b. Angel Creek day use area
c. Azalea Cove campground
d. Big Silver group campground
e. Camino Cove campground
f. Fashoda campground
g. Gerle Creek campground complex
h. Ice House campground/ boat launch/day use area
i. Jones Fork campground
j. Junction Reservoir boat launch
k. Lone Rock campground
l. Loon Lake campground/boat ramp
m. Loon Lake chalet
n. Northshore campground
o. Northshore RV campground
p. Pleasant campground
q. Red Fir group campground
r. Strawberry Point campground
(s.) Sunset campground/boat launch
t. Union Valley bike trail
u. Wench Creek campground
v. Wench Creek group campground
w. West Point campground/boat launch
x. Wolf Creek campground
y. Wolf Creek group campground
z. Yellowjacket campground/boat launch
Other _____

7. Number and description of bears (how many, what color, size, adult or cub, sex?):
One black/brown - large male adult bear

8. What was the bear doing when you first saw it?
Breaking into an ice chest

9. Did you react to the bear?
no

10. How did the bear react to your response?
N/A

11. Was human food present?
(a.) Some food/trash NOT in bear resistant container
b. All food/trash in bear resistant container
c. No food present/ordor only
d. Food hung in tree
e. Some food in vehicle
f. Unknown

12. Did the bear eat any human food?
a. No (b.) Yes (what?) Lunchables
c. Unknown

13. Did the bear damage property?
(a. No) b. Yes (list property and estimate costs) _____

14. Did the bear(s) harm anyone?
(a. No) b. Yes* (describe) _____

15. Details of bear-human interaction (optional):
Bear was not intimidated by human presence. Bear returned to seek more food multiple times throughout the night (no food was left out for him).

* If there was a physical encounter with the bear or a bear was harmed in the incident, please report to the USFS Ranger and California Department of Fish and Wildlife.

APPENDIX C2

Bear Encounter Summary

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Bear Encounter Form - Bear Management Monitoring, Crystal Basin Recreation Area - UARP, Eldorado National Forest

2023 Results Summary

1. Name	2. Description	3. Visitor Activity	4. Group Size	5. Date/Time of Encounter	6. Location	7. Number / description of bear(s)	8-14 - Description of interaction w/ bear	15. Food Present	16.Consumption by Bear	17. Property Damage	Comments
NA	Visitor	Camping - developed	5	7/9/2023	Wench Creek Group CG	1 adult, black	Bear tipped dumpster.	unknown	unknown	No	Bear was not bothered by noise made by campers and even walked toward them.
NA	Visitor	Camping - developed	5	7/11/2023	Wench Creek Group CG	1 adult, black	Bear tipped dumpster.	unknown	unknown	No	Bear was not bothered by noise made by campers and even walked toward them.
NA	USFS Employee	Camping - developed	Unknown	8/17/2023	Northwind CG	1 adult	Bear hanging around the campsite.	Yes - no container	No	No	Family was sitting at campsite and the bear came through.
NA	Visitor	Camping - developed	4	7/14/2023	Wolf Creek CG	1 adult, black	Bear ran from Campsite 1 and went through Campsite 2 to the bike path.	Yes - no container	No	No	Campers didn't react to the bear as it ran past them.
NA	USFS Employee	Camping - developed	Unkown	8/4/2023	Jones Fork CG	Unknown	Bear walked through camp	Yes - no container	unknown	No	Campers were aspleep, but the bear likely got into ice chest overnight.
NA	Visitor	Camping - developed	2	8/22/2023	Sunset CG	1 adult, medium brown with dark legs	First encounter walking in camp, second encounter attacking Yeti ice chest.	Food odor only	No	Yes, ice chest $100	Campers made loud noises and the bear was unphased and slowly walked away.
NA	Visitor	Camping - developed	2	8/23/2023	Sunset CG	1 adult, large black and brown	Bear was breaking into ice chest	Yes - no container	Yes, lunchables	No	Bear was not intimidated by human presence, and the bear returned to seek more food multiple times throughout the night (food was not left out after first incident).

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APPENDIX D

2023 Water Temperature Graphs

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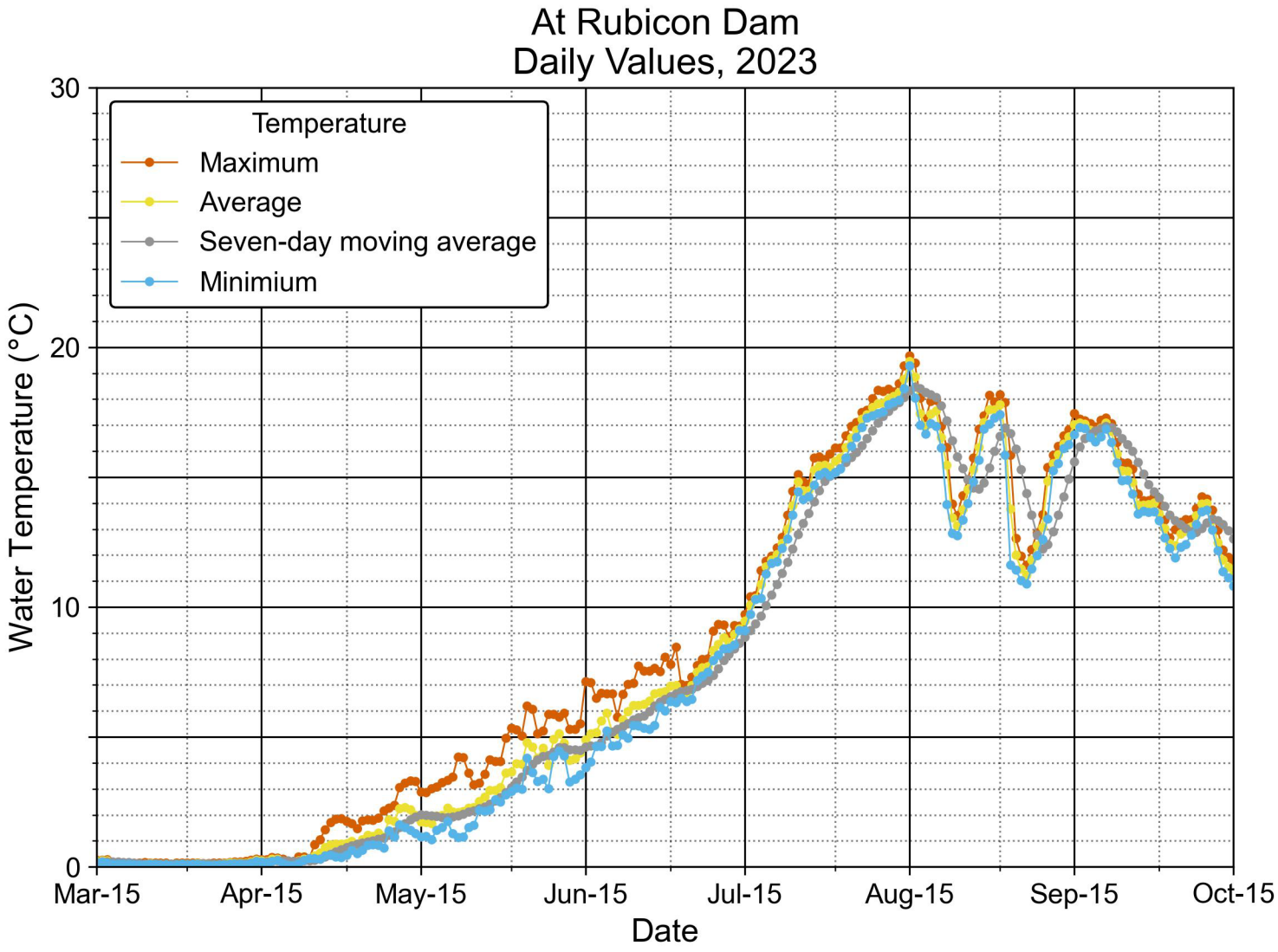

Figure D-1. Rubicon River immediately below Rubicon Reservoir Dam (Site RR5).

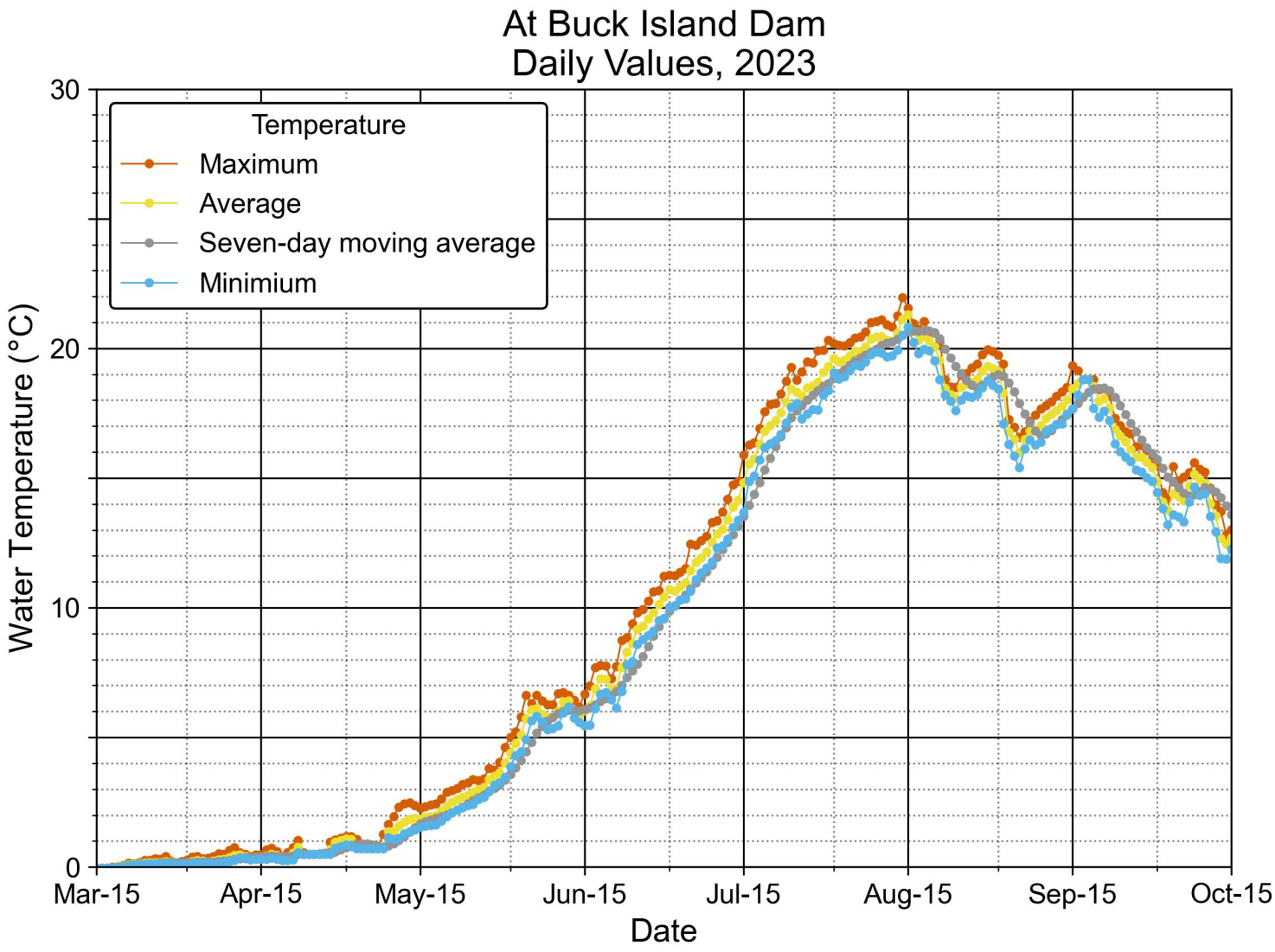

Figure D-2. Little Rubicon River immediately below Buck Island Reservoir Dam (Site LRR3).

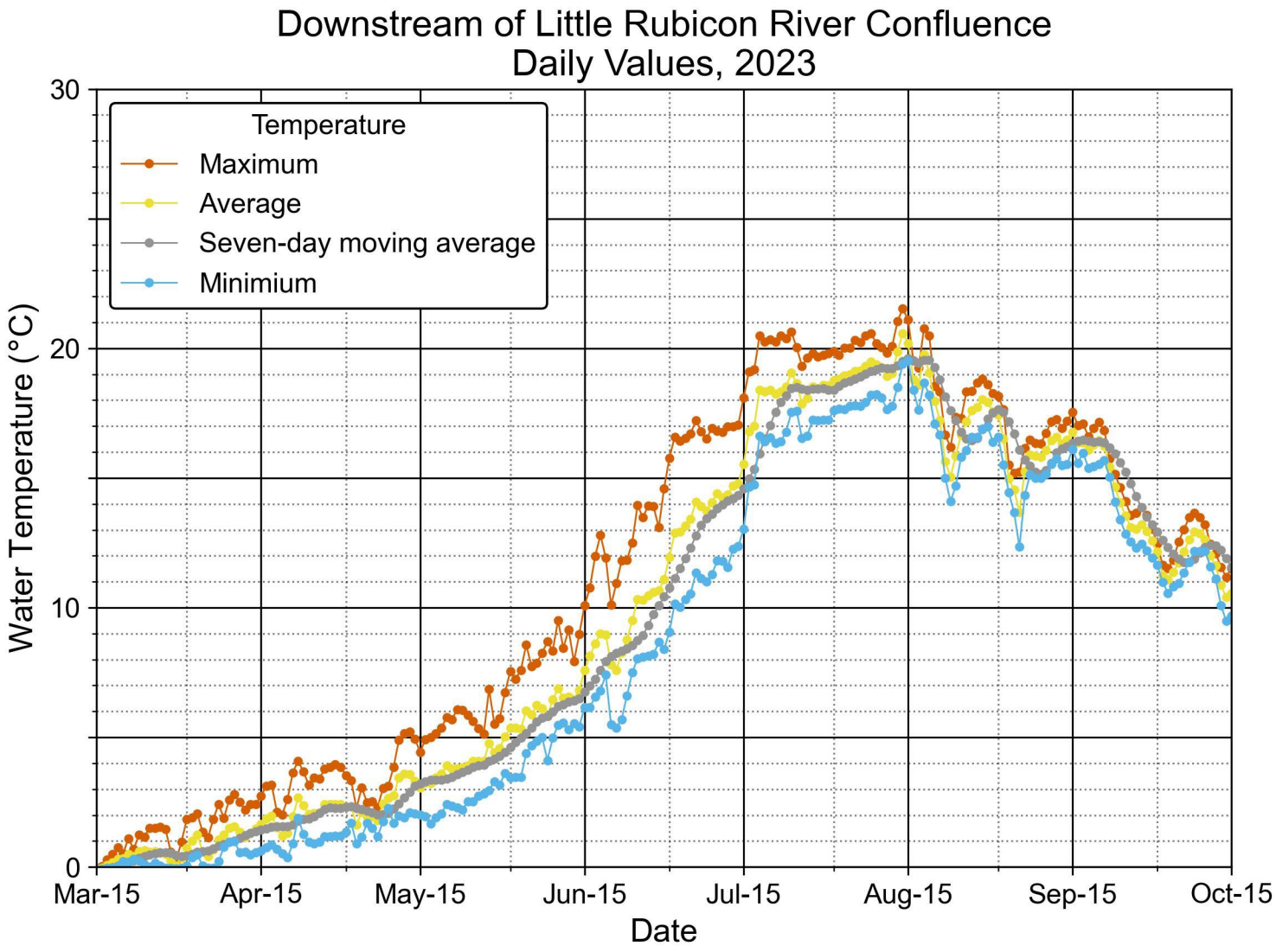

Figure D-3. Rubicon River below confluence of Little Rubicon River at the Project boundary (Site RR1).

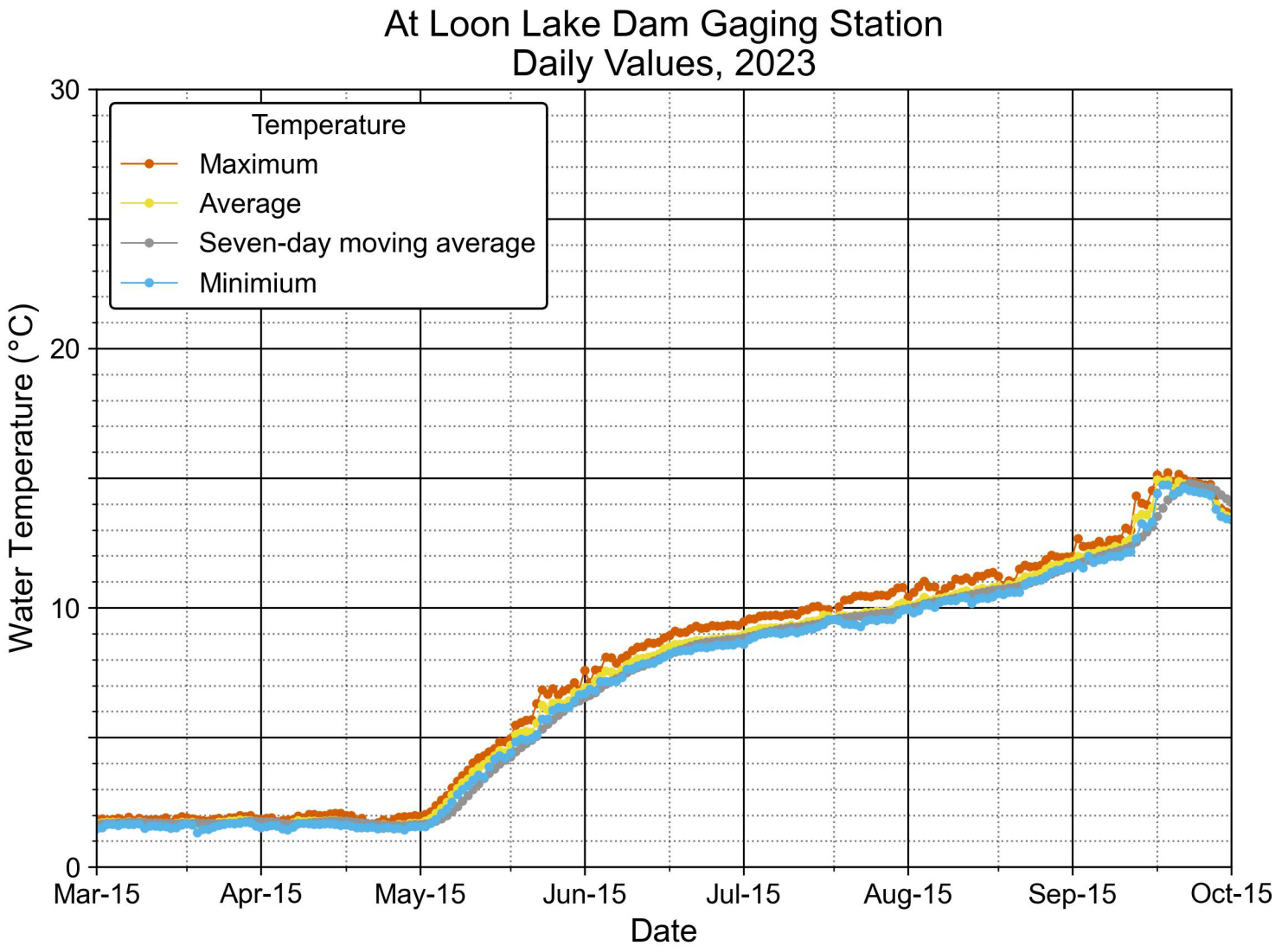

Figure D-4. Gerle Creek Immediately below Loon Lake Reservoir Dam (Site GC7).

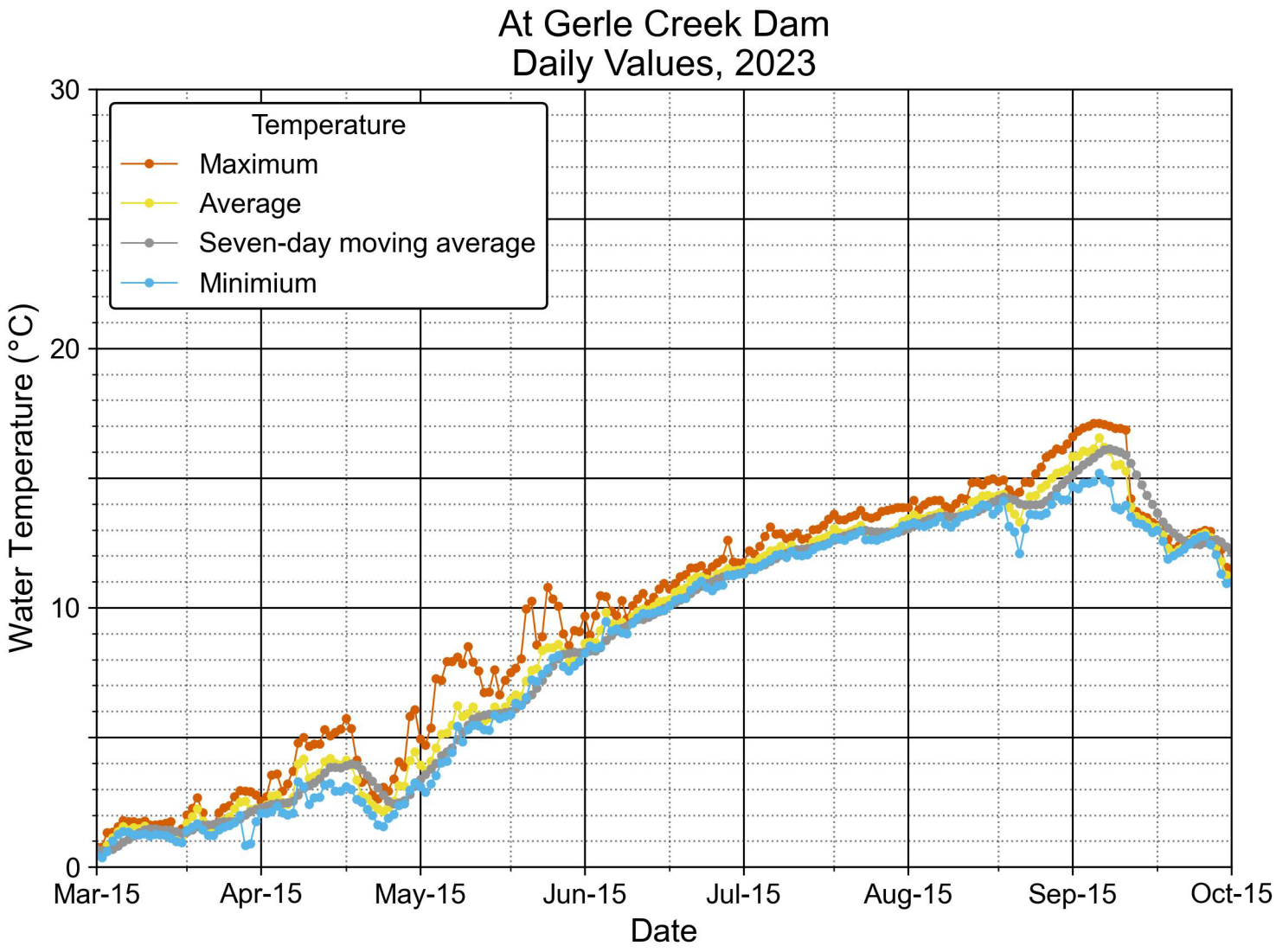

Figure D-5. Gerle Creek immediately below Gerle Creek Reservoir Dam (Site GC8).

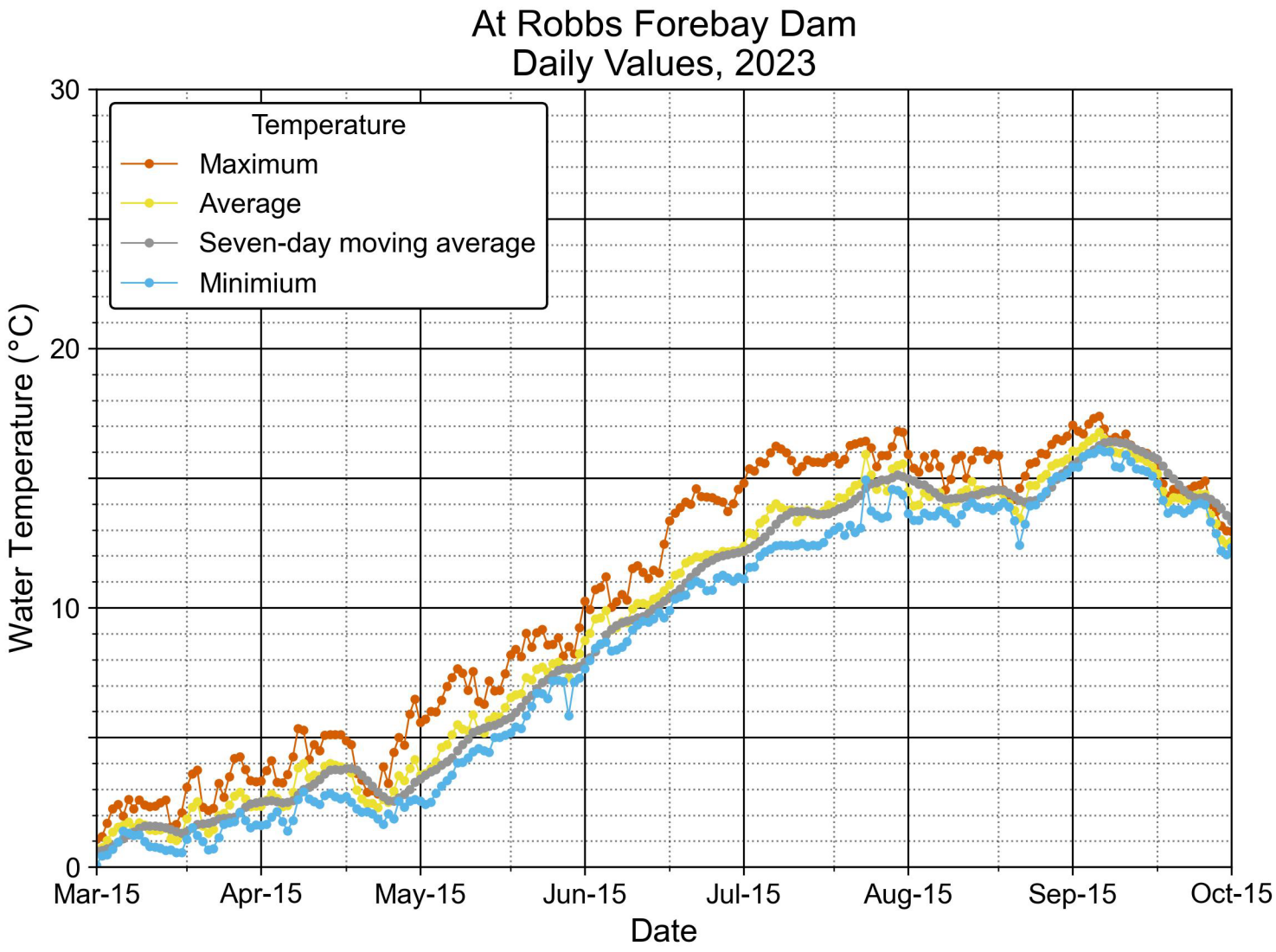

Figure D-6. South Fork Rubicon River immediately below Robbs Peak Reservoir Dam (Site SFRR5).

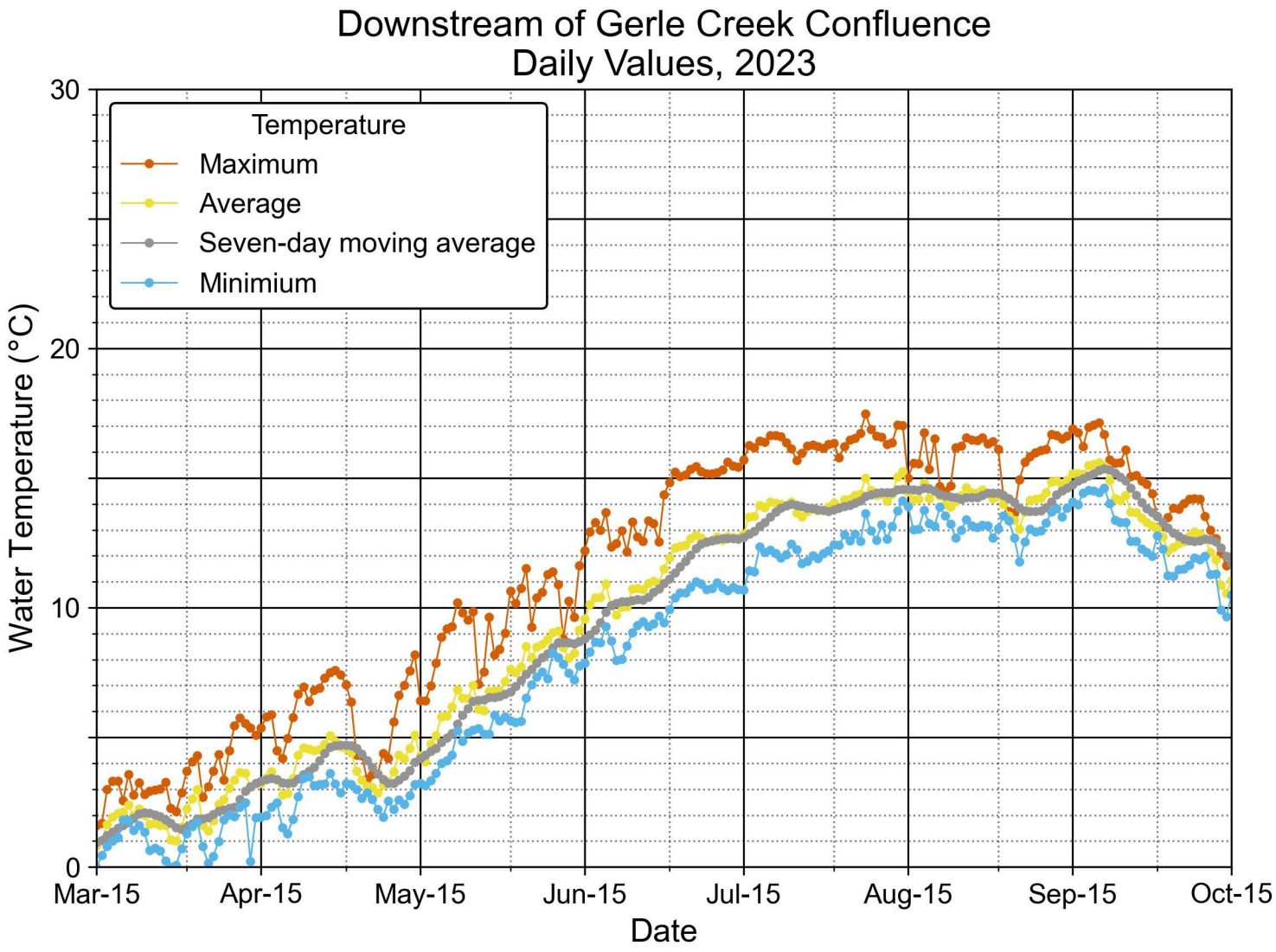

Figure D-7. South Fork Rubicon River below confluence of Gerle Creek (Site SFRR6).

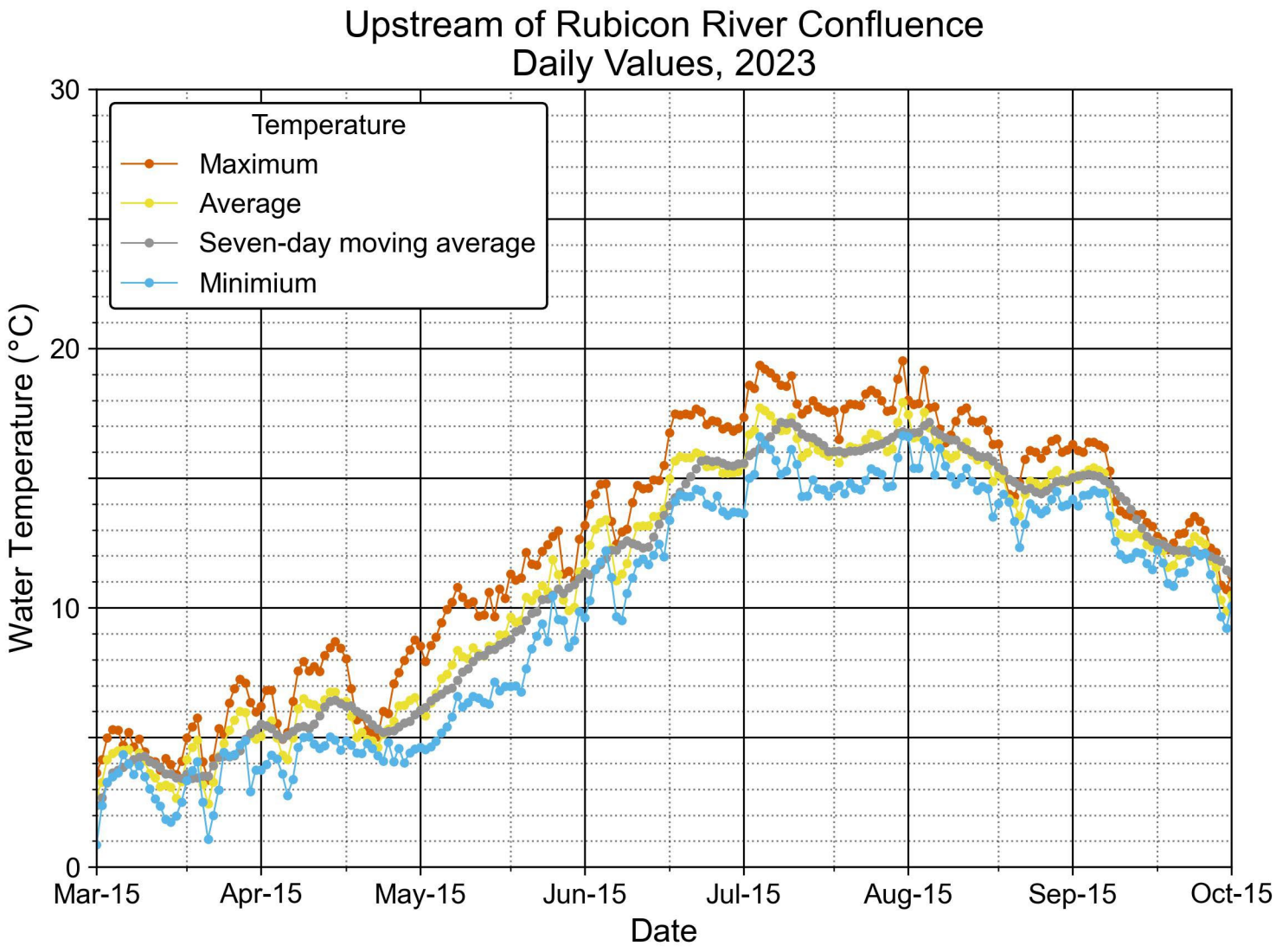

Figure D-8. South Fork Rubicon River immediately upstream of confluence with the Rubicon River (Site SFRR7).

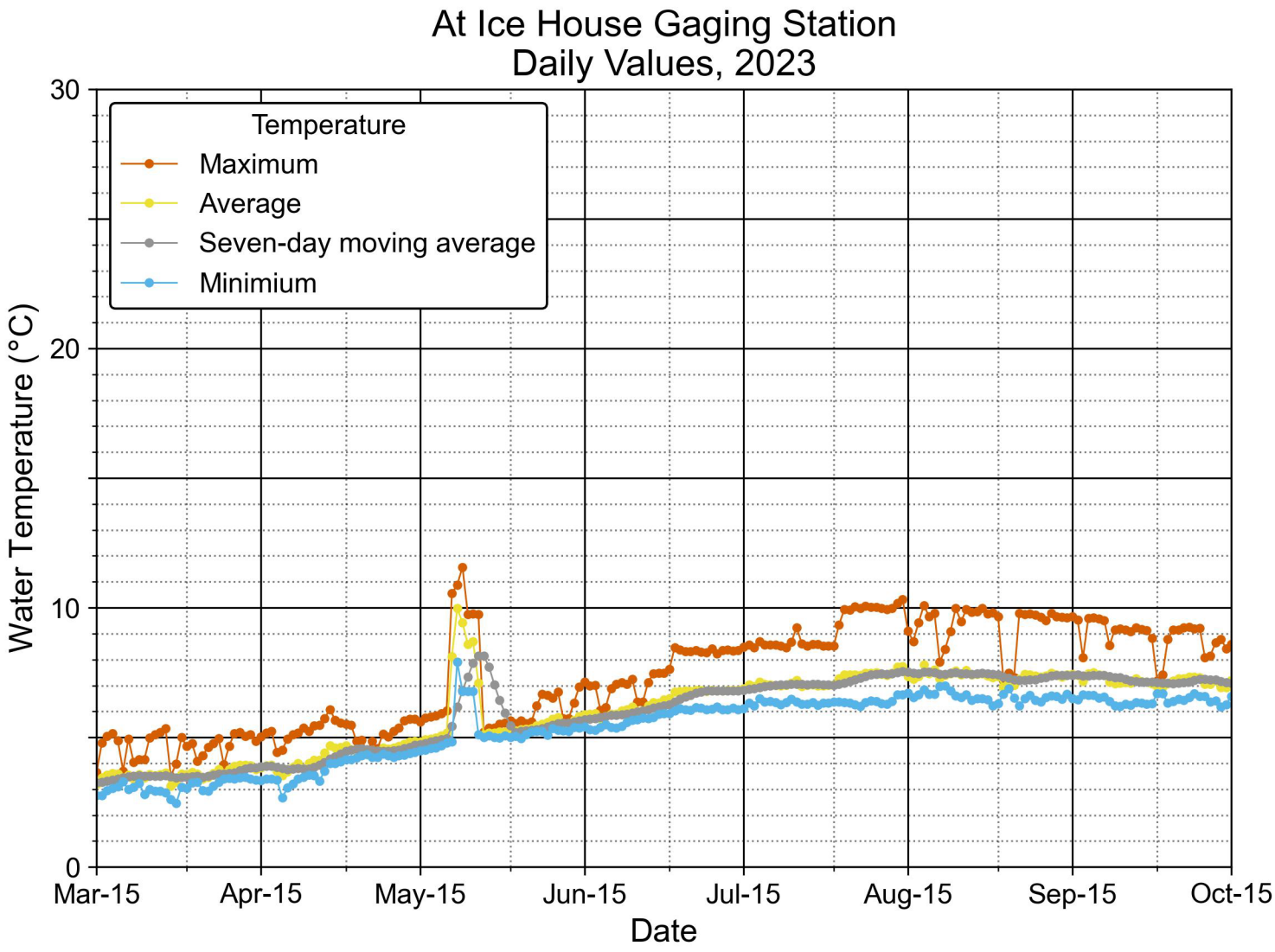

Figure D-9. South Fork Silver Creek immediately below Ice House Reservoir Dam (Site SFSC7).

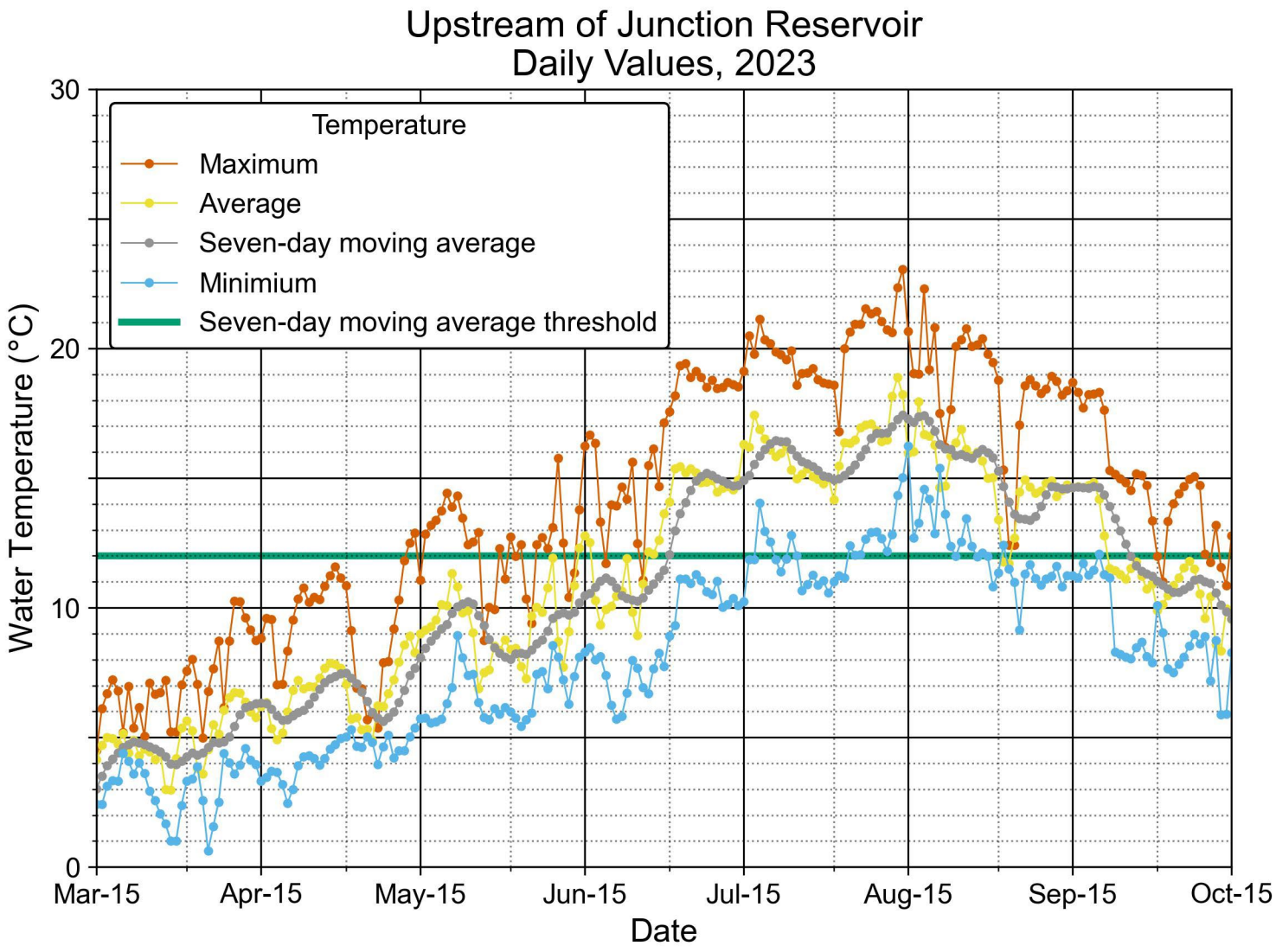

Figure D-10. South Fork Silver Creek immediately upstream of Junction Reservoir (Site SFSC8).

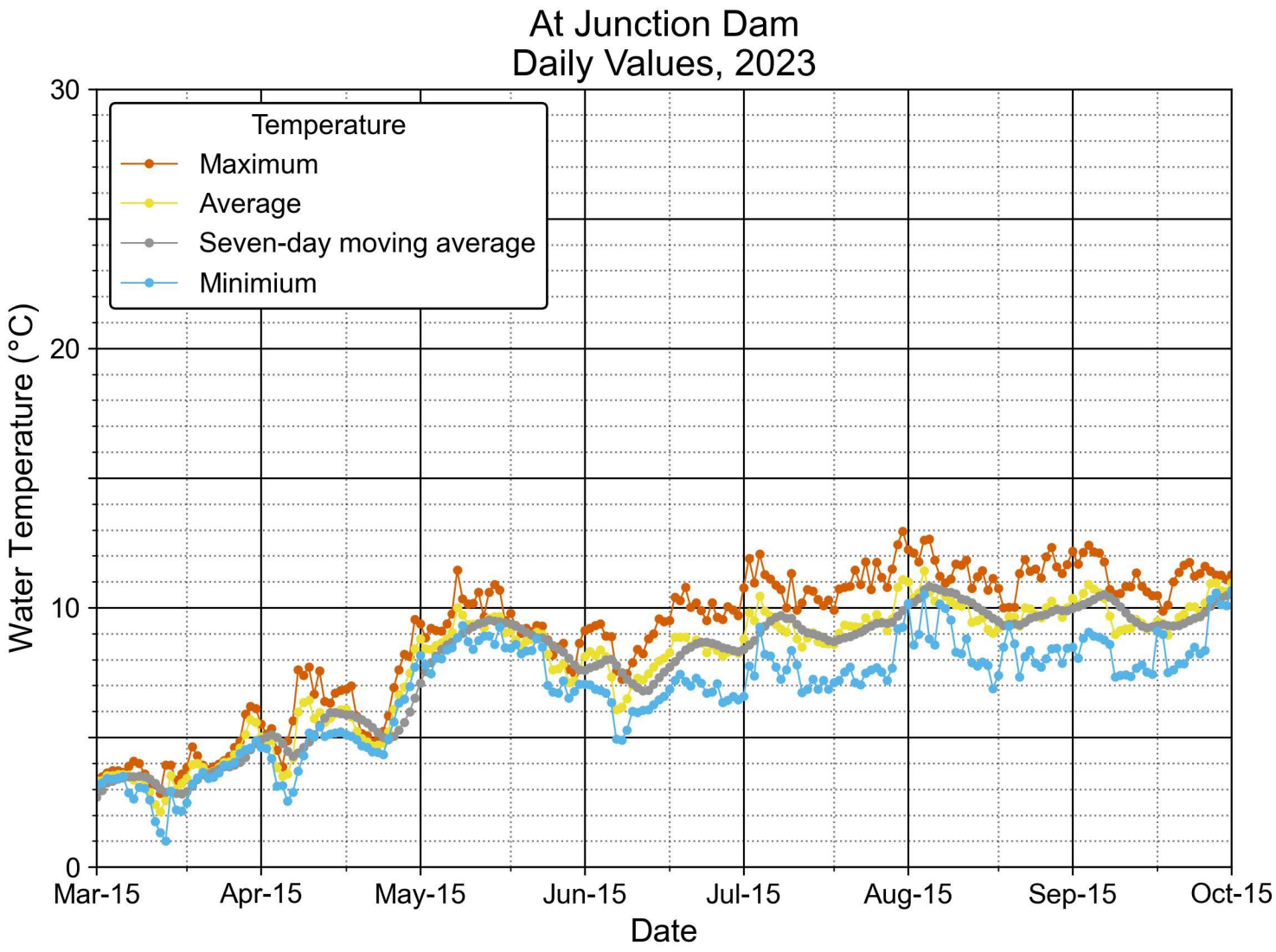

Figure D-11. Silver Creek immediately below Junction Reservoir Dam (Site SC5).

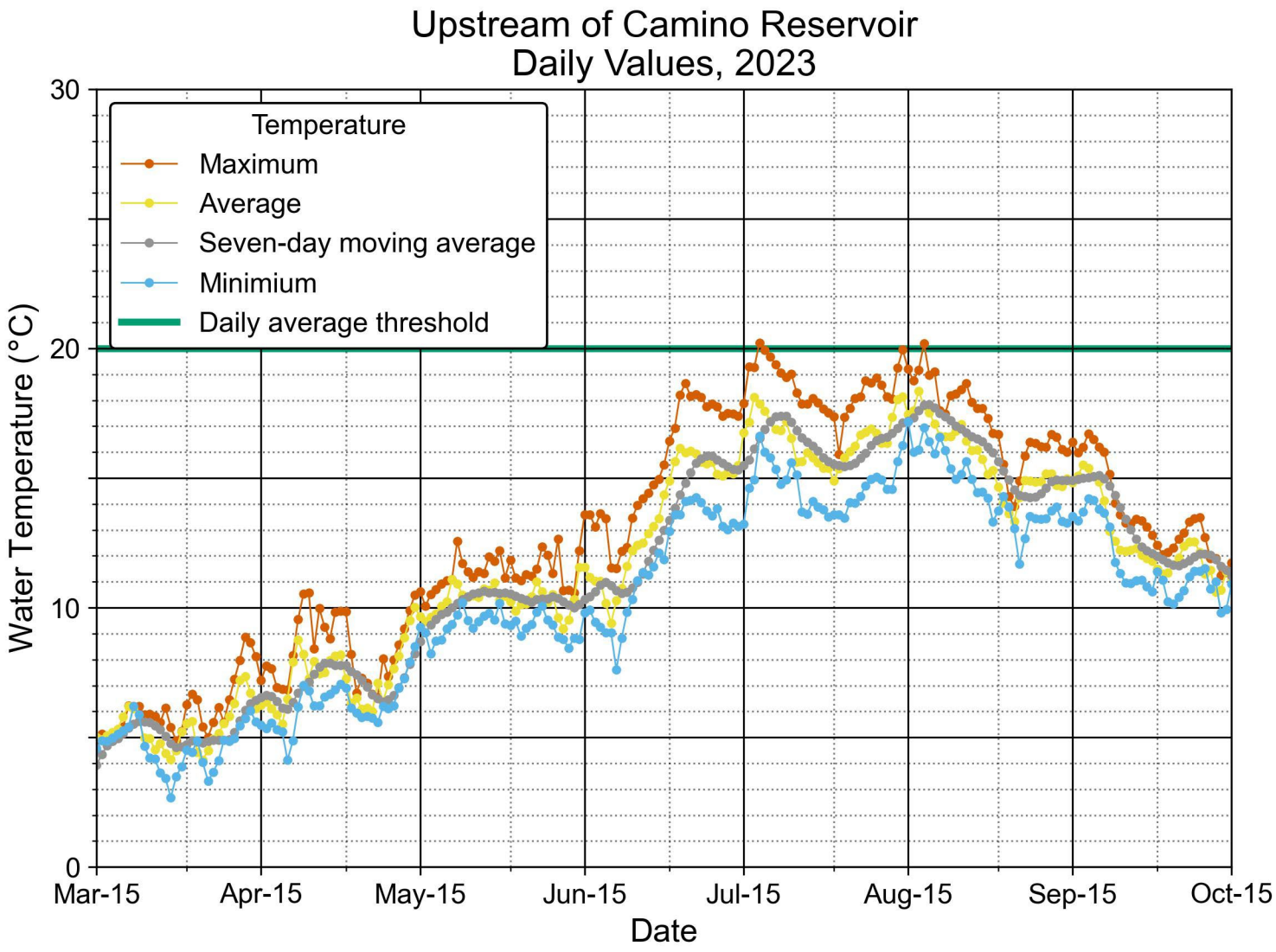

Figure D-12. Silver Creek immediately above Camino Reservoir Dam (Site SC6).

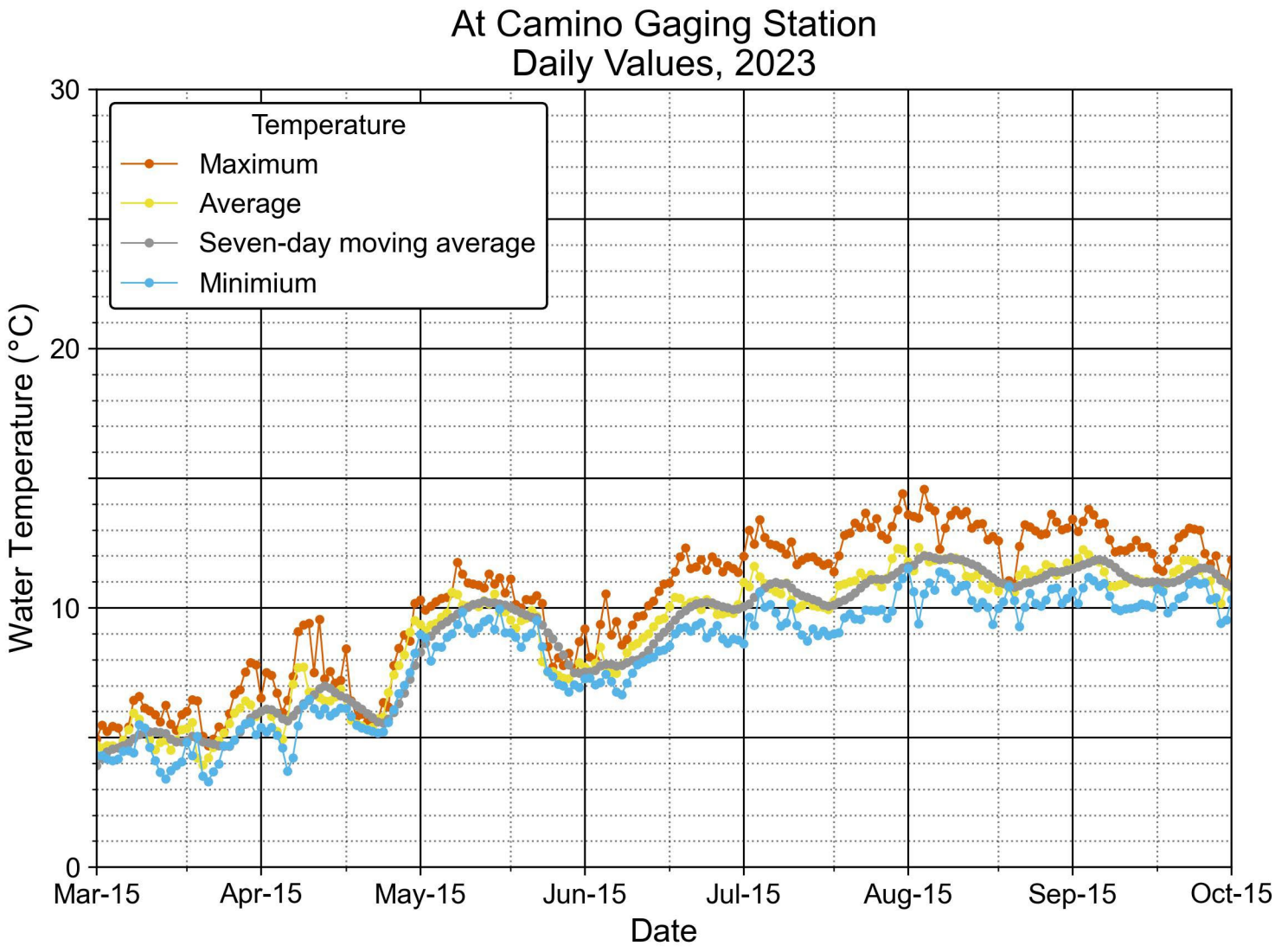

Figure D-13. Silver Creek immediately below Camino Reservoir Dam (Site SC7).

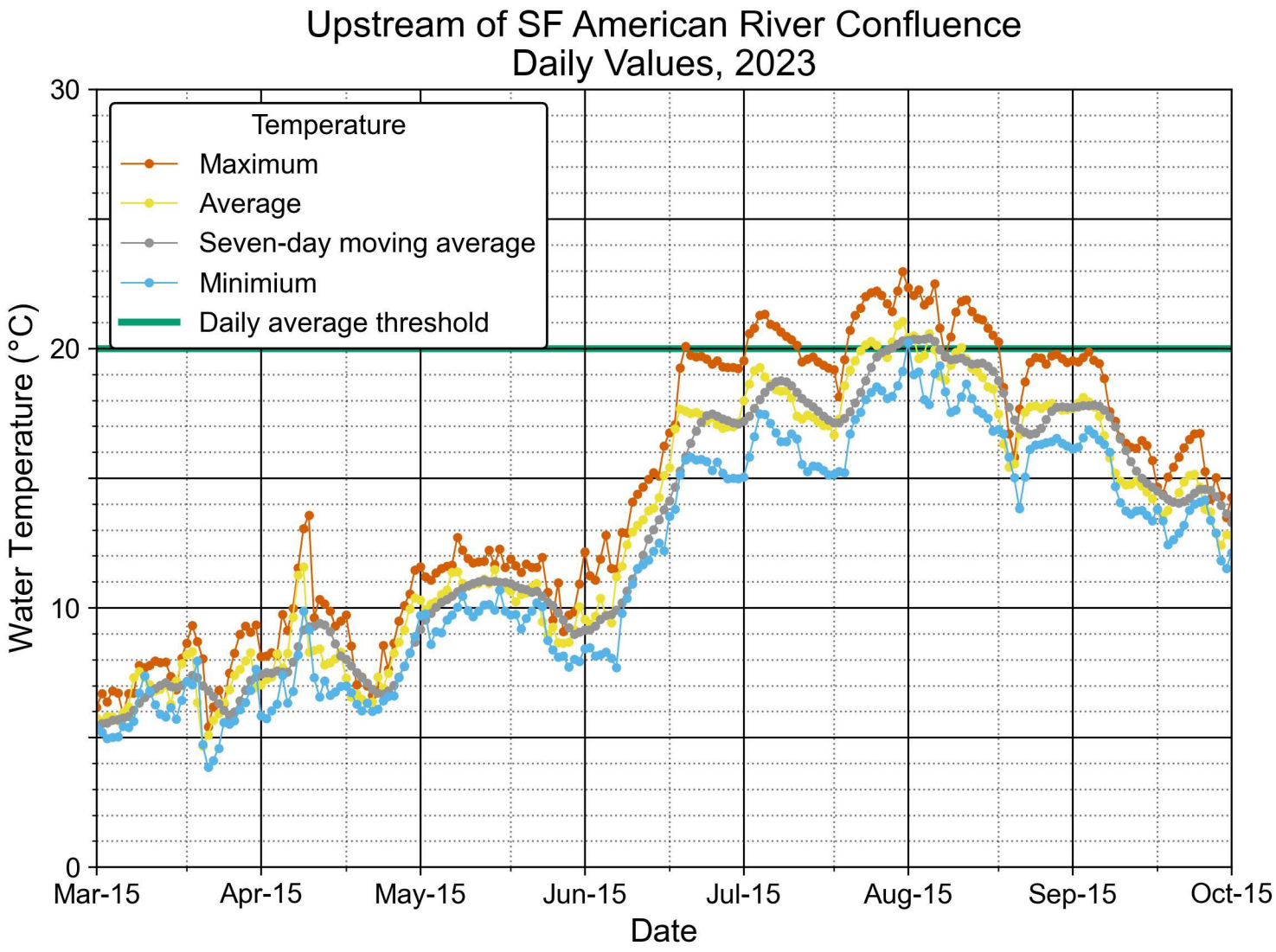

Figure D-14. Silver Creek immediately upstream of the South Fork American River (Site SC8).

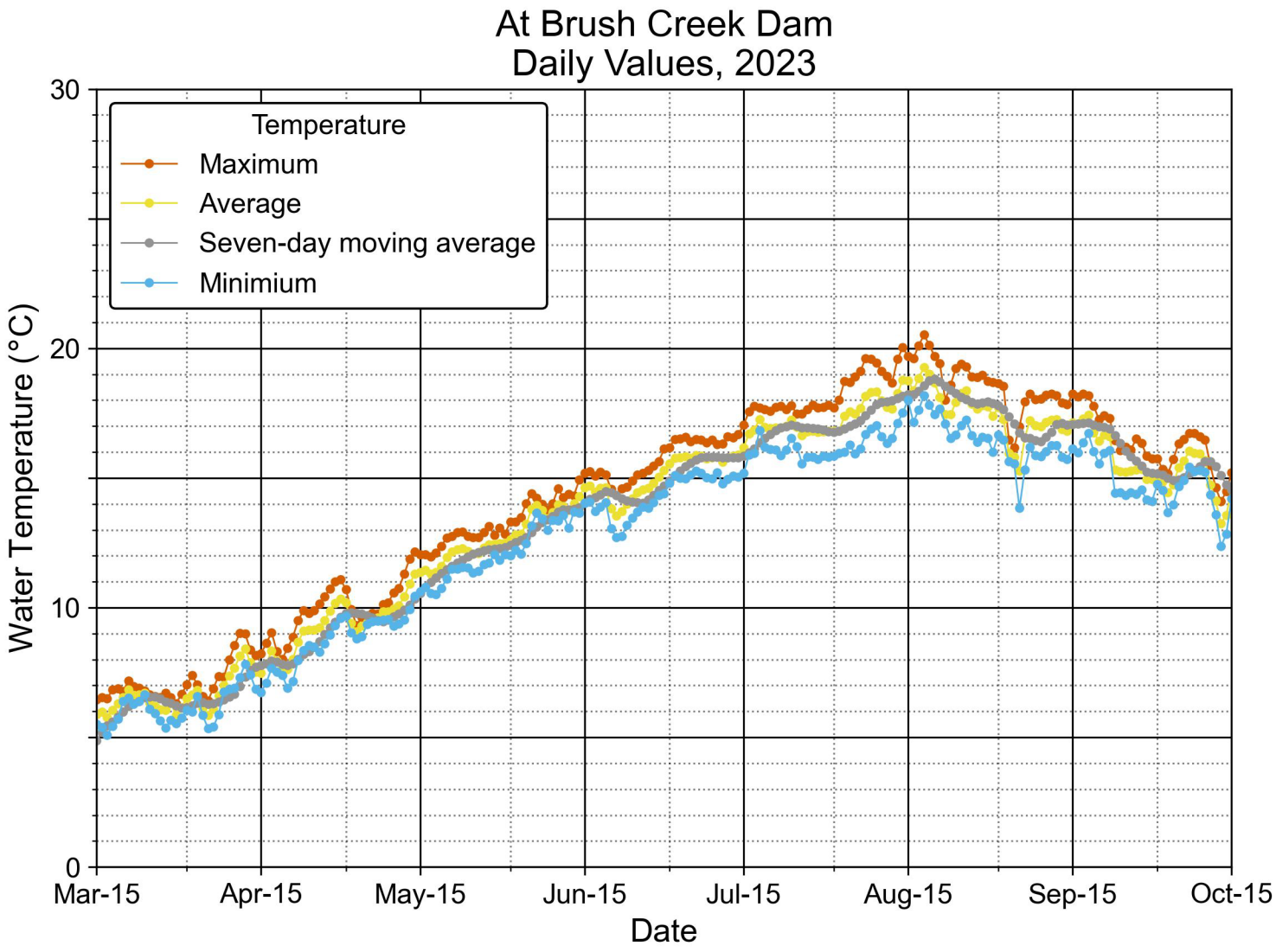

Figure D-15. Brush Creek immediately below Brush Creek Reservoir Dam (Site BC4).

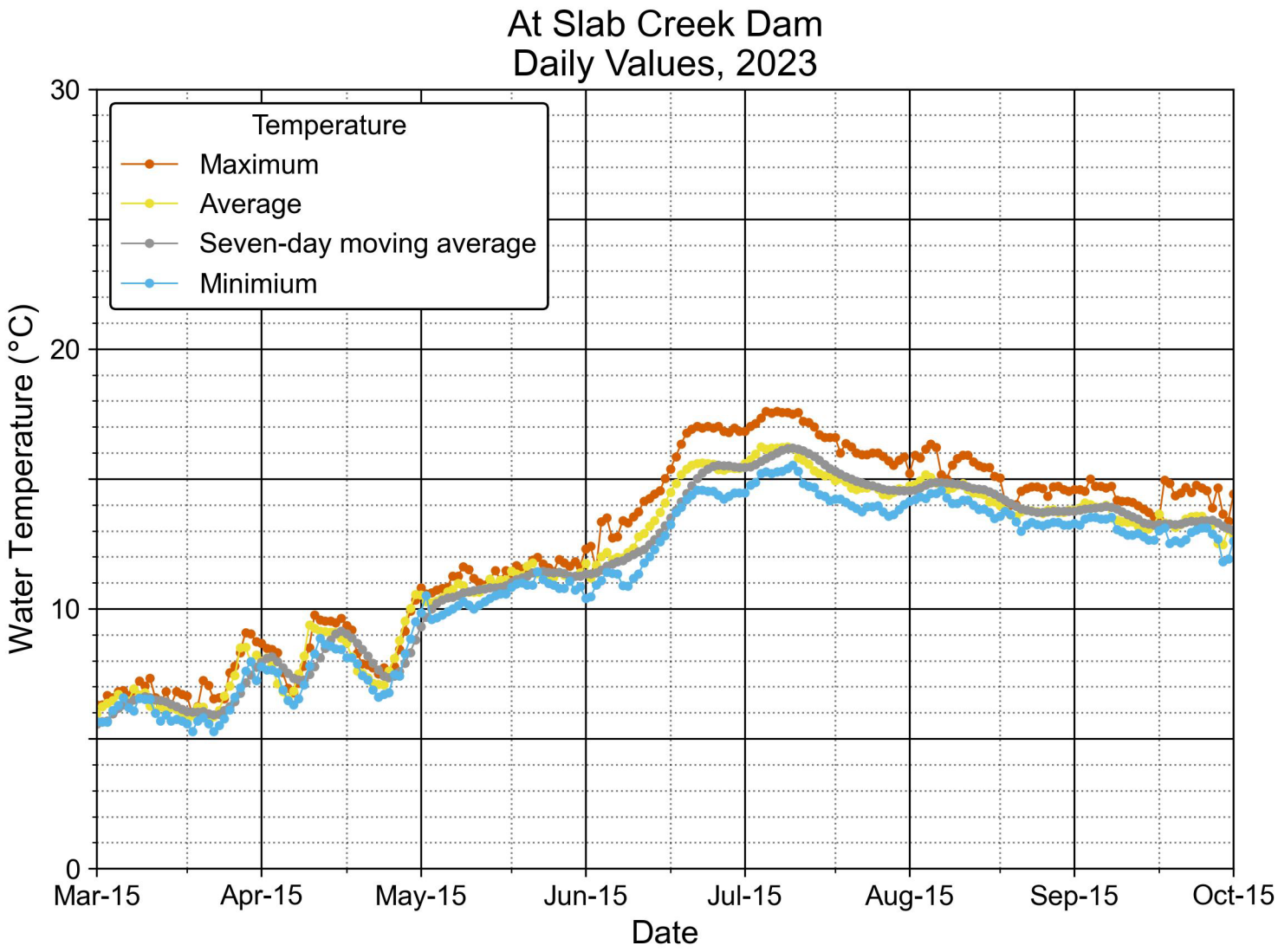

Figure D-16. South Fork American River immediately below Slab Creek Reservoir Dam (Site SFAR13).

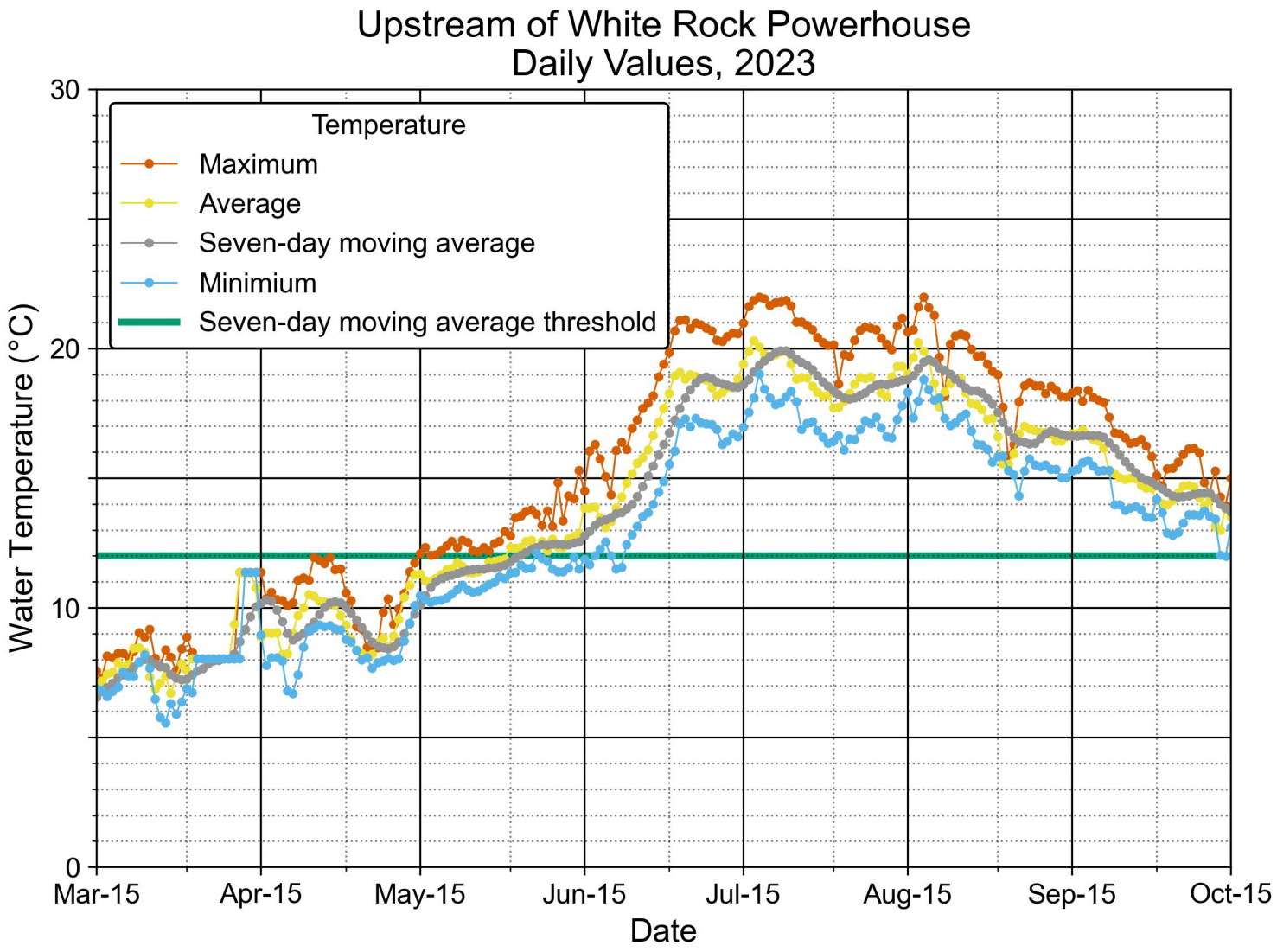

Figure D-17. South Fork American River approximately 0.5 mile upstream of White Rock Powerhouse (Site SFAR15).

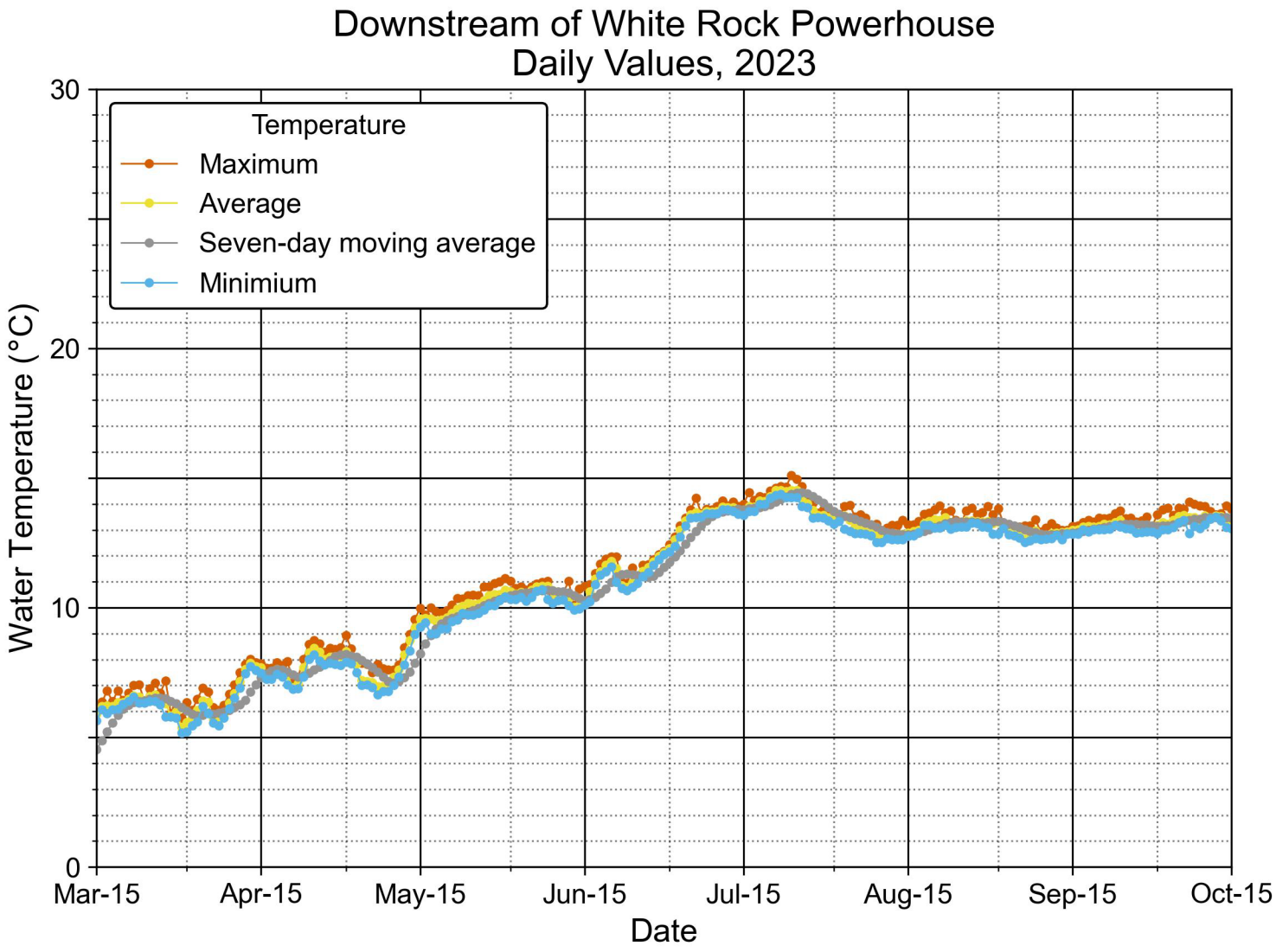

Figure D-18. South Fork American River to record White Rock Powerhouse discharge temps (Site SFAR16).