

# Monitoring Program 2025

## Volume I: Final Annual Report

### Sacramento Municipal Utility District

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Hydro License Implementation • June 2026

Upper American River Project

FERC Project No. 2101



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## ACRONYMS AND ABBREVIATIONS

| Acronym              | Definition                                                                                                                                                                                                                                           |
|----------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| uS/cm                | microsiemen per centimeter                                                                                                                                                                                                                           |
| 7DMAVG               | 7-day moving average                                                                                                                                                                                                                                 |
| Basin Plan           | Water Quality Control Plan for the Central Valley Region, the Sacramento River Basin and the San Joaquin River Basin                                                                                                                                 |
| BMI                  | benthic macroinvertebrate                                                                                                                                                                                                                            |
| °C                   | degrees Celsius                                                                                                                                                                                                                                      |
| CDEC                 | California Data Exchange Center                                                                                                                                                                                                                      |
| CDFW                 | California Department of Fish and Wildlife                                                                                                                                                                                                           |
| CSCI                 | California Stream Condition Index                                                                                                                                                                                                                    |
| DWR                  | California Department of Water Resources                                                                                                                                                                                                             |
| °F                   | degrees Fahrenheit                                                                                                                                                                                                                                   |
| FERC                 | Federal Energy Regulatory Commission                                                                                                                                                                                                                 |
| Forest Service       | U.S. Department of Agriculture, Forest Service                                                                                                                                                                                                       |
| License              | FERC Order Issuing New License for the Upper American River Project (FERC Project No. 2101), issued July 2014                                                                                                                                        |
| mm                   | millimeter                                                                                                                                                                                                                                           |
| MMI                  | multi-metric index                                                                                                                                                                                                                                   |
| O/E                  | observed-to-expected ratio                                                                                                                                                                                                                           |
| Plan(s)              | Trout Monitoring Plan, Aquatic Macroinvertebrate Monitoring Plan, Bald Eagle Monitoring Plan, Hardhead Monitoring Plan, Amphibian and Aquatic Reptile Monitoring Plan, Bear-Human Interaction Monitoring Plan, and Water Temperature Monitoring Plan |
| Report               | Annual Monitoring Report                                                                                                                                                                                                                             |
| Settlement Agreement | <i>UARP and Chili Bar Hydroelectric Project Rationale Report for the Relicensing Settlement Agreement</i>                                                                                                                                            |
| SFAR                 | South Fork American River                                                                                                                                                                                                                            |
| Slab Creek Dam Reach | South Fork American River downstream of the Slab Creek Dam                                                                                                                                                                                           |
| SMUD                 | Sacramento Municipal Utility District                                                                                                                                                                                                                |
| SWAMP                | Surface Water Ambient Monitoring Program                                                                                                                                                                                                             |

| Acronym | Definition                          |
|---------|-------------------------------------|
| SWRCB   | State Water Resources Control Board |
| TL      | total length                        |
| UARP    | Upper American River Project        |
| USFWS   | U.S. Fish and Wildlife Service      |
| USGS    | U.S. Geological Survey              |
| YOY     | young-of-year                       |

## 1.0 INTRODUCTION AND BACKGROUND

This Annual Monitoring Report (Report) addresses monitoring requirements set forth in Sacramento Municipal Utility District's (SMUD's) Trout Monitoring Plan, Aquatic Macroinvertebrate Monitoring Plan, Bald Eagle Monitoring Plan, Hardhead Monitoring Plan, Amphibian and Aquatic Reptile Monitoring Plan, Bear-Human Interaction Monitoring Plan, and Water Temperature Monitoring Plan<sup>1</sup> (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 (Forest Service) 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 23 July 2014 (License; FERC 2014), as well as in Forest Service Section 4(e) Conditions 14 and 15 for the Slab Creek Flow Facility Project License Amendment (Forest Service 2015). The Plans were developed in consultation with SWRCB, Forest Service, 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 2025. Additionally, this Report summarizes large woody debris findings, as specified in SWRCB Condition 10.

SMUD owns and operates the UARP, which 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 was 2015. Pre- and post-2014 minimum streamflow requirements (i.e., prior License and current License) are provided in Appendix A1.

This Report summarizes the results of Monitoring Year 11 (2025). 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 2025 water year type as Below Normal. The final 2025 water year type remained classified as Below Normal based on DWR's Full Natural Flow record for the American River at Folsom in October 2025.

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<sup>1</sup> Results of implementing the Water Quality Monitoring Plan (SMUD 2021) are provided in the 2025 Water Quality Monitoring Report (SMUD 2026).

## **1.1 MONITORING SITES**

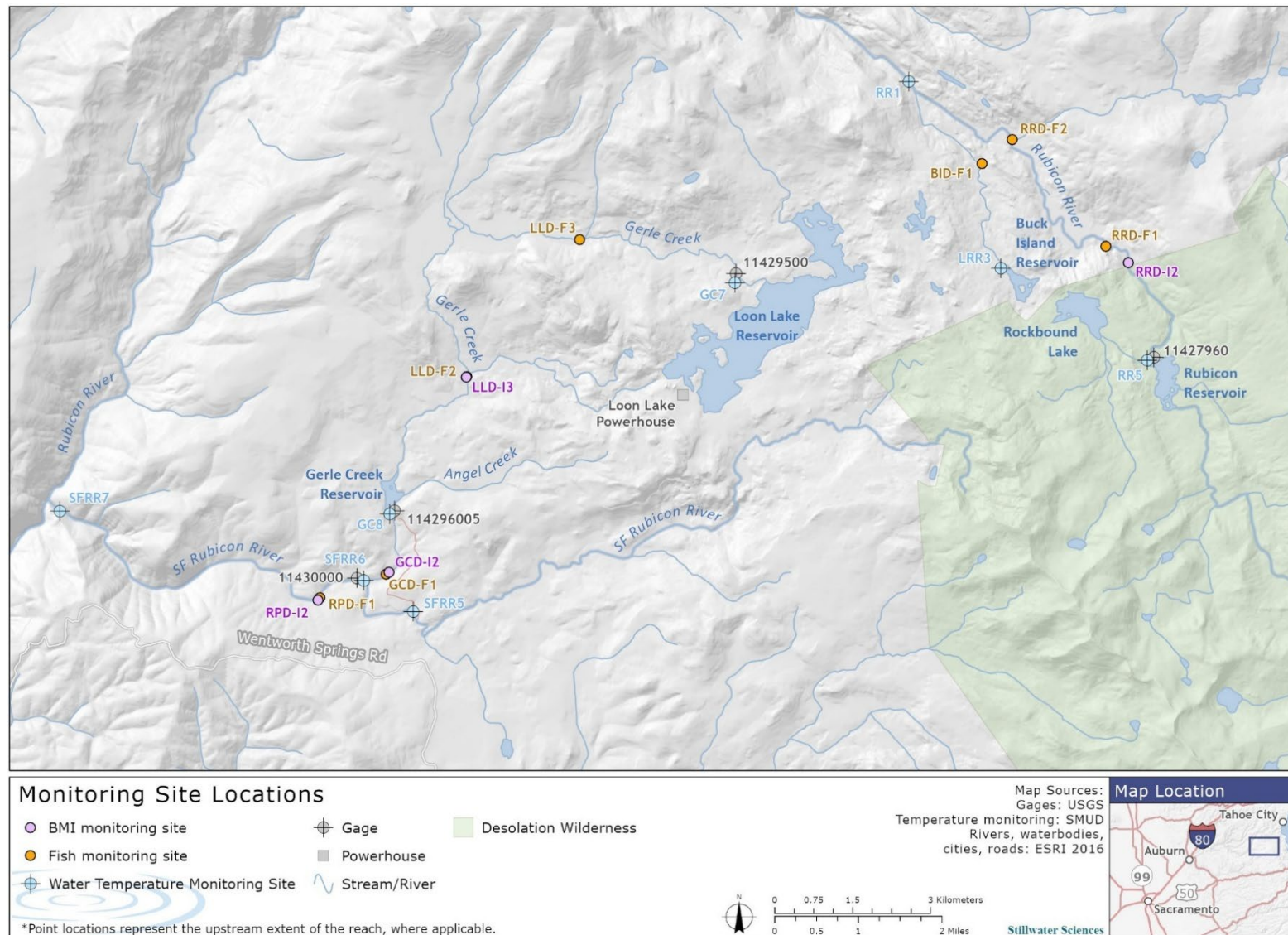
Monitoring sites are depicted in Figure 1-1 through Figure 1-3 for all 2025 study locations.

## **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 15 years of the License. As noted in Section 1.0, some monitoring activities have specific reporting requirements and deadlines in lieu of this Report.

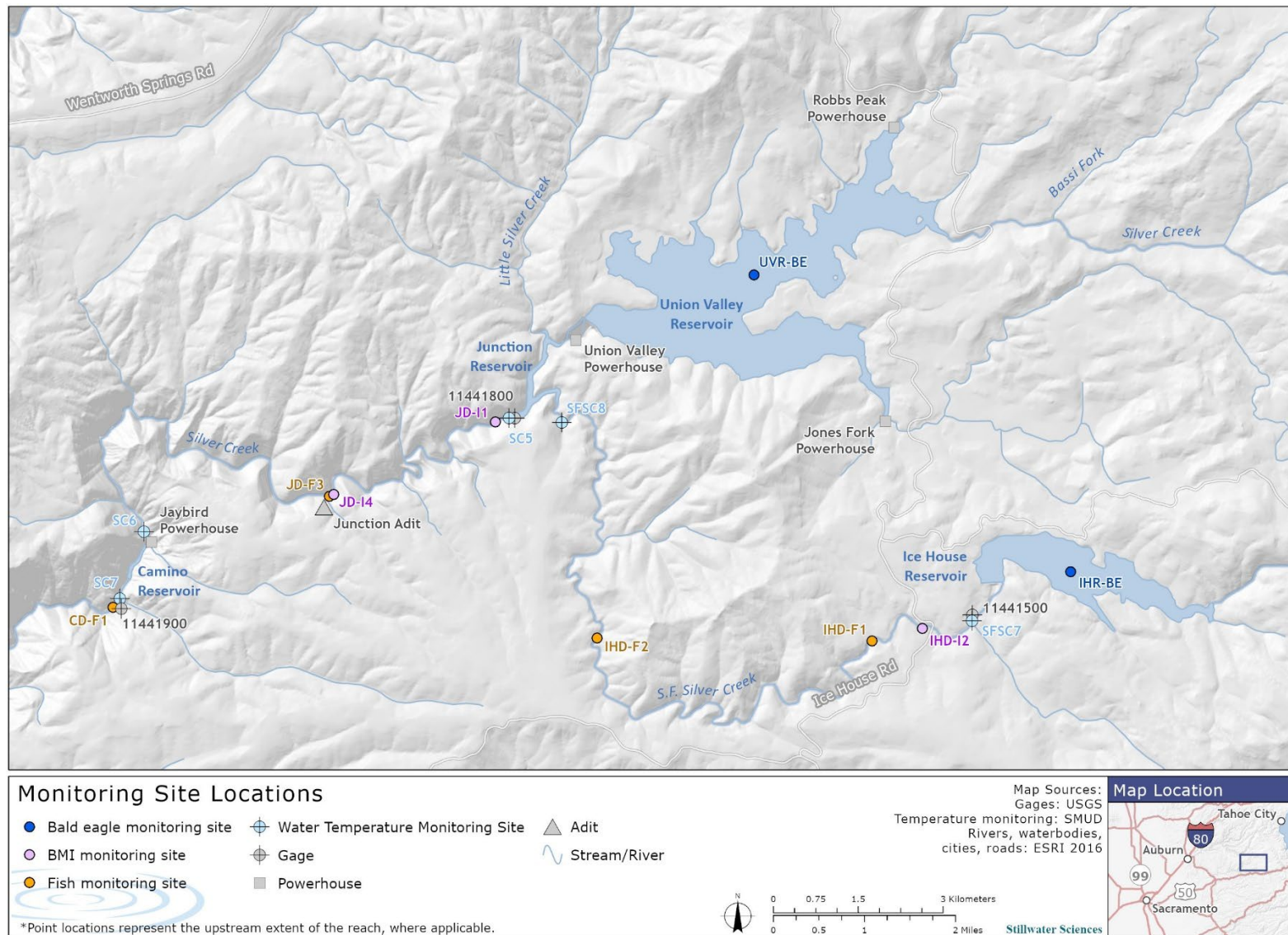
## **1.3 CONSULTATION**

The draft Report was submitted to the Consultation Group via a secure file transfer website on March 12, 2026. Comments on the draft Report and SMUD's replies to those comments are provided in Appendix A2.



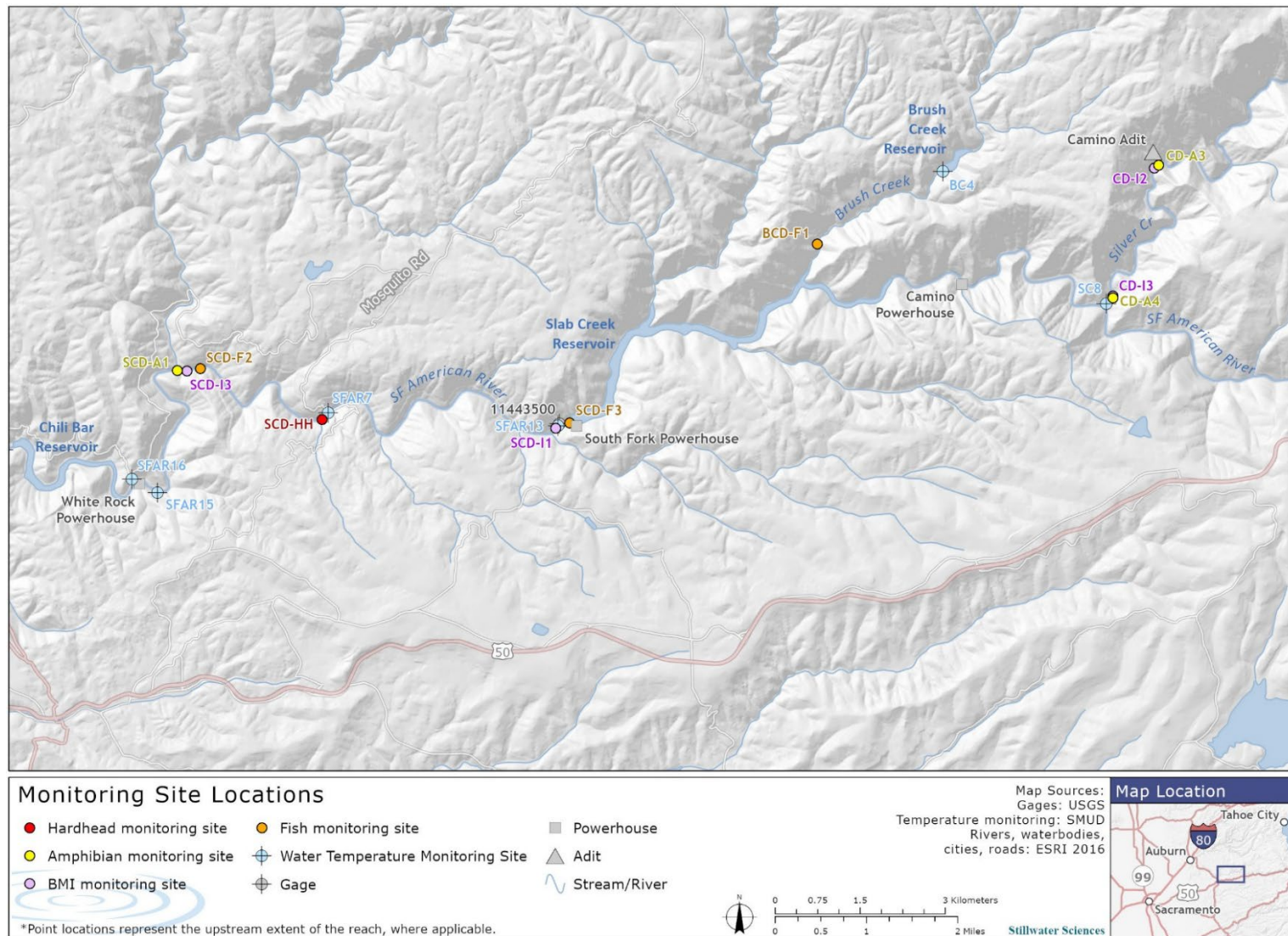
**Figure 1-1. Monitoring locations downstream of Rubicon Reservoir, Rockbound Lake, Buck Island Reservoir, Loon Lake Reservoir, and Gerle Creek Reservoir, 2025.**





**Figure 1-2. Monitoring locations downstream of Ice House Reservoir, Union Valley Reservoir, Junction Reservoir, and Camino Reservoir, 2025.**





Note: Fish monitoring site BCD-F1 was not scheduled for monitoring in 2025 but is included here for reference.

**Figure 1-3. Monitoring locations downstream of Camino Reservoir (continued), Brush Creek Reservoir, and Slab Creek Reservoir, 2025.**

**Table 1-1. Monitoring Frequency for the First 15 Years of Implementation for the Upper American River Project.**

| Monitoring Effort                                                            | License Monitoring Year |        |        |        |        |        |        |        |        |        |        |        |        |        |        |
|------------------------------------------------------------------------------|-------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
|                                                                              | 1                       | 2      | 3      | 4      | 5      | 6      | 7      | 8      | 9      | 10     | 11     | 12     | 13     | 14     | 15     |
|                                                                              | (2015)                  | (2016) | (2017) | (2018) | (2019) | (2020) | (2021) | (2022) | (2023) | (2024) | (2025) | (2026) | (2027) | (2028) | (2029) |
| Trout Population                                                             |                         |        |        |        | X      | X      |        |        |        | X      | X      |        |        |        | X      |
| Robbs Peak Powerhouse Entrainment                                            | X                       | X      | X      |        |        |        |        |        |        |        |        |        |        |        |        |
| Aquatic Macroinvertebrate                                                    |                         |        |        |        | X      | X      |        |        |        | X      | X      |        |        |        | X      |
| Geomorphology (Sensitive Site Investigation and Mitigation Plan Development) | X                       | X      |        |        |        |        |        |        |        |        |        |        |        |        |        |
| Geomorphology (Continuing Evaluation of Representative Channel Areas)        |                         |        |        |        | X      |        |        |        |        | X      |        |        |        |        | X      |
| Riparian Vegetation                                                          |                         |        |        |        | X      |        |        |        |        | X      |        |        |        |        | X      |
| Bald Eagle                                                                   |                         | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      |
| Hardhead Population                                                          |                         | X      | X      |        | X      | X      |        |        |        | X      | X      |        |        |        | X      |
| Amphibian and Aquatic Reptile (including Foothill Yellow-legged Frog)        |                         | X      | X      | X      | X      | X      | X      |        |        | X      | X      |        |        |        | X      |
| Sierra Nevada Yellow-legged Frog                                             |                         |        |        |        | X      |        |        |        |        | X      |        |        |        |        | X      |
| Bear Management                                                              |                         | X      | X      | X      | 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      | X      | X      | X      |
| Water Temperature                                                            |                         | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      |
| Algae Species                                                                |                         | X      |        |        |        |        |        |        |        |        |        |        |        |        |        |
| <i>In Situ</i> Water Quality <sup>1</sup>                                    | X                       | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      |
| Bacteria Monitoring <sup>1</sup>                                             | X                       | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      | X      |
| Metals Bioaccumulation <sup>1</sup>                                          |                         | X      |        |        |        |        | X      |        |        |        |        | X      |        |        |        |
| Water General Chemistry <sup>1</sup>                                         |                         |        | X      |        |        |        |        | X      |        |        |        |        | X      |        |        |

<sup>1</sup> Results of implementing the Water Quality Monitoring Plan (SMUD 2021) are provided in the 2025 Water Quality Monitoring Report (SMUD 2026).

## 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.

Forest Service (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.

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. 2026. *Water Quality Monitoring Report (2025). Hydro License Implementation. Upper American River Project, FERC Project No. 2101*. June.

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## 2.0 TROUT

### 2.1 MONITORING PLAN OBJECTIVES

The objective of the Trout Monitoring Plan (Plan) is to evaluate changes in trout populations throughout the UARP related to implementation of streamflows required under the 2014 License (SMUD 2016). Additionally, the *UARP and Chili Bar Hydroelectric Project Rationale Report for the Relicensing Settlement Agreement* (Settlement Agreement) (SMUD 2007) identifies resource objectives and rationale for the terms and conditions included in the UARP License and Chili Bar License. Resource objectives specific to the fish community were designed to maintain, restore, or recover ecological conditions for all life stages of rainbow trout (*Oncorhynchus mykiss*), other native fishes, and select non-native fishes (i.e., brown trout [*Salmo trutta*]) in their approximate range and habitat.

This Report summarizes the results of the 2025 surveys and evaluates fish species richness and trout biomass, density, age-class structure, and health. The 2025 surveys represent License Year 11 and the fourth year of required monitoring.

### 2.2 METHODS

In accordance with the Plan, 13 sites within 5 stream reaches were surveyed in 2025. Nine sites (Sites RRD-F1, RRD-F2, BID-F1, LLD-F2, LLD-F3, GCD-F1, RPD-F1, IHD-F1, and IHD-F2) were surveyed via backpack electrofishing, and four sites (Sites JD-F3, CD-F1, SCD-F2, and SCD-F3) were surveyed via snorkeling. After completion of a snorkel survey, the margins of accessible sites with rearing edgewater habitat (i.e., Site SCD-F2 and Site SCD-F3) were electrofished opportunistically to confirm species identification of juvenile fishes and to survey for species that may have been difficult to detect during snorkeling. Methodology was consistent with the Plan, as refined in the 2019 Report and 2020 Report (SMUD 2020, 2021). Site locations are shown in Figure 1-1 through Figure 1-3.

Detection probabilities differ between electrofishing and snorkel methods. Electrofishing generally has a higher detection probability for smaller size classes of fish compared with snorkel surveys, which tend to more accurately estimate larger size classes (Korman et al. 2010) and can result in length-frequency distributions that underrepresent smaller fish (e.g., young-of-year [YOY]). However, snorkel sites in the UARP generally contain deep or swift habitat, which is more suitable for larger fish compared with the shallower habitats sampled at electrofishing sites. To account for any potential bias, length-frequency histograms are separated by sampling method.

## 2.3 RESULTS

### 2.3.1 Stream Habitat

Habitat conditions in 2025 were consistent with 2024 (SMUD 2025), except at Site RRD-F2, which previously transitioned from a gravel-dominated pool in prior years to a cobble-dominated glide in 2024. In 2025, Site RRD-F2 was a silt-dominated glide. This section of the river is relatively flat, with finer sediment deposits. Shifts in habitat conditions are attributed to beaver dams upstream of the site. Site photographs and habitat conditions are provided in Appendices B1 and B2, respectively.

### 2.3.2 Species Richness

Seven fish species, including six native and one non-native species, were documented during the 2025 surveys. Unidentified fry (less than 25 millimeter [mm] total length [TL]) in the family Cyprinidae, referred to herein as Cyprinid spp., were also observed in 2025. UARP-wide species richness (number of species) in 2025 was generally similar to recent monitoring years. As in prior monitoring years, the reaches downstream of Slab Creek Dam and Rubicon Dam had the greatest number of species (four to five) of all survey reaches in 2025 (Table 2-1, Figure 2-1).

Rainbow trout was the most widely distributed fish species during 2025 monitoring and was observed in eight of the nine surveyed reaches. Although Sacramento sucker (*Catostomus occidentalis*) was observed in the reaches downstream of Rubicon Dam and Buck Island Dam in 2024, the species was not observed in these reaches in 2025 (Table 2-1). Speckled dace (*Rhinichthys osculus*) and sculpin (*Cottus* spp.) were also observed in 2024 in the South Fork American River (SFAR) downstream of Slab Creek Dam (Slab Creek Dam Reach) and in Silver Creek downstream of Camino Dam, respectively, but were not observed in these reaches in 2025. Rainbow and brown trout were captured at Site RRD-F2 for the first time since 2020 (Figure 2-1). Detailed individual fish capture data are provided in Appendix B3.

**Table 2-1. Fish Species Observed in Upper American River Project Study Reaches, 2002–2025.<sup>1</sup>**

| Fish Species                                              | Stream Reach <sup>2</sup> |            |            |            |            |            |            |                  |            |            |
|-----------------------------------------------------------|---------------------------|------------|------------|------------|------------|------------|------------|------------------|------------|------------|
|                                                           | RRD <sup>3</sup>          | BID        | LLD        | GCD        | RPD        | IHD        | JD         | BCD <sup>4</sup> | CD         | SCD        |
| <b>Native</b>                                             |                           |            |            |            |            |            |            |                  |            |            |
| California roach<br>( <i>Hesperoleucus symmetricus</i> )  | • □ X<br>Δ                | • □ X<br>Δ |            |            |            |            |            |                  |            | •          |
| Hardhead<br>( <i>Mylopharodon conocephalus</i> )          |                           |            |            |            |            |            |            |                  |            | •          |
| Rainbow trout<br>( <i>Oncorhynchus mykiss</i> )           | • □ X<br>Δ                | •          | • □ X<br>Δ | • □ X<br>Δ | • □ X<br>Δ | • □ X<br>Δ | • □ X<br>Δ | • □              | • □ X<br>Δ | • □ X<br>Δ |
| Riffle sculpin<br>( <i>Cottus gulosus</i> )               |                           |            |            |            |            |            |            |                  |            | •          |
| Sacramento pikeminnow<br>( <i>Ptychocheilus grandis</i> ) |                           |            |            |            |            |            |            |                  |            | • □ X<br>Δ |
| Sacramento sucker<br>( <i>Catostomus occidentalis</i> )   | • X                       | □ X        |            |            |            | • □ X<br>Δ | •          |                  | •          | • □ X<br>Δ |
| Sculpin spp.<br>( <i>Cottus</i> spp.)                     |                           |            |            |            |            |            |            |                  | X          | • □ X<br>Δ |
| Speckled dace<br>( <i>Rhinichthys osculus</i> )           | • □ X<br>Δ                |            |            |            |            |            |            |                  |            | • X        |
| Unidentified minnow<br>(Cyprinidae spp.)                  |                           |            |            |            |            |            |            |                  |            | X Δ        |
| <b>Non-native</b>                                         |                           |            |            |            |            |            |            |                  |            |            |
| Brook trout<br>( <i>Salvelinus fontinalis</i> )           | •                         |            |            |            |            |            |            |                  |            |            |
| Brown trout<br>( <i>Salmo trutta</i> )                    | • □ X<br>Δ                |            | • □ X<br>Δ | • □ X<br>Δ | • □ X<br>Δ | • □ X<br>Δ | • □ X<br>Δ | •                | •          | • □ X<br>Δ |
| Golden shiner<br>( <i>Notemigonus crysoleucas</i> )       |                           | • □        |            |            |            |            |            |                  |            |            |
| Smallmouth bass<br>( <i>Micropterus dolomieu</i> )        |                           |            |            |            |            |            |            |                  |            | •          |
| Sunfish spp.<br>( <i>Lepomis</i> spp.)                    |                           |            |            |            |            |            |            |                  |            | □          |

<sup>1</sup> • = 2002, 2003, 2004, and/or 2005 surveys

□ = 2019 and 2020 surveys

X = 2024 surveys

Δ = 2025 surveys

<sup>2</sup> BCD = Brush Creek Dam

BID = Buck Island Dam

CD = Camino Dam

GCD = Gerle Creek Dam

IHD = Ice House Dam

JD = Junction Dam

LLD = Loon Lake Dam

RPD = Robbs Peak Dam

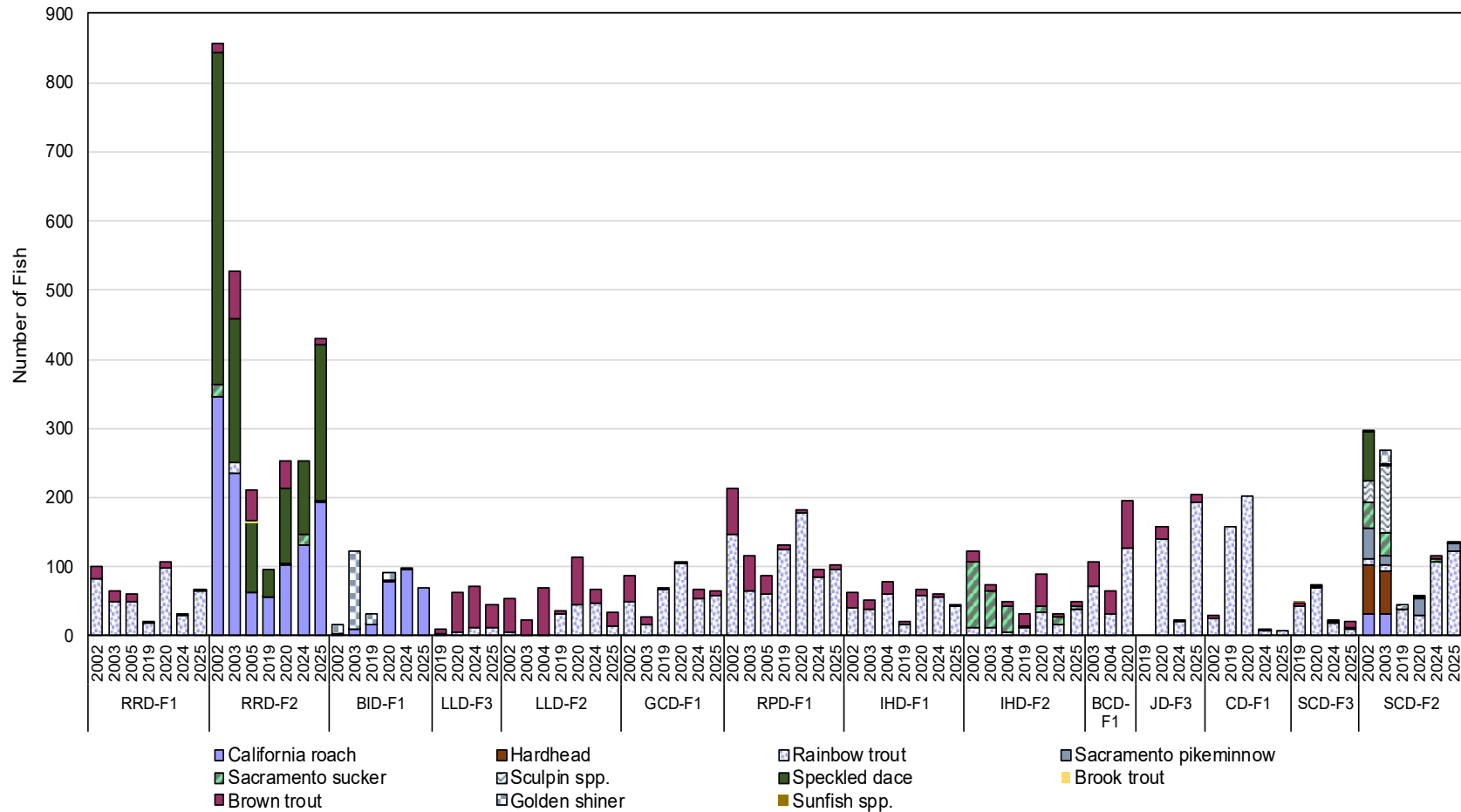
RRD = Rubicon Dam

SCD = Slab Creek Dam

<sup>3</sup> Hitch (*Lavina exilicauda*) were observed only in 2002 in the RRD reach following private stocking at Rubicon Springs Campground and are therefore excluded from analysis.

<sup>4</sup> Not surveyed in 2019, 2024, or 2025 per the Plan.



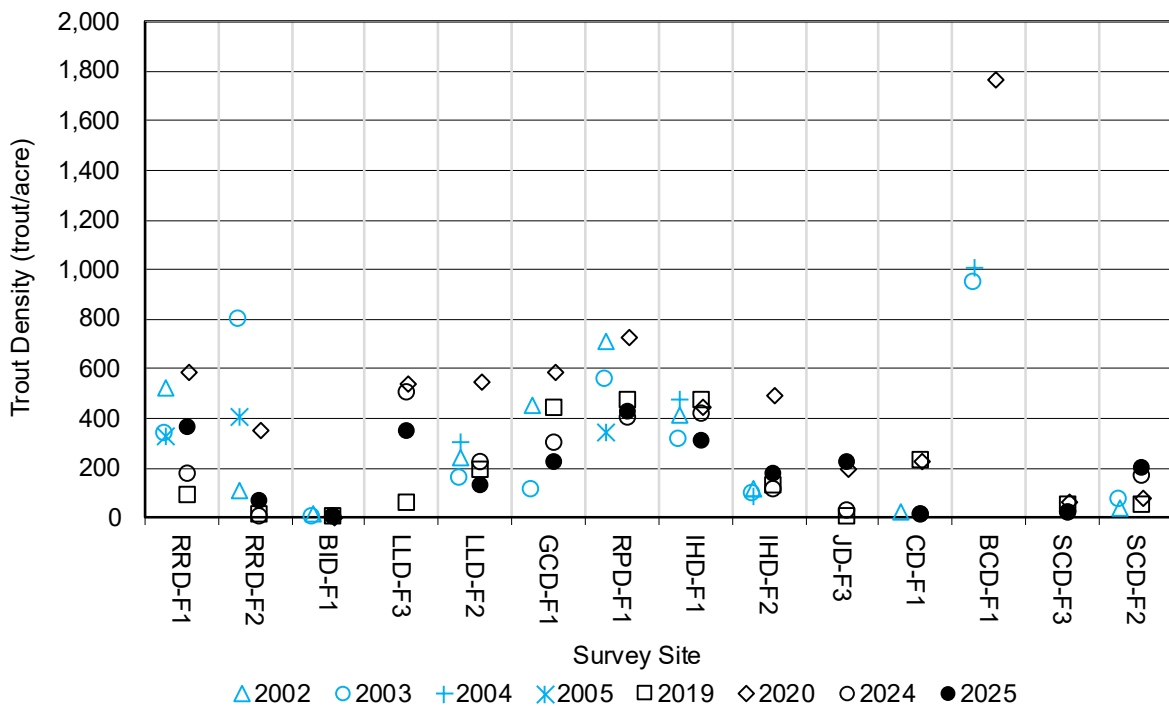


Notes: Not all sites were surveyed each year. Snorkel surveys were conducted in all monitoring years at Site CD-F1 and in monitoring years 2019–2025 at Sites JD-F3, SCD-F3, and SCD-F2.

**Figure 2-1. Fish species richness and abundance among Upper American River Project trout monitoring sites, 2002–2025.**

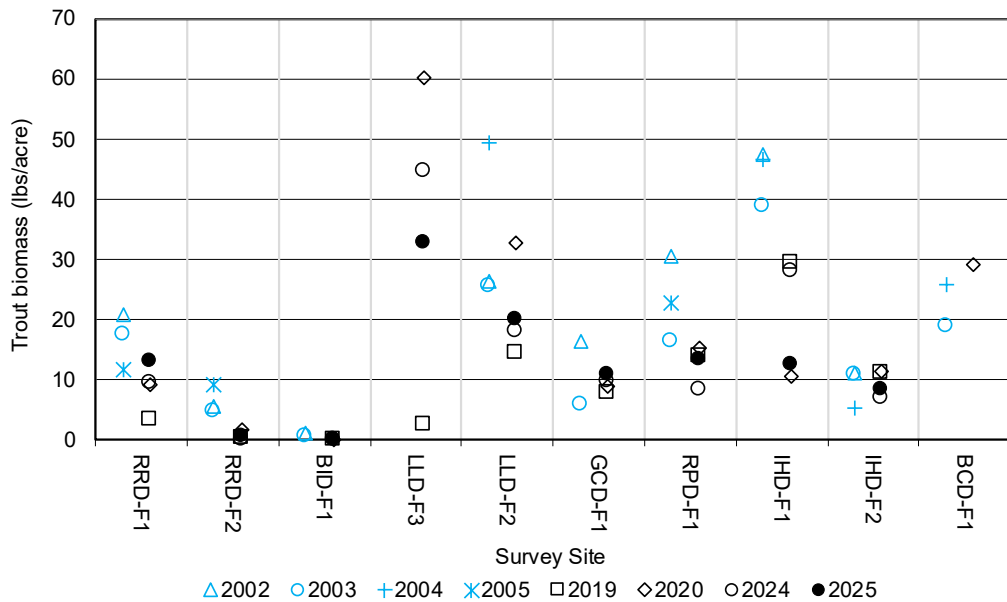
### 2.3.3 Trout Density, Biomass, and Catchable Trout

Trout (all trout species combined) density and biomass varied across sites in 2025 but were generally within the range of previous survey years (Figure 2-2, Figure 2-3). Similarly, catchable trout (greater than 152 mm TL) abundance in 2025 was generally within range of prior License survey years, except at Site JD-F3, which had a notable increase (Figure 2-4). Some shifts observed in 2024 were also observed in 2025—catchable trout abundances remained higher than pre-2024 monitoring years at Site SCD-F2 and lower than pre-2024 monitoring years at Site CD-F1. Detailed trout density and biomass data and site-specific density and biomass figures are provided in Appendices B4 and B5, respectively.



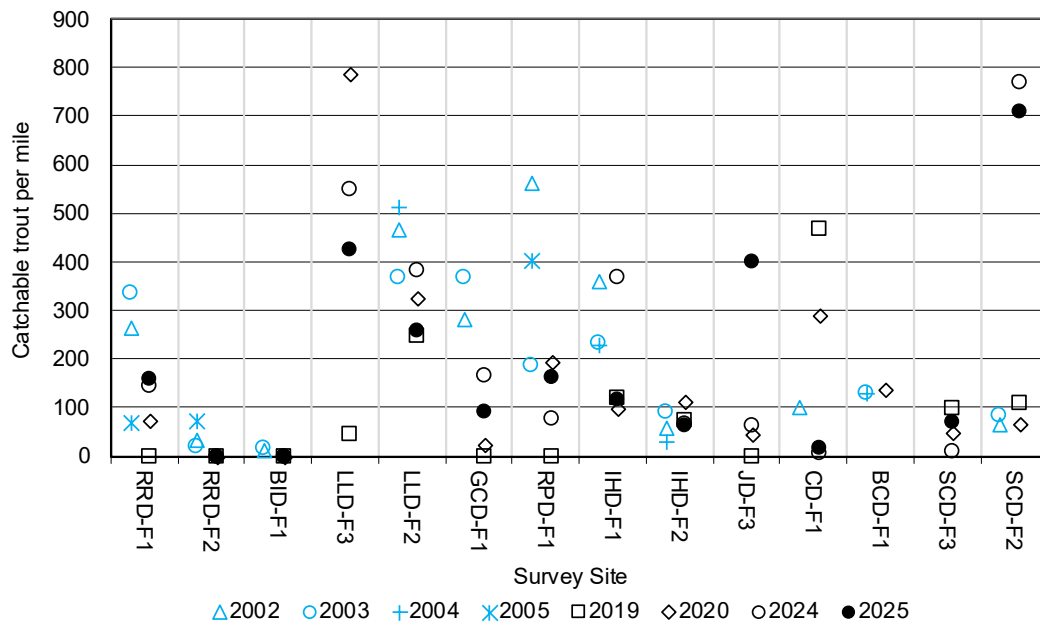
Notes: Not all sites were surveyed each year. Snorkel surveys were conducted in all monitoring years at Site CD-F1 and in monitoring years 2019–2025 at Sites JD-F3, SCD-F3, and SCD-F2.

**Figure 2-2. Trout density in the Upper American River Project study area by site, 2002–2025.**



Notes: Not all sites were surveyed each year.  
lbs = pounds

**Figure 2-3. Trout biomass in the Upper American River Project study area by site, 2002–2025.**



Notes: Not all sites were surveyed each year. Snorkel surveys were conducted in all monitoring years at Site CD-F1 and in monitoring years 2019–2025 at Sites JD-F3, SCD-F3, and SCD-F2.

**Figure 2-4. Number of catchable trout (>152 millimeters total length) per mile in the Upper American River Project study area by site, 2002–2025.**

#### 2.3.4 Trout Condition

Mean condition factors ( $k$ -values)<sup>2</sup> of rainbow and brown trout sampled in 2025 were between 0.8 and approximately 1.0 across sites, similar to prior sampling years, and indicate that the nutritional state of trout throughout the UARP remains good<sup>3</sup> (Table 2-2 and Figure 2-5 and Figure 2-6). Condition factors were generally within ranges reported for other western Sierran streams. Detailed trout condition data are provided in Appendix B6.

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<sup>2</sup> Fulton's condition factor (Ricker 1975) is an indicator of nutritional health related to fish size and is calculated using the Fulton formula:  $k = 100 * (\text{weight (grams)} / \text{length (TL mm)}^3)$ .

<sup>3</sup> Condition factors for wild trout in western Sierran streams typically range from 0.8 to 2.0, with a mean condition factor generally 1.2 or below (EA 1986, Beak 1991, Ebasco Environmental 1993, Wilcox 1994, Hanson Environmental 2005). Rabe (1967) reported the condition factor to be between 0.9 and 1.1 for rainbow trout in alpine lakes. Arismendi et al. (2011) cites a broader range (0.5 to 2.0); however, condition depends on the time of sampling, the species, the strain of trout, state of sexual maturity, and the metric used to define fish length (e.g., fork length, TL, or standard length), which is not often documented with the results. TL has been used as the standard of measurement throughout 2002–2025 trout monitoring.

**Table 2-2. Condition Factors for Rainbow and Brown Trout in the Upper American River Project Study Area by Site, 2002–2025.<sup>a</sup>**

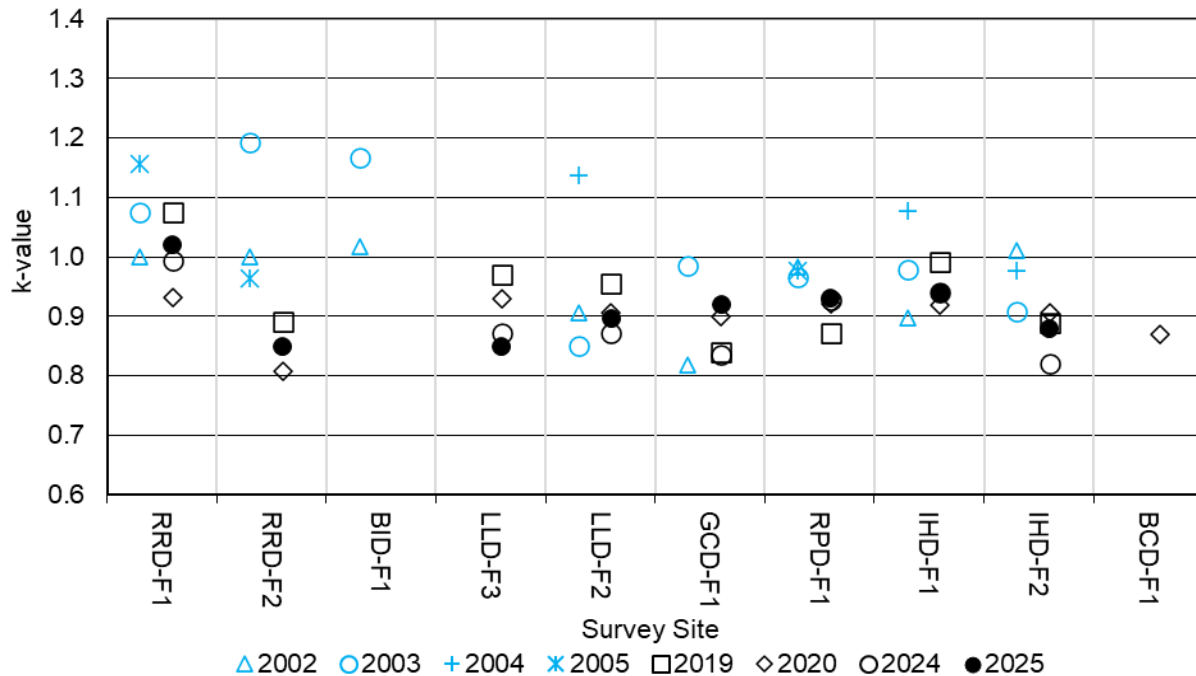
| Year          | Site            |                   |                 |                 |                 |                 |                 |                 |                 | Average     |
|---------------|-----------------|-------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-------------|
|               | RRD-F1          | RRD-F2            | LLD-F3          | LLD-F2          | GCD-F1          | RPD-F1          | IHD-F1          | IHD-F2          | BCD-F1          |             |
| Rainbow Trout |                 |                   |                 |                 |                 |                 |                 |                 |                 |             |
| 2025          | 1.02            | 0.85              | 0.85            | 0.90            | 0.92            | 0.93            | 0.94            | 0.88            | -- <sup>c</sup> | <b>0.91</b> |
| 2024          | 0.99            | -- <sup>b</sup>   | 0.87            | 0.88            | 0.86            | 0.93            | 0.94            | 0.82            | -- <sup>c</sup> | <b>0.90</b> |
| 2020          | 0.93            | 0.81              | 0.93            | 0.91            | 0.90            | 0.92            | 0.92            | 0.91            | 0.87            | <b>0.90</b> |
| 2019          | 1.08            | 0.89              | 0.97            | 0.96            | 0.84            | 0.87            | 0.99            | 0.89            | -- <sup>c</sup> | <b>0.94</b> |
| 2005          | 1.16            | 0.96              | -- <sup>b</sup> | -- <sup>c</sup> | -- <sup>c</sup> | 0.98            | -- <sup>c</sup> | -- <sup>c</sup> | -- <sup>c</sup> | <b>1.03</b> |
| 2004          | -- <sup>c</sup> | -- <sup>c</sup>   | -- <sup>c</sup> | 1.14            | -- <sup>c</sup> | -- <sup>c</sup> | 1.08            | 0.98            | 0.95            | <b>1.04</b> |
| 2003          | 1.08            | 1.19              | -- <sup>c</sup> | 0.85            | 0.99            | 0.97            | 0.98            | 0.91            | 0.97            | <b>0.99</b> |
| 2002          | 1.00            | 1.00              | -- <sup>c</sup> | 0.91            | 0.82            | 0.98            | 0.90            | 1.01            | -- <sup>c</sup> | <b>0.95</b> |
| Average       | <b>1.04</b>     | <b>0.95</b>       | <b>0.91</b>     | <b>0.93</b>     | <b>0.89</b>     | <b>0.94</b>     | <b>0.96</b>     | <b>0.91</b>     | <b>0.93</b>     | --          |
| Brown Trout   |                 |                   |                 |                 |                 |                 |                 |                 |                 |             |
| 2025          | 0.93            | 0.8               | 0.94            | 0.92            | 0.95            | 1.02            | 0.87            | 0.92            | -- <sup>c</sup> | <b>0.92</b> |
| 2024          | 0.89            | -- <sup>b</sup>   | 0.90            | 1.00            | 0.93            | 0.99            | 0.91            | 0.98            | -- <sup>c</sup> | <b>0.94</b> |
| 2020          | 0.95            | 0.88              | 0.97            | 0.96            | 0.84            | 1.03            | 1.01            | 0.93            | 0.89            | <b>0.94</b> |
| 2019          | 1.10            | 0.00 <sup>b</sup> | 1.18            | 0.94            | 1.00            | 1.01            | 0.98            | 0.99            | --              | <b>1.03</b> |
| 2005          | 1.10            | 0.97              | 0.97            | -- <sup>c</sup> | -- <sup>c</sup> | 0.98            | -- <sup>c</sup> | -- <sup>c</sup> | -- <sup>c</sup> | <b>1.00</b> |
| 2004          | -- <sup>c</sup> | -- <sup>c</sup>   | -- <sup>c</sup> | 1.09            | -- <sup>c</sup> | 0.98            | 1.02            | 1.03            | 1.04            | <b>1.03</b> |
| 2003          | 1.02            | 1.07              | -- <sup>c</sup> | 0.97            | 1.25            | 1.05            | 0.95            | 0.99            | 0.96            | <b>1.03</b> |
| 2002          | 0.98            | 0.97              | -- <sup>c</sup> | 1.05            | 0.97            | 1.00            | 0.86            | 1.06            | --              | <b>0.98</b> |
| Average       | <b>1.00</b>     | <b>0.94</b>       | <b>1.00</b>     | <b>0.99</b>     | <b>0.99</b>     | <b>1.01</b>     | <b>0.94</b>     | <b>0.99</b>     | <b>0.96</b>     | --          |

Notes: -- = no data

<sup>a</sup> Condition factors were calculated using total length as the metric for length.

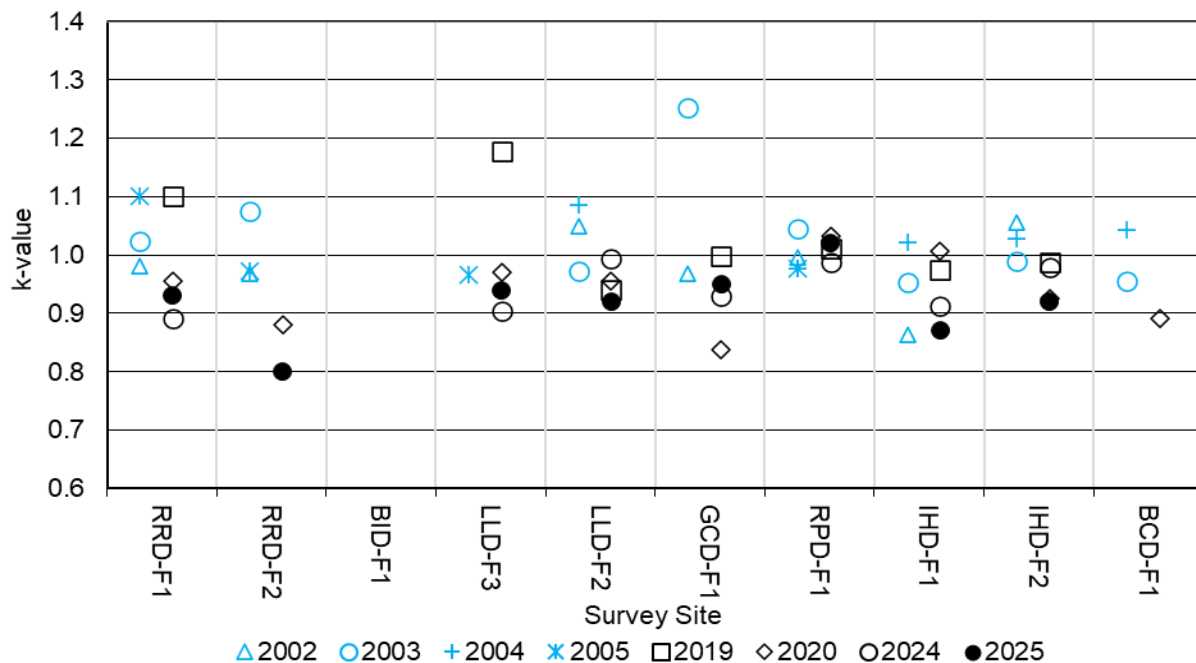
<sup>b</sup> No trout of this species were captured during sampling; value is not included in year or site average calculations.

<sup>c</sup> Not sampled, consistent with the Plan or SMUD (2007).



Note: Not all sites were surveyed each year.

**Figure 2-5. Condition factors (*k*-values) for rainbow trout captured by electrofishing in the Upper American River Project study area by site, 2002–2025.**



Note: Not all sites were surveyed each year.

**Figure 2-6. Condition factors (*k*-values) for brown trout captured by electrofishing in the Upper American River Project study area by site, 2002–2025.**

### 2.3.5 Trout Length-at-Age

Length-at-age data used to determine approximate age classes of each trout species are provided in Table 2-3 and Figure 2-7, and Figure 2-8. Site-specific length-frequency distributions are provided in Appendix B7. Age data resulting from the scale analysis are provided in Appendix B8.

**Table 2-3. Trout Length-at-Age Summary.**

| Trout Species        | Length at Age<br>(millimeter total length) |                  |                   |                  |                  |                  |
|----------------------|--------------------------------------------|------------------|-------------------|------------------|------------------|------------------|
|                      | YOY                                        | 1+               | 2+                | 3+               | 4+               | 5+               |
| <b>Rainbow Trout</b> |                                            |                  |                   |                  |                  |                  |
| Moyle (2002)         | < 75                                       | 75–140           | 140–190           | 190–235          | -- <sup>a</sup>  | -- <sup>a</sup>  |
| 2025 Scale Analysis  | 59–83<br>(n=12)                            | 71–145<br>(n=24) | 120–202<br>(n=28) | 155–244<br>(n=7) | -- <sup>b</sup>  | -- <sup>b</sup>  |
| <b>Brown Trout</b>   |                                            |                  |                   |                  |                  |                  |
| Moyle (2002)         | < 80                                       | 70–220           | 130–360           | 230–450          | -- <sup>a</sup>  | -- <sup>a</sup>  |
| 2025 Scale Analysis  | 63–90<br>(n=7)                             | 77–160<br>(n=13) | 147–201<br>(n=8)  | 209–304<br>(n=8) | 260–329<br>(n=8) | 330–334<br>(n=2) |

Notes: < less than  
-- = no data  
n = number of fish  
YOY = young-of-year

<sup>a</sup> No length data are reported for this age class.

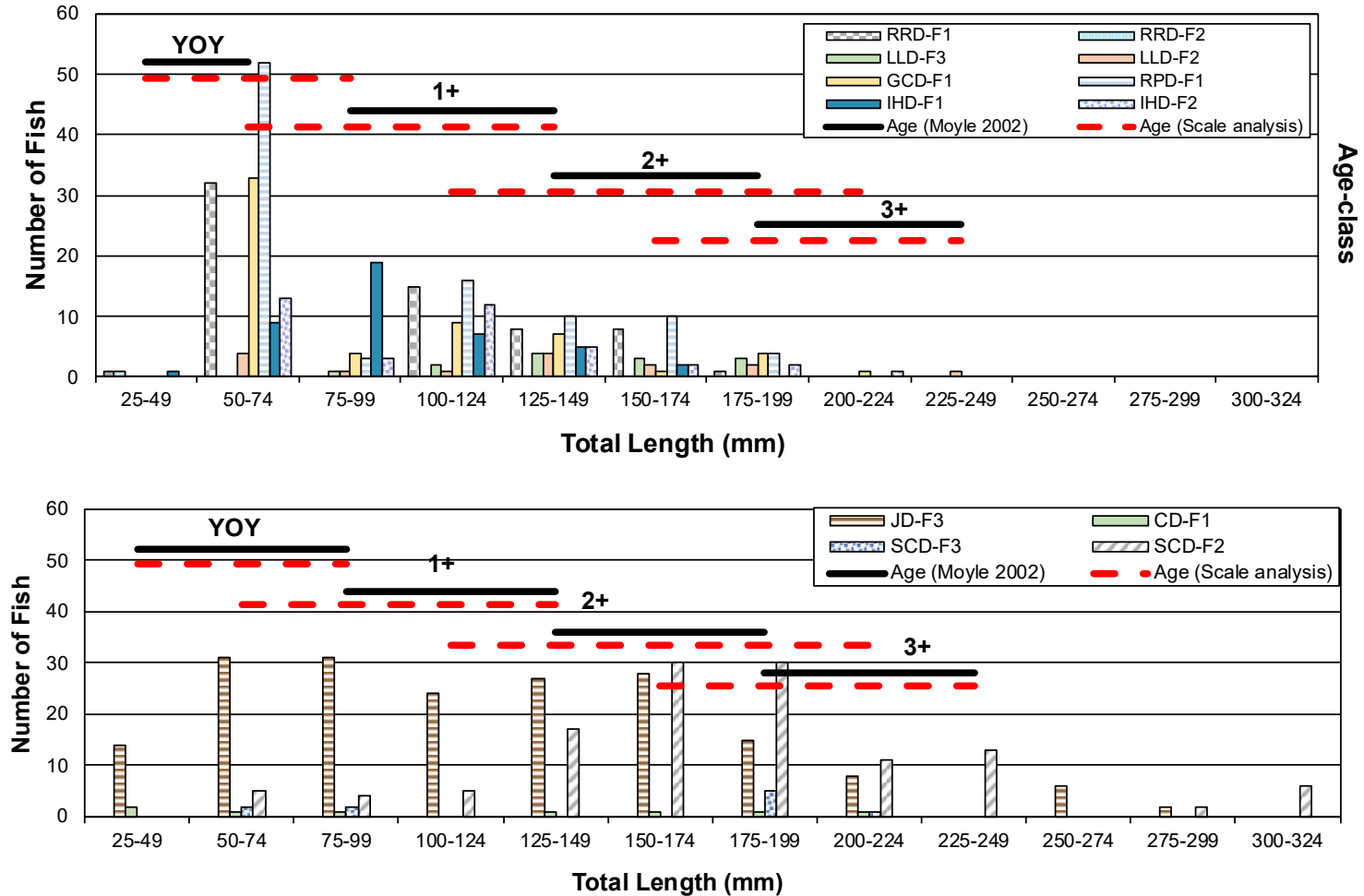
<sup>b</sup> No scales in this age class were analyzed in 2025 or prior monitoring years.

In 2025, rainbow trout ranged from 32 mm to approximately 300 mm TL throughout the UARP (Figure 2-7). Except at Site RRD-F2 and Site LLD-F3, rainbow trout populations were generally represented by multiple age classes ranging from YOY to 3+ or older, suggesting continued annual recruitment into older age classes (Figure 2-7). Only one YOY rainbow trout was captured at Site RRD-F2 in 2025, consistent with low catch in prior monitoring years (Figure 2-7; Appendix B7, Figure B7-3). At Site LLD-F3, no rainbow trout in the YOY age class and few rainbow trout in the 1+ through 3+ age classes were observed in 2025, consistent with the age-class distribution and length-frequency observed during prior monitoring years (Figure 2-7; Appendix B7, Figure B7-5).

Brown trout throughout the UARP ranged from 54 to 334 mm TL in 2025 (Figure 2-8). Multiple brown trout age classes were observed in 2025 at Sites LLD-F3, LLD-F2, GCD-F1, RPD-F1, IHD-F1, IHD-F2, and JD-F3, suggesting that continued recruitment and survival into older age classes occurs in these stream reaches (Figure 2-8). In the Rubicon River Dam Reach, one brown trout in the 3+ age class was observed at Site RRD-F1 in 2025 (Figure 2-8); missing age classes were also documented in previous monitoring years, suggesting that poor recruitment and/or low survival continue

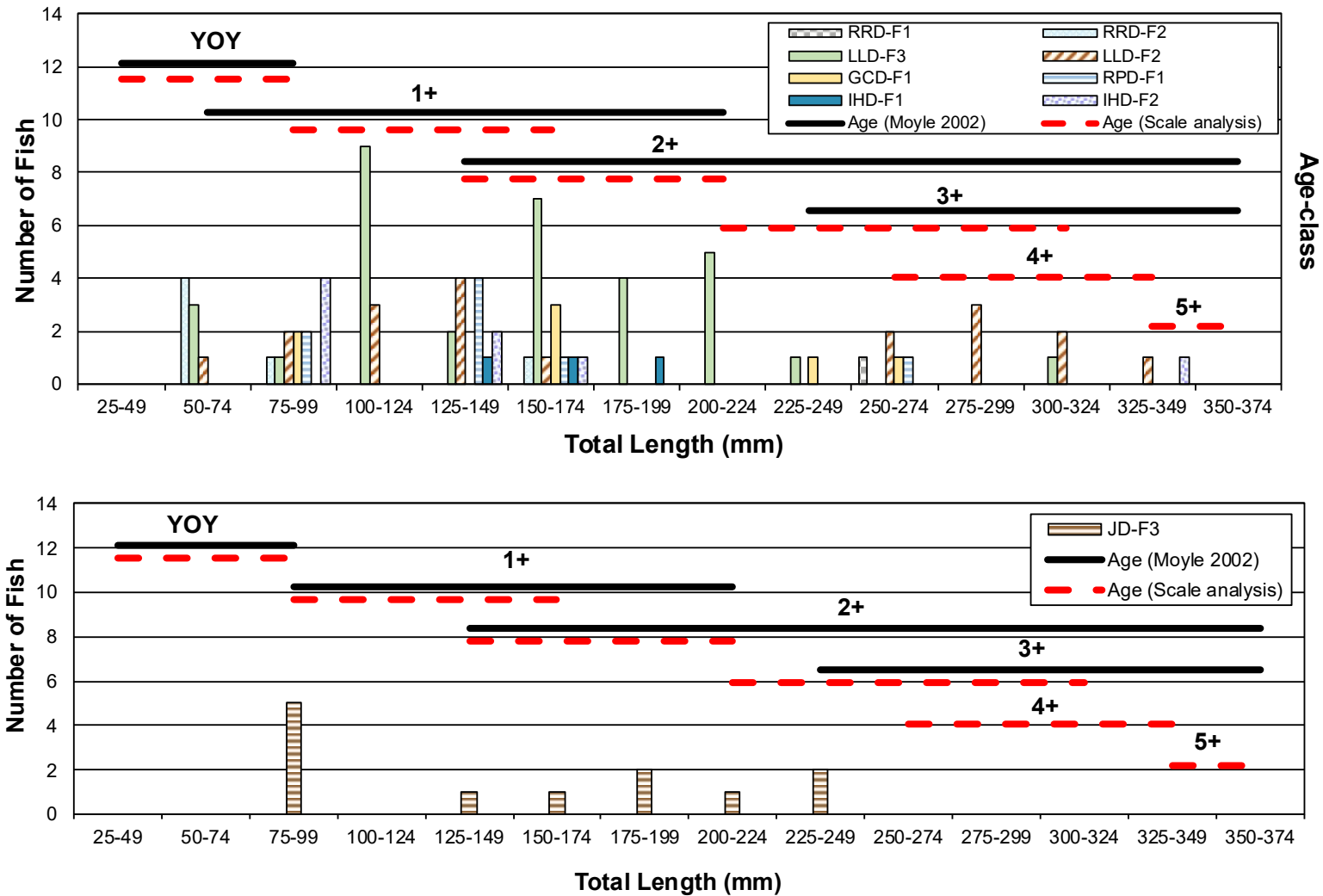


at this site (Appendix B7, Figure B7-2). However, in 2025, brown trout in the YOY through 2+ age classes were observed at Site RRD-F2 for the first time since 2020 (Figure 2-8; Appendix B7, Figure B7-4). Similar to previous monitoring years, few or no brown trout were observed at Site CD-F1, Site SCD-F3, or Site SCD-F2 (Appendix B7, Figures B7-21 and B7-23).



Notes: mm = millimeter, YOY = young-of-year

**Figure 2-7. Length-frequency and age-class distribution of rainbow trout at electrofishing sites (top) and snorkel sites (bottom), 2025.**



Notes: mm = millimeter, YOY = young-of-year

**Figure 2-8. Length-frequency and age-class distribution of brown trout at electrofishing sites (top) and snorkel sites (bottom), 2025.**

### 2.3.6 Historical Comparison

Species richness throughout the UARP was generally similar under License implementation and pre-License conditions; however, the total number of species observed in Slab Creek Dam Reach at Site SCD-F2<sup>4</sup> decreased from nine in 2002–2003 to between three and five in 2019–2025, with a shift from a transitional-zone fish assemblage consisting of predominantly Sacramento sucker and native Cyprinid spp. to trout (Table 2-1, Figure 2-1).

Trout density during License implementation was similar to the pre-License period (Figure 2-2). Trout biomass and catchable trout per mile at upper elevation reaches (downstream of Rubicon Dam and Loon Lake Dam) were generally lower during License implementation monitoring years compared with the pre-License period (Figure 2-3, Figure 2-4). Trout populations at mid- and lower-elevation reaches (downstream of Ice House Dam) were generally similar in License implementation and pre-License monitoring years. However, the lowest elevation site, Site SCD-F2, showed a slight increase in trout density and a substantial increase in catchable trout per mile in 2025 compared with prior monitoring years (Figure 2-2, Figure 2-4).

## 2.4 DISCUSSION

The Settlement Agreement includes reach-specific objectives for species richness and trout density, biomass, and abundance (Table 2-4). Of the three sites with species richness objectives, one site (Site BID-F1) partially met the objective in 2025. Zero of the ten sites with density objectives met the density objective in 2025. Of the 11 sites with trout biomass or catchable trout objectives, 2 (Sites LLD-F3 and SCD-F2) met the objectives (Table 2-4) in 2025.

In general, species richness and trout density throughout the UARP have remained similar across pre-License and License implementation monitoring years, while trout biomass and catchable trout abundance was generally lower during License implementation monitoring years compared with the pre-License period, especially at upper elevation sites (Section 2.3.6). The observation of multiple age classes at most sites indicates that trout reproductive success continues to occur throughout the UARP. Species composition in the SFAR downstream of Slab Creek Dam, the lowest elevation reach, shifted from a transitional-zone fish assemblage to a predominantly trout assemblage. Both this study and the hardhead study (see Section 5.0) indicate notable changes in fish populations in the SFAR downstream of Slab Creek Dam during License implementation compared with the pre-License period, which may be at least partially attributable to the change in streamflow and water temperature regimes in this reach.

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<sup>4</sup> Site SCD-F2 was surveyed via electrofishing in 2002 and 2003 and snorkeling in 2019 through 2025.

**Table 2-4. Fish Community Resource Objectives Specified in the Rationale Report for the Settlement Agreement.**

| Stream Reach                                        | Site   | Species Richness and Abundance                                       |                                                | Trout Biomass or Catchable Trout   |                              |                          |                          |
|-----------------------------------------------------|--------|----------------------------------------------------------------------|------------------------------------------------|------------------------------------|------------------------------|--------------------------|--------------------------|
|                                                     |        | Objective (SMUD 2007)                                                | License Status (2024–2025)                     | Objective (SMUD 2007) <sup>1</sup> | Pre-License (2002–2005 mean) | License (2019–2020 mean) | License (2024–2025 mean) |
| Rubicon River downstream of Rubicon Dam             | RRD-F1 | Increase rainbow trout density                                       | Decreased                                      | Biomass $\geq 24$ lbs/acre         | 16.7 lbs/acre                | 6.4 lbs/acre             | 11.3 lbs/acre            |
|                                                     | RRD-F2 | Increase rainbow trout density                                       | Decreased                                      | Biomass $\geq 33$ lbs/acre         | 6.9 lbs/acre                 | 1.1 lbs/acre             | 0.4 lb/acre              |
| Little Rubicon River downstream of Buck Island Dam  | BID-F1 | Reduce or eliminate golden shiner and increase rainbow trout density | Golden shiner reduced; rainbow trout decreased | Move toward 33 lbs/acre            | 0.9 lb/acre                  | 0 lb/acre                | 0 lb/acre                |
| Gerle Creek downstream of Loon Lake Dam             | LLD-F3 | Increase rainbow trout and maintain brown trout density              | --                                             | Biomass $\geq 33$ lbs/acre         | --                           | 31.4 lbs/acre            | 38.8 lbs/acre            |
|                                                     | LLD-F2 | Increase rainbow trout and maintain brown trout density              | Rainbow trout increased; brown trout decreased | Biomass $\geq 24$ lbs/acre         | 33.1 lbs/acre                | 23.6 lbs/acre            | 19.2 lbs/acre            |
| Gerle Creek downstream of Gerle Dam                 | GCD-F1 | Increase rainbow trout and maintain brown trout density              | Rainbow trout increased; brown trout decreased | Biomass $\geq 24$ lbs/acre         | 11.1 lbs/acre                | 8.5 lbs/acre             | 10.3 lbs/acre            |
| South Fork Rubicon downstream of Robbs Peak Dam     | RPD-F1 | Increase rainbow trout and maintain brown trout density              | Rainbow trout increased; brown trout decreased | Biomass $\geq 24$ lbs/acre         | 23.2 lbs/acre                | 15.3 lbs/acre            | 10.9 lbs/acre            |
| South Fork Silver Creek downstream of Ice House Dam | IHD-F1 | Increase rainbow trout density                                       | Decreased slightly                             | Biomass $\geq 24$ lbs/acre         | 44.5 lbs/acre                | 20.0 lbs/acre            | 20.4 lbs/acre            |
|                                                     | IHD-F2 | Increase rainbow trout density                                       | Decreased slightly                             | Biomass $\geq 24$ lbs/acre         | 9.1 lbs/acre                 | 11.4 lbs/acre            | 7.7 lbs/acre             |

| Stream Reach                                           | Site   | Species Richness and Abundance                                                                      |                                                                                                           | Trout Biomass or Catchable Trout      |                               |                          |                          |
|--------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|---------------------------------------|-------------------------------|--------------------------|--------------------------|
|                                                        |        | Objective (SMUD 2007)                                                                               | License Status (2024–2025)                                                                                | Objective (SMUD 2007) <sup>1</sup>    | Pre-License (2002–2005 mean)  | License (2019–2020 mean) | License (2024–2025 mean) |
| Silver Creek downstream of Junction Dam                | JD-F3  | Increase rainbow trout abundance                                                                    | --                                                                                                        | --                                    | 344.8 <sup>2</sup> trout/mile | 106.2 trout/mile         | 231.6 trout/mile         |
| Silver Creek downstream of Camino Dam                  | CD-F1  | Increase rainbow trout abundance                                                                    | Decreased                                                                                                 | Catchable trout 278/mile              | 100.5 trout/mile              | 378.0 trout/mile         | 10.7 trout/mile          |
| South Fork American River downstream of Slab Creek Dam | SCD-F3 | Healthy age class distribution of transitional fishes, including hardhead; increase trout abundance | Trout assemblage, very few transitional fish species                                                      | Catchable trout 278/mile              | --                            | 179.5 trout/mile         | 39.2 trout/mile          |
|                                                        | SCD-F2 | Healthy age class distribution of transitional fishes, including hardhead; increase trout abundance | General decline of species richness; fewer transitional fish species, hardhead not confirmed <sup>3</sup> | Catchable trout 278/mile <sup>4</sup> | 76 trout/mile                 | 230.4 trout/mile         | 737.2 trout/mile         |

Notes: -- = no objective or not applicable

≥ = greater than or equal to

lbs = pounds

Sites RRD-F1, RRD-F2, BID-F1, LLD-F3, LLD-F2, GCD-F1, RPD-F1, IHD-F1, and IHD-F2 were surveyed via electrofishing. Sites JD-F3, CD-F1, SCD-F3, and SCD-F2 were surveyed via snorkeling.

<sup>1</sup> The mean biomass (lbs/acre) and catchable trout (trout per mile) objectives are based on Gerstung (1973).

<sup>2</sup> Pre-License catchable trout per mile was calculated from data collected at Site JD-F1.

<sup>3</sup> Although hardhead were not observed at this site in 2025, they were observed during the 2025 hardhead survey in the same reach (Section 5.0).

<sup>4</sup> Trout biomass was listed as the goal in the rationale document. However, biomass estimates were not possible because Site SCD-F2 was snorkeled in License implementation monitoring years, so catchable trout per mile was used instead.

## 2.5 LITERATURE CITED

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### **3.0 BENTHIC MACROINVERTEBRATES**

#### **3.1 MONITORING PLAN OBJECTIVES**

The primary goal of the Aquatic Macroinvertebrate Monitoring Plan (Plan) (SMUD 2016) is to monitor benthic macroinvertebrate (BMI) assemblages and use an aquatic ecosystem health index as an indicator of stream conditions during implementation of the streamflows required under the License.

#### **3.2 METHODS**

In accordance with the Plan, BMI monitoring was conducted at 11 sites in 8 stream reaches (Figure 1-1 through Figure 1-3, Table 3-1) in 2025 (License Year 11). Methodology was consistent with the Plan and followed the Surface Water Ambient Monitoring Program (SWAMP) protocol (Ode et al. 2025)<sup>5</sup> with refinements described in the 2019 Report (SMUD 2020). These refinements were made in consultation with authors of the protocol (Ode, pers comm, 2019; Rehn, pers comm, 2020) and discussed with CDFW staff (McBride and Mack, pers comm, 2024).

##### **3.2.1 Benthic Macroinvertebrate Sampling and Physical Habitat Data Collection**

Monitoring was conducted using the standard reach-wide benthos method for collecting BMI and documenting physical habitat described in the SWAMP protocol (Ode et al. 2025). Sites were divided into 11 equidistant main transects and 10 inter-transects arranged perpendicular to the direction of flow. BMI were collected at main transects using a D-frame net with 0.5-mm-diameter mesh and subsequently combined into a single composite sample for each site. A total of 13 BMI samples were collected—1 sample at each of the 11 sites and a duplicate sample at 2 sites (Site LLD-I3 and Site SCD-I3). Water quality (e.g., temperature, pH, dissolved oxygen) and physical habitat (e.g., wetted width, canopy cover, substrate) parameters described in the Plan were recorded.

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<sup>5</sup> The SWAMP protocol was updated in 2025 (Ode et al. 2025); previous License implementation monitoring followed 2016 guidance (Ode et al. 2016).

**Table 3-1. Benthic Macroinvertebrate Sites Sampled for the Upper American River Project, 2025.**

| Site                | Sample Date  | Stream Reach                                           | Description                                      | Northing / Easting (meters) <sup>a</sup> | Elevation (meters) | Site Reach Length (meters) <sup>b</sup> |
|---------------------|--------------|--------------------------------------------------------|--------------------------------------------------|------------------------------------------|--------------------|-----------------------------------------|
| RRD-I2              | 18 September | Rubicon River downstream of Rubicon Dam                | Upstream of Rubicon Springs                      | 4321159 / 740001                         | 1,871              | 150                                     |
| LLD-I3              | 9 September  | Gerle Creek downstream of Loon Lake Dam                | Upstream of Rocky Basin Creek confluence         | 4318674 / 727272                         | 1,647              | 150                                     |
| GCD-I2              | 9 September  | Gerle Creek downstream of Gerle Creek Dam              | Upstream of South Fork Rubicon River             | 4314970 / 725682                         | 1,528              | 150                                     |
| RPD-I2              | 8 September  | South Fork Rubicon River downstream of Robbs Peak Dam  | Downstream of Gerle Creek Confluence             | 4314517 / 724276 <sup>c</sup>            | 1,490              | 150                                     |
| IHD-I2              | 17 September | South Fork Silver Creek downstream of Ice House Dam    | Downstream of Ice House Reservoir                | 4299814 / 727760                         | 1,584              | 150                                     |
| JD-I1               | 10 September | Silver Creek downstream of Junction Dam                | Downstream of Junction Reservoir                 | 4303286 / 720200                         | 1,299              | 150                                     |
| JD-I4 <sup>d</sup>  | 10 September |                                                        | Near Jaybird Tunnel access                       | 4302088 / 717319                         | 1,203              | 150                                     |
| CD-I2 <sup>e</sup>  | 11 September | Silver Creek downstream of Camino Dam                  | Near Camino Tunnel access                        | 4298471 / 710090                         | 715                | 90                                      |
| CD-I3 <sup>e</sup>  | 12 September |                                                        | Upstream of South Fork American River Confluence | 4296211 / 709334                         | 629                | 100                                     |
| SCD-I1 <sup>f</sup> | 11 September | South Fork American River downstream of Slab Creek Dam | Upstream of South Fork Powerhouse                | 4293960 / 699540                         | 499                | 80                                      |
| SCD-I3 <sup>g</sup> | 17 September |                                                        | Upstream of Rock Creek confluence                | 4295026 / 692949                         | 336                | 150                                     |

Note: SWAMP = Surface Water Ambient Monitoring Program

<sup>a</sup> Universal Transverse Mercator Zone 10 North, North American Datum of 1983; located at Transect A established in 2019 (SMUD 2020) unless otherwise indicated.

<sup>b</sup> Reach lengths were reduced from the SWAMP standard guidelines (Ode et al. 2016) as necessary when established in 2019 (SMUD 2020).

<sup>c</sup> In 2024, Relocated approximately 50 meters upstream of the location surveyed during 2019 and 2020 (SMUD 2019, 2020) to maximize sampleable habitat.

<sup>d</sup> As described in the Plan, this site was not sampled during relicensing and was added to replace historical Site JD-I2 (SMUD and PG&E 2005), which is located on private property and has unreliable access.

<sup>e</sup> Site was partitioned to avoid unsampleable habitat.

<sup>f</sup> Site identified as Site SCD-I1a in the Plan. Site SCD-I1b was relocated downstream; therefore, this sample location is referred to as Site SCD-I1 herein.

<sup>g</sup> Site not sampled during relicensing; replacement for Site SCD-I1b described in the Plan, which was determined to be unsafe to sample using SWAMP methodology during site assessment in 2019 (SMUD 2020).

### 3.2.2 Laboratory Methods

Laboratory methods followed procedures referenced in the Plan and outlined in *Standard Operating Procedures for Laboratory Processing and Identification of BMIs in California* (Woodard et al. 2012). At least 600 BMIs were subsampled from each composite sample and identified using standard aquatic BMI identification keys (e.g., Wiggins 1996, Thorp and Covich 2001, Stewart and Stark 2002, Merritt et al. 2008). All organisms from the subsample were identified to a minimum level 1 taxonomic effort as specified in the Southwestern Association of Freshwater Invertebrate Taxonomists (Richards and Rogers 2011). The CDFW Aquatic Bioassessment Laboratory (Chico, California) conducted quality control of BMI identification for 10% of the samples.<sup>6</sup>

### 3.2.3 Data Analysis

A suite of standard metrics describing taxonomic richness, composition, and tolerance (Karr and Chu 1999, Richards and Rogers 2011, Post et al. 2025) and the composite California Stream Condition Index (CSCI) (Rehn et al. 2015) were calculated for each BMI sample. The CSCI is based on predictive modeling generated from a statewide BMI database and is used to evaluate aquatic habitat quality and identify overall trends related to stream condition as reflected by the BMI community.

The CSCI integrates two measures for evaluating sites: (1) BMI taxonomic completeness based on an observed-to-expected ratio (O/E) and (2) a multi-metric index (MMI) that quantifies biological condition based on BMI richness, composition, and diversity. The O/E is a measure of taxonomic completeness between observed taxa collected at a site and expected taxa generated through predictive modeling from the input of site-specific environmental variables (e.g., climate, topography, and geology) that are known to influence BMI communities (Rehn et al. 2015). The MMI generates anticipated values for six metrics<sup>7</sup> demonstrated to be reliable indicators with minimal variability (Rehn et al. 2015). Scores for each metric are calculated by comparing anticipated values based on environmental variables and taxonomic composition at reference sites built into the model with empirical values from the BMI sample collected from each site. As observed values approach those predicted by the model, scores for each measure (i.e., MMI and O/E) increase; conversely, as observed values deviate from those expected, scores decrease.

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<sup>6</sup> The CDFW Aquatic Bioassessment Laboratory re-identified the sample from UARP Site IHD-I2 for laboratory quality control per the SWAMP protocol (Ode et al. 2025). Sample collection and laboratory identification, including quality control, for the UARP and Chili Bar Project (SMUD 2026) were performed simultaneously.

<sup>7</sup> Total clinger taxa; percent Coleoptera taxa; percent Ephemeroptera, Plecoptera, and Trichoptera taxa; percent intolerant individuals; shredder taxa richness; and taxonomic richness.

The CSCI is calculated using R statistical software (Engeln and Beck 2025, R Core Team 2025) and integrates O/E taxonomic completeness and MMI results into a single score typically ranging from 0.1 to 1.4.<sup>8</sup> The CSCI score range is divided into four categories of biological condition, based on the 30th, 10th, and 1st percentiles of CSCI scores at reference sites in the state-wide database (Rehn et al. 2015):

- $\geq 0.92$  = *likely intact* condition,
- 0.91 to 0.80 = *possibly altered* condition,
- 0.79 to 0.63 = *likely altered* condition, and
- $\leq 0.62$  = *very likely altered* condition.

A two-level hierarchical Bayesian model was fitted to estimate the median CSCI scores between the pre-License and License implementation periods with area (i.e., the UARP or Chili Bar Project area) being the first hierarchical level ( $n=2$ ) and site being the second hierarchical level ( $n=13$ , including 2 Chili Bar Project sites). Priors were chosen to be weakly regularized to control for under- and overfitting the model to the data. Convergence criteria, such as effective sample sizes and R-hat values, were used to check for appropriate model convergence throughout. R statistical software was used to fit the model and generate the figures (Bürkner 2018, Kay 2024, R Core Team 2025).

### 3.3 RESULTS

#### 3.3.1 Water Quality

Water quality parameters recorded at sites during BMI collection are shown in Table 3-2.

**Table 3-2. Water Quality Data Collected during Benthic Macroinvertebrate Sampling for the Upper American River Project, 2025.**

| Site   | Water Temperature (°C) | pH (s.u.) | Alkalinity (mg/L) | Dissolved Oxygen (% sat) | Dissolved Oxygen (mg/L) | Specific Conductance (uS/cm) |
|--------|------------------------|-----------|-------------------|--------------------------|-------------------------|------------------------------|
| RRD-I2 | 14.1                   | 7.3       | 16                | 79                       | 8.2                     | 20                           |
| LLD-I3 | 13.9                   | 6.7       | 8                 | 81                       | 8.4                     | 10                           |
| GCD-I2 | 16.3                   | 6.9       | 8                 | 82                       | 8.1                     | 11                           |
| RPD-I2 | 15.8                   | 6.4       | 8                 | 85                       | 8.4                     | 11                           |
| IHD-I2 | 6.6                    | 7.1       | 12                | 84                       | 10.3                    | 14                           |
| JD-I1  | 7.1                    | 6.6       | 8                 | 83                       | 10.1                    | 13                           |
| JD-I4  | 11.9                   | 6.9       | 8                 | 85                       | 9.2                     | 15                           |

<sup>8</sup> The average CSCI score of reference sites is 1.00. CSCI scores greater than 1.00 indicate greater taxonomic richness and more complex ecological function than predicted for reference sites. Scores that approach 0 indicate departure from reference condition and degradation of biological condition (Rehn et al. 2015).

| Site   | Water Temperature (°C) | pH (s.u.) | Alkalinity (mg/L) | Dissolved Oxygen (% sat) | Dissolved Oxygen (mg/L) | Specific Conductance (uS/cm) |
|--------|------------------------|-----------|-------------------|--------------------------|-------------------------|------------------------------|
| CD-I2  | 13.8                   | 6.8       | 8                 | 92                       | 9.6                     | 18                           |
| CD-I3  | 15.8                   | 6.8       | 8                 | 93                       | 9.3                     | 19                           |
| SCD-I1 | 12.8                   | 6.8       | 8                 | 93                       | 9.8                     | 19                           |
| SCD-I3 | 15.8                   | 7.6       | 16                | 100                      | 9.9                     | 22                           |

Notes: °C = degree Celsius  
% sat. = percent saturation  
uS/cm = microsiemen per centimeter  
mg/L = milligram per liter  
s.u. = standard unit

### 3.3.2 Physical Habitat Assessment

Physical habitat, instream habitat complexity, and riparian vegetation cover data are summarized in Table 3-3 and Table 3-4. Site photographs are presented in Appendix C1. Aquatic habitat among sampling sites was diverse, ranging from low gradient pools to high gradient riffles with associated substrate size classes ranging from sand to bedrock (Table 3-3). Instream habitat complexity elements were present at all sites, typically ranking within the sparse category (Table 3-4). Boulders were the most common habitat complexity element. Artificial structures (e.g., pipes, bridge buttresses) were absent at all sites (Table 3-4). Above the stream channel, average canopy cover ranged from 3% to 52% (Table 3-3). At most sites, the upper riparian canopy on the streambanks was characterized as sparse, the lower canopy as moderate or heavy, and ground cover as moderate (Table 3-4).

Most sites showed little evidence of human disturbance, except for Site SCD-I1 and Site SCD-I3. Site SCD-I1 is upstream of South Fork Powerhouse and is bordered by a pedestrian bridge and public access trail. Site SCD-I3 is upstream of Rock Creek Powerhouse and provides public river access.

**Table 3-3. Physical Habitat Data Collected during Benthic Macroinvertebrate Sampling for the Upper American River Project, 2025.**

| Site   | Gradient (%) <sup>1</sup> | Discharge (cfs) <sup>2</sup> | Average Wetted Width (meters) <sup>3</sup> | Average Canopy Cover (%) | Dominant Habitat (subdominant) <sup>4</sup> | Dominant Substrate (subdominant) <sup>5</sup> |
|--------|---------------------------|------------------------------|--------------------------------------------|--------------------------|---------------------------------------------|-----------------------------------------------|
| RRD-I2 | 1.3                       | 1.3                          | 10.9                                       | 52                       | Glide (Riffle)                              | Coarse gravel (Cobble)                        |
| LLD-I3 | 2.7                       | 15.8 <sup>6</sup>            | 11.8                                       | 23                       | Riffle (Glide)                              | Bedrock (Small boulder)                       |
| GCD-I2 | 2.2                       | 8.3                          | 10.9                                       | 39                       | Pool (Riffle)                               | Cobble (Bedrock)                              |
| RPD-I2 | 2.6                       | 22.8                         | 11.3                                       | 33                       | Riffle (Run)                                | Bedrock (Coarse gravel)                       |
| IHD-I2 | 1.6                       | 16.6 <sup>6</sup>            | 9.8                                        | 45                       | Run (Riffle/Pool)                           | Bedrock (Sand)                                |
| JD-I1  | 4.8                       | 16.7 <sup>6</sup>            | 14.8                                       | 21                       | Riffle (Run)                                | Small Boulder (Bedrock)                       |
| JD-I4  | 2.4                       | 38.7                         | 18.6                                       | 28                       | Riffle (Pool)                               | Small Boulder (Bedrock)                       |
| CD-I2  | 1.9                       | 16.0 <sup>6</sup>            | 10.2                                       | 6                        | Run (Pool)                                  | Bedrock (Small boulder)                       |
| CD-I3  | 2.1                       | 21.8                         | 10.6                                       | 28                       | Riffle (Run)                                | Bedrock (Cobble/small boulder)                |
| SCD-I1 | 1.1                       | 79.4 <sup>6</sup>            | 13.8                                       | 3                        | Run (Riffle)                                | Small boulder (Cobble)                        |
| SCD-I3 | 1.7                       | 84.4                         | 35.3                                       | 6                        | Run (Pool)                                  | Cobble (Large boulder)                        |

Note: % = percent  
cfs = cubic feet per second  
USGS = U.S. Geological Survey

<sup>1</sup> Calculated using satellite imagery and the USGS National Elevation Dataset Digital Elevation Model (USGS 2023).

<sup>2</sup> Estimated by wading discharge measurement in the field unless otherwise noted.

<sup>3</sup> Averaged across 11 main transects per site.

<sup>4</sup> Calculated using habitat data collected on the 10 inter-transects between the downstream and upstream main transects at each site.

<sup>5</sup> Calculated using substrate size classes defined in the SWAMP protocol (Ode et al. 2025) and data collected on the 11 main transects and 10 inter-transects at each site.

<sup>6</sup> Discharge at USGS gage (USGS 2025).



**Table 3-4. Instream Habitat Complexity and Riparian Vegetation Areal Cover by Site during Benthic Macroinvertebrate Sampling for the Upper American River Project, 2025.<sup>a</sup>**

| Site   | Instream Habitat Complexity Feature Areal Cover |                                             |            |                       |                       |                |                     |                 |                       | Riparian Canopy Class Areal Cover |                        |                       |
|--------|-------------------------------------------------|---------------------------------------------|------------|-----------------------|-----------------------|----------------|---------------------|-----------------|-----------------------|-----------------------------------|------------------------|-----------------------|
|        | Filamentous Algae                               | Aquatic Macrophytes/<br>Emergent Vegetation | Boulders   | Woody Debris (>0.3 m) | Woody Debris (<0.3 m) | Undercut Banks | Overhang Vegetation | Live Tree Roots | Artificial Structures | Upper Canopy (>5 m)               | Lower Canopy (0.5–5 m) | Ground Cover (<0.5 m) |
| RRD-I2 | Sparse                                          | Sparse                                      | Sparse     | Sparse                | Sparse                | Sparse         | Sparse              | Absent          | Absent                | Moderate                          | Moderate               | Moderate              |
| LLD-I3 | Absent                                          | Sparse                                      | Heavy      | Sparse                | Sparse                | Sparse         | Sparse              | Sparse          | Absent                | Sparse                            | Moderate               | Moderate              |
| GCD-I2 | Sparse                                          | Sparse                                      | Moderate   | Sparse                | Sparse                | Sparse         | Sparse              | Sparse          | Absent                | Sparse                            | Moderate               | Moderate              |
| RPD-I2 | Sparse                                          | Sparse                                      | Sparse     | Sparse                | Sparse                | Sparse         | Sparse              | Sparse          | Absent                | Sparse                            | Moderate               | Moderate              |
| IHD-I2 | Sparse                                          | Sparse                                      | Sparse     | Sparse                | Sparse                | Sparse         | Sparse              | Sparse          | Absent                | Moderate                          | Heavy                  | Moderate              |
| JD-I1  | Sparse                                          | Sparse                                      | Very heavy | Sparse                | Sparse                | Absent         | Sparse              | Absent          | Absent                | Sparse                            | Moderate               | Moderate              |
| JD-I4  | Sparse                                          | Moderate                                    | Very heavy | Sparse                | Sparse                | Absent         | Sparse              | Sparse          | Absent                | Sparse                            | Moderate               | Moderate              |
| CD-I2  | Sparse                                          | Sparse                                      | Moderate   | Sparse                | Sparse                | Sparse         | Sparse              | Sparse          | Absent                | Sparse                            | Sparse                 | Moderate              |
| CD-I3  | Sparse                                          | Sparse                                      | Heavy      | Sparse                | Sparse                | Absent         | Sparse              | Sparse          | Absent                | Sparse                            | Moderate               | Moderate              |
| SCD-I1 | Sparse                                          | Sparse                                      | Heavy      | Sparse                | Sparse                | Absent         | Sparse              | Sparse          | Absent                | Moderate                          | Heavy                  | Moderate              |
| SCD-I3 | Sparse                                          | Moderate                                    | Moderate   | Sparse                | Sparse                | Absent         | Sparse              | Sparse          | Absent                | Sparse                            | Moderate               | Moderate              |

Notes: m = meter  
Absent = 0%  
Sparse = < 10%  
Moderate = 10–40%  
Heavy = 41–75%  
Very heavy = > 75%

<sup>a</sup> Areal cover averaged across 11 main transects per site.

### 3.3.3 Benthic Macroinvertebrate Assemblage Evaluation

A total of 8,056 BMIs representing 140 distinct taxa were identified from the samples collected at the UARP study sites in 2025. Interlaboratory quality control results identified no taxonomic errors (Appendix C2). A complete taxonomic list with associated functional feeding group and tolerance value designations is presented in Appendix C3. Standard metrics (e.g., the Shannon Diversity Index) that describe taxonomic richness, composition, and tolerance, including those used to calculate the CSCI, are presented in Appendix C4.

CSCI scores for the BMI samples collected in 2025 (Table 3-5, Figure 3-1) ranged from 0.53 at Site SCD-I3 to 1.22 at Sites RRD-I2 and LLD-I3. Of the 13 samples collected, 8 fell within the *likely intact* category, 4 fell within the *possibly altered* or *likely altered* categories, and 1 fell within the *very likely altered* category (Rehn et al. 2015). Duplicate samples collected at Site SCD-I3 during 2025 were similar (0.63 and 0.53) but ranked within two different condition categories (*likely altered* and *very likely altered*, respectively). CSCI scores exhibited little variation between 2024 and 2025; only two sites changed condition category. Site IHD-I2 changed from *possibly altered* to *likely intact*, and Site RPD-I2 changed from *likely intact* to *possibly altered*. Variations in CSCI scores between the two monitoring years were primarily driven by minor changes in MMI component metrics (e.g., percent Coleoptera taxa, taxonomic richness).

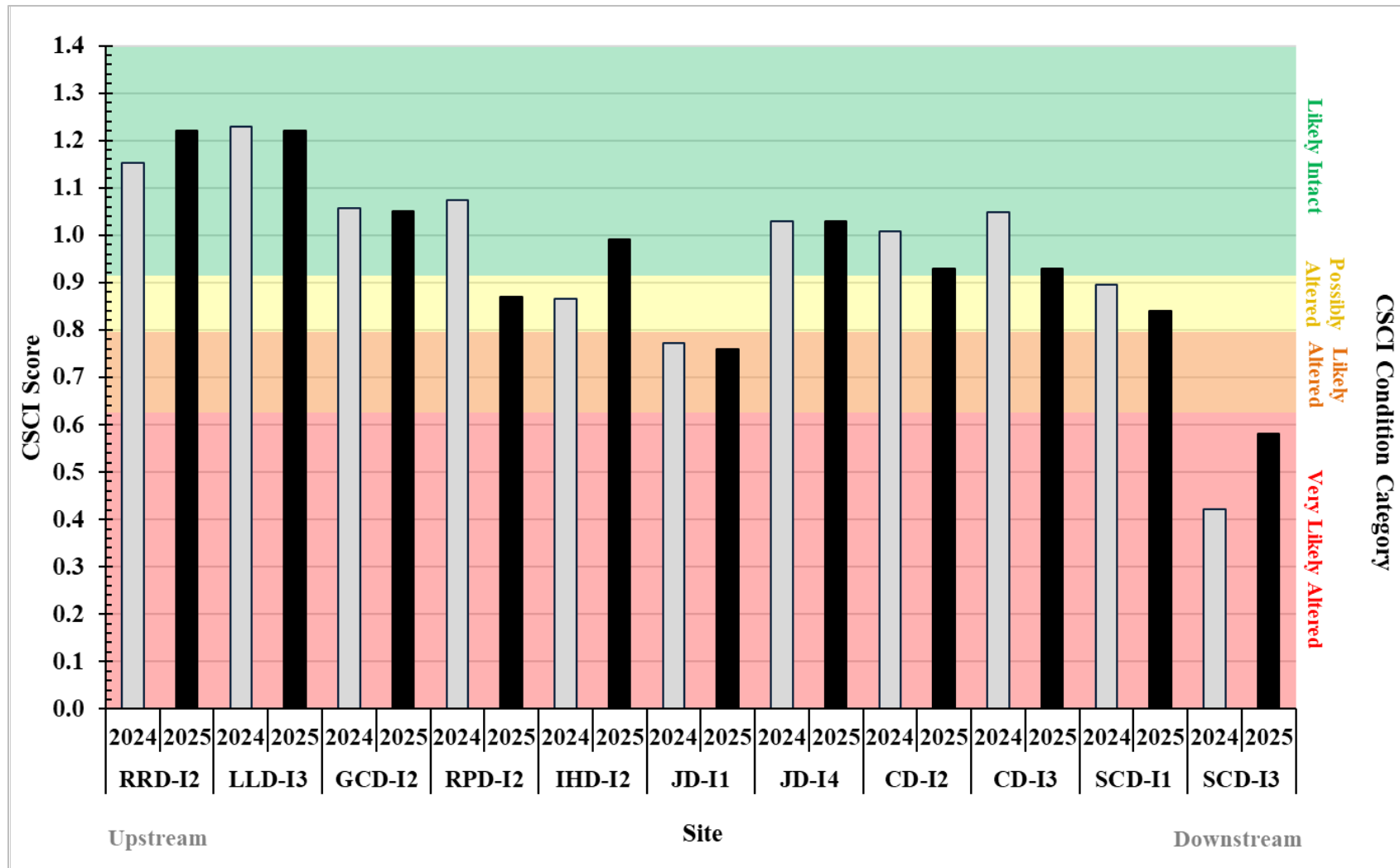
**Table 3-5. California Stream Condition Index Scores for Benthic Macroinvertebrate Samples Collected for the Upper American River Project, 2025.**

| Site                          | 2024 CSCI Score <sup>a</sup> | 2025 CSCI Score <sup>a</sup> |
|-------------------------------|------------------------------|------------------------------|
| RRD-I2                        | 1.15                         | 1.22                         |
| LLD-I3 <sup>b</sup> (average) | 1.25, 1.21 (1.23)            | 1.22, 1.21 (1.22)            |
| GCD-I2                        | 1.06                         | 1.05                         |
| RPD-I2                        | 1.07                         | 0.87                         |
| IHD-I2                        | 0.86                         | 0.99                         |
| JD-I1                         | 0.77                         | 0.76                         |
| JD-I4                         | 1.03                         | 1.03                         |
| CD-I2                         | 1.01                         | 0.93                         |
| CD-I3                         | 1.05                         | 0.93                         |
| SCD-I1                        | 0.89                         | 0.84                         |
| SCD-I3 <sup>b</sup> (average) | 0.42                         | 0.63, 0.53 (0.58)            |

Notes: ≤ = less than or equal to; ≥ = greater than or equal to; BMI = benthic macroinvertebrate  
CSCI = California Stream Condition Index; SWAMP = Surface Water Ambient Monitoring Program

<sup>a</sup> CSCI categories of biological condition (Rehn et al. 2015): ≥ 0.92 = *likely intact*, 0.91 to 0.80 = *possibly altered*, 0.79 to 0.63 = *likely altered*, ≤ 0.62 = *very likely altered*.

<sup>b</sup> SWAMP quality assurance protocols require duplicate sampling of BMIs at 10% of sites (Ode et al. 2016). For additional quality control, a duplicate sample was also collected at Site SCD-I3 because its 2024 CSCI score fell within the *very likely altered* category.

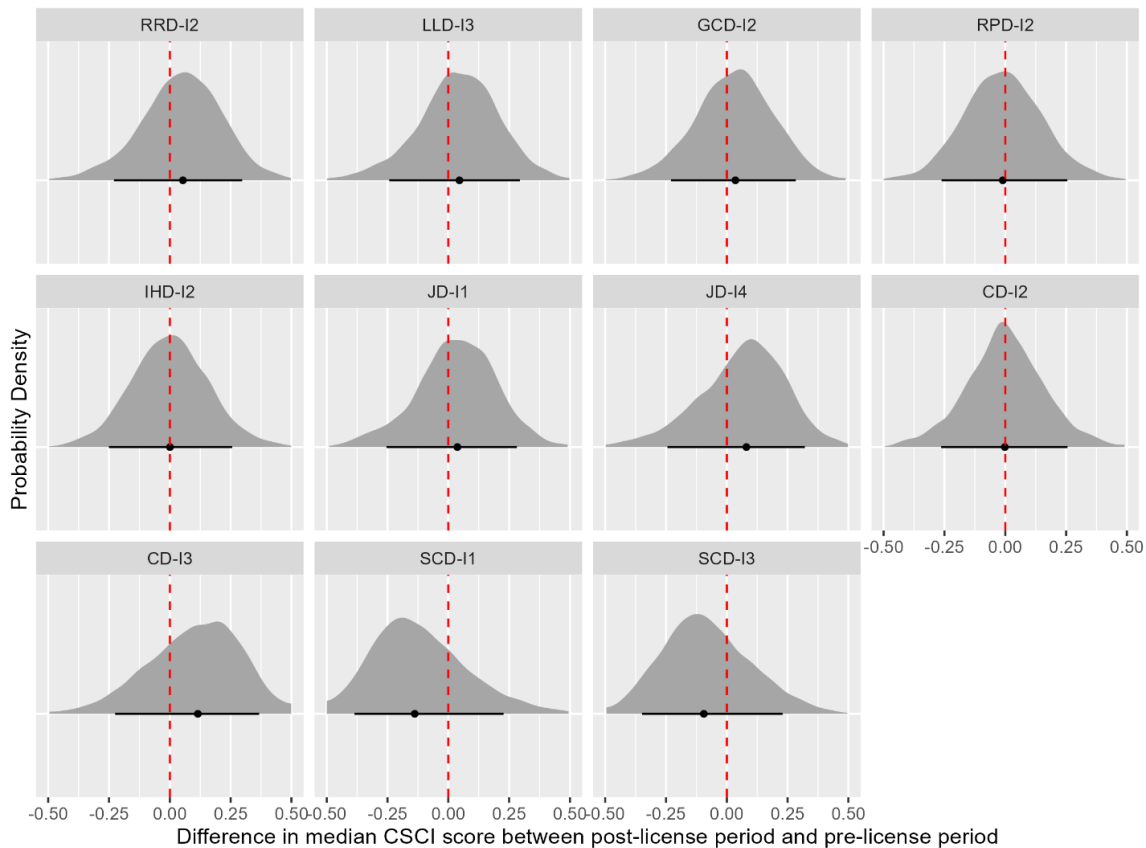


Note: Average CSCI scores are shown for sites with duplicate collections (i.e., Site LLD-I3 [2024 and 2025] and Site SCD-I3 [2025]). Table 3-5 shows scores for individual samples from each site.  
CSCI = California Stream Condition Index

**Figure 3-1. California Stream Condition Index Scores and condition categories for benthic macroinvertebrate samples collected for the Upper American River Project, 2024 and 2025.**

### 3.4 DISCUSSION

Pre-License BMI monitoring in the UARP was conducted in 2002 and 2003, prior to implementation of the minimum instream flows required under the License (Appendix A1, Table A-1). License implementation BMI monitoring has been conducted in 2019, 2020, 2024, and 2025 (License Years 5, 6, 10, and 11, respectively) (Table 3-6). In general, aquatic habitat conditions as reflected by BMI assemblages and associated CSCI scores have not changed substantially in the UARP under the new flow regime. Bayesian posterior contrast values comparing License implementation (2019, 2020, 2024, and 2025) and pre-License (2002 and 2003) sampling events indicated no predicted difference in CSCI scores between the two periods, with median CSCI scores the same or slightly higher under License implementation at all sites (i.e., the differences are mostly zero or positive numbers, respectively), except at Sites SCD-I1 and SCD-I3 where CSCI scores were slightly lower under License Implementation (i.e., the differences are negative numbers) (Figure 3-2).



Note: Black dots denote median, black horizontal lines denote the 89% credible interval, and red dashed vertical lines denote zero contrast values.  
CSCI = California Stream Condition Index

**Figure 3-2. Posterior contrast distribution by site between License implementation (2019, 2020, 2024, and 2025) and pre-License (2002 and 2003) median California Stream Condition Index scores with 89% credible intervals.**

During both pre-License and License implementation monitoring, average CSCI scores in the UARP predominantly ranked within the *likely intact* condition category (Table 3-6, Figure 3-3), indicating that aquatic habitat (e.g., habitat complexity, water quality [see Section 3.3.1]) is in good condition throughout most of the UARP. Condition categories for CSCI scores during License implementation sampling events (2019 and 2020; 2024 and 2025) were comparable and in the same or higher condition categories than pre-License samples. CSCI scores and corresponding condition categories were typically lower for samples collected at Sites JD-I1, SCD-I1, and SCD-I3, as described below.

**Table 3-6. California Stream Condition Index Scores for Pre-License and License Implementation Benthic Macroinvertebrate Monitoring for the Upper American River Project.**

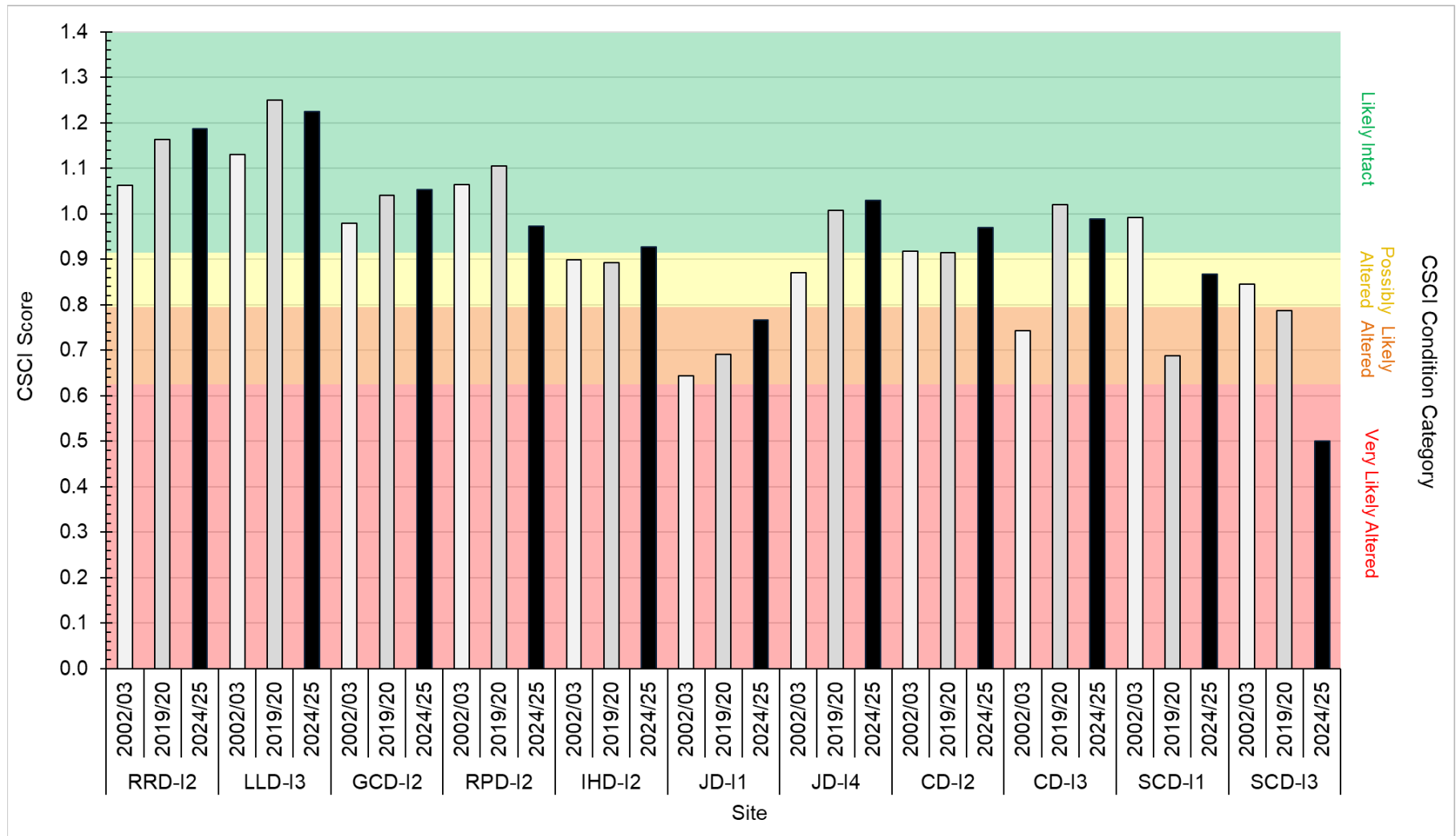
| Site                | CSCI Scores <sup>a</sup>   |                            |                            |
|---------------------|----------------------------|----------------------------|----------------------------|
|                     | Pre-License                | License Implementation     |                            |
|                     | 2002 and 2003<br>(average) | 2019 and 2020<br>(average) | 2024 and 2025<br>(average) |
| RRD-I2              | 1.06                       | 1.16                       | 1.19                       |
| LLD-I3              | 1.13                       | 1.25                       | 1.22                       |
| GCD-I2              | 0.98                       | 1.04                       | 1.05                       |
| RPD-I2              | 1.06                       | 1.11                       | 0.97                       |
| IHD-I2              | 0.90                       | 0.89                       | 0.93                       |
| JD-I1               | 0.64                       | 0.69                       | 0.77                       |
| JD-I4 <sup>b</sup>  | 0.87                       | 1.01                       | 1.03                       |
| CD-I2               | 0.92                       | 0.91                       | 0.97                       |
| CD-I3               | 0.74                       | 1.02                       | 0.99                       |
| SCD-I1 <sup>c</sup> | 0.99                       | 0.69                       | 0.87                       |
| SCD-I3 <sup>b</sup> | 0.84                       | 0.79                       | 0.50                       |
| Average (all sites) | 0.92                       | 0.96                       | 0.95                       |

Notes: CSCI = California Stream Condition Index

<sup>a</sup> CSCI categories of biological condition (Rehn et al. 2015):  $\geq 0.92$  = *likely intact*, 0.91 to 0.80 = *possibly altered*, 0.79 to 0.63 = *likely altered*,  $\leq 0.62$  = *very likely altered*.

<sup>b</sup> Site was not sampled during relicensing study (SMUD 2016); data from a proximal relicensing study site were used for historical comparison (Site JD-I2 for Site JD-I4 and Site SCD-I2 for Site SCD-I3).

<sup>c</sup> Pre-License data for this site include an additional sample collected in 2010 (ECORP 2011).



Note: Site JD-I4 and Site SCD-I3 were not sampled during the relicensing (i.e., 2002, 2003) studies (SMUD 2015); data from the most proximal relicensing study site were used (Sites JD-I2 and SCD-I2, respectively).

**Figure 3-3. Average California Stream Condition Index scores and condition categories for samples collected during pre-License (2002 and 2003) and License implementation (2019 and 2020; 2024 and 2025) benthic macroinvertebrate monitoring for the Upper American River Project.**

Site JD-I1 is located just downstream (0.25 mile) of Junction Dam. Average CSCI scores for samples collected at this site were within the *likely altered* condition category during both pre-License and License implementation monitoring (Table 3-6, Figure 3-3). This is consistent with documented trends in BMI assemblages where relatively low biological index values (e.g., CSCI scores) typically occur immediately downstream of large impoundments but increase with distance downstream (i.e., Sites JD-I1 and JDI4, respectively) (Rehn et al. 2007). This trend was not evident in the Camino Dam reach, where Sites CD-I2 and CD-I3 are both located more than 3 miles downstream from the impoundment.

Site SCD-I1 is located between Slab Creek Dam and South Fork Powerhouse. Average CSCI scores for samples collected varied widely across monitoring periods, ranking within three different condition categories (Table 3-6, Figure 3-3). The lowest average CSCI score, in the *likely altered* condition category, occurred in the 2019 and 2020 monitoring period and is attributable to significant channel bed disturbance and temporary dewatering associated with the construction of the South Fork Powerhouse in 2018 (SMUD 2020). The increased average CSCI score and higher condition category (*possibly altered*) for the 2024 and 2025 monitoring period indicate a recovering BMI community and improved stream condition.

The 2024 and 2025 CSCI scores for Site SCD-I3 ranked within the lowest condition category (*very likely altered*) (Table 3-5, Figure 3-1). The depressed score in 2024 was partially driven by a reduced percentage of taxa known to be sensitive to large streamflow fluctuations (SMUD 2025; Robinson et al. 2004, Rosi-Marshall et al. 2010) and, therefore, likely attributable to a powerhouse maintenance release that substantially increased flows before and during sampling. The slightly improved CSCI score in 2025 was influenced by an increase in the percentage of these taxa (Appendix C4), suggesting some improvement in stream condition as reflected by the BMI community at this location.

Site SCD-I3 has, however, exhibited consistently lower average CSCI scores during both pre-License and License implementation monitoring (Table 3-6, Figure 3-3). This may be attributable to multiple factors known to influence BMI, including habitat characteristics (e.g., presence of deep pools, lack of riffles [Table 3-3]); physical streambed disturbance due to relative ease of public accessibility; nearby infrastructure (i.e., Rock Creek Powerhouse); and significant flow fluctuation in the Slab Creek Dam Reach from powerhouse releases and reservoir spills (Logan and Brooker 1983, Wright and Li 1998, Karr and Chu 1999, Allan 2004, Kennedy et al. 2016, Steel et al. 2017). Site characteristics at Site SCD-I3 have remained similar across monitoring periods, yet CSCI scores have decreased during License implementation monitoring, suggesting that other factors, including some of those listed above, are also contributing to the lower scores.



### 3.5 CONCLUSION AND FUTURE MONITORING

CSCI scores for BMI samples collected prior to License implementation were generally similar to those for samples collected during License implementation monitoring and are predominantly indicative of *likely intact* stream conditions during both monitoring periods. Bayesian posterior contrast values indicate no predicted difference between pre-License and License implementation CSCI scores. BMI samples collected in future years will further facilitate identification of changes at monitoring sites or new system-wide trends in stream conditions over time. In accordance with the frequency described in the Plan, BMI samples will be collected again from the UARP in the following years: 2029, 2030, and thereafter for 2 consecutive years for every 10 years for the term of the License.

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## 4.0 BALD EAGLE

### 4.1 MONITORING PLAN OBJECTIVES

The objectives of bald eagle (*Haliaeetus leucocephalus*) monitoring at the UARP are to document bald eagle nesting activity in the study area and ensure that bald eagle nests are not adversely affected by UARP-related activities. Results are intended to inform future bald eagle management at the UARP (SMUD 2015).

### 4.2 METHODS

Bald eagle surveys were conducted during the 2025 breeding season at Union Valley Reservoir and Ice House Reservoir<sup>9</sup> in accordance with the *Protocol for Evaluating Bald Eagle Habitat and Populations in California* (Jackman and Jenkins 2004), *Bald Eagle Breeding Survey Instructions* (CDFW 2017), and the Bald Eagle Monitoring Plan (Plan) (SMUD 2015) (Figure 1-2, Table 4-1). At Union Valley Reservoir, the early and mid-breeding season surveys augmented data from a camera that SMUD and the Forest Service installed above the nest at Sunset Campground. This camera transmitted live video footage of the nest from early February to the end of May when it became non-operational.

**Table 4-1. Bald Eagle Survey and Reproductive Status Check Dates, 2025.**

| Survey Type                  | Survey Date            |                     |
|------------------------------|------------------------|---------------------|
|                              | Union Valley Reservoir | Ice House Reservoir |
| Early breeding season survey | 26 March               | 26 March            |
| Mid-breeding season survey   | 13 May                 | 13 May              |
| Late breeding season survey  | 1 July                 | 30 June             |
| Reproductive status check    | 16 July                | 16, 24, 25 July     |

Nest sites documented during previous years of surveys (SMUD 2025) 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. 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 and other possible sources of disturbance 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 D1). Bald eagle observations were summarized using the California Bald Eagle Nesting Territory

<sup>9</sup> Per the Plan, surveys were not performed at Loon Lake Reservoir in 2025 because bald eagle reproductive activity was not observed at this reservoir during the 2021–2023 breeding season surveys (SMUD 2022, 2023, 2024).

Form (CDFW 2017) and submitted to CDFW at the end of the breeding season (Appendix D2).

### **4.3 RESULTS**

#### **4.3.1 Union Valley Reservoir**

Bald eagles successfully reproduced at Union Valley Reservoir in 2025 using the nest at Sunset Campground, which has been used annually since 2016 (SMUD 2017–2025) (Table 4-2, Figure 4-1). The nest camera provided footage of egg laying in the early breeding season (Figure 4-2 and Figure 4-3) and development of two hatchlings throughout the mid-breeding season (Figure 4-4). During the late breeding season survey (1 July), only one juvenile was observed on the nest, and the remnants of a second juvenile (dense clusters of feathers and scattered bones [Figure 4-5]) were found directly below the nest. The surviving juvenile was observed branching during this survey, and a subsequent reproductive status check (16 July) confirmed fledging as the juvenile was seen flying from the nest.

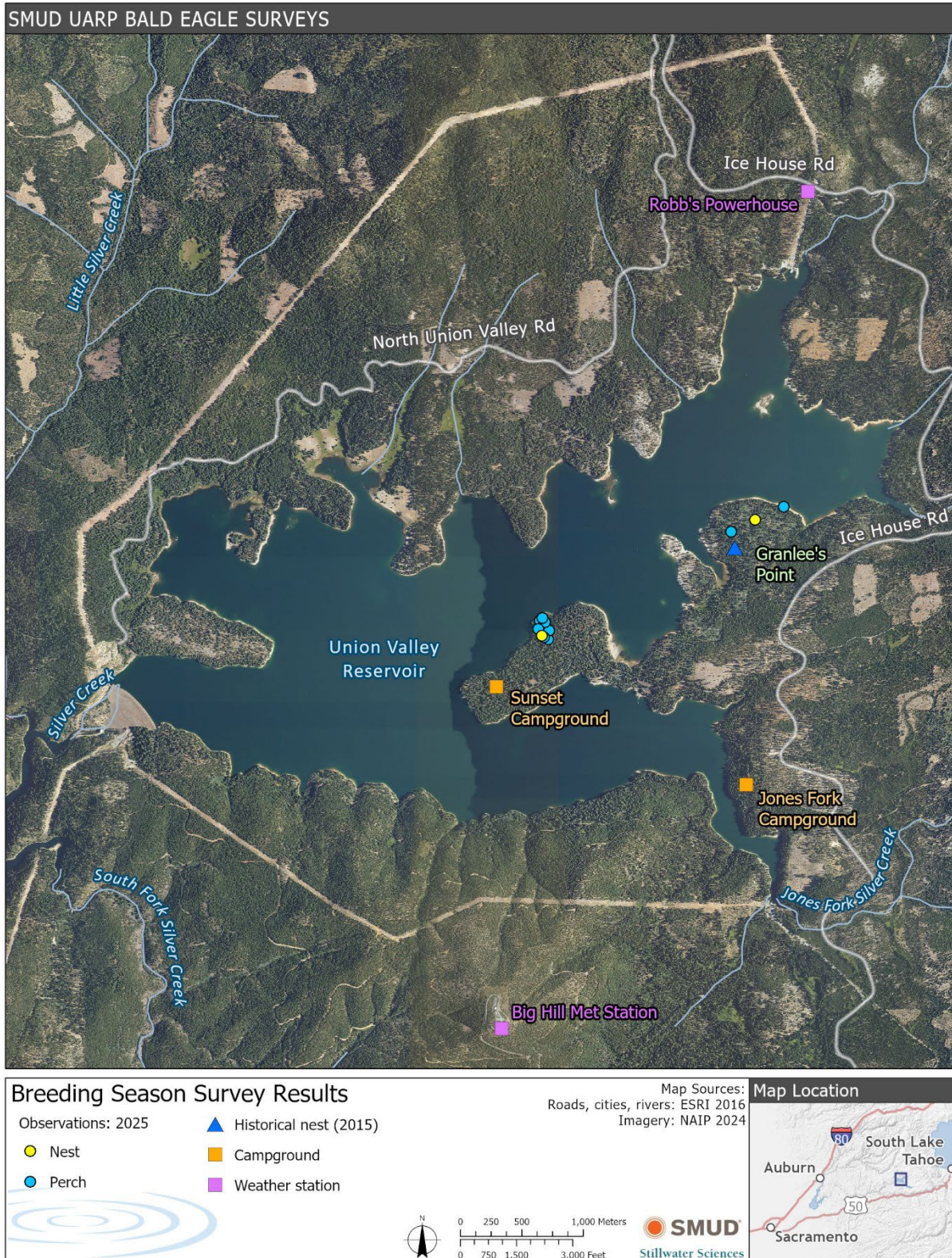
Surveys of suitable habitat elsewhere on the reservoir identified an additional bald eagle nesting attempt at Granlee's Point, where adult bald eagles were observed during all three breeding season surveys. During the mid-breeding season survey (13 May), a pair of eagles was observed at this location, perched in a large sugar pine (*Pinus lambertina*) with a partially assembled nest in the crook of a branch in the upper canopy (Figure 4-6). Concurrently, nest camera footage showed a third adult eagle on the nest at Sunset Campground. During the late breeding season survey, the partial nest at Granlee's Point was larger and restructured, indicating continued nest building (Figure 4-7). No additional evidence of bald eagle reproductive activity was observed during surveys of other suitable habitat around the reservoir. Additional details regarding surveys and reproductive status checks conducted at Union Valley Reservoir in 2025 are provided in Appendix D2.



**Table 4-2. Bald Eagle Observations during the Breeding Season at Union Valley Reservoir, 2025.**

| Date     | Time        | Number of Eagles | Age Class       | Notes                                                                                                                                                                                                          |
|----------|-------------|------------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 26 March | 14:41       | 2                | Adult           | Adult (female) vocalizing from nest in response to pair of ravens ( <i>Corvus corax</i> ). Adult (male) flew in from northeast, chased ravens, and landed in sugar pine ( <i>Pinus lambertina</i> ) near nest. |
| 26 March | 14:47       | 1                | Adult           | Adult (male) departed sugar pine perch, circled nest, and flew west across reservoir.                                                                                                                          |
| 26 March | 14:55       | 2                | Adult           | Adult (male) landed on nest, adult (female) vocalizing from nest.                                                                                                                                              |
| 26 March | 15:52       | 1                | Adult           | Adult perched in prominent sugar pine with snag top on Granlee's Point.                                                                                                                                        |
| 26 March | 16:26       | 1                | Immature        | Immature (second year) flew north along shoreline near Tells Creek Inlet and out of sight to the east.                                                                                                         |
| 13 May   | 15:20       | 1                | Adult           | Adult perched near top of sugar pine with incomplete nest structure on Granlee's Point.                                                                                                                        |
| 13 May   | 15:25       | 2                | Adult           | Second adult, vocalizing, landed in same sugar pine.                                                                                                                                                           |
| 13 May   | 15:50       | 2                | Adult           | One adult departed perch, flying north over reservoir.                                                                                                                                                         |
| 13 May   | 15:58       | 1                | Adult           | Remaining adult departed perch, flying northeast.                                                                                                                                                              |
| 1 July   | 07:00       | 2                | Adult; juvenile | Adult (male) vocalizing from nest tree and juvenile perched on nest.                                                                                                                                           |
| 1 July   | 07:50       | 1                | Adult           | Adult (male) flew northeast from nest and landed in sugar pine on shoreline.                                                                                                                                   |
| 1 July   | 07:55       | 2                | Adult           | Adult (male) relocated to second sugar pine. Adult (female) flew east toward Granlee's Point.                                                                                                                  |
| 1 July   | 08:40       | 1                | Adult           | Adult (male) departed perch and flew north to snag located closer to shoreline.                                                                                                                                |
| 1 July   | 08:58       | 1                | Adult           | Adult (male) departed snag and flew south over nest toward Jones Fork Inlet and out of sight.                                                                                                                  |
| 1 July   | 07:00–13:05 | 1                | Juvenile        | Juvenile remained at nest at Sunset Campground, flapping wings, preening, and branching.                                                                                                                       |
| 1 July   | 11:20       | 2                | Adult           | Adult pair perched in ponderosa pine ( <i>Pinus ponderosa</i> ) on shoreline of northeast side of Granlee's Point approximately 800 feet from previously referenced sugar pine.                                |
| 1 July   | 11:25       | 2                | Adult           | Adult pair departed perch, flying north over reservoir, circling southeast and ultimately out of sight.                                                                                                        |
| 1 July   | 12:20       | 1                | Adult           | Adult flew from southwest to northeast above the inlet west of Granlee's Point, chasing a pair of ravens.                                                                                                      |
| 16 July  | 08:54       | 1                | Juvenile        | Juvenile flew east from nest landing in adjacent tree.                                                                                                                                                         |
| 16 July  | 08:59       | 1                | Juvenile        | Juvenile departed perch, landing in sugar pine approximately 120 feet southeast of nest tree.                                                                                                                  |
| 16 July  | 09:20       | 2                | Adult; juvenile | Adult flew in from southeast and landed on nest, juvenile joined adult on nest.                                                                                                                                |
| 16 July  | 09:26       | 1                | Adult           | Adult flew approximately 150 feet northwest and landed in sugar pine.                                                                                                                                          |
| 16 July  | 09:38       | 1                | Juvenile        | Juvenile flew southeast from nest and out of sight.                                                                                                                                                            |





**Figure 4-1. Bald eagle activity at Union Valley Reservoir, 2025.**





**Figure 4-2. Bald eagle egg in nest at Sunset Campground, March 2025.**



**Figure 4-3. Bald eagle chicks hatching in nest at Sunset Campground, April 2025.**





**Figure 4-4. Bald eaglets in nest at Sunset Campground, May 2025.**



**Figure 4-5. Juvenile bald eagle remnants at base of nest tree at Sunset Campground, July 2025.**





**Figure 4-6.** Pair of bald eagles perched in sugar pine on Granlee's Point with nest structure (indicated by arrow), May 2025.



**Figure 4-7.** Nest structure in sugar pine at Granlee's Point in May 2025 (left) and July 2025 (right).

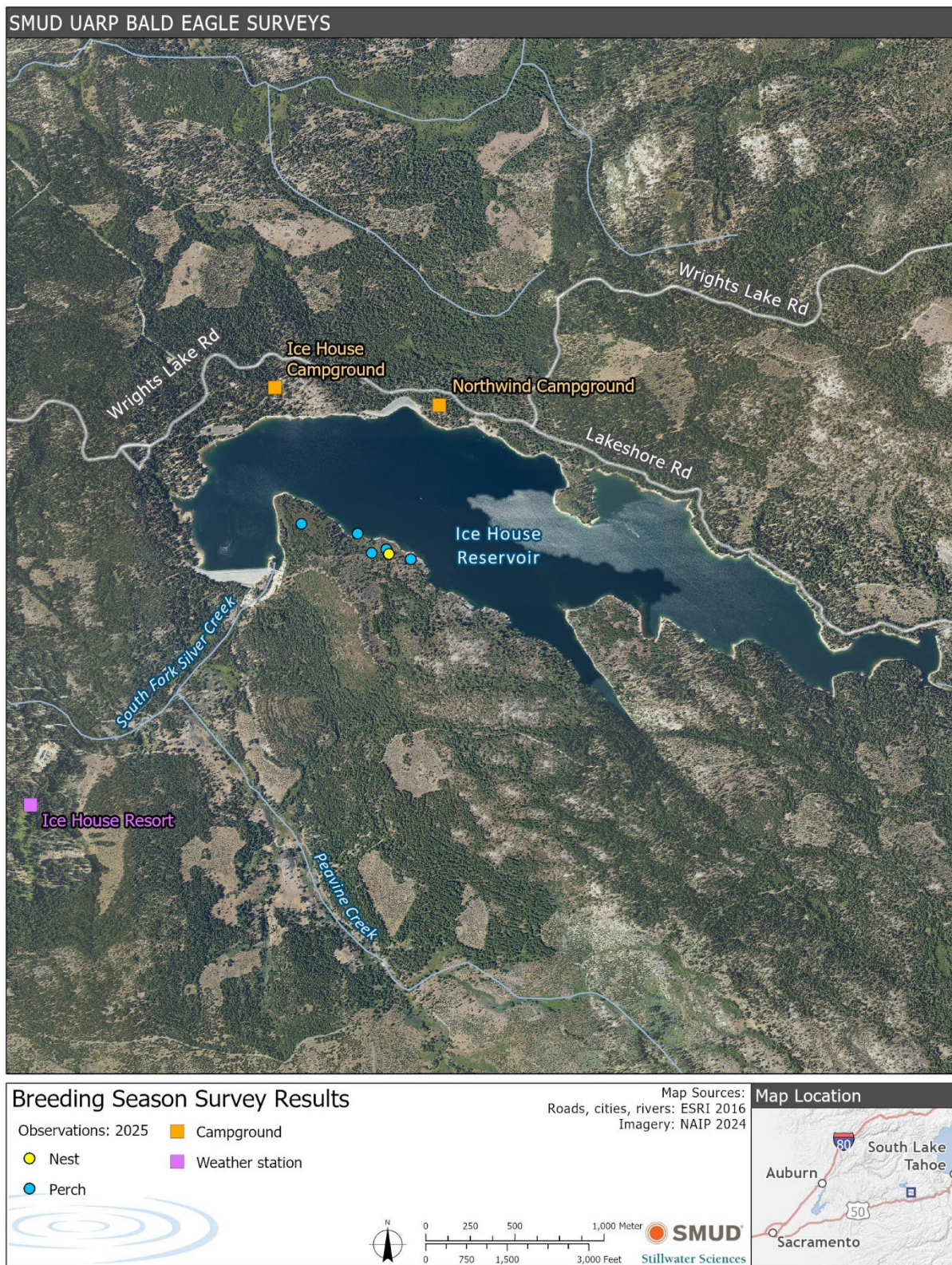
### 4.3.2 Ice House Reservoir

Bald eagles successfully reproduced at Ice House Reservoir in 2025 using the nest on the south shore that has been used annually since 2022 (SMUD 2025) (Table 4-3, Figure 4-8). Incubation was observed during the early breeding season survey (26 March). During the mid-breeding season survey (13 May), an adult was observed attending to two chicks at the nest. By the late breeding season survey (30 June), only one juvenile was observed branching near the nest (Figure 4-9). The single juvenile was observed near the nest again during a follow-up reproductive status check (16 July); it was no longer present at the nest during subsequent checks (24 and 25 July), indicating that the bird had likely fledged. Additional details regarding surveys and reproductive status checks conducted in 2025 at Ice House Reservoir are provided in Appendix D2.

**Table 4-3. Bald Eagle Observations during Breeding Season Surveys at Ice House Reservoir, 2025.**

| Date     | Time  | Number of Eagles | Age Class       | Notes                                                                                                                                      |
|----------|-------|------------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| 26 March | 12:37 | 1                | Adult           | Adult (female) in incubation posture on nest in incense cedar ( <i>Calocedrus decurrens</i> ) on south shore of reservoir.                 |
| 13 May   | 13:53 | 1                | Adult           | Adult (male) flew in from east and perched above nest.                                                                                     |
| 13 May   | 13:58 | 1                | Adult           | Adult (male) departed perch, landed on ground approximately 600 feet west of nest tree, and relocated to nearby fir.                       |
| 13 May   | 14:01 | 3                | Adult; nestling | Adult (male) departed perch in fir, landed on nest, and began feeding two nestlings.                                                       |
| 30 June  | 17:45 | 1                | Juvenile        | Juvenile perched on nest, hopping to adjacent branches, vocalizing, and flapping wings intermittently.                                     |
| 30 June  | 20:30 | 1                | Adult           | Adult perched in incense cedar immediately west of nest tree.                                                                              |
| 16 July  | 11:16 | 1                | Juvenile        | Juvenile perched on nest.                                                                                                                  |
| 16 July  | 12:02 | 2                | Adult; juvenile | Adult flew in from west and landed on nest with juvenile.                                                                                  |
| 16 July  | 12:13 | 2                | Adult; juvenile | Adult departed nest and flew west out of sight; juvenile remained on nest.                                                                 |
| 16 July  | 12:45 | 2                | Adult; juvenile | Adult flew in from west, circled and then landed on nest with juvenile.                                                                    |
| 16 July  | 12:54 | 2                | Adult; juvenile | Adult and juvenile feeding in nest.                                                                                                        |
| 16 July  | 13:23 | 2                | Adult; juvenile | Adult departed nest and flew east out of sight; juvenile remained on nest, hopping to adjacent branches and flapping wings intermittently. |
| 25 July  | 10:19 | 1                | Adult           | Adult circling high over the northwest end of the reservoir then flying north out of sight.                                                |
| 25 July  | 10:35 | 1                | Adult           | Adult perched in prominent Douglas fir ( <i>Pseudotsuga menziesii</i> ) on ridge west of nest tree.                                        |





**Figure 4-8. Bald eagle activity at Ice House Reservoir, 2025.**





**Figure 4-9. Juvenile bald eagle in nest on south shore of Ice House Reservoir, June 2025.**

#### **4.4 DISCUSSION**

During the 2025 breeding season, reproductive activity was observed at more than one location on Union Valley Reservoir for the first time since monitoring began in 2016. The potential development of a second nest site at Granlee's Point is consistent with documented trends in bald eagle population growth in California, including recent observations of multiple bald eagle pairs nesting at a similarly sized reservoir (Airola et al. 2025, GGRO 2025). Although historical records of bald eagles nesting at Granlee's Point date back to the early 1990s (SMUD 2015), this confirmed reproductive attempt is the first on the peninsula in a decade (SMUD 2017).

The reproductive attempt at Granlee's Point did not progress beyond nest building; however, bald eagles successfully reproduced at Sunset Campground on Union Valley Reservoir and on the south shore of Ice House Reservoir in 2025, continuing a recent trend of successful reproduction at the UARP. At both locations two chicks were initially observed in the nest but only one juvenile survived through fledging, consistent with typical bald eagle nesting success rates in California (Jenkins and Jackman 2006, Airola et al. 2025). While the circumstances surrounding the loss of one chick from the nest at Ice House Reservoir are unknown, juvenile eagle remains found below the nest at Sunset Campground on Union Valley Reservoir suggest predation. Plumage in the

remains suggests the bird may have been near fledging; premature fledging can strand young eagles on the ground and leave them vulnerable to mammalian predators (Buehler 2022).

Relatively mild weather at the UARP during the 2025 breeding season likely contributed to the nesting success at both reservoirs, unlike prior monitoring years when severe weather with heavy precipitation and/or high wind, particularly in the spring, likely caused bald eagle nest failures or damage to eagle nests within the study area (SMUD 2004, 2020, 2021, 2024). Water year 2025 was Below Normal (DWR 2025a).

Cumulative precipitation during the breeding season at Robbs Powerhouse (California Data Exchange Center [CDEC] Station ID: RBP)<sup>10</sup> was 30 inches, and there were no significant precipitation events during the late breeding season (DWR 2025b). Wind speed measured at Big Hill (Station ID: BHS) peaked during a storm in early February at 47 miles per hour, the lowest recorded peak wind speed since 2022. Snowpack (as measured by snow water content) in 2025 was the lowest of any year since Bald Eagle monitoring began in 2016, peaking in mid-March with 4.8 inches at Robbs Powerhouse and 4 inches at Ice House Resort (CDEC Station ID: IHS), and had melted completely by mid-April.

Conditions at each reservoir were conducive to bald eagle foraging throughout the breeding season. Though minimum air temperatures occasionally dropped below freezing through May (CDEC Station ID: RBP, BHS), the surfaces of both reservoirs were free of ice during the early breeding season surveys and the remainder of the breeding season (DWR 2025b). Reservoir storage ranged from 176,100 acre-feet to 263,300 acre-feet at Union Valley Reservoir (U.S. Geological Survey [USGS] gage 11441001) and from 28,140 acre-feet to 41,430 acre-feet at Ice House Reservoir (USGS gage 11441100). These values are consistent with typical breeding-season storage ranges measured since Bald Eagle monitoring began in 2016.

Maintenance, construction, and recreation activities did not affect bald eagle nesting success at either reservoir in 2025. Consistent with observations in prior years (SMUD 2017–2025), bald eagles did not exhibit signs of disturbance in response to these types of activities during surveys. Maintenance activities during the breeding season at both reservoirs were routine and did not involve significant noise generation near the nests. Construction of the mountain bike trail along the south shore of Ice House Reservoir resumed in May, but a 0.25-mile protective buffer around the nest tree was maintained until the juvenile fledged in late July. Trail construction extended along the south side of Union Valley Reservoir where all work occurred more than .25 miles from the nests in Sunset Campground and on Granlee's Point. No other construction occurred at Ice House or Union Valley reservoirs during the 2025 breeding season. Recreation on and around both reservoirs was minimal during the early and mid-breeding season surveys; however, an increase in boating and campground activity was noted at both locations during the late breeding season surveys (Appendix D2). At Union Valley Reservoir, the

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<sup>10</sup> Referenced values are from the station closest to each reservoir with available data.

Forest Service closed the portion of Sunset Campground immediately surrounding the eagle nest until the surviving juvenile fledged (Section 4.3.1).

#### 4.5 LITERATURE CITED

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## **5.0 HARDHEAD**

### **5.1 MONITORING PLAN OBJECTIVES**

The objective of the Hardhead Monitoring Plan (Plan) is to evaluate long-term trends in the longitudinal distribution and relative abundance of hardhead (*Mylopharodon conocephalus*) following implementation of 2014 License conditions requiring higher minimum streamflows in the Slab Creek Dam Reach (FERC 2014, SMUD 2016). Long-term trends are being evaluated by a series of 2 consecutive survey years (2016 and 2017, 2019 and 2020, 2024 and 2025, 2029 and 2030), and thereafter for 2 consecutive years during every 10 years for the term of the License. The 2025 hardhead survey was the sixth year of monitoring since implementation of the current flow regime.

### **5.2 METHODS**

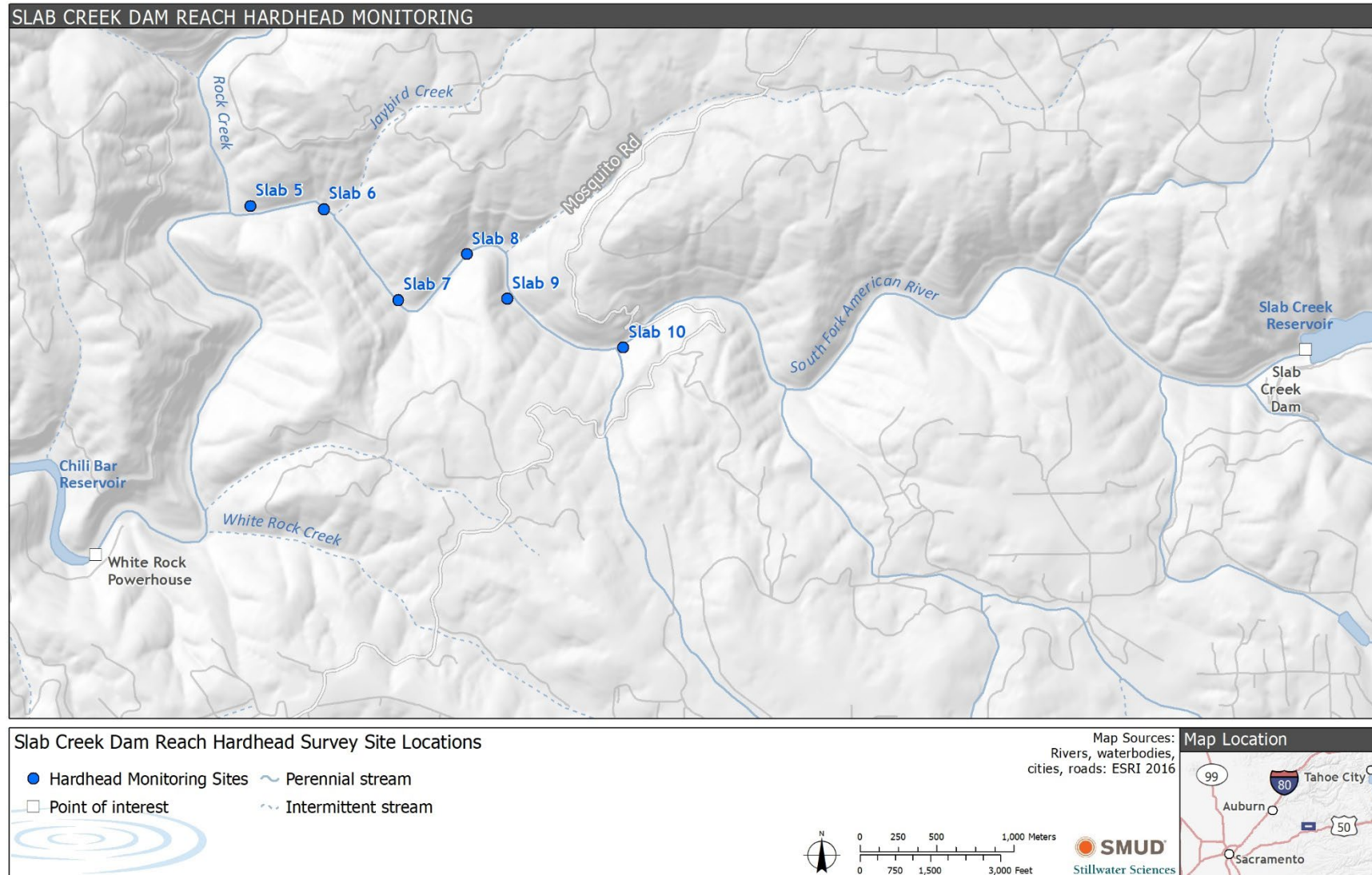
The hardhead monitoring area is shown in Figure 1-3. Site locations are depicted in Figure 5-1. During hardhead surveys, three to four snorkelers were positioned in parallel lanes and swam a single pass downstream to upstream, counting all fish observed. Lane width was determined on site, depending on visibility and habitat complexity. Fish were enumerated by species and binned into 25-mm size classes. Consistent survey locations and methods have been used throughout License implementation, including in 2025 (SMUD 2017, 2018, 2020, 2021, 2025). Additionally, beach seining was performed to confirm species identification of smaller cyprinids (Appendix E1, Table E1-1, Figures E1-1, E1-2, E1-3). Further details on field and analytical methods used in snorkel surveys are described in Sections 3.1 and 4.0 of the Plan (SMUD 2016).

### **5.3 RESULTS**

Snorkel surveys within the Slab Creek Dam Reach were conducted on 2 and 3 September 2025 (Table 5-1). Weather conditions during surveys were calm with cloudy to clear skies and water visibility of 8.0 to 15.5 feet (measured with a Secchi disk). Discharge during snorkel surveys within the Slab Creek Dam Reach was approximately 79 cubic feet per second.

#### **5.3.1 Habitat Characteristics**

Sites in 2025 varied in length and habitat type (e.g., run, pool, or pocket water) (Table 5-1). Most habitat units included boulder- and bedrock-dominant substrates. Fish cover, primarily in the form of large boulders, was present at all units; other forms of cover included overhanging vegetation and bubble curtains. Water quality conditions during sampling included high dissolved oxygen levels (average 95% saturation), cool water temperatures (ranging from 13.7 degrees Celsius [°C] to 17.4°C), and low conductivity (ranging from 17.8 to 19.0 microsiemens per centimeter [uS/cm]) (Table 5-2).



**Figure 5-1. Hardhead monitoring site locations in the South Fork American River downstream of Slab Creek Dam, 2025.**

**Table 5-1. Physical Characteristics at Hardhead Monitoring Sites in the South Fork American River Downstream of Slab Creek Dam, September 2025.**

| Site    | Habitat Type | Substrate |              | Cover    |                        |         | Average Width (feet) | Unit Length (feet) |
|---------|--------------|-----------|--------------|----------|------------------------|---------|----------------------|--------------------|
|         |              | Dominant  | Sub-dominant | Dominant | Sub-dominant           | Total % |                      |                    |
| Slab 5  | Run          | Boulder   | Bedrock      | Boulder  | None                   | 40      | 84                   | 231                |
|         | Pool         | Bedrock   | Boulder      |          |                        | 40      | 59                   | 91                 |
| Slab 6  | Pool         | Boulder   | Bedrock      | Boulder  | Overhanging vegetation | 15      | 59                   | 299                |
|         | Run          |           |              |          | None                   | 30      | 66                   | 105                |
| Slab 7  | Pool 1       | Boulder   | Bedrock      | Boulder  | None                   | 10      | 67                   | 103                |
|         | Pool 2       |           |              |          | Bubble curtain         | 10      | 62                   | 60                 |
| Slab 8  | Run 1        | Boulder   | Cobble       | Boulder  | Bubble curtain         | 15      | 62                   | 110                |
|         | Run 2        | Bedrock   | Boulder      |          | None                   | 25      | 76                   | 70                 |
|         | Pool         |           |              |          | Bubble curtain         | 25      | 63                   | 215                |
| Slab 9  | Pool         | Boulder   | Bedrock      | Boulder  | Bubble curtain         | 55      | 47                   | 121                |
|         | Run          |           |              |          |                        | 30      | 44                   | 93                 |
| Slab 10 | Pocket water | Boulder   | Bedrock      | Boulder  | Bubble curtain         | 20      | 51                   | 121                |
|         | Run          |           |              |          | None                   | 30      | 57                   | 170                |

**Table 5-2. Water Quality Conditions at Hardhead Monitoring Sites in the South Fork American River Downstream of Slab Creek Dam, September 2025.**

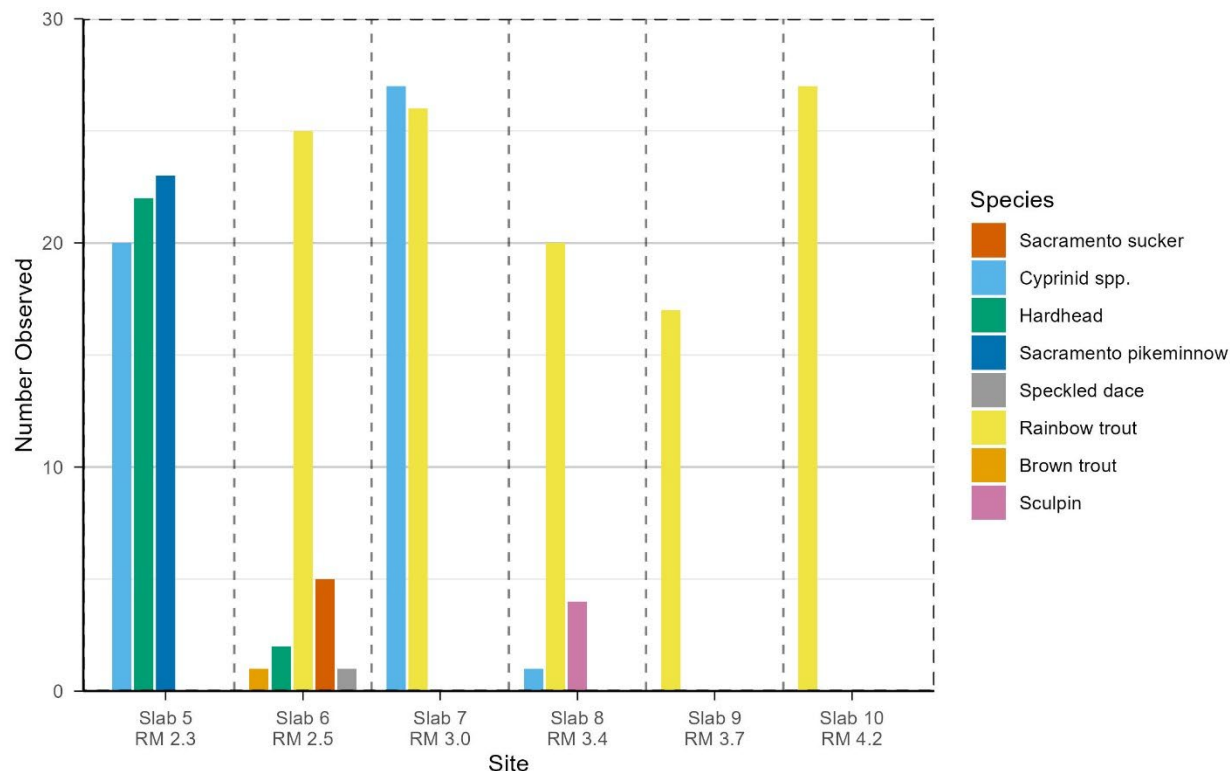
| Site    | Habitat Unit | Conductivity (uS/cm) | Temperature (°C) | Dissolved Oxygen |      |
|---------|--------------|----------------------|------------------|------------------|------|
|         |              |                      |                  | %                | mg/L |
| Slab 5  | Run          | 18.5                 | 16.2             | 96.6             | 9.5  |
|         | Pool         |                      |                  |                  |      |
| Slab 6  | Pool         | 18.8                 | 17.4             | 93.3             | 8.9  |
|         | Run          |                      |                  |                  |      |
| Slab 7  | Pool 1       | 19.0                 | 16.8             | 96.0             | 9.3  |
|         | Pool 2       |                      |                  |                  |      |
| Slab 8  | Run 1        | 18.4                 | 15.7             | 95.4             | 9.5  |
|         | Run 2        |                      |                  |                  |      |
|         | Pool         |                      |                  |                  |      |
| Slab 9  | Pool         | 18.1                 | 14.7             | 95.0             | 9.7  |
|         | Run          |                      |                  |                  |      |
| Slab 10 | Pocket water | 17.8                 | 13.7             | 95.1             | 9.9  |
|         | Run          |                      |                  |                  |      |

Notes: % = percent  
°C = degree Celsius  
uS/cm = microsiemen per centimeter  
mg/L = milligram per liter

### 5.3.2 Species Composition

Seven fish species were observed within the Slab Creek Dam Reach during 2025 survey efforts: hardhead, Sacramento pikeminnow (*Ptychocheilus grandis*), speckled dace (*Rhinichthys osculus*), rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), Sacramento sucker (*Catostomus occidentalis*), and sculpin (*Cottus* spp.) (Figure 5-2). Unidentified YOY cyprinids<sup>11</sup> (<50 mm TL) are referred to herein as Cyprinid spp.

<sup>11</sup> Unidentified cyprinids are likely Sacramento pikeminnow, hardhead, or speckled dace based on past observations of older life stages in the reach, but California roach (*Hesperoleucus symmetricus*) may also be present.



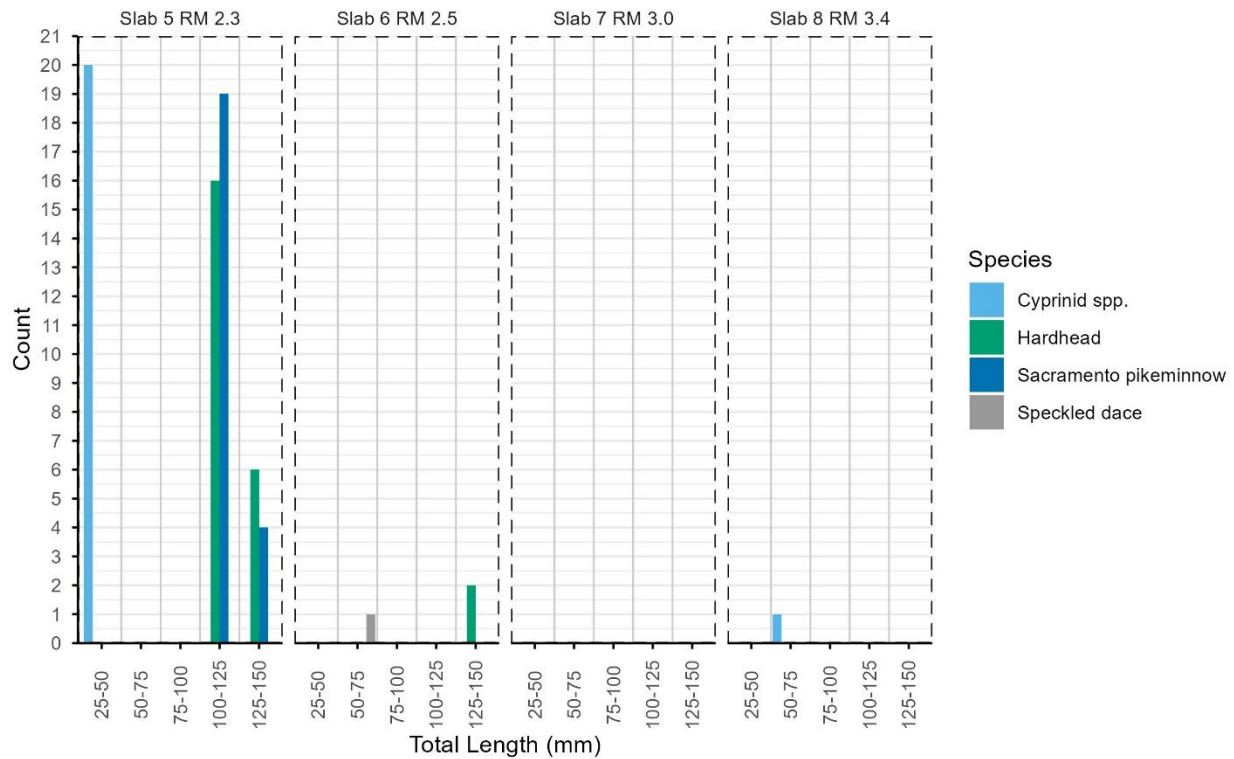
Notes: Unidentified Cyprinid spp. were less than 50 mm total length.  
mm = millimeter, RM = river mile

**Figure 5-2. Fish species observed during snorkel surveys by site and river mile in the South Fork American River downstream of Slab Creek Dam, September 2025.**

### 5.3.2.1 Cyprinids

In 2025, cyprinids were observed at every site within the study reach, except Slab 9 and Slab 10 (Figure 5-3). Many cyprinids were YOY and were not positively identified to species due to their size and lack of distinguishable characteristics; the remaining cyprinids were identified as hardhead, Sacramento pikeminnow, and speckled dace (Figure 5-3).



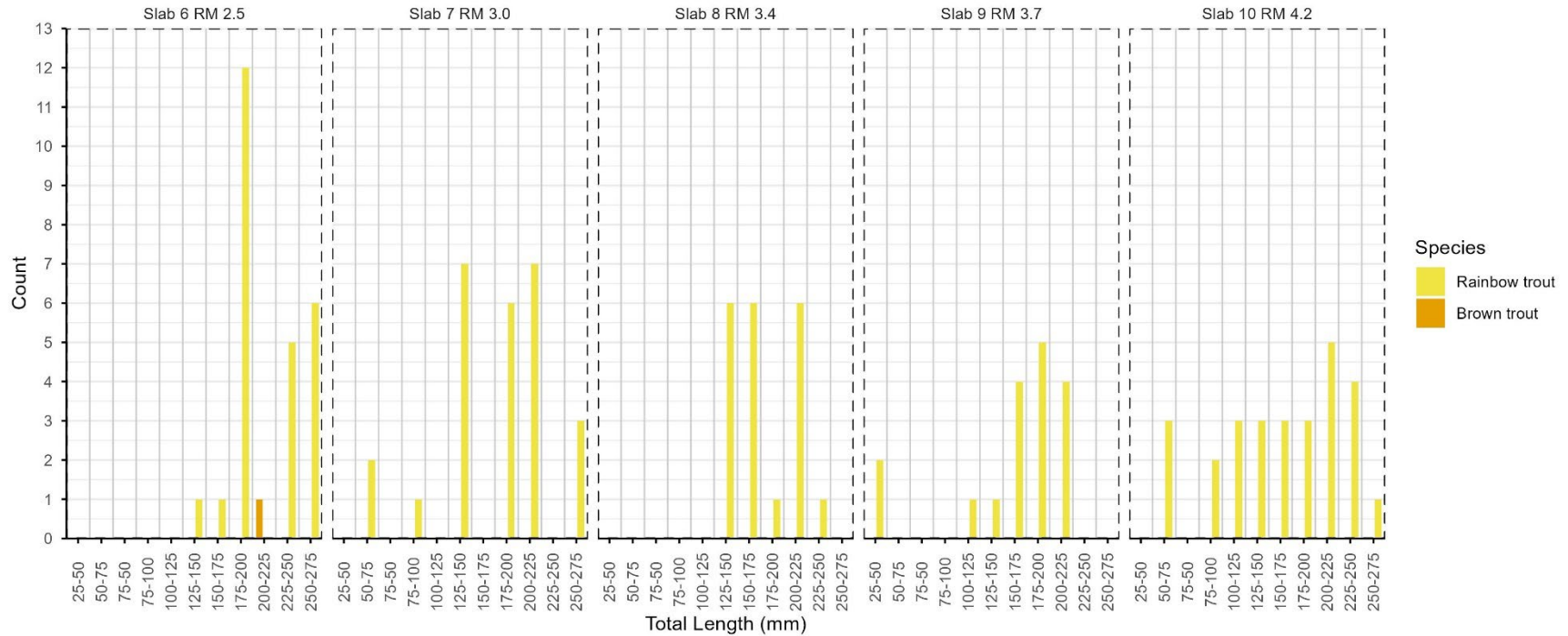


Notes: One Cyprinid spp. was greater than 50 mm total length.  
mm = millimeter

**Figure 5-3. Length-frequency histogram by site for cyprinids observed during snorkel surveys in the South Fork American River downstream of Slab Creek Dam, September 2025.**

### 5.3.2.2 Salmonids

Rainbow trout were observed at every site within the study reach, except Slab 5 (Figure 5-2). A total of 115 rainbow trout representing multiple age classes were observed, ranging from 25 to 275 mm TL (Figure 5-4). One brown trout ranging from 200 to 225 mm TL was observed at Slab 6 (Figure 5-2 and Figure 5-4).

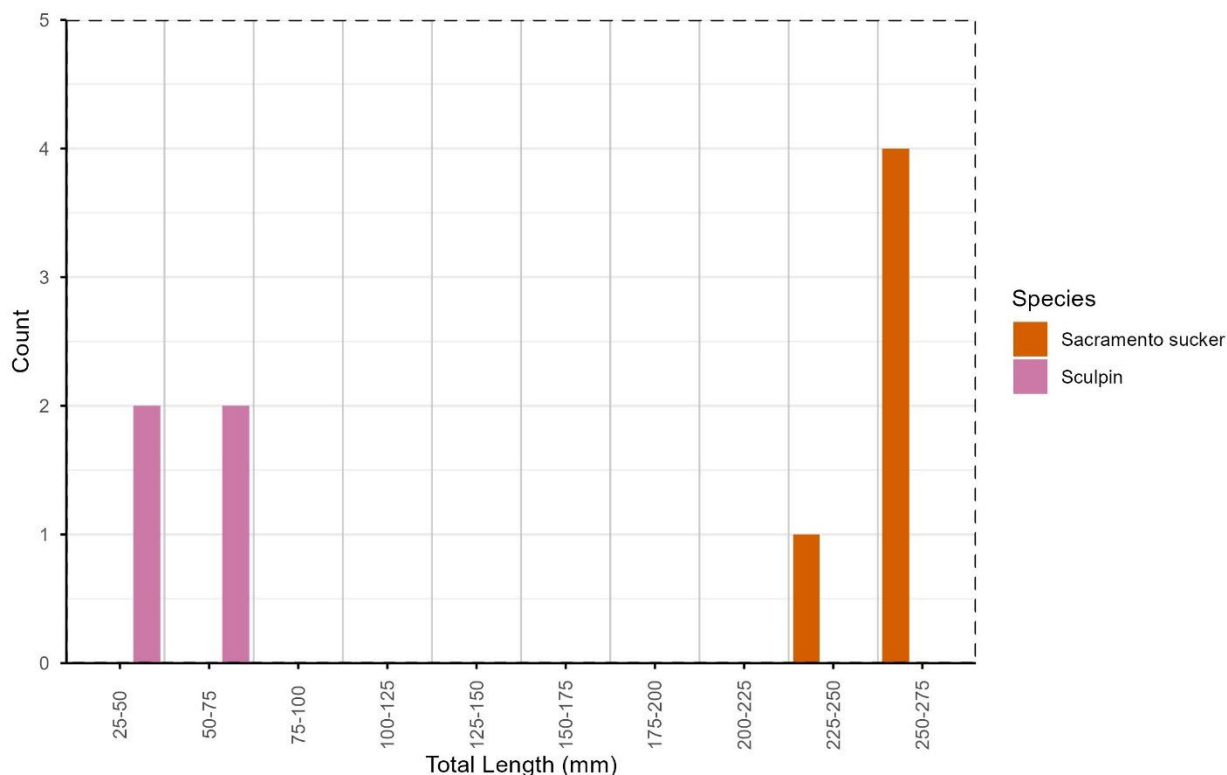


Note: mm = millimeter

**Figure 5-4. Length-frequency histogram by site for salmonids observed during snorkel surveys in the South Fork American River downstream of Slab Creek Dam, September 2025.**

### 5.3.2.3 Additional Species

A total of five Sacramento suckers were observed at Slab 6, ranging from 225 to 275 mm TL (Figure 5-5). Additionally, four sculpin were observed at Slab 8, ranging from 50 to 75 mm TL (Figure 5-5).



Note: mm = millimeter

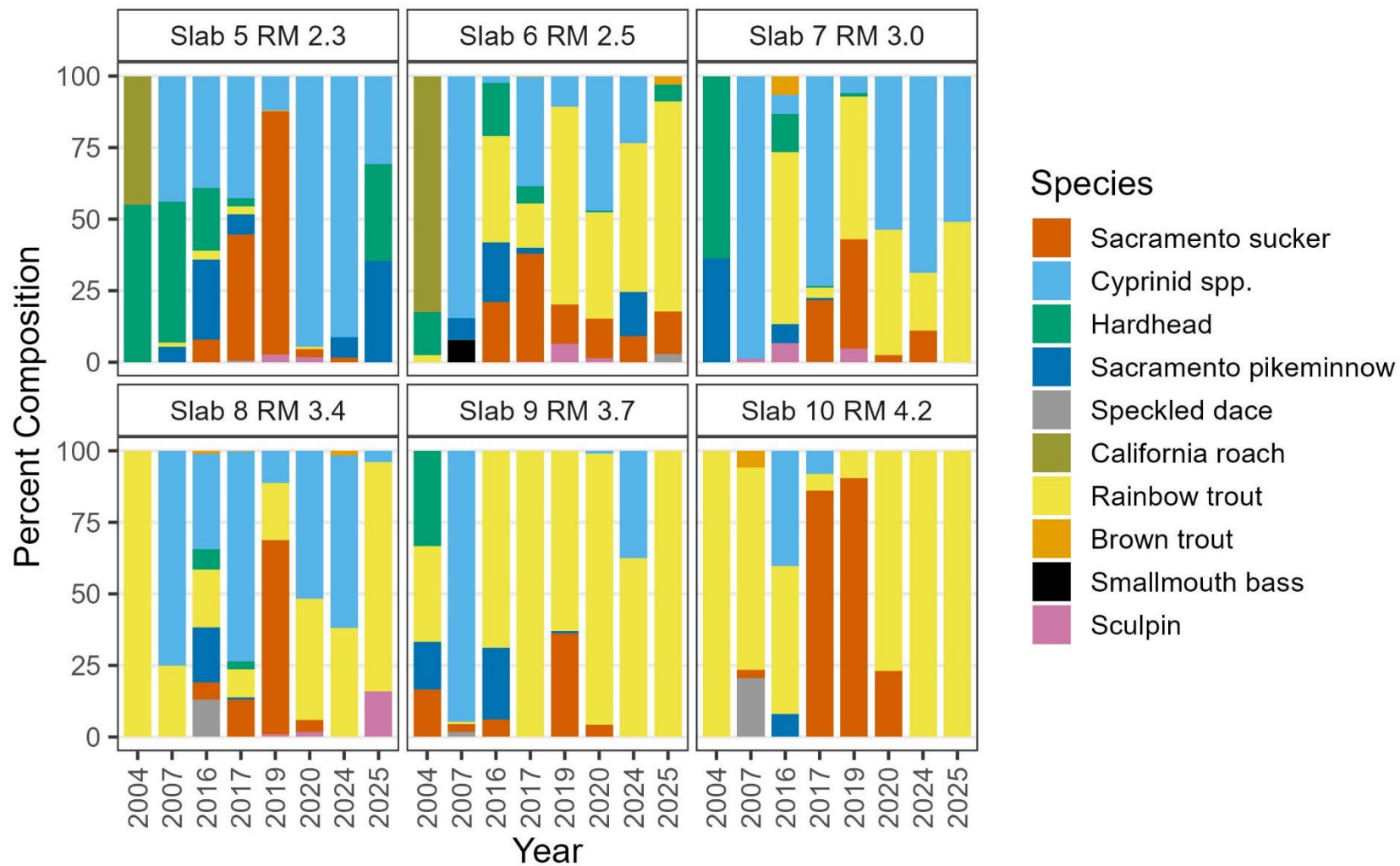
**Figure 5-5. Length-frequency histogram for Sacramento sucker observed during snorkel surveys in the South Fork American River downstream of Slab Creek Dam, September 2025.**

### 5.3.3 Historical Comparisons

#### 5.3.3.1 Fish Populations

The 2025 hardhead surveys documented increased species diversity and a shift in species composition compared with recent surveys conducted in 2020 and 2024. Monitoring in 2025 was the first year since 2019 in which more than one hardhead was observed and had the lowest observations of unidentified cyprinids since 2007 (Figure 5-6 and Figure 5-7). Other species observed in 2025 included sculpin, last observed in 2020, and speckled dace, last observed in 2017 (Figure 5-6). Species observed in previous survey years but absent in 2025 included California roach (*Hesperoleucus symmetricus*) and smallmouth bass (*Micropterus dolomieu*), which were observed in 2004 and 2007, respectively (Figure 5-6).

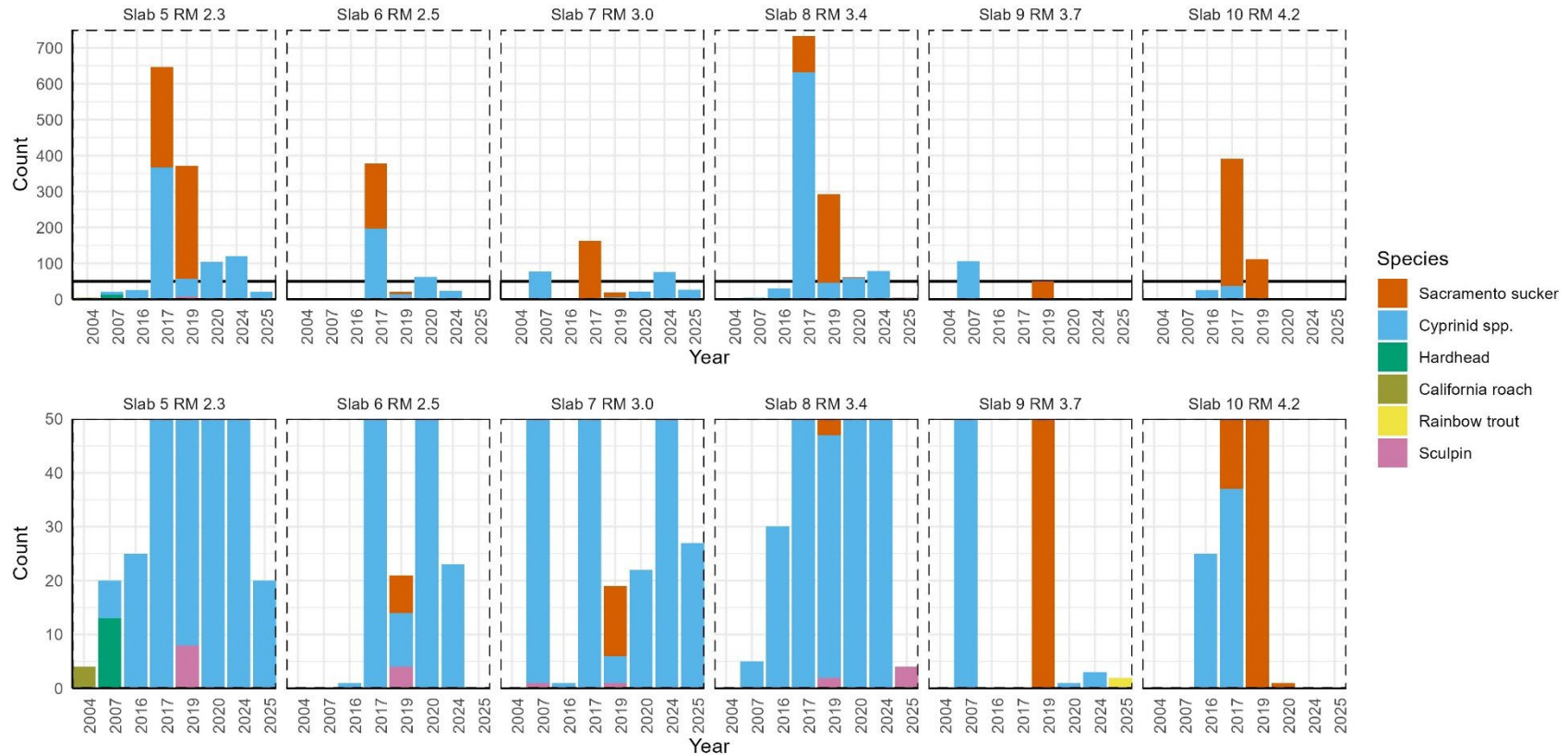
Counts of rainbow trout and hardhead greater than 50 mm TL represented the majority (52% and 11%, respectively) of observations in 2025 (Figure 5-6). Diversity of adult fish at the two sites farthest downstream (Slab 5 and Slab 6) was higher in 2025 compared with 2019, 2020, and 2024. Diversity was lowest in sites upstream of river mile 3.4 and dominated by rainbow trout greater than 50 mm TL (Figure 5-6).



Note: RM = river mile

**Figure 5-6. Species composition and distribution of fish by site and river mile observed during snorkel surveys conducted in 2004, 2007, 2016, 2017, 2019, 2020, 2024, and 2025.**

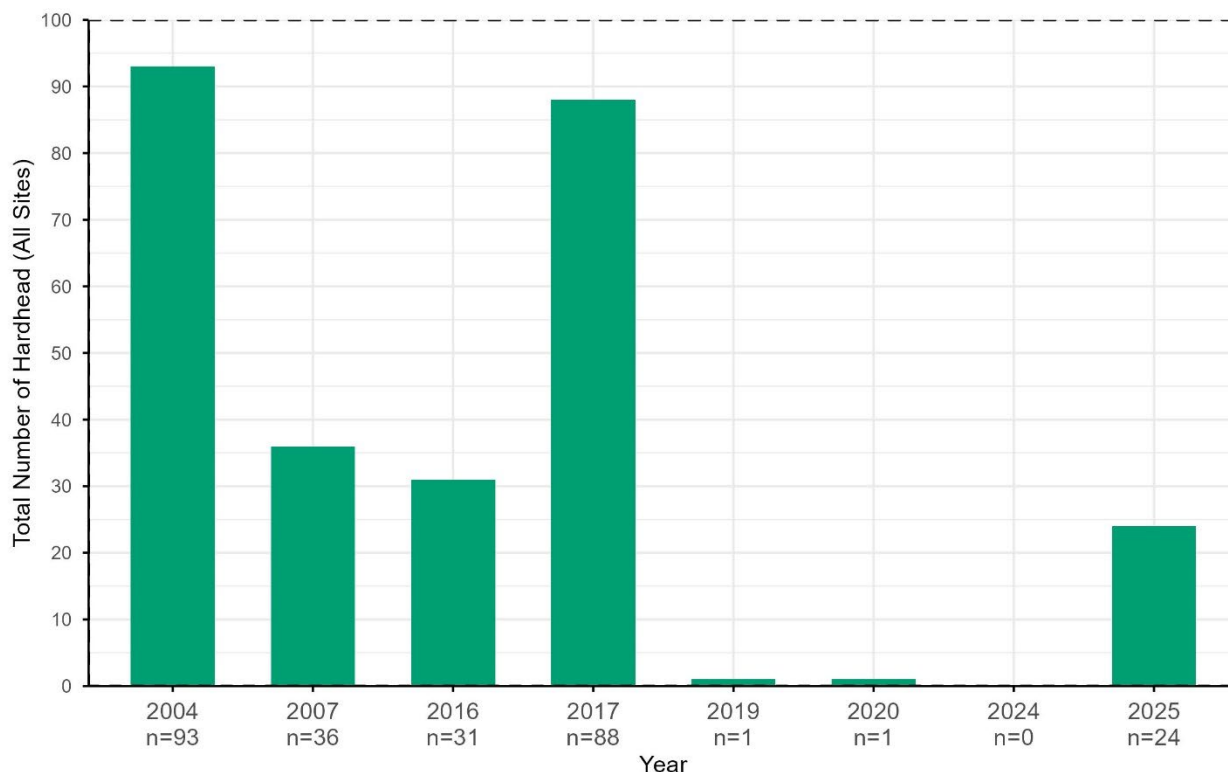




Notes: The top panel displays all counts, and the bottom panel is magnified to display observations of species less than 50 in count. Black line in top panel is the extent of magnification for the bottom panel.  
RM = river mile

**Figure 5-7. Abundance and distribution of young-of-year fish (<50 millimeters total length) by site and river mile observed during snorkel surveys conducted in 2004, 2007, 2016, 2017, 2019, 2020, 2024, and 2025.**

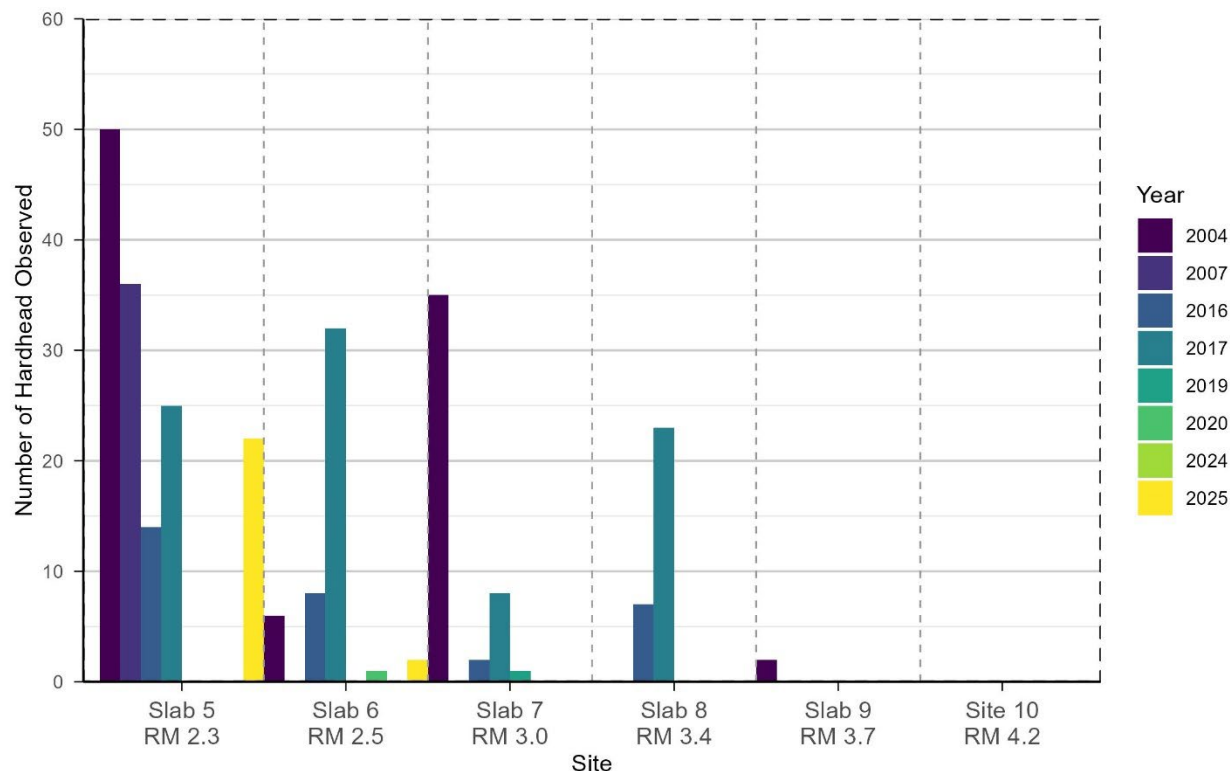
Hardhead abundance declined since survey year 2017— 88 hardhead were observed in 2017, 1 was observed per year in 2019 and 2020, and none were observed in 2024 (Figure 5-8). In 2025, hardhead abundance increased with 24 hardhead observed.



Note: Surveys were conducted in 2004, 2007, 2016, 2017, 2019, 2020, 2024, and 2025.

**Figure 5-8. Total number of hardhead (>50 millimeters total length) observed by year across sites in the South Fork American River downstream of Slab Creek Dam.**

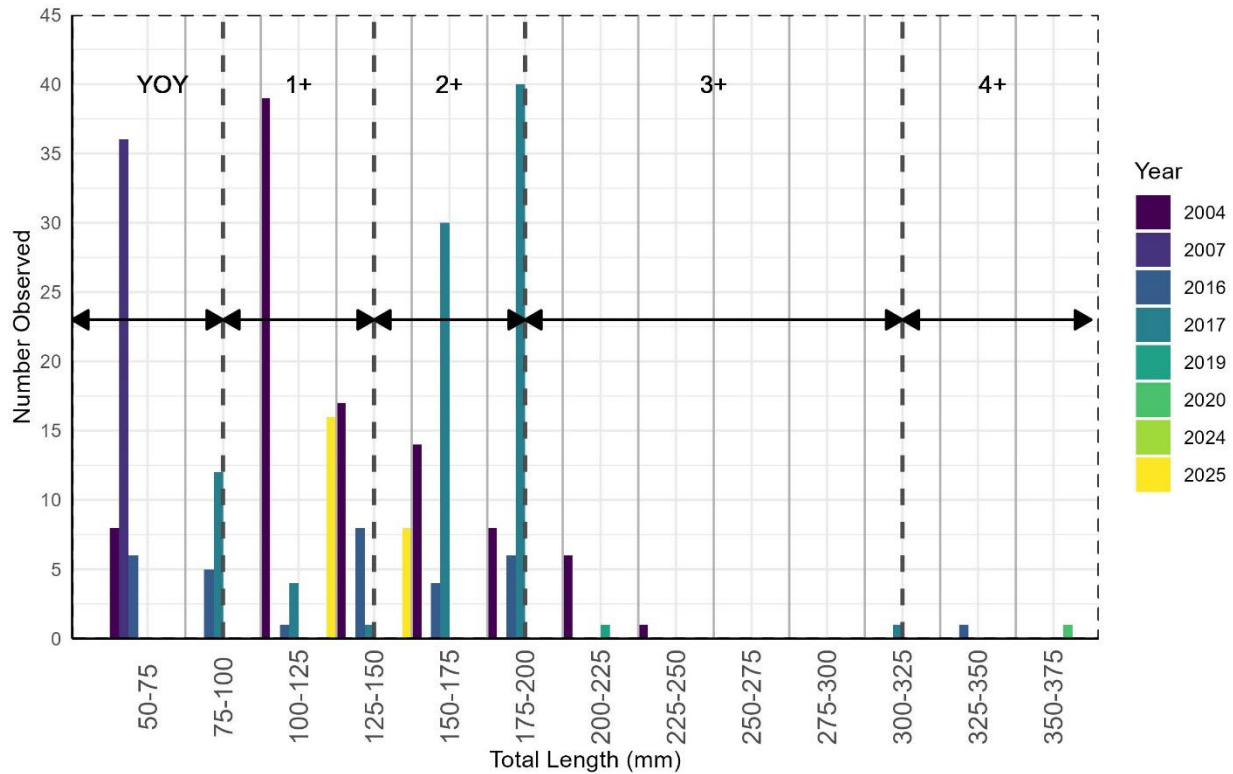
The distribution of observed hardhead in the Slab Creek Dam Reach became increasingly restricted during the survey period (Figure 5-9). Hardhead were observed at Slab 5, Slab 6, Slab 7, and Slab 9 in 2004 but only at Slab 5 in 2007 (Figure 5-9). Observations in 2016 and 2017 were contiguous between Slab 5 and Slab 8; however, by 2019 and 2020, a single observation was limited to Slab 7 and Slab 6, respectively (Figure 5-9). In 2025, 92% of hardhead observations were at Slab 5, and 8% were at Slab 6 (Figure 5-9). In comparison, 57% of hardhead observations from 2004 to 2017 were at Slab 5, and 17% were at Slab 6.



Notes: Surveys were conducted in 2004, 2007, 2016, 2017, 2019, 2020, 2024, and 2025.  
RM = river mile

**Figure 5-9. Longitudinal distribution of hardhead (>50 millimeters total length) by site and river mile in the South Fork American River downstream of Slab Creek Dam.**

The hardhead age-class structure shifted over the study period. Age-class structure during pre-License monitoring was generally stratified across all observed cohorts—observations of YOY were high and observations with increasing age up to 4+ declined, as expected (Figure 5-10). In comparison, age-class structure during License implementation monitoring has skewed older with fewer to no observations of YOY hardhead. In 2016, age-class distribution spanned cohorts from YOY to age 2+ with fewer YOY observed in 2016 compared with 2004 or 2007. Distribution in 2017 also skewed toward older age classes where the majority of observed hardhead were age 2+ or older. By 2019 and 2020, observations of hardhead were limited to two adults that were age 3+ or older. These results indicate generally poor recruitment between 2017 and 2024, resulting in an aging population with declining numbers of breeding adults. However, all hardhead observed in 2025 were age 1+ to 2+, indicating successful recruitment in 2023 and/or 2024, likely in the downstream section of the survey area.

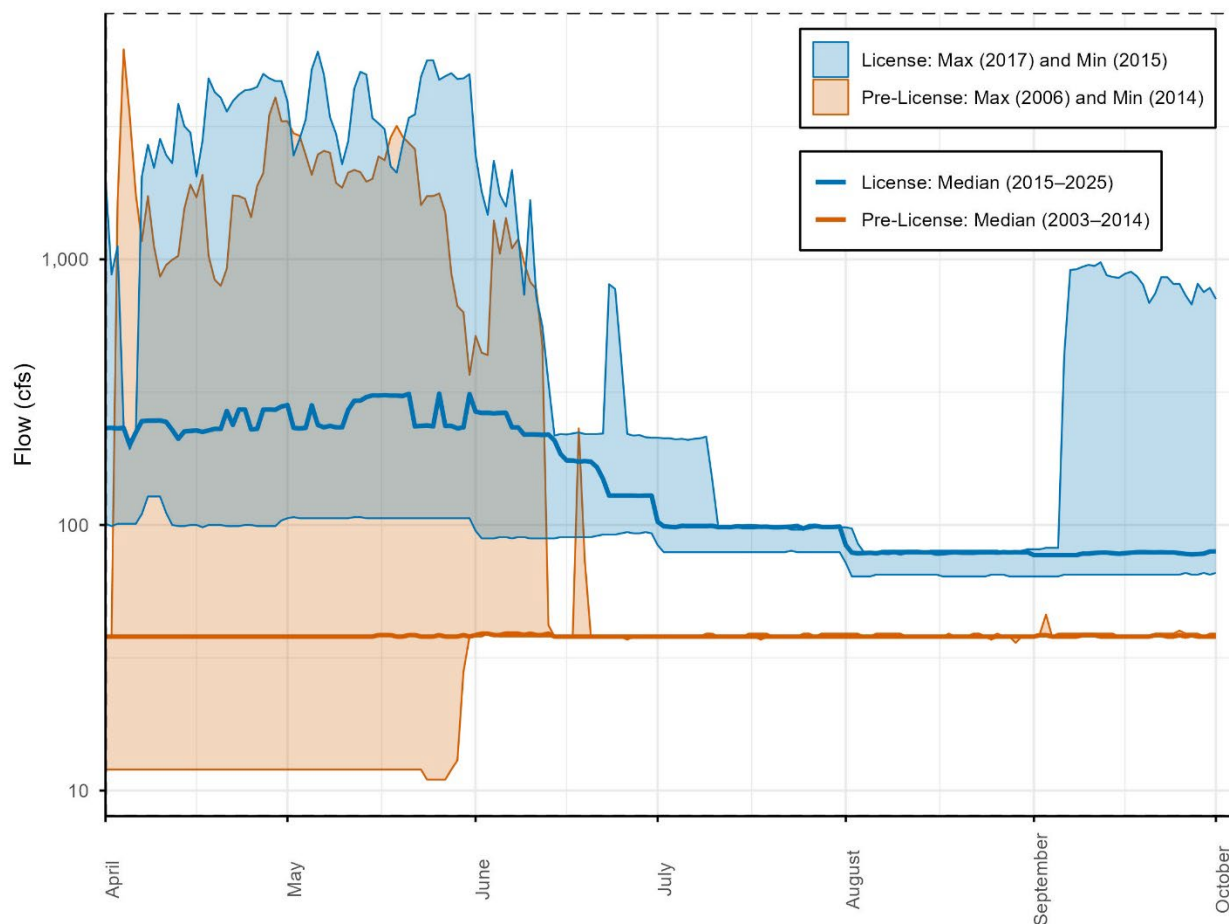


Note: Surveys were conducted in 2004, 2007, 2016, 2017, 2019, 2020, 2024, and 2025.  
mm = millimeter

**Figure 5-10. Age-class (Moyle 2002) and length-frequency distribution of hardhead in the South Fork American River downstream of Slab Creek Dam.**

### 5.3.3.2 Discharge and Water Temperature

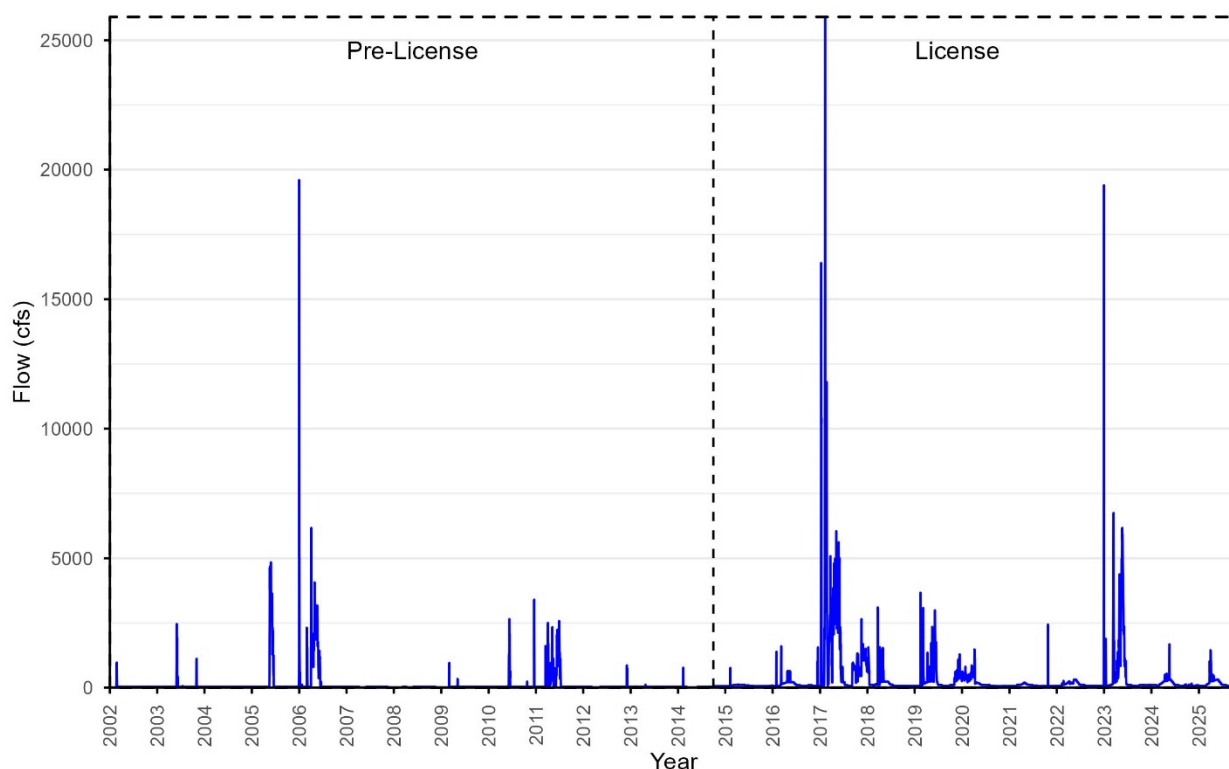
Figure 5-11 displays mean daily flow within the Slab Creek Dam Reach before (2003–2014) and during (2015–2025) License implementation. The pre-License implementation survey years included Dry, Below Normal, Above Normal, and Wet water year types; License implementation monitoring years included Critically Dry, Dry, Below Normal, and Wet water year types. The magnitude and timing of spring peak flows in wetter water years are consistent between pre-License and License operations but differ in drier water years (Figure 5-11 and Figure 5-12). Flows in summer months of all water years are higher under the current flow regime compared with pre-License conditions (Figure 5-11; Appendix A1, Tables A-1 and A-2).



Notes: Water year data were ranked by total annual flow at USGS gage 11443500 (South Fork American River downstream of Slab Creek Dam), and the minimum, median, and maximum flow years are plotted above. The lower middle year was selected when identifying median flow year.  
cfs = cubic feet per second, USGS = U.S. Geological Survey

**Figure 5-11. Mean daily flow at USGS gage 11443500 (South Fork American River upstream of White Rock Powerhouse before (2003–2014, blue) and after (2015–2025, red) License implementation.**

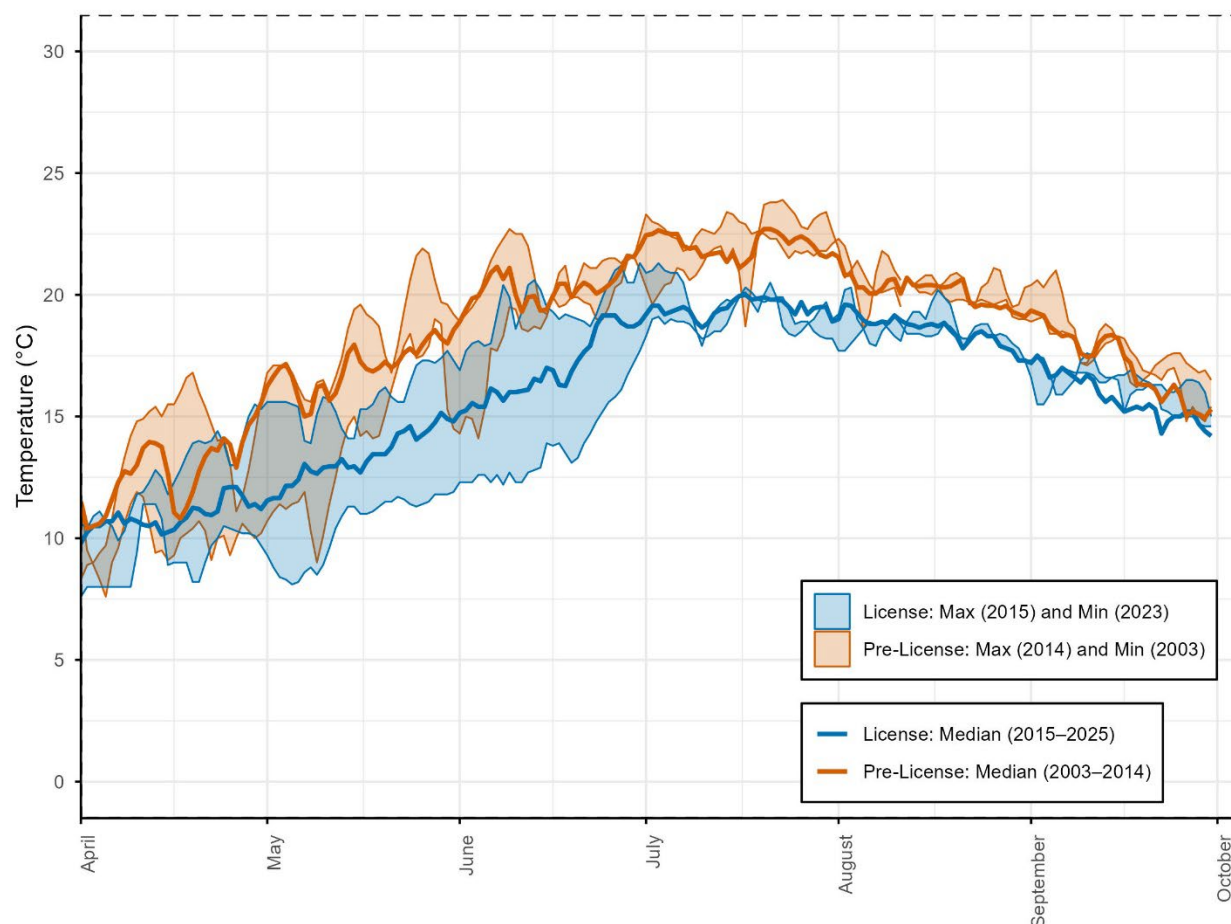




Note: cfs = cubic feet per second, USGS = U.S. Geological Survey

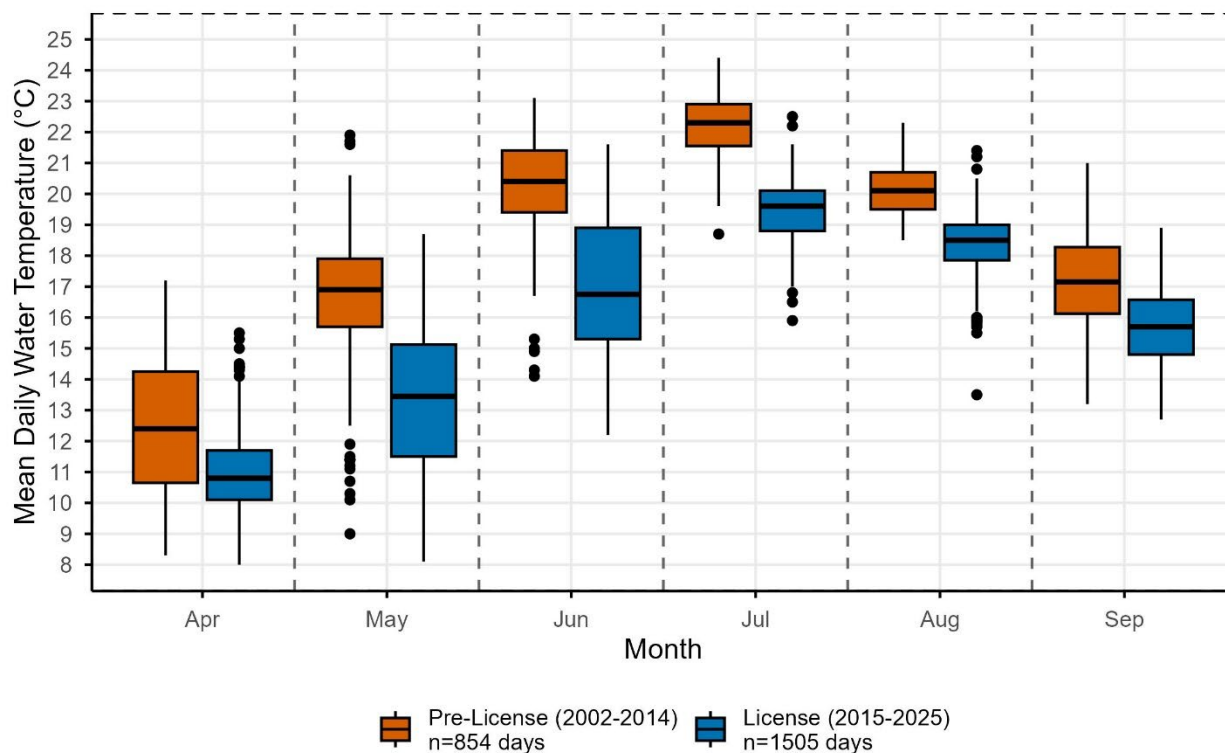
**Figure 5-12. Mean daily flow at USGS gage 11443500 (South Fork American River downstream of Slab Creek Dam), 2002–2025.**

Analysis of variance of daily water temperature in the Slab Creek Dam Reach (SMUD Gage SFAR15) by month was used to compare mean monthly water temperatures for the pre-License (2004–2014) and License implementation (2015–2025) periods. In the pre-License period, mean monthly water temperature upstream of White Rock Powerhouse during the early spawning period was 12.5°C in April, 16.6°C in May, and 20.2°C in June. In the License implementation period (2015–2025), mean monthly water temperature was 10.8°C in April, 13.3°C in May, and 16.9°C in June. Similarly, in the pre-License period, mean monthly water temperature during hardhead late spawning and summer rearing periods (July–September) was 22.2°C in July, 20.1°C in August, and 17.1°C in September. In the License implementation period, mean monthly water temperature during hardhead late spawning and summer rearing periods was 19.5°C in July and 18.4°C in August, and 15.7°C in September (Figure 5-13 and Figure 5-14, Appendix E1, Table E1-1). Analysis of variance showed statistically significant differences (0.001 significance level, i.e.,  $p$ -value  $< 0.001$ ) between pre-License and License implementation mean monthly water temperatures for all spawning and rearing months (Appendix E1, Table E1-1).



Notes: Complete temperature data were unavailable for 2005–2012 and 2017. Water years with temperature data were ranked by total annual flow at USGS gage 11443500 (South Fork American River downstream of Slab Creek Dam), and the minimum, median, and maximum flow years plotted above. The lower middle year was selected when identifying median flow year because there are an even number of years in the License periods. Minimum, median, and maximum water years differ from Figure 5-11 due to temperature data gaps. SMUD = Sacramento Municipal Utility District

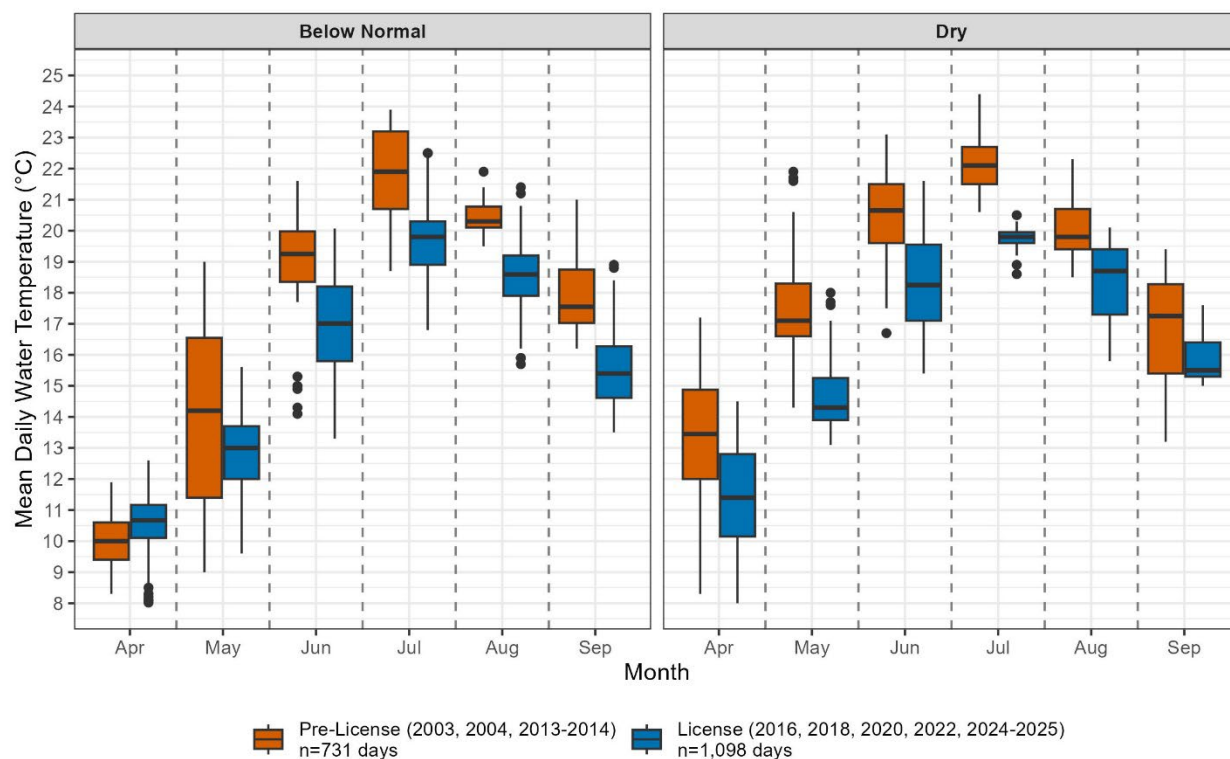
**Figure 5-13. Mean daily water temperature in the South Fork American River upstream of White Rock Powerhouse (SMUD gage SFAR15, RM 0.0), before (2003–2014, blue) and after (2015–2025, red) License implementation.**



Notes: Whiskers are drawn to the farthest point within 1.5 x interquartile range; black line within box denotes 50<sup>th</sup> percentile, and boxes span the 25<sup>th</sup> through 75<sup>th</sup> percentile. Outliers for box and whisker plots shown as individual points. Complete temperature data were unavailable for 2005–2012 and 2017.

**Figure 5-14. Box and whisker plots of mean daily water temperature by month in the South Fork American River upstream of White Rock Powerhouse (SMUD gage SFAR15, RM 0.0) before and after License implementation.**

To account for flow and temperature variability among water year types, daily temperature data were compared between pre-License and License implementation years with the same water year type. Water temperature data were not available for 2005–2012 and 2017, so comparisons were conducted only for Below Normal and Dry water year types (Figure 5-15). Analysis of variance showed statistically significant differences (0.001 significance level) between pre-License and License implementation mean monthly water temperatures for all hardhead spawning and rearing months, except April in Below Normal water year types (Appendix E1, Table E1-2). Pre-License water temperatures were warmer for all months except April of Below Normal water year types (Figure 5-15).



Notes: Whiskers are drawn to the farthest point within 1.5 x interquartile range; black line within box denotes 50<sup>th</sup> percentile, and boxes span the 25<sup>th</sup> through 75<sup>th</sup> percentile. Outliers for box and whisker plots shown as individual points. Complete temperature data were unavailable for 2005–2012 and 2017.

**Figure 5-15. Median monthly water temperatures calculated from daily temperatures for Below Normal and Dry water year types in the South Fork American River upstream of White Rock Powerhouse (SMUD gage SFAR15, RM 0.0) before and after License implementation.**

## 5.4 DISCUSSION

Declines of hardhead have been common in foothill streams in recent decades and may be attributed to predation and competition from non-native centrarchids, loss of habitat from urbanization and agriculture, and altered flow regimes from dam operations (Moyle 2002). Although predation by non-native predators is possible in the Slab Creek Dam Reach, it is assumed to be unlikely in recent survey years because smallmouth bass have not been observed during monitoring surveys since 2007 (Figure 5-6, Table 2-1). The Slab Creek Reach is relatively remote, with little to no influence from urban infrastructure and agricultural practices. Additionally, habitat types and dominant substrates in the reach have remained generally consistent through License implementation (SMUD 2017, 2018, 2020, 2021, 2025), which provides further evidence that physical habitat has not substantially changed. The 2025 results confirm successful recruitment and that hardhead have not been extirpated from the reach. Hardhead presence in 2025 within the lower section of the reach may be attributable to interannual

variation in population dynamics and environmental conditions (e.g., water temperature changes).

Hardhead populations in foothill streams generally reach maturity at age 2 and spawn from April to August, with peak spawning occurring in spring (April through June) (Moyle 2002). After a short egg incubation period, larval hardhead grow rapidly during summer, reaching 80 mm in length by their first year (Moyle 2002). This rearing period typically occurs from July through September. Streams supporting hardhead typically have mean summer temperatures above 20°C; adults and juveniles prefer mean temperatures of 20.5°C and 19.5°C, respectively (Moyle 2002, Thompson et al. 2012). Hardhead have also been shown to avoid temperatures below 14°C, regardless of life stage (Thompson et al. 2012). In laboratory studies, colder temperatures can also have negative impacts on swimming performance because adults become lethargic at 11°C and juveniles typically do not swim between 11°C to 16°C (Fangue et al. 2015).

As has been demonstrated in this study and past analyses, water temperatures in the Slab Creek Dam Reach under the pre-License flow regime were marginally suitable for hardhead spawning and rearing, and the species was generally restricted to the downstream (warmer) portions of the reach. Cooler water temperatures under License implementation have likely reduced the reproductive success of hardhead, leading to lower abundance and density in the study reach and an associated reduction in their longitudinal distribution in the Slab Creek Dam Reach.

Stream thermal regimes are affected by minimum instream flows, peak flows, water year type, and climate. Decreases in water temperature during the summer hardhead rearing period following License implementation in 2014 likely reflect the combined effects of annual variability in climate factors (i.e., precipitation and air temperature) and changes to the streamflow regime (Figure 5-11). Observed changes in the thermal regime are consistent with the original hypothesis of the relicensing Aquatic Technical Work Group; water temperature in the Slab Creek Reach during License implementation has generally been below the preferred temperature range for hardhead. The extent to which cooler water temperatures during spawning and rearing periods have contributed to the reduction in successful recruitment, occurrence, and distribution of hardhead in the study reach is unknown.

The 2029 survey will provide further insight into long-term trends in the longitudinal distribution and relative abundance of hardhead in the reach.



## 5.5 LITERATURE CITED

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## **6.0 AMPHIBIAN AND AQUATIC REPTILE**

### **6.1 MONITORING PLAN OBJECTIVES**

The main objectives of the Amphibian and Aquatic Reptile Monitoring Plan (Plan) (SMUD 2016) are to monitor for and document the presence and distribution of target amphibians and aquatic reptiles, including foothill yellow-legged frog (*Rana boylei*) and western pond turtle<sup>12</sup> (*Actinemys marmorata*), in the UARP over the term of the License (FERC 2014). Monitoring is being conducted to help determine if populations of these species are changing following the implementation of current streamflows as defined in the License (FERC 2014).

### **6.2 FIELD METHODS**

#### **6.2.1 Monitoring Sites**

In accordance with the Plan, three of the six monitoring sites<sup>13</sup> were surveyed in 2025 (License Year 11) (Table 6-1, Figure 1-1 through Figure 1-3). Table 6-1 includes a summary of foothill yellow-legged frog and western pond turtle observations during pre-License and License implementation monitoring studies in the UARP.

Opportunistic searches for foothill yellow-legged frogs were also conducted at three locations near Site CD-A3, including a seep from a cliff face along the access road to Site CD-A3, a small stream flowing from the Camino Adit, and a small section of a tributary to Silver Creek visible from the access trail to Site CD-A3.

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<sup>12</sup> The Plan was written prior to the recognized split of western pond turtle into two species (northwestern pond turtle [*Actinemys marmorata*] and southwestern pond turtle [*Actinemys pallida*]). The UARP is located within the range of the northwestern pond turtle; for consistency with the Plan, this Report will continue to use the prior species name western pond turtle.

<sup>13</sup> Site codes used in this and past annual monitoring reports differ from site codes in the Plan but correspond with naming conventions used for other UARP monitoring studies.

**Table 6-1. Amphibian and Aquatic Reptile Monitoring Sites, 2025.**

| Site <sup>1</sup>     | Stream Reach                                                                             | Site Length (feet) | Elevation (feet) | Prior Observation at Monitoring Site (Yes/No) |                     |
|-----------------------|------------------------------------------------------------------------------------------|--------------------|------------------|-----------------------------------------------|---------------------|
|                       |                                                                                          |                    |                  | Foothill Yellow-legged Frog                   | Western Pond Turtle |
| CD-A3 / CA-3 / C-3    | Silver Creek downstream of Camino Dam (near Camino Adit)                                 | 735                | 2,336            | Yes <sup>2</sup>                              | No                  |
| CD-A4 / SFA-4         | Silver Creek downstream of Camino Dam (at the confluence with South Fork American River) | 404                | 2,067            | Yes <sup>2</sup>                              | No                  |
| SCD-A1 / SCA-6a–SCA-4 | South Fork American River downstream of Slab Creek Dam                                   | 10,404             | 1,007            | No                                            | Yes <sup>3</sup>    |

<sup>1</sup> Site codes used in this Report differ from site codes in the Plan. Site codes were developed to mirror site codes used for other monitoring studies and match codes used in past reports.

<sup>2</sup> Observations made during pre-License (2003–2004) and License implementation monitoring (2016–2024).

<sup>3</sup> Observations made during License implementation monitoring (2016–2024).

## 6.2.2 Foothill Yellow-Legged Frog

### 6.2.2.1 Visual Encounter Surveys

In 2025, four visual encounter surveys (surveys) were conducted in all safely accessible areas following methods outlined in the Plan (SMUD 2016) and detailed in the 2017 and 2018 annual monitoring reports (SMUD 2018, 2019). Other amphibian and reptile species and potential predators (e.g., fish, crayfish, American bullfrogs [*Lithobates catesbeianus*]) were also recorded.

#### 6.2.2.2 Adaptive Management Monitoring

No adaptive management monitoring occurred in 2025 because neither Camino Reservoir nor Slab Creek Reservoir spilled after the 7-day moving average (7DMAVG) water temperatures exceeded 12°C in targeted UARP reaches.

### 6.2.3 Western Pond Turtle

Western pond turtle surveys were conducted using methods detailed in the Plan (SMUD 2016) and refined as noted in the 2017 and 2018 annual monitoring reports (SMUD 2018, 2019). Western pond turtle surveys were conducted concurrently with

foothill yellow-legged frog surveys in July and August at Sites CD-A3 and CD-A4 and all four surveys at Site SCD-A1.

### 6.3 RESULTS

Surveys were conducted during daylight hours and favorable weather conditions (e.g., clear to partially cloudy skies, calm winds) for amphibian and aquatic reptile detection (Table 6-2).

**Table 6-2. Survey Conditions, 2025.**

| Site   | Survey Date | Time (hours) |       | Temperature Range (degrees Celsius) |       | Weather Conditions      |
|--------|-------------|--------------|-------|-------------------------------------|-------|-------------------------|
|        |             | Start        | End   | Water                               | Air   |                         |
| CD-A3  | 10 June     | 15:52        | 17:07 | 16–17                               | 27–32 | Sunny/clear, no wind    |
|        | 7 July      | 15:52        | 16:39 | 17                                  | 27–29 | Sunny/clear, no wind    |
|        | 4 August    | 15:48        | 16:27 | 17                                  | 29    | Sunny/clear, light wind |
|        | 3 September | 14:56        | 16:18 | 19                                  | 31–33 | Sunny/clear, light wind |
| CD-A4  | 11 June     | 09:40        | 10:46 | 16                                  | 21–26 | Sunny/clear, no wind    |
|        | 9 July      | 09:21        | 10:13 | 16–17                               | 22    | Sunny/clear, light wind |
|        | 6 August    | 09:05        | 10:04 | 17                                  | 17–21 | Sunny/clear, no wind    |
|        | 3 September | 10:06        | 11:04 | 18–19                               | 24–30 | Partly cloudy, no wind  |
| SCD-A1 | 12 June     | 09:21        | 17:06 | 16–20                               | 20–27 | Sunny/clear, no wind    |
|        | 8 July      | 09:28        | 16:37 | 17–22                               | 21–31 | Sunny/clear, no wind    |
|        | 5 August    | 09:42        | 17:44 | 17–21                               | 24–28 | Sunny/clear, no wind    |
|        | 4 September | 09:37        | 18:00 | 16–19                               | 24–27 | Sunny/clear, light wind |

#### 6.3.1 Foothill Yellow-Legged Frog

In 2025, post-metamorphic foothill yellow-legged frogs were observed at Site CD-A3, Site CD-A4, and two opportunistic search locations: the small stream at the Camino Adit and a small section of the tributary to Silver Creek visible from the Site CD-A3 access trail. No foothill yellow-legged frog egg masses or tadpoles were observed at any monitoring sites, and no life stages of the species were observed at Site SCD-A1 or the opportunistically searched seep. Photos of foothill yellow-legged frogs and representative habitat are included in Appendices F1 and F2, respectively.

##### 6.3.1.1 Site CD-A3

Adult and subadult life stages of foothill yellow-legged frog were observed at the downstream end of Site CD-A3 (Table 6-3, Figure 6-1 through Figure 6-3). Habitat



conditions at Site CD-A3 in 2025 were the same as observed in 2024 and are detailed in the 2024 annual monitoring report (SMUD 2025).

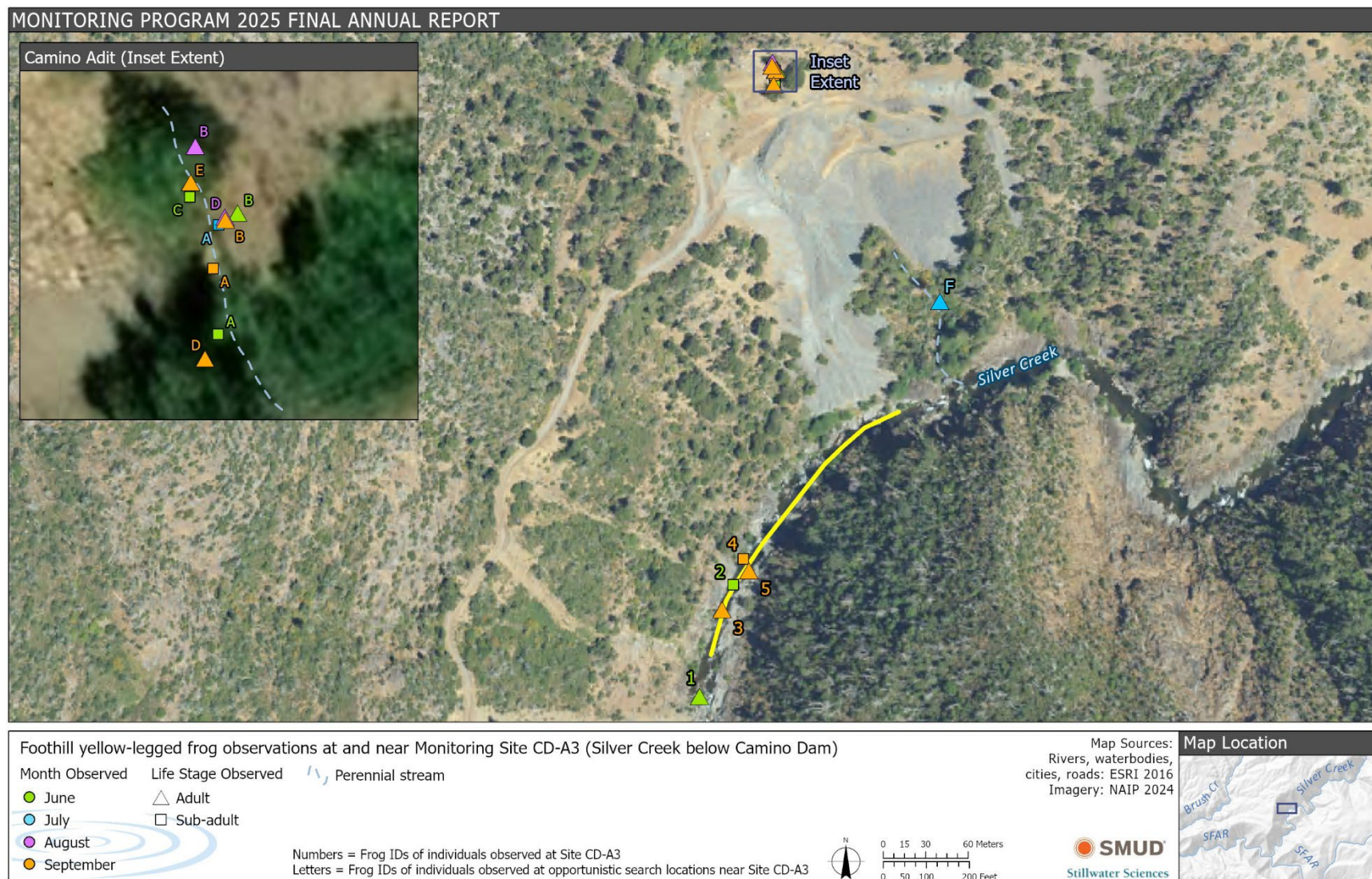
**Table 6-3. Foothill Yellow-Legged Frog Observation Details at Site CD-A3, 2025.**

| Date         | Life Stage | Frog ID | Length <sup>1</sup> (mm) | Species Notes                                                                                          | Habitat Conditions                                                                                    |
|--------------|------------|---------|--------------------------|--------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| 10 June      | Adult      | 1       | 42                       | Male                                                                                                   | Backwater pool with boulder/cobble substrate and high solar exposure                                  |
|              | Subadult   | 2       | 34                       | Unknown <sup>2</sup>                                                                                   | Small off-channel bedrock pool                                                                        |
| 3 September  | Adult      | 3       | 35                       | Male                                                                                                   | Bedrock backwater pool                                                                                |
|              | Subadult   | 4       | --                       | --                                                                                                     | Bedrock basking substrate adjacent to deep run                                                        |
| 11 September | Adult      | 5       | --                       | Large adult; observed being predated by Sierra garter snake ( <i>Thamnophis couchii</i> ) (Figure 6-3) | Incidental observation at Site CD-A3 during BMI survey on left bank bedrock outcrop near water's edge |

Notes: -- = no data available; individual observed but not captured  
ID = identification  
mm = millimeter

<sup>1</sup> Post-metamorphic individuals were measured by snout-to-urostyle length.

<sup>2</sup> Subadult; secondary sexual characteristics were not observed.



**Figure 6-1. Foothill yellow-legged frog observations at and near Site CD-A3, 2025.**





**Figure 6-2. Adult foothill yellow-legged frog (Frog ID No. 3) (left) and habitat (right) at Site CD-A3, 3 September 2025.**



**Figure 6-3. Sierra garter snake with predated adult foothill yellow-legged frog (Frog ID No. 5), Site CD-A3, 11 September 2025.**

#### Incidental Observations

Incidental foothill yellow-legged frog observations were made at opportunistic search locations near Site CD-A3 (stream at Camino Adit and the tributary to Silver Creek). Observation details and locations are provided in Table 6-4 and Figure 6-1, respectively.

**Table 6-4. Foothill Yellow-Legged Frog Incidental Observations near Site CD-A3, 2025.**

| Date                      | Life Stage | Frog ID | Length <sup>1</sup> (mm) | Species Notes        | Habitat Conditions                                         |
|---------------------------|------------|---------|--------------------------|----------------------|------------------------------------------------------------|
| Camino Adit               |            |         |                          |                      |                                                            |
| 10 June                   | Subadult   | A       | 31                       | Unknown <sup>2</sup> | Small, cool stream flowing from Camino Adit                |
|                           | Adult      | B       | 37                       | Female               |                                                            |
|                           | Subadult   | C       | --                       | --                   |                                                            |
| 7 July                    | Subadult   | A       | 34                       | Unknown <sup>2</sup> |                                                            |
| 4 August                  | Adult      | D       | 38                       | Male                 |                                                            |
|                           | Adult      | B       | 46                       | Female               |                                                            |
| 3 September               | Adult      | B       | 47                       | Female               |                                                            |
|                           | Adult      | E       | 47                       | Female               |                                                            |
|                           | Subadult   | A       | 34                       | Unknown <sup>2</sup> |                                                            |
|                           | Adult      | D       | 41                       | Male                 |                                                            |
| Tributary to Silver Creek |            |         |                          |                      |                                                            |
| 7 July                    | Adult      | F       | 49                       | Male                 | Small, cool, shaded section of a tributary to Silver Creek |

Notes: -- = no data available; individual observed but not captured  
ID = identification  
mm = millimeter

<sup>1</sup> Post-metamorphic individuals were measured by snout-to-urostyle length.

<sup>2</sup> Subadult; secondary sexual characteristics were not observed.

Ten adult or subadult foothill yellow-legged frogs were incidentally observed (nine captured, one uncaptured) at a stream flowing from the Camino Adit gate during opportunistic visits in 2025. Four of the captured frogs were identified as individuals with multiple recaptures using chin-marking comparisons (Frog IDs A, B, D, and E) (Marlow et al. 2016). The stream was approximately 50 feet long and 3 feet wide. The banks were lined with tall, weedy vegetation, and the substrate was mostly gravel with some larger cobbles and boulders providing cover near the gate. Frogs were most often found basking on the weedy banks and seeking cover in algae.

One adult foothill yellow-legged frog was incidentally observed in the 25-foot-long tributary segment that was visible from the access trail to Site CD-A3 (Figure 6-4). This area was opportunistically searched during all 2025 surveys when accessing Site CD-A3. The stream in this location was approximately 5 feet wide, high-gradient, cool, with low flow, and moss-covered cobble/boulder substrate. Dense canopy cover shaded the stream.

### 6.3.1.2 Site CD-A4

Two adult foothill yellow-legged frogs were observed at Site CD-A4 in 2025, one of which was captured (Table 6-5, Figure 6-4). Habitat conditions at Site CD-A4 in 2025 were the same as in 2024 and are detailed in the 2024 annual monitoring report (SMUD 2025).

**Table 6-5. Foothill Yellow-Legged Frog Observation Details at Site CD-A4, 2025.**

| Date     | Life stage | Frog ID | Number Observed | Length <sup>1</sup> (mm) | Sex  | Habitat Conditions |
|----------|------------|---------|-----------------|--------------------------|------|--------------------|
| 11 June  | Adult      | 1       | 1               | --                       | --   | Backwater pool     |
| 6 August | Adult      | 2       | 1               | 49                       | Male | Backwater pool     |

Note: -- = no data available; individual observed but not captured  
mm = millimeter

<sup>1</sup> Post-metamorphic individuals were measured by snout-to-urostyle length.



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**Figure 6-4. Foothill yellow-legged frog observations at Site CD-A4, 2025.**

The uncaptured adult frog (Frog ID No. 1) at Site CD-A4 was observed in a backwater pool in June. One adult male (Frog ID No. 2) was captured in a nearby pool in August (Figure 6-5). Both frogs were observed basking on boulders located in a series of backwater pools along the right bank of the braided channel. The pools were lined with boulders, cobbles, and silt. Some pools had moderate flow and full sun exposure, while others were disconnected from the main channel and shaded by the dense canopy of white alders and willows. Maximum pool depth ranged from approximately 0.5 foot to more than 2 feet.

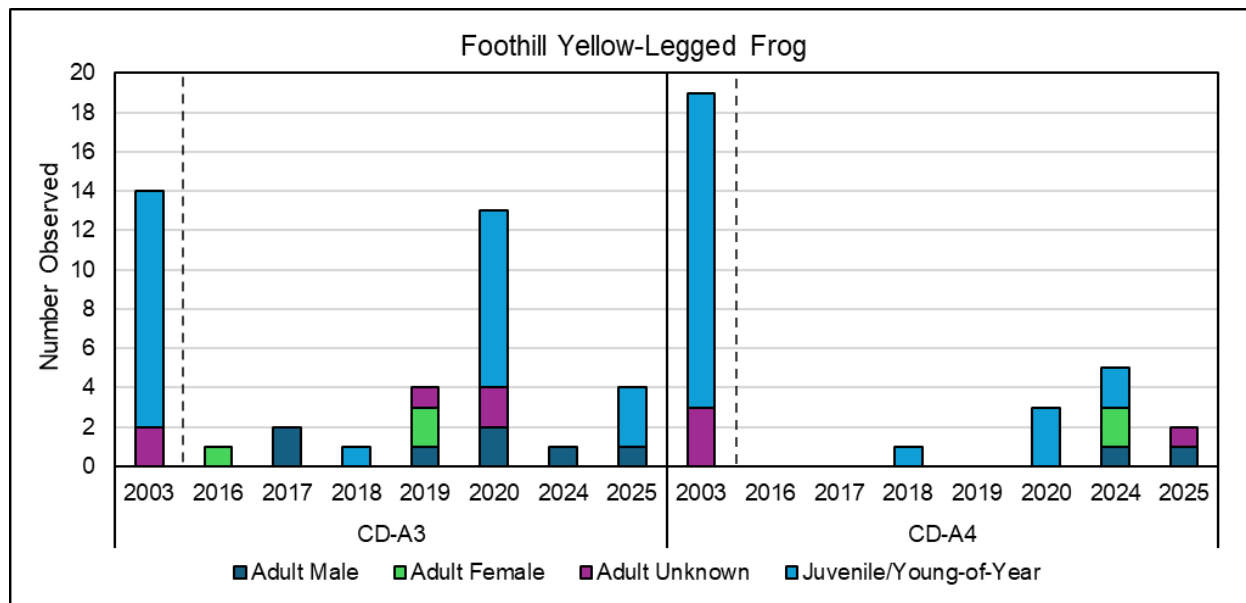


**Figure 6-5. Foothill yellow-legged frog (Frog ID No. 2) observed (left: top and bottom) at backwater pool habitat (right), Site CD-A4, 6 August 2025.**

### 6.3.1.3 Historical Comparison

Foothill yellow-legged frogs were observed at Sites CD-A3 and CD-A4 during most monitoring years. At Site CD-A3, the number of post-metamorphic individuals observed was highest in 2003 (pre-License monitoring) and 2020 (License implementation monitoring) (Figure 6-6). At Site CD-A4, the number of post-metamorphic individuals observed was higher in 2003 (pre-License monitoring) compared with all License implementation monitoring years (Figure 6-6).

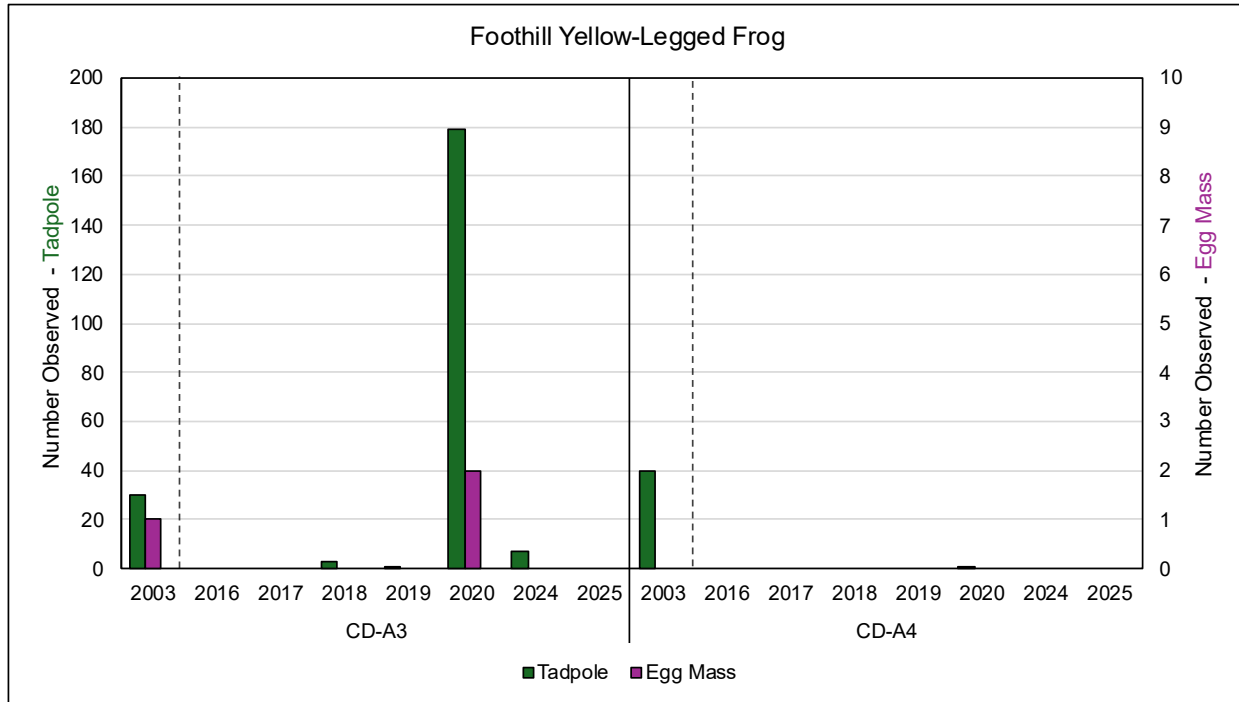
Egg masses were infrequently observed during pre-License and License implementation monitoring at Site CD-A3 and were not observed at Site CD-A4 during either monitoring period (Figure 6-7). More tadpoles were observed at Site CD-A3 in 2020 than in any other pre-License or License implementation monitoring year. At Site CD-A4, the number of tadpoles observed was highest in 2003. No tadpoles were observed at either site in 2025 (Figure 6-7).



Note: These data are cumulative for each monitoring year (i.e., observations include counts of recaptured individuals) and do not include deceased or moribund individuals; therefore, totals may differ from the number of individuals observed in a given year.

**Figure 6-6. Post-metamorphic foothill yellow-legged frog observations at Sites CD-A3 and CD-A4 during pre-License (2003) and License implementation monitoring years.**





Note: Tadpole data are cumulative for each monitoring year. Individual tadpoles may have been observed on multiple visits, particularly near egg mass locations in years in which egg masses were observed. Therefore, totals may exceed the actual number of individuals observed

**Figure 6-7. Egg mass and tadpole foothill yellow-legged frog observations at Sites CD-A3 and CD-A4 during pre-License (2003) and License implementation monitoring years.**

### 6.3.2 Western Pond Turtle

In 2025, western pond turtles were observed only at Site SCD-A1.

#### 6.3.2.1 Site SCD-A1

One juvenile and seven adult western pond turtles were observed across all surveys at Site SCD-A1 in 2025 (Table 6-6, Figure 6-8 and Figure 6-9). Turtles were predominantly observed in the downstream half of the monitoring site, with only one observation (Turtle ID No. 7) in the upstream half of the monitoring site in September.

**Table 6-6. Western Pond Turtle Observation Details at Site SCD-A1, 2025.**

| Date        | Life Stage/<br>Sex    | Turtle ID | Carapace Measurements (mm) |                 | Number of Scute Rings | Habitat / Behavior at Observation                                                    |
|-------------|-----------------------|-----------|----------------------------|-----------------|-----------------------|--------------------------------------------------------------------------------------|
|             |                       |           | Length                     | Width           |                       |                                                                                      |
| 13 June     | Adult/<br>female      | 1         | 163                        | 124             | 10                    | Basking underwater in a warm backwater pool                                          |
| 8 July      | Adult/<br>female      | 2         | 148                        | 118             | -- <sup>1</sup>       | Hiding in an undercut bank on edge of the main channel                               |
| 8 July      | Adult/<br>male        | 3         | 158                        | 129             | -- <sup>1</sup>       | Swimming near sedge roots                                                            |
| 5 August    | Juvenile <sup>2</sup> | 4         | 108                        | 90              | 4                     | Hiding under an undercut bank and instream tree branch on edge of the main channel   |
| 5 August    | Adult/<br>female      | 5         | 130                        | 103             | 7                     | Hiding underneath boulder in a backwater pool                                        |
| 5 August    | Adult/<br>unknown     | 6         | -- <sup>3</sup>            | -- <sup>3</sup> | -- <sup>3</sup>       | Basking underwater on cobbles under sedges in a slow flowing, shallow backwater pool |
| 4 September | Adult/<br>female      | 7         | 121                        | 98              | 9                     | Resting under overhanging bedrock in a crevice at edge of the main channel           |
| 4 September | Adult/<br>male        | 8         | 121                        | 98              | 8                     | Hiding under willows in a slow flowing, shallow backwater pool                       |

Notes: -- = no data available  
ID = identification  
mm = millimeter

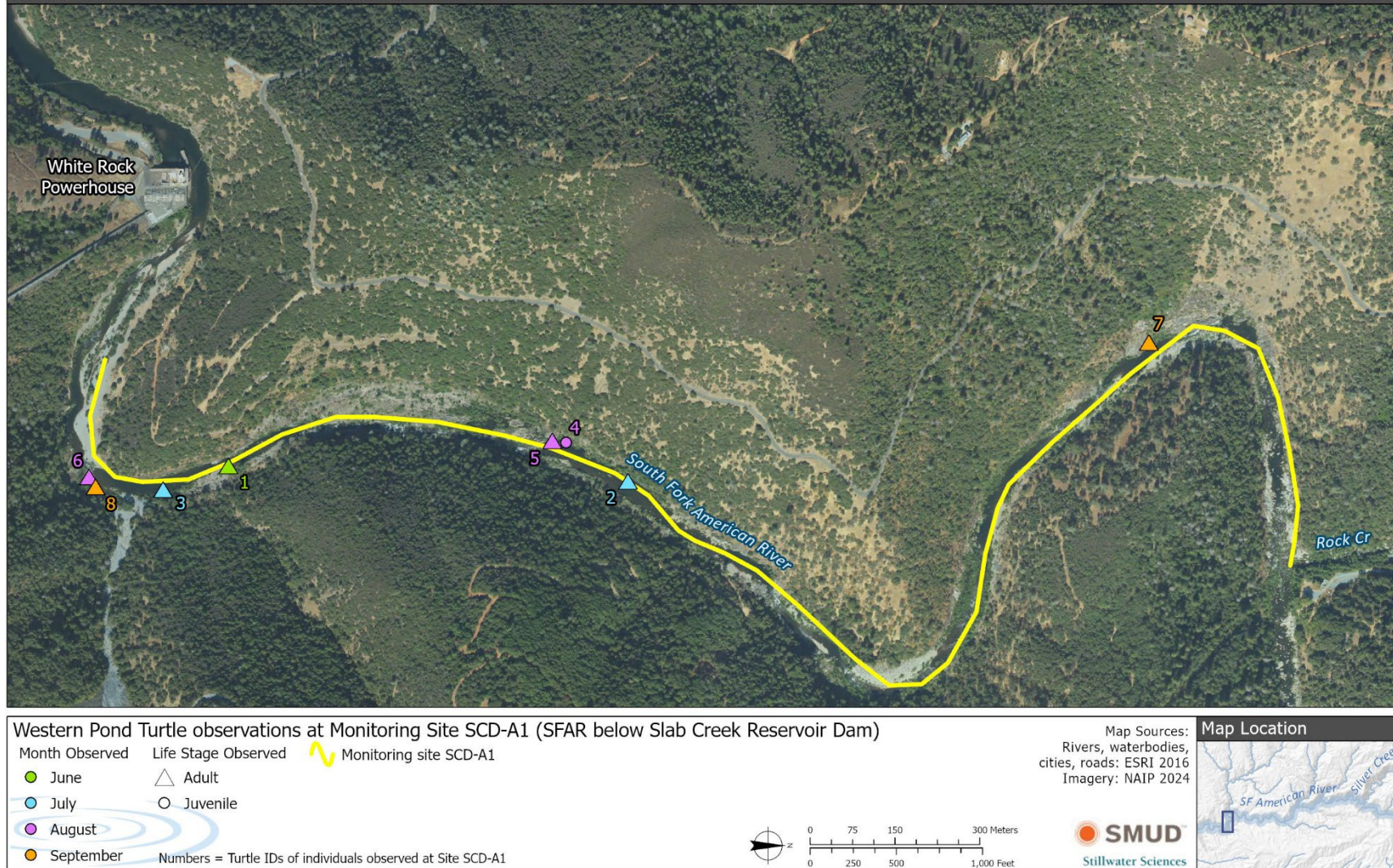
<sup>1</sup> Plastral scutes were too worn to be counted.

<sup>2</sup> Secondary sexual characteristics may not be fully developed at this life stage.

<sup>3</sup> This turtle was not captured.



MONITORING PROGRAM 2025 FINAL ANNUAL REPORT



**Figure 6-8. Western pond turtle observations at Site SCD-A1, 2025.**





**Figure 6-9. Western pond turtle (left: 8 July, Turtle ID No. 2) and carapace (right: 4 September, Turtle ID No. 7) at Site SCD-A1, 2025.**

Snorkelers observed eight turtles underwater at depths ranging from 1 inch to 5 feet in runs, glides, and mid-channel and backwater pools (Figure 6-10). Turtles were often observed seeking cover in root systems, undercut banks, bedrock crevices, boulders, sedges, and woody debris.



**Figure 6-10. Representative habitat where western pond turtles were observed (left: 5 August; right: 4 September) at Site SCD-A1, 2025.**

Seven of the eight turtles observed in 2025 were adults with secondary sexual characteristics.<sup>14</sup> Ages of the five turtles with countable scute rings were estimated to be between 4 and 10 years<sup>15</sup> (Table 6-6). Of the remaining three turtles observed, one was uncaptured and two had scute rings too worn to be counted (Figure 6-11). Additional photos of observed western pond turtles and associated habitat at Site SCD-A1 are available in Appendix F3.



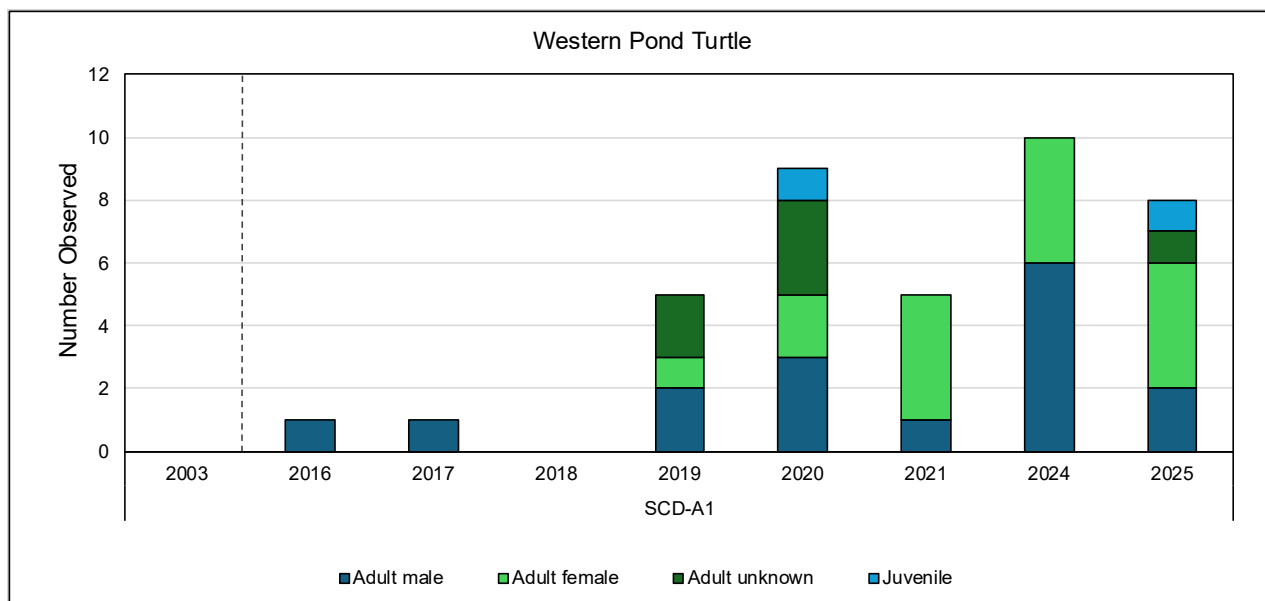
**Figure 6-11. Western pond turtle with a worn plastron with no countable scutes (left: 8 July, Turtle ID No. 2) and one with countable scutes (right: 5 August, Turtle ID No. 5), 2025.**

### 6.3.2.2 Historical Comparison

The number of western pond turtle observations at Site SCD-A1 has ranged from five to ten per monitoring year since 2019. Prior to 2019 (including pre-License and License implementation monitoring) a total of two western pond turtles were observed at Site SCD-A1 (Figure 6-12). Adult western pond turtles have been observed during most License implementation monitoring years, and one juvenile was recorded in both 2020 and 2025 (Figure 6-12, SMUD 2021).

<sup>14</sup> Juvenile turtles (less than 110–125 millimeters [mm] carapace length) of both sexes often exhibit female coloration (i.e., darker chin and throat with markings) but may begin exhibiting sexual dimorphism around this size (Bury et al. 2012). Size at maturity is poorly known and highly variable but estimated to be approximately 120-mm carapace length (Bury and Germano 2008, as cited in Bury et al. 2012).

<sup>15</sup> Plastron scute ring counts on western pond turtles can be used to estimate age. Scute rings are thought to be deposited annually up to 10 rings for this species (Bury and Germano 1998), after which they may be deposited inconsistently or become worn down, making them less accurate for age estimates (Germano and Bury 1998, Bury and Germano 1998).

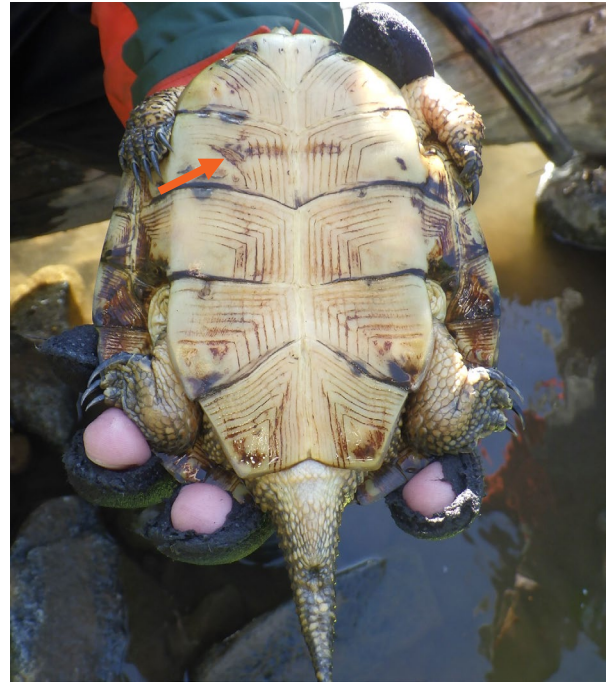


Note: One turtle observed in 2024 was identified as female at time of capture, but its sex has been updated to male in 2025 after additional review.

**Figure 6-12. Western pond turtle observations at Site SCD-A1 during pre-License and License implementation monitoring years.**

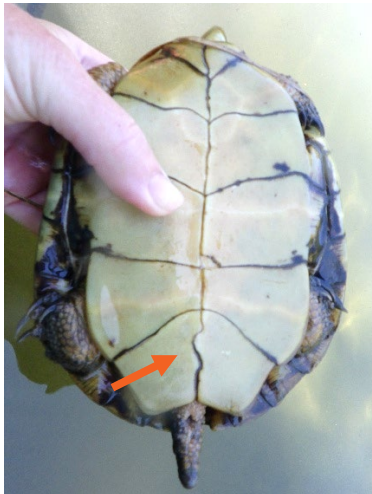
Two turtles captured in 2025 are recaptures from prior years, as determined by comparing photos of unique physical characteristics for individual turtles documented throughout License implementation monitoring. One adult male turtle (Turtle ID No. 8) was originally captured in 2024 (Figure 6-13). One adult female turtle (Turtle ID No. 2) was captured previously in 2019 and 2021 (Figure 6-14); her plastral scutes were too worn to be counted, suggesting she was at least 10 years of age in 2019 and thus at least 16 years of age in 2025. Both recaptured turtles were found near the respective areas within the monitoring site where they were previously captured.





Note: Orange arrows indicate unique features used to identify individuals.

**Figure 6-13. Adult male western pond turtle (Turtle ID No. 8) captured in 2024 (left: 25 September, 120-millimeter carapace length), and 2025 (right: 4 September, 121-millimeter-carapace length).**



Note: Orange arrows indicate unique features used to identify individuals.

**Figure 6-14. Adult female western pond turtle (Turtle ID No. 2) captured in 2019 (left: 31 July, 138-millimeter carapace length), 2021 (middle: 15 June, 140-millimeter carapace length), and 2025 (right: 8 July, 148-millimeter carapace length).**



### 6.3.2.3 Habitat Conditions

As with prior monitoring years, all survey sites contained suitable habitat for both foothill yellow-legged frog and western pond turtle; habitat conditions were similar to prior monitoring years and are detailed in the 2024 annual monitoring report (SMUD 2025). Representative photos of habitat at all survey sites in 2025 are available in Appendix F2. Notable habitat observations during the 2025 surveys are described below.

Similar to 2024, a substantial portion of the river's right bank at Site SCD-A1—dry during all monitoring years before 2024—was inundated during the June survey in 2025 (Figure 6-15). The area was dry again during all subsequent 2025 surveys.



Note: Orange arrow is the landmark point for reference.

**Figure 6-15. Habitat at Site SCD-A1 that was inundated on 12 June (left) and dry on 4 September (right), 2025.**

Gnawed riparian vegetation was observed at Site SCD-A1, indicating presence of North American beaver (*Castor canadensis*).

### 6.3.3 Non-Target Species Observations

Five non-target amphibian and aquatic reptile species were observed during surveys in 2025 (Table 6-7, Figure 6-16). Non-target species observations included several known predators of foothill yellow-legged frogs and/or western pond turtles: non-native American bullfrogs (Woodruff et al. 2025, CDFW 2019, Nicholson et al. 2020, Sloan 2012), native garter snake species (*Thamnophis* spp.) (CDFW 2019), signal crayfish (*Pacifastacus leniusculus*), and fish. During the June survey at Site SCD-A1, an American bullfrog egg mass was observed in a large, warm backwater pool on the right bank. No American bullfrog egg masses have been detected in the reach prior to 2025, though all other life stages (including newly hatched and second year tadpoles) have been observed (Figure 6-17). Additional photos of non-target amphibian and reptile species observed during surveys are included in Appendix F4.

**Table 6-7. Non-target Herpetofauna Species Observed by Life Stage and Site, 2025.**

| Species Common Name<br>(Scientific name)                | Number of Individuals Observed <sup>1</sup> by Life Stage |                     |                  | Site(s) Where Species Observed                      |
|---------------------------------------------------------|-----------------------------------------------------------|---------------------|------------------|-----------------------------------------------------|
|                                                         | Egg Mass                                                  | Larval <sup>2</sup> | Juvenile / Adult |                                                     |
| Amphibians                                              |                                                           |                     |                  |                                                     |
| Sierran treefrog<br>( <i>Pseudacris sierra</i> )        | 0                                                         | 55                  | 1                | SCD-A1                                              |
| American bullfrog<br>( <i>Lithobates catesbeianus</i> ) | 1                                                         | 3,426               | 65               | SCD-A1                                              |
| Sierra newt<br>( <i>Taricha sierrae</i> )               | 1                                                         | 3 <sup>3</sup>      | 1                | CD-A3<br>(Figure 6-16),<br>Camino Adit <sup>4</sup> |
| Aquatic Reptiles                                        |                                                           |                     |                  |                                                     |
| Sierra garter snake<br>( <i>Thamnophis couchii</i> )    | 0                                                         | 0                   | 6                | CD-A3, CD-A4,<br>SCD-A1                             |
| Common garter snake<br>( <i>Thamnophis sirtalis</i> )   | 0                                                         | 0                   | 1                | SCD-A1                                              |

<sup>1</sup> Observations were totaled for all surveys.

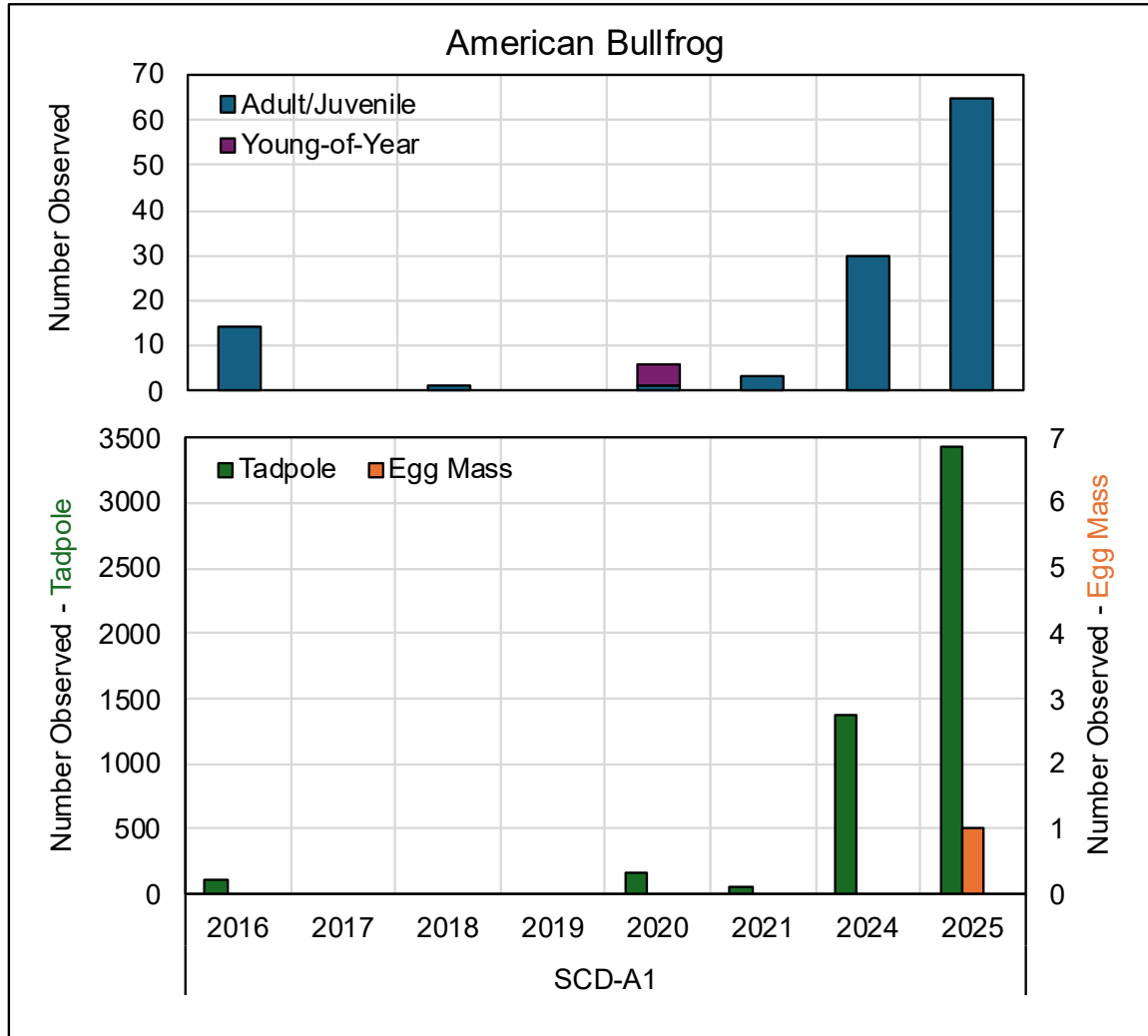
<sup>2</sup> Total numbers were approximated and cumulative.

<sup>3</sup> One of the three individuals observed was deceased.

<sup>4</sup> Camino Adit is an opportunistic search location.



**Figure 6-16. Sierra newt larva, Site CD-A3, 3 September 2025.**



**Figure 6-17. Observations of American bullfrog at Site SCD-A1 across License implementation monitoring years.**

## 6.4 DISCUSSION

### 6.4.1 Foothill Yellow-Legged Frog

Consistent with pre-License (2003–2004) and License implementation (Years 1–9, 2016–2024) monitoring, foothill yellow-legged frogs were observed only at Sites CD-A3 and CD-A4 during 2025 surveys.

In general, the number of frogs observed per year during License implementation monitoring at Site CD-A3 has remained lower than the single pre-License year, with no apparent trends across License implementation monitoring years. In contrast to 2024 survey results, there was no evidence to suggest foothill yellow-legged frog breeding in 2025 (i.e., no tadpole or egg mass observations). Sierra garter snake predation of an adult frog in 2025 (Section 6.3.1.1) and of a tadpole in 2024 (SMUD 2025) indicates that garter snakes are exerting pressure on this Silver Creek foothill yellow-legged frog

population. Foothill yellow-legged frogs have evolved alongside these native predators; however, due to this population's relatively small size, natural predation may have a disproportionately large impact on the relative abundance of frogs from year to year (Mills et al. 2012). At Site CD-A4, the number of foothill yellow-legged frog observations was generally lower in 2025 than the single pre-License year and the License implementation monitoring years. Site CD-A4 contains suitable foothill yellow-legged frog breeding habitat, though no definitive evidence of breeding (i.e., egg masses) has been observed during pre-License or License implementation monitoring.

Foothill yellow-legged frogs have not been observed at Site SCD-A1 during pre-License or License implementation monitoring. The site contains suitable aquatic features for breeding, so other factors likely preclude the species from occupying this monitoring site. American bullfrogs have been known to severely limit foothill yellow-legged frog abundance through predation and competition (CDFW 2019), so their presence at Site SCD-A1 likely contributes to the absence of foothill yellow-legged frogs. Bullfrogs are also a known carrier of *Batrachochytrium dendrobatidis*, the pathogen that causes chytridiomycosis, which is associated with die-offs in foothill yellow-legged frog populations (Adams et al. 2017). There were more American bullfrog observations of all life stages at Site SCD-A1 in 2025 than in previous years (SMUD 2021, 2022, 2025) (Figure 6-17). More than twice as many American bullfrog tadpoles and subadults/adults were observed at the monitoring site in 2025 than in 2024. This increased abundance could result in higher predation pressure on native herpetofauna, including foothill yellow-legged frogs.

#### 6.4.2 Western Pond Turtle

Consistent with pre-License and License implementation monitoring, western pond turtles were only observed at Site SCD-A1 in 2025. The total number of western pond turtles observed at Site SCD-A1 in 2025 was similar to the total number of observations in 2024 and 2020 (SMUD 2021, 2025), indicating that the number of western pond turtles at the site has generally been stable since 2019. However, most turtles observed during License implementation monitoring were adults, with only two juveniles observed (one in 2020 [SMUD 2021] and one in 2025 at Site SCD-A1). This older age structure is consistent with other studies that have found many populations of western pond turtles in California are skewed toward adults (Reese 1996, Manzo et al. 2021). This shift in age distribution may be attributed to lower detectability of younger age classes of turtles (Bury et al. 2012) or reduced recruitment rates. Predation by American bullfrogs is a primary cause of reduced recruitment in western pond turtle populations across their range, particularly for juvenile and hatchling turtles (Woodruff et al. 2025, Nicholson et al. 2020, Sloan 2012). Therefore, it is possible that the American bullfrog population at Site SCD-A1 is contributing to the lack of observed hatchling and juvenile pond turtles, despite the population of sexually mature turtles and suitable nesting habitat available at the monitoring site.



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## **7.0 BEAR MANAGEMENT MONITORING**

This Bear-Human Interaction Monitoring Report addresses monitoring set forth in Condition Number 31 of Appendix B of Forest Service 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 whether the measures (primarily installation of bear-proof food and trash lockers, and public education) implemented by SMUD and 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 2025 recreation season are provided in this Report.

### **7.1 MONITORING PLAN OBJECTIVES**

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

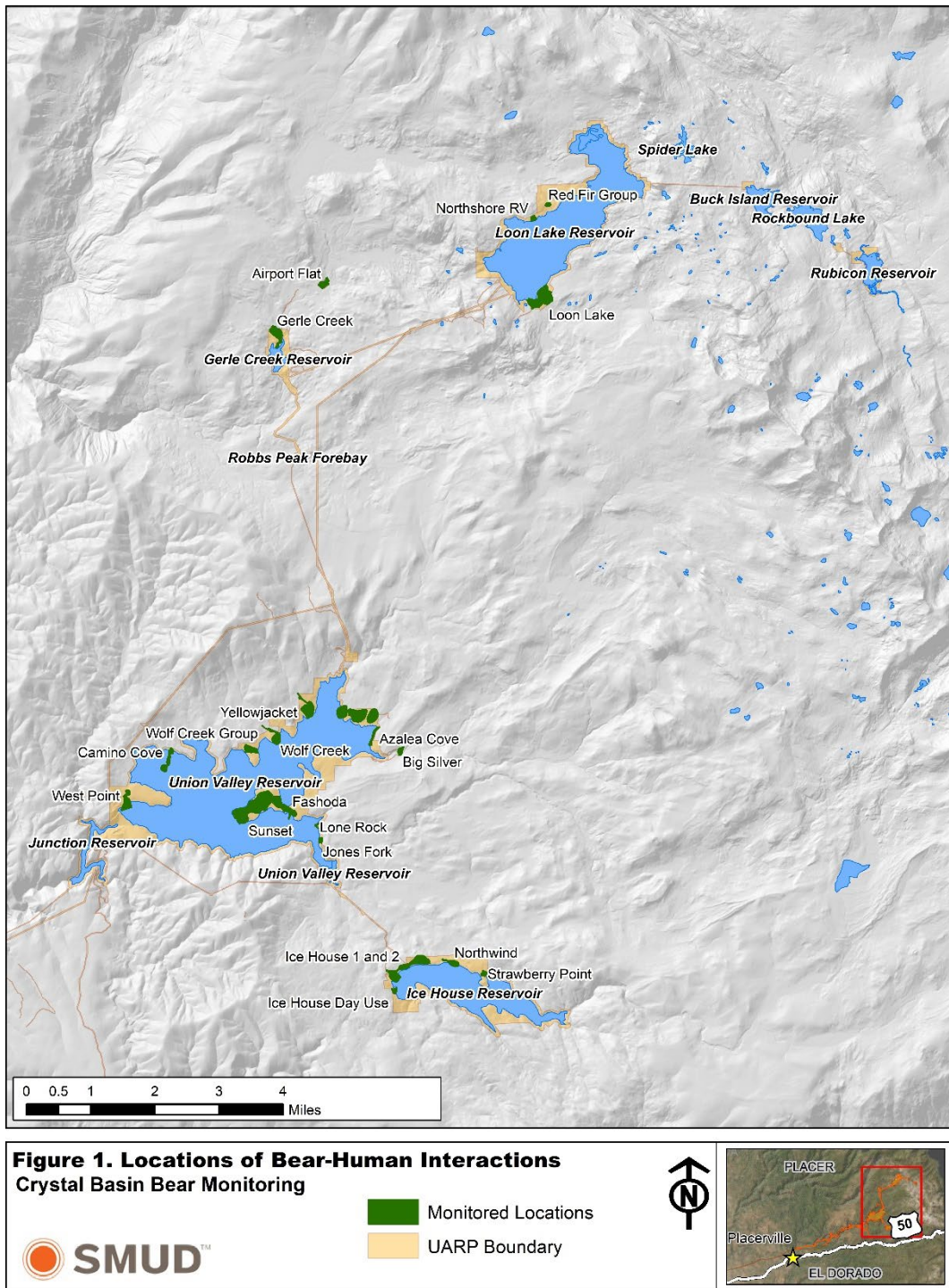
Monitor effectiveness of measures related to bear management using a method acceptable to FS [Forest Service], FWS [USFWS], and CDFG [California Department of Fish and Game].

This monitoring will help determine whether 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 [Forest Service], FWS [USFWS], and CDFG to identify and implement additional measures necessary to reduce such problems.

### **7.2 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 7-1, Table 7-1). These recreation facilities included both day-use and overnight facilities, hosted and unhosted.



**Figure 7-1. Bear-human interaction monitoring locations.**

**Table 7-1. Sites associated with the Upper American River Project Bear-Human Interaction 2025 Monitoring Program.**

| <b>Facility</b>                                                                          | <b>Existing Lockers / Trash</b> | <b>Hosted Site</b> | <b>Monitored</b> | <b>Comment</b>                                        |
|------------------------------------------------------------------------------------------|---------------------------------|--------------------|------------------|-------------------------------------------------------|
| 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                | CG closed due to construction                         |
| Red Fir CG                                                                               | Y                               | N                  | Y                | Monitoring form box installed                         |
| Pleasant Boat-in CG                                                                      | Y                               | N                  | N                | Monitoring form box installed at wilderness trailhead |
| 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 timber harvest plan       |
| Jones Fork CG                                                                            | Y                               | N                  | Y                | Monitoring form box installed                         |
| 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                         |

| Facility                          | Existing Lockers / Trash | Hosted Site | Monitored | Comment                                    |
|-----------------------------------|--------------------------|-------------|-----------|--------------------------------------------|
| 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         | Monitoring form box to be installed        |

Note: CG = Campground

### 7.3 METHODS

The methods of this monitoring program are outlined in the Plan prepared by SMUD in consultation with the Forest Service and CDFW in 2015. SMUD has prepared a form to collect standardized bear-human interaction data. The form is supplied to the Forest Service at the outset of each recreation season, and the Forest Service distributes the forms to campground hosts and to form boxes supplied by SMUD for unhosted sites. Signage that describes the monitoring program is supplied by SMUD and is posted at kiosk locations throughout the Crystal Basin. The Forest Service collects completed forms throughout the season and provides them to SMUD at the end of the season for reporting purposes. Data are provided by the visiting public, Forest Service staff, or campground hosts who have interviewed campers. SMUD staff communicate with Forest Service staff throughout the season to ensure supplies of forms are sufficient.

### 7.4 RESULTS AND DISCUSSION

At the annual kickoff meeting with the Forest Service and the recreation concessionaire in 2025, SMUD discussed the bear monitoring program and asked concessionaire staff at hosted campgrounds to distribute and collect informational forms from campers. As seen in Table 7-1, most of the facilities were monitored throughout the 2025 recreation season, except for a closure at Camino Cove related to the Forest Service’s timber harvest plan along the north shore of Union Valley



Reservoir. In 2025, Forest Service and SMUD staff stocked collection boxes regularly with bear-human interaction forms. The concessionaire hosts were also supplied with forms that were collected at the end of the season by Forest Service staff.

SMUD received seven completed forms (Appendix G1) from the Forest Service for the 2025 recreation season. The results of which are summarized in the table located in Appendix G2. Completed bear-human encounter forms came from the following designated monitoring sites: Jones Fork Campground (2), Northwind Campground (2), Gerle Campground (1), Strawberry Point Campground (1), and Union Valley Bike Trail (1).

Since monitoring started in 2016, the number of reported incidents of human-bear encounters has fluctuated from a high of 43 in 2017 to a low of 7 in 2023 and 2025. Reported incidents have come from recreational facilities across the Crystal Basin. Many bears involved in the interactions seem to be habituated to humans and are not easily deterred, particularly when numerous incidents occur in a single area. All campground and day use locations in the monitoring program have bear-resistant trash and food storage containers (Table 7-1).

In 2025, four of the seven bear-human encounters involved food stored outside designated bear-resistant storage containers (Appendix G2). The remaining incidents involved bears attracted to food odor and trash or were encountered on recreational trails. Most bear encounters occurred at the Jones Fork and Northwind Campgrounds. Two forms reported property damage to a backpack and a trailer.

As indicated in previous reports, continuing public education and enforcement are needed to ensure **all food, trash, or scented products** are stored in bear-proof food lockers or trash receptacles. This message should be continually reinforced by the Forest Service and its concessionaire hosts. Based on observations and the monitoring results to date, SMUD makes the following recommendations and suggestions:

- SMUD, CDFW, and the Forest Service should continue to present information on the monitoring program to the concessionaire hosts during an annual meeting and emphasize the importance of proper food storage.
- SMUD and the Forest Service 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.
- The Forest Service should continue to emphasize the need for concessionaire staff to inform 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.

- The Forest Service could consider having all guests that make reservations online for campsites to sign an acknowledgment regarding complying with food storage.

SMUD will continue to provide the results of monitoring to the Forest Service 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.

## **7.5 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 2025, SMUD, with the help of the Forest Service, will ensure that each site, including hosted sites, have adequate signage to educate the public about bears and inform visitors of the monitoring program. If requested by the Forest Service, SMUD will attend the annual kick-off meeting with the recreation concessionaire to present the details of the monitoring program. SMUD will also provide the Forest Service with 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.

## **7.6 LITERATURE CITED**

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## **8.0 LARGE WOODY DEBRIS**

No large woody debris met the size criteria for passage at Robbs Reservoir Dam, Junction Reservoir Dam, Camino Reservoir Dam, or Slab Creek Reservoir Dam in 2025.

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## **9.0 WATER TEMPERATURE**

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

### **9.1 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 whether 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.”



## 9.2 METHODS

### 9.2.1 Study Area and Sampling Locations

Continuous water temperature monitoring of stream reaches occurred in 2025 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 9-1 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 9-1. Upper American River Project Water Temperature Monitoring Site Locations.**

| Site Name | Site Description                                                               | UTM (NAD 83) |          | Sensor Type       | Data                | Threshold | Complete Record |
|-----------|--------------------------------------------------------------------------------|--------------|----------|-------------------|---------------------|-----------|-----------------|
|           |                                                                                | Easting      | Northing |                   |                     |           |                 |
| RR5       | Rubicon River immediately below Rubicon Reservoir Dam                          | 740501       | 4319200  | CS450L            | Telemetry           | None      | No <sup>1</sup> |
| 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   | Fiber Optic Network | None      | Yes             |
| SFRR5     | South Fork Rubicon River immediately below Robbs Peak Reservoir Dam            | 726202       | 4314316  | CS450L            | Fiber Optic Network | None      | Yes             |

| Site Name | Site Description                                                                       | UTM (NAD 83) |          | Sensor Type       | Data                | Threshold      | Complete Record |
|-----------|----------------------------------------------------------------------------------------|--------------|----------|-------------------|---------------------|----------------|-----------------|
|           |                                                                                        | Easting      | Northing |                   |                     |                |                 |
| SFRR6     | South Fork Rubicon River below confluence of Gerle Creek at the Project boundary       | 725256       | 4314907  | Onset data-logger | Manual              | 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             |
| SC8       | Silver Creek immediately upstream of the South Fork American River                     | 709310       | 4296208  | CS450L            | Telemetry           | DAVG<br>7DMAVG | Yes             |

| Site Name | Site Description                                                                   | UTM (NAD 83) |          | Sensor Type       | Data                | Threshold | Complete Record |
|-----------|------------------------------------------------------------------------------------|--------------|----------|-------------------|---------------------|-----------|-----------------|
|           |                                                                                    | Easting      | Northing |                   |                     |           |                 |
| 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      | No <sup>1</sup> |
| SFAR7     | South Fork American River at Mosquito Road Bridge                                  | 695572       | 4294304  | Onset Data-logger | Manual              | None      | Yes             |
| 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             |

Notes: 7DMAVG = 7-day moving average  
DAVG = daily average  
NAD 83 = North American Datum 1983  
UTM = Universal Transverse Mercator

<sup>1</sup> See Section 9.2.4 for discussion on missing record.

### 9.2.2 Temperature Data at Fixed Stations

Fifteen 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 batteries or by an existing hard-wired 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, Aquarius, 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 9-1).

### 9.2.3 Temperature Data at Datalogger Stations

Simple, non-permanent, calibrated temperature dataloggers (Onset HOBO<sup>®</sup> Water Temperature Pro V2) were deployed prior to 15 March 2025 at the remaining three sites (“manual” sites in Table 9-1). 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 9-1). 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 9-2 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.

### 9.2.4 Variances and Problems Encountered

Issues occurred with two telemetered fixed stations. RR5 (Rubicon River immediately below Rubicon Reservoir Dam) and SFAR13 (South Fork American River immediately below Slab Creek Reservoir Dam) missing data were caused by upgrades being made to the site during in which the site was non-operational. The missing data at RR5 occurred from September 9 to September 17; the missing data at SFAR13 occurred from June 25 to June 30.



**Figure 9-1. Water temperature datalogger housing, Rubicon River below confluence of Little Rubicon River.**

**Table 9-2. Specifications for Monitoring Equipment.**

| Sampling Equipment         | Accuracy                                                            | Range                                 |
|----------------------------|---------------------------------------------------------------------|---------------------------------------|
| Campbell Scientific 107L   | $<\pm 0.2^{\circ}\text{C}$ from $0^{\circ}$ to $50^{\circ}\text{C}$ | $-35^{\circ}$ to $50^{\circ}\text{C}$ |
| Campbell Scientific 450L   | $\pm 0.2^{\circ}\text{C}$ from $0^{\circ}$ to $50^{\circ}\text{C}$  | $0^{\circ}$ to $60^{\circ}\text{C}$   |
| Onset Computer Corp. HOBO® | $\pm 0.2^{\circ}\text{C}$ from $0^{\circ}$ to $50^{\circ}\text{C}$  | $-40^{\circ}$ to $50^{\circ}\text{C}$ |

Notes:  $<$  = less than  
 $^{\circ}\text{C}$  = degree Celsius



### **9.3 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.

### **9.4 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 releases 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) and in 4(e) Condition 27 (Forest Service). This monitoring involves informing the release of an additional “block of water” during Wet water year types when the daily average temperature 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).

## 9.5 ADAPTIVE MANAGEMENT

Thresholds connected to various UARP adaptive management conditions were crossed at three sites during the monitoring period (Table 9-3), triggering adaptive management actions.

**Table 9-3. 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 3                        |
| SC8       | Silver Creek immediately upstream of South Fork American River confluence | 7DMAVG, 12°C | May 27                        |
| SFAR15    | South Fork American River approximately 0.5 mile upstream of White Rock   | 7DMAVG, 12°C | May 4                         |

Note: 7DMAVG = 7-day moving average

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 3. The threshold exceedance did not trigger cancellation of recreational releases because foothill yellow-legged frog have not been documented in this section of river.

For water temperature monitoring at Silver Creek immediately upstream of South Fork American River confluence (SC8), No spill occurred at Camino Dam after the 7DMAVG reached the 12°C threshold on May 27.

For water temperature monitoring at South Fork American River approximately 0.5 mile upstream of White Rock, no spills occurred at Slab Dam after the 7DMAVG exceeded the 12°C threshold on May 4. Furthermore, all recreation releases were complete prior to the threshold exceedance date (May 4).

Because water year 2025 was Below Normal, the “block of water” adaptive management measures were not required.

## 9.6 RESULTS

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

## 9.7 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.

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# Monitoring Program 2025

## Volume II: Final Annual Report

### Appendices

#### Sacramento Municipal Utility District

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Upper American River Project

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## **APPENDIX A1**

### **Pre-License and License Minimum Streamflow Requirements for the Upper American River Project**

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**Table A-1. Minimum Streamflow Requirements prior to the 2014 License.**

| USGS<br>Gaging<br>Station                                                                   | Stream Reach                                                  | FERC<br>Article<br>29<br>Ref. | Minimum Streamflow<br>(cfs) |       |     |     |     |     |     |     |     |     |     |     |
|---------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------|-----------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                                                                             |                                                               |                               | Oct                         | Nov   | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| Years when less than 1.0 million acre-feet annual inflow is forecasted for Folsom Reservoir |                                                               |                               |                             |       |     |     |     |     |     |     |     |     |     |     |
| 11427960                                                                                    | Rubicon River below Rubicon Dam <sup>1</sup>                  | (a)                           | 6                           | 6     | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   |
| 11428400                                                                                    | Little Rubicon River below Buck Island Dam <sup>2</sup>       | (b)                           | 1                           | 1     | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 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 <sup>3,4</sup>  | (d) (g)                       | 1                           | 1     | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 11430000                                                                                    | Gerle Creek below Gerle Creek Dam <sup>3,4</sup>              | (d) (g)                       | 4                           | 4     | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   |
| 11441500                                                                                    | South Fork Silver Creek below Ice House Dam <sup>5</sup>      | (e) (g)                       | 5                           | 5     | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   |
| 11441800                                                                                    | Silver Creek below Junction Dam <sup>3</sup>                  | (f) (g)                       | 5                           | 5     | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   |
| 11441900                                                                                    | Silver Creek below Camino Dam <sup>3</sup>                    | (g)                           | 5                           | 5     | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   |
| 11442700                                                                                    | Brush Creek below Brush Creek Dam <sup>6,7</sup>              | (l)                           | 2                           | 4     | 4   | 4   | 4   | 4   | 4   | 4   | 2   | 2   | 2   | 2   |
| 1143500                                                                                     | South Fork American River below Slab Creek Dam <sup>7,8</sup> | (h)                           | 36                          | 36/10 | 10  | 10  | 10  | 10  | 10  | 10  | 36  | 36  | 36  | 36  |
| Years when 1.0–1.499 million acre-feet annual inflow is forecasted for Folsom Reservoir     |                                                               |                               |                             |       |     |     |     |     |     |     |     |     |     |     |
| 11427960                                                                                    | Rubicon River below Rubicon Dam <sup>1</sup>                  | (a)                           | 6                           | 6     | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   |
| 11428400                                                                                    | Little Rubicon River below Buck Island Dam <sup>2</sup>       | (b)                           | 1                           | 1     | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 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 <sup>3,4</sup>  | (d) (g)                       | 1                           | 1     | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 11430000                                                                                    | Gerle Creek below Gerle Creek Dam <sup>3,4</sup>              | (d) (g)                       | 4                           | 4     | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   | 4   |

| USGS<br>Gaging<br>Station                                                                                | Stream Reach                                                  | FERC<br>Article<br>29<br>Ref. | Minimum Streamflow<br>(cfs) |       |     |     |     |     |     |     |     |     |     |     |
|----------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|-------------------------------|-----------------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                                                                                          |                                                               |                               | Oct                         | Nov   | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| 11441500                                                                                                 | South Fork Silver Creek below Ice House Dam <sup>5</sup>      | (e) (g)                       | 5                           | 5     | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   | 5   |
| 11441800                                                                                                 | Silver Creek below Junction Dam <sup>3</sup>                  | (f) (g)                       | 10                          | 6     | 6   | 6   | 6   | 6   | 6   | 10  | 10  | 10  | 10  | 10  |
| 11441900                                                                                                 | Silver Creek below Camino Dam <sup>3</sup>                    | (g)                           | 10                          | 6     | 6   | 6   | 6   | 6   | 6   | 10  | 10  | 10  | 10  | 10  |
| 11442700                                                                                                 | Brush Creek below Brush Creek Dam <sup>6,7</sup>              | (i)                           | 2                           | 4     | 4   | 4   | 4   | 4   | 4   | 4   | 2   | 2   | 2   | 2   |
| 11443500                                                                                                 | South Fork American River below Slab Creek Dam <sup>7,8</sup> | (h)                           | 36                          | 36/10 | 10  | 10  | 10  | 10  | 10  | 10  | 36  | 36  | 36  | 36  |
| <b>Years when less than 1.5-1.999 million acre-feet annual inflow is forecasted for Folsom Reservoir</b> |                                                               |                               |                             |       |     |     |     |     |     |     |     |     |     |     |
| 11427960                                                                                                 | Rubicon River below Rubicon Dam <sup>1</sup>                  | (a)                           | 6                           | 6     | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   |
| 11428400                                                                                                 | Little Rubicon River below Buck Island Dam <sup>2</sup>       | (b)                           | 1                           | 1     | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 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 <sup>3,4</sup>  | (d) (g)                       | 3                           | 1     | 1   | 1   | 1   | 1   | 1   | 3   | 3   | 3   | 3   | 3   |
| 11430000                                                                                                 | Gerle Creek below Gerle Creek Dam <sup>3,4</sup>              | (d) (g)                       | 7                           | 4     | 4   | 4   | 4   | 4   | 4   | 7   | 7   | 7   | 7   | 7   |
| 11441500                                                                                                 | South Fork Silver Creek below Ice House Dam <sup>5,8</sup>    | (e) (g)                       | 12                          | 10/4  | 4   | 3   | 3   | 3   | 3   | 8   | 8   | 15  | 15  | 15  |
| 11441800                                                                                                 | Silver Creek below Junction Dam <sup>3</sup>                  | (f) (g)                       | 15                          | 8     | 8   | 8   | 8   | 8   | 8   | 15  | 15  | 15  | 15  | 15  |
| 11441900                                                                                                 | Silver Creek below Camino Dam <sup>3</sup>                    | (g)                           | 15                          | 8     | 8   | 8   | 8   | 8   | 8   | 15  | 15  | 15  | 15  | 15  |
| 11442700                                                                                                 | Brush Creek below Brush Creek Dam <sup>6,7</sup>              | (l)                           | 3                           | 6     | 6   | 6   | 6   | 6   | 6   | 6   | 3   | 3   | 3   | 3   |
| 1143500                                                                                                  | South Fork American River below Slab Creek Dam <sup>7</sup>   | (h)                           | 36                          | 36    | 36  | 36  | 36  | 36  | 36  | 36  | 36  | 36  | 36  | 36  |



| USGS<br>Gaging<br>Station                                                                 | Stream Reach                                                 | FERC<br>Article<br>29<br>Ref. | Minimum Streamflow<br>(cfs) |      |     |     |     |     |     |     |     |     |     |     |
|-------------------------------------------------------------------------------------------|--------------------------------------------------------------|-------------------------------|-----------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                                                                                           |                                                              |                               | Oct                         | Nov  | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep |
| Years when more than 2 million acre-feet annual inflow is forecasted for Folsom Reservoir |                                                              |                               |                             |      |     |     |     |     |     |     |     |     |     |     |
| 11427960                                                                                  | Rubicon River below Rubicon Dam <sup>1</sup>                 | (a)                           | 6                           | 6    | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   | 6   |
| 11428400                                                                                  | Little Rubicon River below Buck Island Dam <sup>2</sup>      | (b)                           | 1                           | 1    | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   | 1   |
| 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 <sup>3,4</sup> | (d) (g)                       | 3                           | 1    | 1   | 1   | 1   | 1   | 1   | 3   | 3   | 3   | 3   | 3   |
| 11430000                                                                                  | Gerle Creek below Gerle Creek Dam <sup>3,4</sup>             | (d) (g)                       | 7                           | 4    | 4   | 4   | 4   | 4   | 4   | 7   | 7   | 7   | 7   | 7   |
| 11441500                                                                                  | South Fork Silver Creek below Ice House Dam <sup>5,8</sup>   | (e) (g)                       | 12                          | 10/4 | 4   | 3   | 3   | 3   | 3   | 8   | 8   | 15  | 15  | 15  |
| 11441800                                                                                  | Silver Creek below Junction Dam <sup>3</sup>                 | (f) (g)                       | 20                          | 10   | 10  | 10  | 10  | 10  | 10  | 20  | 20  | 20  | 20  | 20  |
| 11441900                                                                                  | Silver Creek below Camino Dam <sup>3</sup>                   | (g)                           | 20                          | 10   | 10  | 10  | 10  | 10  | 10  | 20  | 20  | 20  | 20  | 20  |
| 11442700                                                                                  | Brush Creek below Brush Creek Dam <sup>6,7</sup>             | (i)                           | 3                           | 6    | 6   | 6   | 6   | 6   | 6   | 6   | 3   | 3   | 3   | 3   |
| 11443500                                                                                  | South Fork American River below Slab Creek Dam <sup>7</sup>  | (h)                           | 36                          | 36   | 36  | 36  | 36  | 36  | 36  | 36  | 36  | 36  | 36  | 36  |

Notes: cfs = cubic feet per second, DWR = California Department of Water Resources, USGS = U.S. Geological Survey

<sup>1</sup> The minimum streamflow requirement is 6 cfs or the natural flow, whichever is less, plus storage provided by stream flow maintenance dams in Lakes Clyde, Schmidell, Lois, and Middle Velma.

<sup>2</sup> The minimum streamflow requirement is 1 cfs at all times in addition to the storage releases from stream flow maintenance dams in Rockbound and Highland Lakes.

<sup>3</sup> Requirements are based on the 1 April DWR Bulletin 120 forecasted "Water Year Unimpaired Runoff" for Folsom Reservoir.

<sup>4</sup> Combined releases should be either 10 cfs or 5 cfs (as noted in this table), measured on the South Fork Rubicon River below the mouth of Gerle Creek.

<sup>5</sup> Requirements are based on the DWR Bulletin 120 forecasted "Water Year Unimpaired Runoff" to Folsom Reservoir, beginning with the 1 April bulletin and applying in turn the 1 May bulletin as it is issued. The 1 May bulletin applies until 1 April bulletin of the succeeding year is issued.

<sup>6</sup> Requirements are as specified or natural flow, whichever is less.

<sup>7</sup> Requirements are based on the DWR Bulletin 120 forecasted "Water Year Unimpaired Runoff" to Folsom Reservoir, beginning with the 1 March bulletin and applying in turn the 1 April and 1 May bulletins as they are issued. The 1 May bulletin applies until the 1 March bulletin of the succeeding year is issued.

<sup>8</sup> From 1 November–15 November, releases are 10 cfs; from 16 November–30 November, releases are 4 cfs.

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**Table A-2. Minimum Streamflow Requirements in the Current License.**

| USGS<br>Gaging<br>Station                                                                                                        | Stream Reach                                      | Minimum Streamflow<br>(cfs) |                |                |                |                |                |                |                |                |                |                |                |
|----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                                                                                                                  |                                                   | Jan                         | Feb            | Mar            | Apr            | May            | Jun            | Jul            | Aug            | Sep            | Oct            | Nov            | Dec            |
| Critically Dry years when less than 0.9-million acre-feet water year unimpaired inflow was forecast for Folsom Lake <sup>a</sup> |                                                   |                             |                |                |                |                |                |                |                |                |                |                |                |
| 11427960                                                                                                                         | Rubicon River below<br>Rubicon Dam                | 6 <sup>b</sup>              | 6 <sup>b</sup> | 6 <sup>b</sup> | 8              | 10             | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> |
| 11428400                                                                                                                         | Little Rubicon River below<br>Buck Island Dam     | 1 <sup>b</sup>              | 1 <sup>b</sup> | 1 <sup>b</sup> | 2              | 2              | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> |
| 11429500                                                                                                                         | Gerle Creek below Loon<br>Lake Dam                | 12                          | 14             | 19             | 23             | 25             | 10             | 5              | 5              | 5              | 7              | 7              | 8              |
| 114296005                                                                                                                        | Gerle Creek Gerle Creek<br>Dam                    | 5                           | 5              | 7              | 9              | 9              | 9              | 7              | 5              | 5              | 5              | 4              | 4              |
| 11428995                                                                                                                         | South Fork Rubicon River<br>below Robbs Peak Dam  | 2                           | 2              | 3              | 4              | 4              | 4              | 3              | 3              | 3              | 3              | 1              | 1              |
| 11441500                                                                                                                         | South Fork Silver Creek<br>below Ice House Dam    | 6                           | 6              | 8              | 15             | 30             | 25             | 21             | 14             | 10             | 5              | 5              | 5              |
| 11441800                                                                                                                         | Silver Creek below Junction<br>Dam                | 6                           | 6              | 8              | 15             | 30             | 25             | 21             | 14             | 10             | 5              | 5              | 5              |
| 11441900                                                                                                                         | Silver Creek below Camino<br>Dam                  | 6                           | 6              | 8              | 15             | 30             | 25             | 21             | 14             | 10             | 5              | 5              | 5              |
| 11442700                                                                                                                         | Brush Creek below Brush<br>Creek Dam              | 6 <sup>b</sup>              | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 5 <sup>b</sup> | 4 <sup>b</sup> | 3 <sup>b</sup> | 4 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> |
| 11443500                                                                                                                         | South Fork American River<br>below Slab Creek Dam | 63                          | 63             | 63             | 100            | 109            | 90             | 77             | 63             | 63             | 63             | 63             | 63             |

| USGS<br>Gaging<br>Station                                                                                           | Stream Reach                                   | Minimum Streamflow<br>(cfs) |                |                |                 |                 |                |                |                |                |                |                |                |
|---------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------|----------------|----------------|-----------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                                                                                                     |                                                | Jan                         | Feb            | Mar            | Apr             | May             | Jun            | Jul            | Aug            | Sep            | Oct            | Nov            | Dec            |
| Dry years when 0.9- to 1.7-million acre-feet water year unimpaired inflow was forecast for Folsom Lake <sup>a</sup> |                                                |                             |                |                |                 |                 |                |                |                |                |                |                |                |
| 11427960                                                                                                            | Rubicon River below Rubicon Dam                | 6 <sup>b</sup>              | 6 <sup>b</sup> | 8              | 12              | 15              | 8              | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> |
| 11428400                                                                                                            | Little Rubicon River below Buck Island Dam     | 1 <sup>b</sup>              | 1 <sup>b</sup> | 2              | 3               | 3               | 2              | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> |
| 11429500                                                                                                            | Gerle Creek below Loon Lake Dam                | 15                          | 18             | 24             | 32              | 32              | 16             | 14             | 10             | 10             | 11             | 11             | 13             |
| 114296005                                                                                                           | Gerle Creek Gerle Creek Dam                    | 6                           | 6              | 10             | 12              | 12              | 12             | 10             | 9              | 9              | 9              | 4              | 5              |
| 11428995                                                                                                            | South Fork Rubicon River below Robbs Peak Dam  | 5                           | 5              | 7              | 9               | 9               | 9              | 5              | 5              | 5              | 3              | 2              | 3              |
| 11441500                                                                                                            | South Fork Silver Creek below Ice House Dam    | 12                          | 12             | 16             | 28              | 46              | 31             | 21             | 14             | 10             | 10             | 7              | 8              |
| 11441800                                                                                                            | Silver Creek below Junction Dam                | 12                          | 12             | 16             | 28              | 46              | 31             | 21             | 14             | 10             | 10             | 7              | 8              |
| 11441900                                                                                                            | Silver Creek below Camino Dam                  | 12                          | 12             | 16             | 28              | 46              | 31             | 21             | 14             | 10             | 10             | 7              | 8              |
| 11442700                                                                                                            | Brush Creek below Brush Creek Dam              | 7 <sup>b</sup>              | 7 <sup>b</sup> | 7 <sup>b</sup> | 7 <sup>b</sup>  | 7 <sup>b</sup>  | 7 <sup>b</sup> | 5 <sup>b</sup> | 4 <sup>b</sup> | 3 <sup>b</sup> | 4 <sup>b</sup> | 7 <sup>b</sup> | 7 <sup>b</sup> |
| 11443500                                                                                                            | South Fork American River below Slab Creek Dam | 63                          | 63             | 101            | 101–130–150–183 | 164–145–126–107 | 90             | 90             | 70             | 63             | 63             | 63             | 63             |

| USGS<br>Gaging<br>Station                                                                                                    | Stream Reach                                   | Minimum Streamflow<br>(cfs) |                |                             |                             |                             |                             |                |                |                |                |                |                |
|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------|----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                                                                                                              |                                                | Jan                         | Feb            | Mar                         | Apr                         | May                         | Jun                         | Jul            | Aug            | Sep            | Oct            | Nov            | Dec            |
| Below Normal years when 1.7- to 2.6-million acre-feet water year unimpaired inflow was forecast for Folsom Lake <sup>a</sup> |                                                |                             |                |                             |                             |                             |                             |                |                |                |                |                |                |
| 11427960                                                                                                                     | Rubicon River below Rubicon Dam                | 6 <sup>b</sup>              | 6 <sup>b</sup> | 15                          | 20                          | 35                          | 15                          | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> |
| 11428400                                                                                                                     | Little Rubicon River below Buck Island Dam     | 1 <sup>b</sup>              | 1 <sup>b</sup> | 3                           | 5                           | 8                           | 3                           | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> |
| 11429500                                                                                                                     | Gerle Creek below Loon Lake Dam                | 19                          | 22             | 30                          | 40                          | 40                          | 22                          | 22             | 14             | 14             | 16             | 16             | 18             |
| 114296005                                                                                                                    | Gerle Creek Gerle Creek Dam                    | 6                           | 6              | 12                          | 15                          | 15                          | 15                          | 13             | 12             | 10             | 10             | 6              | 6              |
| 11428995                                                                                                                     | South Fork Rubicon River below Robbs Peak Dam  | 7                           | 8              | 11                          | 13                          | 13                          | 13                          | 6              | 6              | 6              | 3              | 3              | 4              |
| 11441500                                                                                                                     | South Fork Silver Creek below Ice House Dam    | 18                          | 18             | 24                          | 41                          | 68                          | 46                          | 30             | 15             | 15             | 15             | 8              | 11             |
| 11441800                                                                                                                     | Silver Creek below Junction Dam                | 20                          | 20             | 25                          | 42                          | 68                          | 50                          | 30             | 15             | 15             | 15             | 20             | 20             |
| 11441900                                                                                                                     | Silver Creek below Camino Dam                  | 20                          | 20             | 25                          | 42                          | 68                          | 50                          | 30             | 15             | 15             | 15             | 20             | 20             |
| 11442700                                                                                                                     | Brush Creek below Brush Creek Dam              | 8 <sup>b</sup>              | 8 <sup>b</sup> | 8 <sup>b</sup>              | 8 <sup>b</sup>              | 8 <sup>b</sup>              | 8 <sup>b</sup>              | 5 <sup>b</sup> | 4 <sup>b</sup> | 3 <sup>b</sup> | 4 <sup>b</sup> | 8 <sup>b</sup> | 8 <sup>b</sup> |
| 11443500                                                                                                                     | South Fork American River below Slab Creek Dam | 70                          | 70             | 110–<br>130–<br>150–<br>180 | 222–<br>236–<br>247–<br>263 | 272–<br>286–<br>297–<br>303 | 255–<br>210–<br>165–<br>120 | 90             | 70             | 70             | 70             | 70             | 70             |



| USGS<br>Gaging<br>Station                                                                                                    | Stream Reach                                   | Minimum Streamflow<br>(cfs) |                |                             |                             |                             |                             |                |                |                |                |                |                |
|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------|----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|
|                                                                                                                              |                                                | Jan                         | Feb            | Mar                         | Apr                         | May                         | Jun                         | Jul            | Aug            | Sep            | Oct            | Nov            | Dec            |
| Above Normal years when 2.6- to 3.5-million acre-feet water year unimpaired inflow was forecast for Folsom Lake <sup>a</sup> |                                                |                             |                |                             |                             |                             |                             |                |                |                |                |                |                |
| 11427960                                                                                                                     | Rubicon River below Rubicon Dam                | 6 <sup>b</sup>              | 6 <sup>b</sup> | 15                          | 20                          | 35                          | 15                          | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> | 6 <sup>b</sup> |
| 11428400                                                                                                                     | Little Rubicon River below Buck Island Dam     | 1 <sup>b</sup>              | 1 <sup>b</sup> | 3                           | 5                           | 8                           | 3                           | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> | 1 <sup>b</sup> |
| 11429500                                                                                                                     | Gerle Creek below Loon Lake Dam                | 23                          | 27             | 37                          | 49                          | 49                          | 27                          | 27             | 17             | 17             | 20             | 20             | 22             |
| 114296005                                                                                                                    | Gerle Creek Gerle Creek Dam                    | 6                           | 6              | 9                           | 9                           | 15                          | 15                          | 15             | 12             | 10             | 10             | 6              | 6              |
| 11428995                                                                                                                     | South Fork Rubicon River below Robbs Peak Dam  | 7                           | 8              | 9                           | 10                          | 13                          | 13                          | 13             | 11             | 6              | 3              | 3              | 4              |
| 11441500                                                                                                                     | South Fork Silver Creek below Ice House Dam    | 18                          | 18             | 24                          | 41                          | 68                          | 46                          | 30             | 15             | 15             | 15             | 8              | 11             |
| 11441800                                                                                                                     | Silver Creek below Junction Dam                | 20                          | 20             | 25                          | 42                          | 68                          | 59                          | 35             | 18             | 18             | 15             | 20             | 20             |
| 11441900                                                                                                                     | Silver Creek below Camino Dam                  | 20                          | 20             | 25                          | 42                          | 68                          | 59                          | 35             | 18             | 18             | 15             | 20             | 20             |
| 11442700                                                                                                                     | Brush Creek below Brush Creek Dam              | 9 <sup>b</sup>              | 9 <sup>b</sup> | 9 <sup>b</sup>              | 9 <sup>b</sup>              | 9 <sup>b</sup>              | 9 <sup>b</sup>              | 5 <sup>b</sup> | 4 <sup>b</sup> | 3 <sup>b</sup> | 4 <sup>b</sup> | 9 <sup>b</sup> | 9 <sup>b</sup> |
| 11443500                                                                                                                     | South Fork American River below Slab Creek Dam | 80                          | 80             | 110–<br>130–<br>150–<br>180 | 222–<br>236–<br>247–<br>263 | 272–<br>316–<br>367–<br>395 | 324–<br>256–<br>188–<br>120 | 90             | 70             | 70             | 80             | 80             | 80             |

| USGS<br>Gaging<br>Station                                                                                                | Stream Reach                                   | Minimum Streamflow<br>(cfs) |                 |                             |                             |                             |                             |                 |                 |                 |                 |                 |                 |
|--------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------|-----------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                                                                                                                          |                                                | Jan                         | Feb             | Mar                         | Apr                         | May                         | Jun                         | Jul             | Aug             | Sep             | Oct             | Nov             | Dec             |
| Wet years when greater than 3.5-million acre-feet water year unimpaired inflow was forecast for Folsom Lake <sup>a</sup> |                                                |                             |                 |                             |                             |                             |                             |                 |                 |                 |                 |                 |                 |
| 11427960                                                                                                                 | Rubicon River below Rubicon Dam                | 6 <sup>b</sup>              | 6 <sup>b</sup>  | 15                          | 20                          | 35                          | 15                          | 6 <sup>b</sup>  | 6 <sup>b</sup>  | 6 <sup>b</sup>  | 6 <sup>b</sup>  | 6 <sup>b</sup>  | 6 <sup>b</sup>  |
| 11428400                                                                                                                 | Little Rubicon River below Buck Island Dam     | 1 <sup>b</sup>              | 1 <sup>b</sup>  | 3                           | 5                           | 8                           | 3                           | 1 <sup>b</sup>  | 1 <sup>b</sup>  | 1 <sup>b</sup>  | 1 <sup>b</sup>  | 1 <sup>b</sup>  | 1 <sup>b</sup>  |
| 11429500                                                                                                                 | Gerle Creek below Loon Lake Dam                | 28                          | 32              | 44                          | 58                          | 58                          | 32                          | 32              | 20              | 20              | 23              | 23              | 26              |
| 114296005                                                                                                                | Gerle Creek Gerle Creek Dam                    | 6                           | 6               | 9                           | 9                           | 15                          | 15                          | 15              | 12              | 10              | 10              | 6               | 6               |
| 11428995                                                                                                                 | South Fork Rubicon River below Robbs Peak Dam  | 7                           | 8               | 9                           | 10                          | 13                          | 13                          | 13              | 11              | 6               | 3               | 3               | 4               |
| 11441500                                                                                                                 | South Fork Silver Creek below Ice House Dam    | 18                          | 18              | 24                          | 41                          | 68                          | 46                          | 30              | 15              | 15              | 15              | 8               | 11              |
| 11441800                                                                                                                 | Silver Creek below Junction Dam                | 20                          | 20              | 25                          | 42                          | 68                          | 59                          | 35 <sup>c</sup> | 18 <sup>c</sup> | 18 <sup>c</sup> | 15 <sup>c</sup> | 20 <sup>c</sup> | 20 <sup>c</sup> |
| 11441900                                                                                                                 | Silver Creek below Camino Dam                  | 20                          | 20              | 25                          | 42                          | 68                          | 59                          | 35 <sup>c</sup> | 18 <sup>c</sup> | 18 <sup>c</sup> | 15              | 20              | 20              |
| 11442700                                                                                                                 | Brush Creek below Brush Creek Dam              | 10 <sup>b</sup>             | 10 <sup>b</sup> | 10 <sup>b</sup>             | 10 <sup>b</sup>             | 10 <sup>b</sup>             | 9 <sup>b</sup>              | 5 <sup>b</sup>  | 4 <sup>b</sup>  | 3 <sup>b</sup>  | 4 <sup>b</sup>  | 9 <sup>b</sup>  | 10 <sup>b</sup> |
| 11443500                                                                                                                 | South Fork American River below Slab Creek Dam | 90                          | 90              | 110–<br>130–<br>150–<br>180 | 222–<br>236–<br>247–<br>263 | 272–<br>337–<br>387–<br>415 | 352–<br>274–<br>197–<br>120 | 90              | 70              | 70              | 90              | 90              | 90              |

Notes: DWR = California Department of Water Resources

- <sup>a</sup> The water year total volume of unimpaired inflow to Folsom Lake is used to determine the water year type. DWR makes forecasts of this volume, in units of thousands of acre-feet. One million acre-feet equals 1,000 thousand acre-feet. DWR publishes Bulletin 120 or posts the forecast on its website several days after 1 February, 1 March, 1 April, and 1 May of each year. The value forecasted in May applies until mid-October. DWR also computes the actual water year unimpaired inflow and posts this value on its website in mid-October. The value posted in October applies until the subsequent 1 February forecast is published.
- <sup>b</sup> Or natural inflow if less, but in all cases not less than 1 cfs
- <sup>c</sup> The Licensee may be required to release additional water below Camino Reservoir Dam in Wet years (see Condition 1.I., *Adaptive Water Temperature Management in Silver Creek below Junction and Camino Reservoir Dams*).

**APPENDIX A2****2025 Draft Annual Monitoring Reports Comment–Response Table**

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**Table A2-1. Responses to Comments on the 2025 Draft Annual Monitoring Report and Draft Water Quality Report, Upper American River Project.**

| Commenter                                                                 | Report Section    | Section No.      | Page No. | Comment                                                                                                                                                                                             | Response                                                                                                                                                                                                                                                                                       |
|---------------------------------------------------------------------------|-------------------|------------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2025 Annual Monitoring Report for the Upper American River Project</b> |                   |                  |          |                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                |
| Forest Service                                                            | --                | Various          | --       | No comments for recreation.                                                                                                                                                                         | Received.                                                                                                                                                                                                                                                                                      |
| Forest Service                                                            | 2.0, <i>Trout</i> | --               | -        | Where can I find information about Rubicon Springs fish stocking? Are they still stocking? What species are they stocking?                                                                          | SMUD does not have this information. This information would need to be requested from CDFW for its fish stocking program.                                                                                                                                                                      |
| Forest Service                                                            | 2.0, <i>Trout</i> | --               | --       | Has there been any evidence if the gravel augmentation below Slab Creek dam has helped increase the trout in the reaches below Slab Creek Dam ? Or just the flow management changes? Or maybe both? | A pilot study completed in 2019 determined that gravel augmentation below Slab Creek Dam is ineffective because it is considered a transport reach. A determination by state and federal resource agencies concurred with the cancellation of the study after 2019 due to its ineffectiveness. |
| Forest Service                                                            | 2.0, <i>Trout</i> | 2.3.3, Table 2-1 | 2-3      | Is there a historical elevational cut-off for California roach? Maybe nice to add this info to summary section of Species Richness (pg. 2-2).                                                       | See the Stream Fisheries Technical Report, Table 4.0, available at: <a href="#">Stream Fisheries Technical Report, January 2005, Version 2.</a>                                                                                                                                                |

| Commenter      | Report Section                         | Section No.      | Page No.     | Comment                                                                                                                                                                                                                                                              | Response                                                                                                                                                                                                                                                                                                                                                                                               |
|----------------|----------------------------------------|------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Forest Service | 2.0, <i>Trout</i>                      | 2.3.3, Table 2-1 | 2-3          | Are Sacramento suckers supposed to be up in the Icehouse reaches historically? What is generally considered the elevational cut-off for this species? May be nice to add this info to summary section of Species Richness (pg. 2-2).                                 | See the Stream Fisheries Technical Report, Table 4.0, available at: <a href="#">Stream Fisheries Technical Report, January 2005, Version 2.</a>                                                                                                                                                                                                                                                        |
| Forest Service | 2.0, <i>Trout</i>                      | 2.3.3, Table 2-1 | 2-3          | Were brook trout detected anywhere? If species not detected, may be good to remove from the legend for the table?                                                                                                                                                    | Brook trout were detected during pre-license studies in 2002–2005 at Rubicon Dam, which adds context to Table 2-1 and the lack of detections since then.                                                                                                                                                                                                                                               |
| Forest Service | 2.0, <i>Trout</i>                      | 2.4, Table 2-4   | 2-15 to 2-16 | I had not recalled seeing these objectives before, like this table. I am wondering a few things: at what point do we re-evaluate the objectives because the trout biomass in a lot of instances are far below the objective. How were these objectives decided upon? | Fish community objectives were set and approved by the Conditioning Approval Authorities in accordance with the Settlement Agreement (SMUD 2007). <sup>1</sup> Re-evaluation of the fish community objectives is not specified by the Settlement Agreement or the License. As described in Section 2.0, trout biomass in most reaches is similar across pre-License and License implementation levels. |
| Forest Service | 3.0, <i>Benthic Macroinvertebrates</i> | Table 3-2        | 3-4 to 3-5   | It would be good to add the sampling date to each site, maybe in Table 3-2 or somewhere else.                                                                                                                                                                        | Sample dates are provided in Table 3-1.                                                                                                                                                                                                                                                                                                                                                                |

| Commenter      | Report Section                                                                                                            | Section No.         | Page No.   | Comment                                                                                                                                                                                                                                                                                                                           | Response                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------|---------------------------------------------------------------------------------------------------------------------------|---------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Forest Service | 3.0, <i>Benthic Macroinvertebrates</i>                                                                                    | Table 3-2           | 3-4 to 3-5 | May be good to say something about the results, like they fall within the expected range, and this may be a good place to mention any thresholds we are trying not to exceed, so as to know how close we may be to high/low levels? I'm curious why alkalinity is higher at certain spots and what is a concerningly high number? | See Section 7, page 26, of the final Water Quality Monitoring Report—2025 for the discussion about pH in the Upper American River Project watersheds and the comparison of Project-wide water quality to State Basin Plan objectives. Alkalinity is generally considered low below 20 mg/L (see <a href="#">National Recommended Water Quality Criteria - Aquatic Life Criteria Table   US EPA</a> ). |
| Forest Service | 4.0, <i>Bald Eagle</i>                                                                                                    | --                  | --         | Will the Sunset Campground bald eagle nest breaking be mentioned in this report or in the 2026 one?                                                                                                                                                                                                                               | Yes, SMUD will address your comment in the 2026 Annual Monitoring Report.                                                                                                                                                                                                                                                                                                                             |
| Forest Service | 5.0, <i>Hardhead</i>                                                                                                      | 5.3.3.1, Figure 5-9 | 5-13       | It would be nice to add the water type year to each year.                                                                                                                                                                                                                                                                         | A discussion of water year type can be found in Section 1.0, <i>Introduction and Background</i> , paragraph 5.                                                                                                                                                                                                                                                                                        |
| Forest Service | Appendix B1, <i>Fish Population Site Photographs</i> , and Appendix C1, <i>Benthic Macroinvertebrate Site Photographs</i> | --                  |            | It would be great if the caption below photos include the date the photo was taken. Seems like high flows. How does timing of surveys compare throughout the years? I would expect differing results from surveys in early summer vs late?                                                                                        | Photo dates have been added to Appendix B1 and Appendix C1 of the 2025 Annual Monitoring Report. SMUD attempts to sample in the same seasonal window each year monitoring is required. Flows and water temperatures are more regularly impacted by water year type than month or week.                                                                                                                |

| Commenter                                                                        | Report Section      | Section No.                                 | Page No. | Comment                                                                                                                                                                              | Response                                                                                                                                                                                                                                                                                                                |
|----------------------------------------------------------------------------------|---------------------|---------------------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>2025 Water Quality Monitoring Report for the Upper American River Project</b> |                     |                                             |          |                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                         |
| Forest Service                                                                   | 6.0, <i>Results</i> | 6.2, <i>Bacteria</i>                        | 24       | It may be nice to mention the bathroom and upgrades made at Junction Reservoir in 2024 could have contributed to lower <i>E. coli</i> counts in 2025 compared to all previous years. | If SMUD continues to record lower <i>E. coli</i> counts, future reports will note the addition of the new bathroom per the Forest Service's request.                                                                                                                                                                    |
| Forest Service                                                                   | 6.0, <i>Results</i> | 6.3, <i>Incidental Species Observations</i> | 24–25    | Do we report incidental sightings of pearlshell mussel anywhere? Can we get the spatial data of where <i>didymo</i> (and pearlshell mussel) are detected throughout the years?       | Pearlshell mussel is not a species that SMUD is required to monitor, but it would be recorded if it were to be opportunistically encountered. To the extent feasible, SMUD will collect and share spatial data on incidental sightings of various species of interest, such as mentioned in the comment, in the future. |

Notes: CDFW = California Department of Fish and Wildlife

*Didymo* = *Didymosphenia geminata*

*E. coli* = *Escherichia coli*

Forest Service = U.S. Department of Agriculture, Forest Service

mg/L = milligram per liter

Settlement Agreement = Upper American River Project, FERC No. 2101, Chili Bar Hydroelectric Project, FERC No. 2155, Rationale Report for

Relicensing Settlement Agreement (SMUD 2007)

SMUD = Sacramento Municipal Utility District)

<sup>1</sup> SMUD (Sacramento Municipal Utility District). 2007. *Upper American River Project, FERC No. 2101, Chili Bar Hydroelectric Project, FERC No. 2155 Rationale Report for Relicensing Settlement Agreement*. 29 January 2007. Available at:

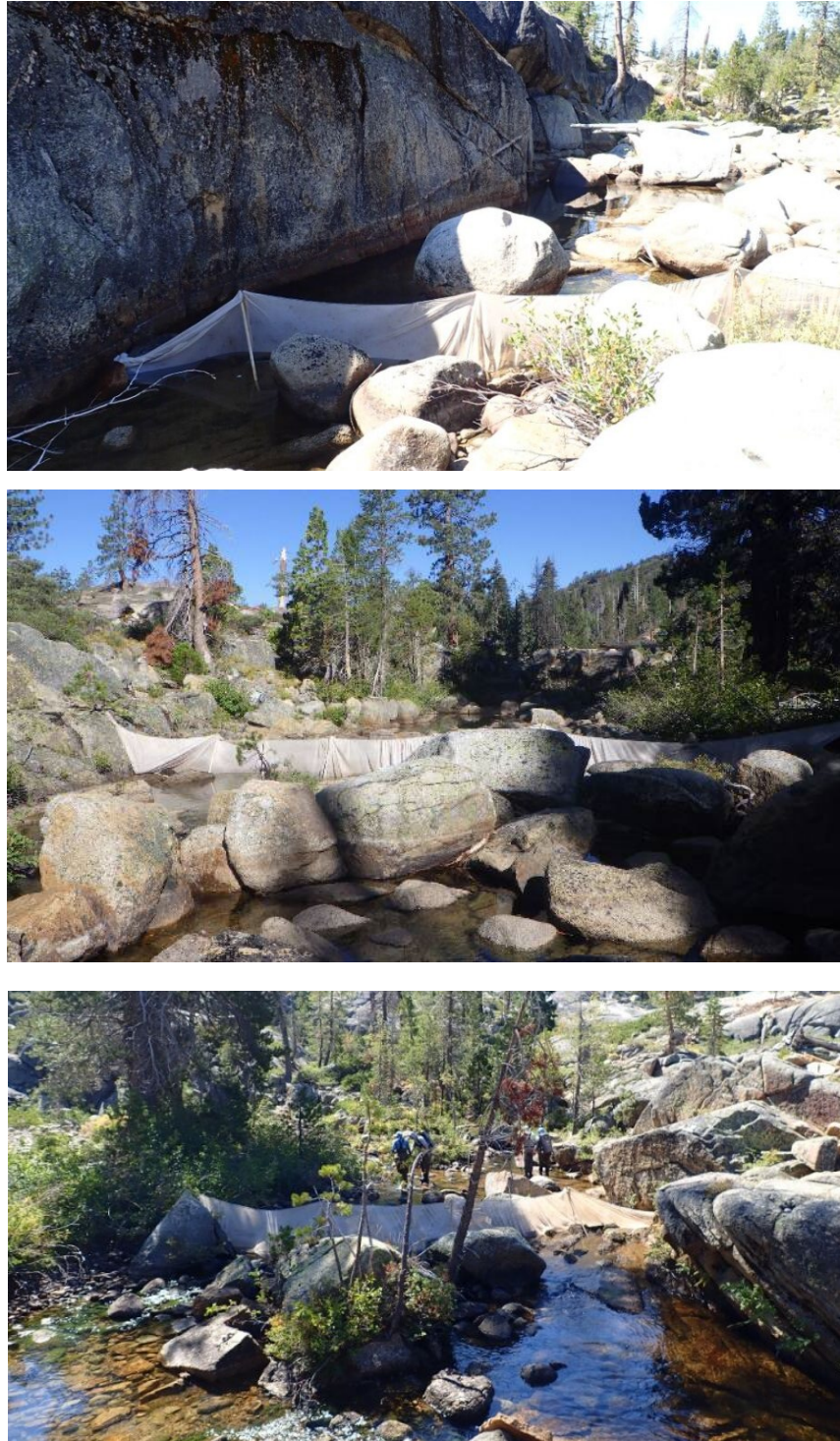
[https://water.waterboards.ca.gov/waterrights/water\\_issues/programs/water\\_quality\\_cert/docs/chilibar\\_ferc2155/rationale\\_report1\\_2007.pdf](https://water.waterboards.ca.gov/waterrights/water_issues/programs/water_quality_cert/docs/chilibar_ferc2155/rationale_report1_2007.pdf).

## **APPENDIX B1**

### **Fish Population Site Photographs**



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Note: Photos taken September 17, 2025.

**Figure B1-1. Site RRD-F1, Rubicon River downstream of Rubicon Dam, 2025: upper net looking downstream (top), middle net looking upstream (center), and lower net looking upstream (bottom).**





Note: Photos taken September 18, 2025.

**Figure B1-2. Site RRD-F2, Rubicon River downstream of Rubicon Dam, 2025: upper net looking upstream (top) and lower net looking downstream (bottom).**

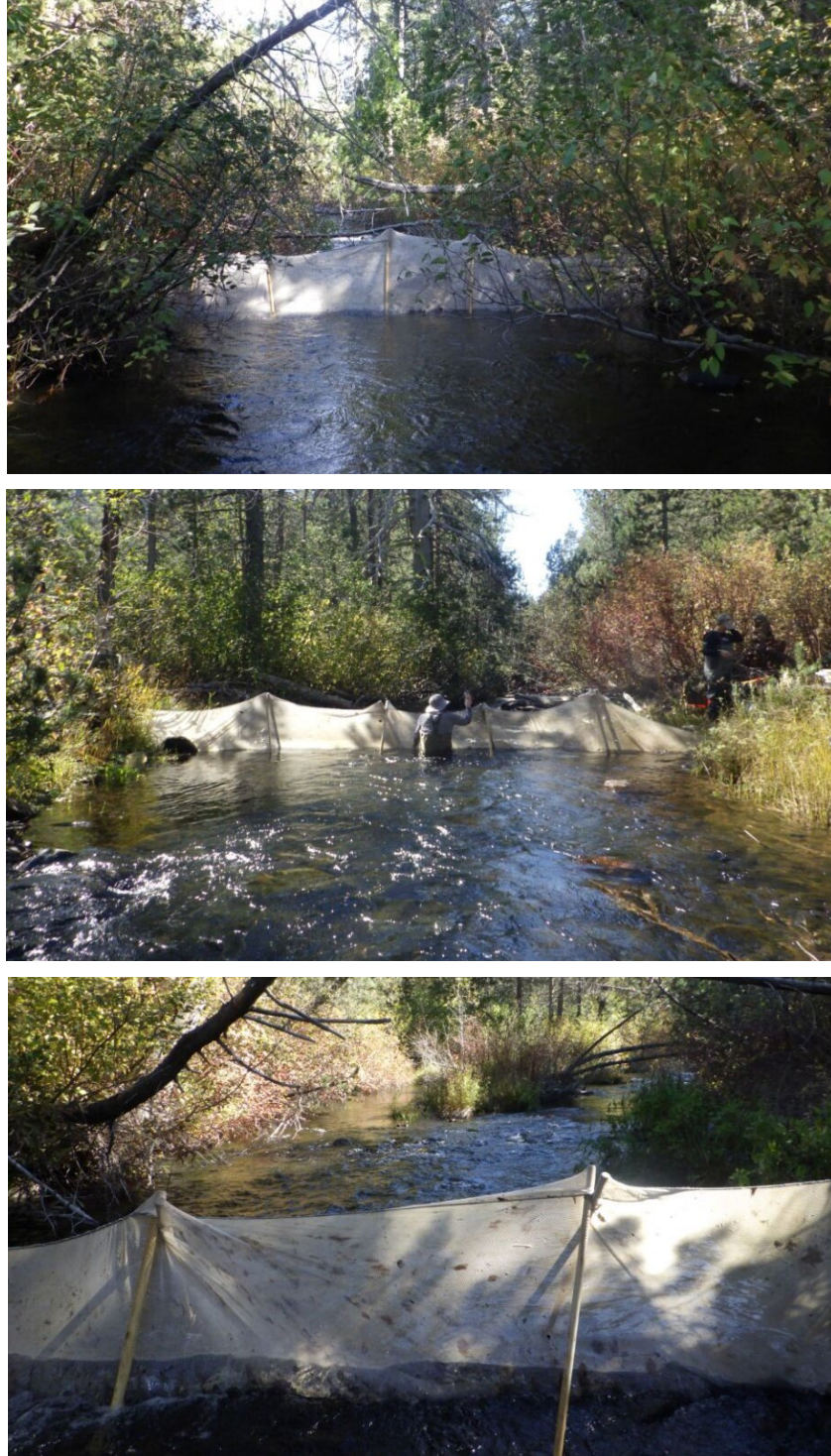




Note: Photos taken September 16, 2025.

**Figure B1-3.** Site BID-F1, Little Rubicon River downstream of Buck Island Dam, 2025: upper segment looking toward upstream barrier (top), middle net looking downstream toward the right bank (center), and lower net looking downstream (bottom).





Note: Photos taken October 2, 2025

**Figure B1-4. Site LLD-F3, Gerle Creek downstream of Loon Lake Dam, 2025: upper net looking downstream (top), middle net looking downstream (center), and lower net looking upstream (bottom).**





Note: Photos taken October 13, 2025.

**Figure B1-5. Site LLD-F2, Gerle Creek downstream of Loon Lake Dam, 2025: upper net looking river right (top), middle net looking upstream (center), and lower net looking downstream (bottom).**

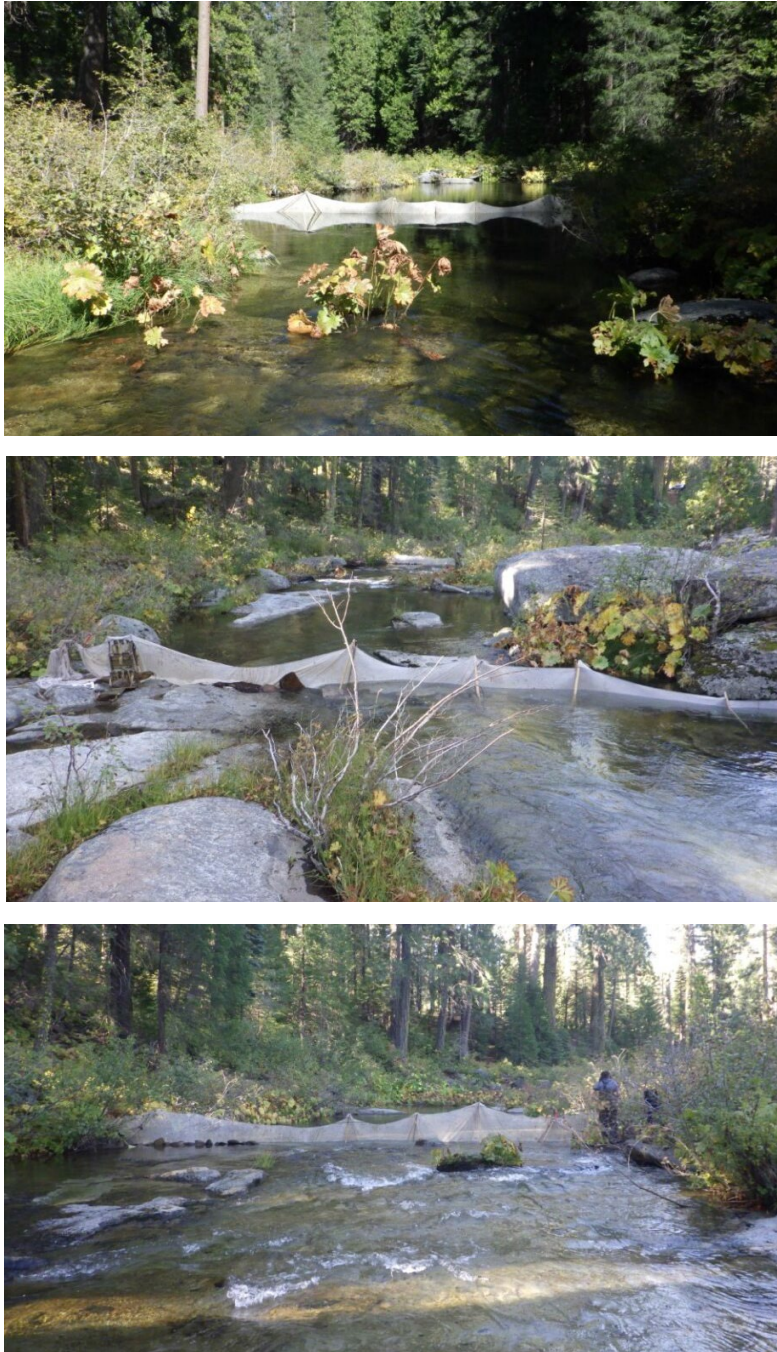




Note: Photos taken October 8, 2025.

**Figure B1-6. Site GCD-F1, Gerle Creek downstream of Gerle Creek Dam, 2025: upper net looking downstream (top), middle net looking upstream (middle), and lower net looking downstream (bottom).**

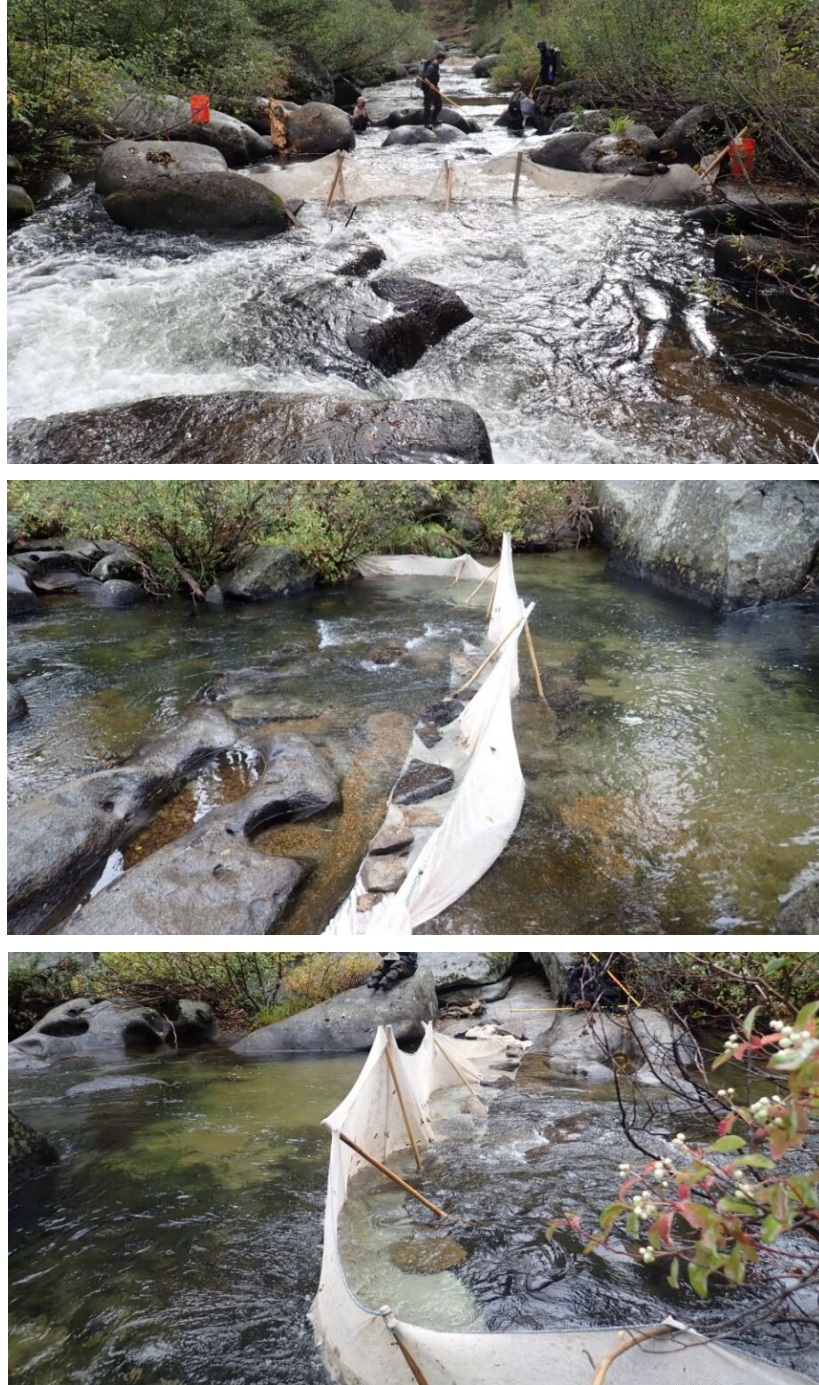




Note: Photos taken October 9, 2025.

**Figure B1-7. Site RPD-F1, South Fork Rubicon River downstream of Robbs Peak Dam, 2025: upper net looking upstream (top), middle net looking upstream (center), and lower net looking upstream (bottom).**





Note: Photos taken October 1, 2025.

**Figure B1-8. Site IHD-F1, South Fork Silver Creek downstream of Ice House Dam, 2025: upper net looking downstream (top), middle net looking toward river left (center), and lower net looking towards river right (bottom).**

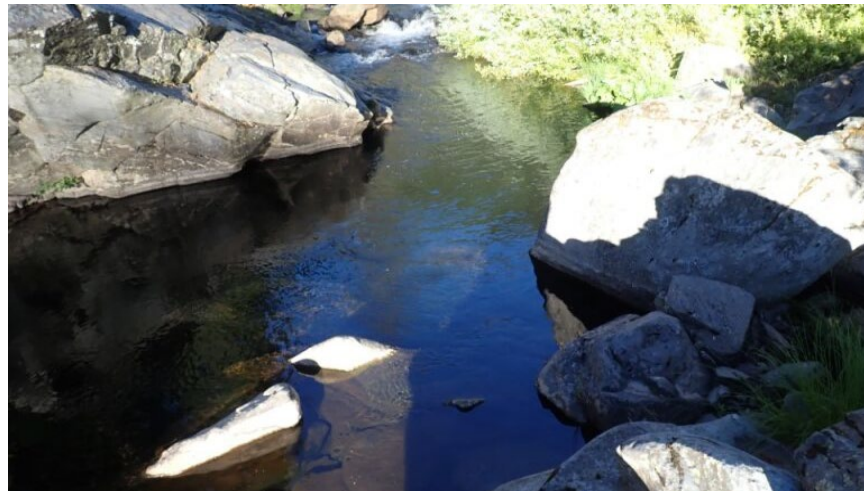




Note: Photos taken October 12, 2025.

**Figure B1-9. Site IHD-F2, South Fork Silver Creek downstream of Ice House Dam, 2025: upper net looking downstream (top), middle net looking upstream (center), and lower net looking downstream (bottom).**





Note: Photos taken August 18, 2025.

**Figure B1-10. Site JD-F3, Silver Creek downstream of Junction Dam, 2025: Unit #1—run (top left), Unit #2—high-gradient riffle (top right), Unit #3—pool (bottom right), and Unit #4—riffle (bottom left).**

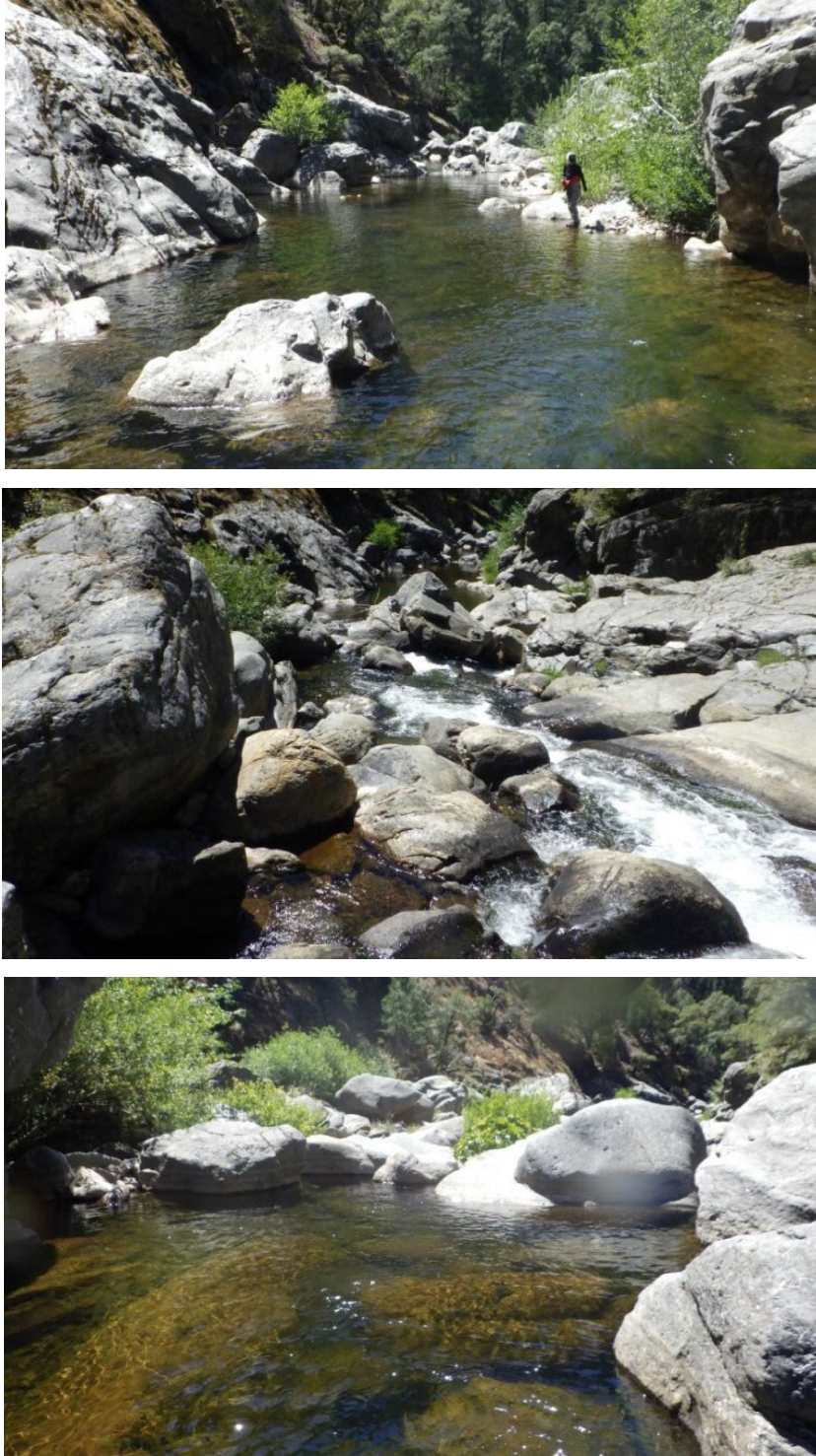




Note: Photos taken August 19, 2025.

**Figure B1-11. Site CD-F1, Silver Creek downstream of Camino Dam, 2025: Unit #1—pool (top left), Unit #2—riffle (top right), Unit #3—pool (bottom right), and Unit #4—riffle (bottom left).**





Note: Photos taken August 19, 2025.

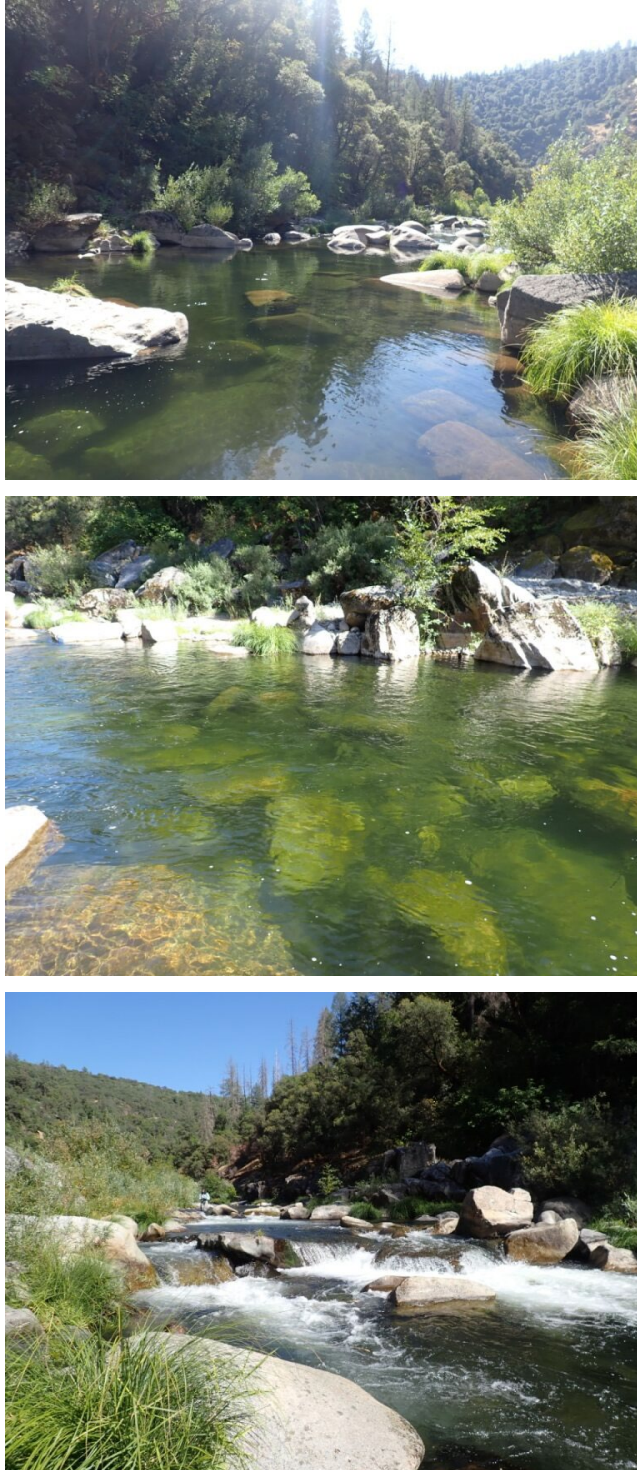
**Figure B1-12. Site CD-F1, Silver Creek downstream of Camino Dam, 2025: Unit #5—pool (top), Unit #6—riffle (center), and Unit #7—pool (bottom).**





Notes: Photos taken August 20, 2024. Due to the inadvertent loss of 2025 photos for this site, these 2024 monitoring photos were selected because they capture conditions similar to those encountered during the 2025 monitoring.

**Figure B1-13. Site SCD-F3, South Fork American River downstream of Slab Creek Dam, 2024: Unit #1—pocket water (top left), Unit #2—pool (top right), Unit #3—riffle (bottom right), Unit #4—pool (bottom left).**



Note: Photos taken September 8, 2025.

**Figure B1-14. Site SCD-F2, South Fork American River downstream of Slab Creek Dam, 2025: Unit #1—pool (top), Unit #2—run (center), Unit #3—run (bottom).**





Note: Photos taken September 8, 2025.

**Figure B1-15. Site SCD-F2, South Fork American River downstream of Slab Creek Dam, 2025: Unit #4—riffle (top) and Unit #5—pool (bottom).**

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## **APPENDIX B2**

### **Fish Population Site Conditions**

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**Table B2-1. Survey Site Conditions at Upper American River Project Trout Survey Locations, 2025.**

| Date       | Stream                  | Reach             | Site Name | Habitat Section | Method  | Site Length (feet) | Average Width (feet) | Maximum Depth (feet) | Water Temperature (°C) | Conductivity (uS/cm) | Approximate Flow (cfs) | Percent Habitat Type |        |     |       |
|------------|-------------------------|-------------------|-----------|-----------------|---------|--------------------|----------------------|----------------------|------------------------|----------------------|------------------------|----------------------|--------|-----|-------|
|            |                         |                   |           |                 |         |                    |                      |                      |                        |                      |                        | Pool                 | Riffle | Run | Glide |
| 9/17/2025  | Rubicon                 | Rubicon River Dam | RRD-F1    | Lower           | E-fish  | 127.6              | 28.4                 | 2.5                  | 15.8                   | 17.4                 | 1.3                    | 0                    | 2      | 28  | 70    |
| 9/17/2025  | Rubicon                 | Rubicon River Dam | RRD-F1    | Upper           | E-fish  | 143.7              | 36.5                 | 7.5                  | 15.8                   | 17.4                 | 1.3                    | 80                   | 2      | 0   | 18    |
| 9/18/2025  | Rubicon                 | Rubicon River Dam | RRD-F2    | Combined        | E-fish  | 230.7              | 24.9                 | 3.0                  | 16.6                   | 21.0                 | 1.3                    | 15                   | 2      | 3   | 80    |
| 9/16/2025  | Little Rubicon          | Buck Island Dam   | BID-F1    | Lower           | E-fish  | 206.7              | 13.7                 | 2.5                  | 14.9                   | 9.7                  | 1.3                    | 10                   | 10     | 0   | 80    |
| 9/16/2025  | Little Rubicon          | Buck Island Dam   | BID-F1    | Upper           | E-fish  | 72.2               | 44.2                 | 5.0                  | 14.9                   | 9.7                  | 1.3                    | 100                  | 0      | 0   | 0     |
| 10/7/2025  | Gerle Creek             | Loon Lake Dam     | LLD-F3    | Lower           | E-fish  | 227.8              | 22.2                 | 3.5                  | 12.6                   | 9.5                  | 17.4                   | 0                    | 20     | 80  | 0     |
| 10/7/2025  | Gerle Creek             | Loon Lake Dam     | LLD-F3    | Upper           | E-fish  | 107.3              | 23.1                 | 2.0                  | 14.7                   | 7.4                  | 17.4                   | 0                    | 25     | 75  | 0     |
| 10/13/2025 | Gerle Creek             | Loon Lake Dam     | LLD-F2    | Lower           | E-fish  | 97.8               | 30.1                 | 4.0                  | 8.8                    | 7.5                  | 18.1                   | 15                   | 5      | 80  | 0     |
| 10/13/2025 | Gerle Creek             | Loon Lake Dam     | LLD-F2    | Upper           | E-fish  | 210.8              | 48.3                 | 3.5                  | 8.8                    | 7.5                  | 18.1                   | 15                   | 25     | 60  | 0     |
| 10/8/2025  | Gerle Creek             | Gerle Creek Dam   | GCD-F1    | Lower           | E-fish  | 146.7              | 31.8                 | 3.0                  | 11.6                   | 9.2                  | 11.0                   | 5                    | 10     | 85  | 0     |
| 10/8/2025  | Gerle Creek             | Gerle Creek Dam   | GCD-F1    | Upper           | E-fish  | 273.6              | 36.8                 | 6.0                  | 13.4                   | 12.0                 | 11.0                   | 0                    | 0      | 100 | 0     |
| 10/9/2025  | South Fork Rubicon      | Robb's Peak Dam   | RPD-F1    | Lower           | E-fish  | 165.5              | 45.3                 | 5.0                  | 11.5                   | 9.9                  | 9.4                    | 5                    | 20     | 75  | 0     |
| 10/9/2025  | South Fork Rubicon      | Robb's Peak Dam   | RPD-F1    | Upper           | E-fish  | 160.4              | 45.9                 | 5.0                  | 12.4                   | 9.8                  | 9.4                    | 90                   | 10     | 0   | 0     |
| 10/1/2025  | South Fork Silver Creek | Ice House Dam     | IHD-F1    | Lower           | E-fish  | 150.9              | 27.4                 | 4.5                  | 7.5                    | 10.0                 | 15.4                   | 0                    | 30     | 45  | 25    |
| 10/1/2025  | South Fork Silver Creek | Ice House Dam     | IHD-F1    | Upper           | E-fish  | 131.2              | 34.7                 | 6.0                  | 7.5                    | 10.0                 | 15.4                   | 35                   | 10     | 55  | 0     |
| 10/12/2025 | South Fork Silver Creek | Ice House Dam     | IHD-F2    | Lower           | E-fish  | 144.0              | 32.3                 | 3.0                  | 6.7                    | 9.7                  | 15.4                   | 0                    | 15     | 75  | 10    |
| 10/12/2025 | South Fork Silver Creek | Ice House Dam     | IHD-F2    | Upper           | E-fish  | 221.5              | 33.4                 | 3.0                  | 6.7                    | 9.7                  | 15.4                   | 0                    | 30     | 55  | 15    |
| 8/18/2025  | Silver Creek            | Junction Dam      | JD-F3     | 1               | Snorkel | 183.7              | 35.6                 | 4.0                  | 15.0                   | 11.6                 | 16.2                   | 0                    | 25     | 75  | 0     |
| 8/18/2025  | Silver Creek            | Junction Dam      | JD-F3     | 2               | Snorkel | 144.4              | 40.5                 | 4.0                  | 15.0                   | 11.6                 | 16.2                   | 15                   | 85     | 0   | 0     |
| 8/18/2025  | Silver Creek            | Junction Dam      | JD-F3     | 3               | Snorkel | 196.9              | 41.2                 | 10.0                 | 15.0                   | 11.6                 | 16.2                   | 100                  | 0      | 0   | 0     |
| 8/18/2025  | Silver Creek            | Junction Dam      | JD-F3     | 4               | Snorkel | 331.4              | 59.1                 | 4.5                  | 15.0                   | 11.6                 | 16.2                   | 2                    | 98     | 0   | 0     |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 1               | Snorkel | 278.9              | 53.3                 | 18.0                 | 11.9                   | 10.5                 | 16.7                   | 100                  | 0      | 0   | 0     |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 2               | Snorkel | 114.8              | 51.5                 | 6.0                  | 11.9                   | 10.5                 | 16.7                   | 50                   | 50     | 0   | 0     |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 3               | Snorkel | 78.7               | 49.4                 | 7.0                  | 11.9                   | 10.5                 | 16.7                   | 100                  | 0      | 0   | 0     |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 4               | Snorkel | 98.4               | 53.2                 | 8.0                  | 11.9                   | 10.5                 | 16.7                   | 75                   | 25     | 0   | 0     |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 5               | Snorkel | 128.0              | 32.8                 | 6.0                  | 11.9                   | 10.5                 | 16.7                   | 98                   | 2      | 0   | 0     |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 6               | Snorkel | 98.4               | 32.4                 | 3.5                  | 11.9                   | 10.5                 | 16.7                   | 0                    | 100    | 0   | 0     |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 7               | Snorkel | 157.5              | 47.5                 | 4.0                  | 11.9                   | 10.5                 | 16.7                   | 15                   | 85     | 0   | 0     |
| 10/6/2025  | South Fork American     | Slab Creek Dam    | SCD-F3    | 1               | Snorkel | 177.2              | 41.6                 | 2.5                  | 12.7                   | 18.4                 | 79.3                   | 0                    | 100    | 0   | 0     |
| 10/6/2025  | South Fork American     | Slab Creek Dam    | SCD-F3    | 2               | Snorkel | 423.2              | 65.0                 | 1.5                  | 12.7                   | 18.4                 | 79.3                   | 95                   | 5      | 0   | 0     |
| 10/6/2025  | South Fork American     | Slab Creek Dam    | SCD-F3    | 3               | Snorkel | 219.8              | 30.9                 | 0.8                  | 12.7                   | 18.4                 | 79.3                   | 0                    | 100    | 0   | 0     |
| 10/6/2025  | South Fork American     | Slab Creek Dam    | SCD-F3    | 4               | Snorkel | 253.0              | 38.8                 | 6.0                  | 12.7                   | 18.4                 | 79.3                   | 30                   | 0      | 70  | 0     |



| Date     | Stream              | Reach          | Site Name | Habitat Section | Method  | Site Length (feet) | Average Width (feet) | Maximum Depth (feet) | Water Temperature (°C) | Conductivity (uS/cm) | Approximate Flow (cfs) | Percent Habitat Type |        |     |       |
|----------|---------------------|----------------|-----------|-----------------|---------|--------------------|----------------------|----------------------|------------------------|----------------------|------------------------|----------------------|--------|-----|-------|
|          |                     |                |           |                 |         |                    |                      |                      |                        |                      |                        | Pool                 | Riffle | Run | Glide |
| 9/8/2025 | South Fork American | Slab Creek Dam | SCD-F2    | 1               | Snorkel | 79.1               | 61.2                 | 6.0                  | 15.2                   | 17.9                 | 79.1                   | 100                  | 0      | 0   | 0     |
| 9/8/2025 | South Fork American | Slab Creek Dam | SCD-F2    | 2               | Snorkel | 110.9              | 39.0                 | 7.0                  | 15.2                   | 17.9                 | 79.1                   | 0                    | 0      | 100 | 0     |
| 9/8/2025 | South Fork American | Slab Creek Dam | SCD-F2    | 3               | Snorkel | 258.2              | 40.5                 | 5.0                  | 15.2                   | 17.9                 | 79.1                   | 0                    | 20     | 80  | 0     |
| 9/8/2025 | South Fork American | Slab Creek Dam | SCD-F2    | 4               | Snorkel | 152.9              | 28.1                 | 3.0                  | 15.2                   | 17.9                 | 79.1                   | 0                    | 100    | 0   | 0     |
| 9/8/2025 | South Fork American | Slab Creek Dam | SCD-F2    | 5               | Snorkel | 86.0               | 37.4                 | 7.0                  | 15.2                   | 17.9                 | 79.1                   | 90                   | 10     | 0   | 0     |

Notes: °C = degree Celsius  
uS/centimeter = microsiemen per centimeter  
cfs = cubic feet per second

**Table B2-2. Substrate, Cover, and Visibility Conditions at Upper American River Project Trout Survey Locations, 2025.**

| Date       | Stream                  | Reach             | Site Name | Habitat Section | Method  | Percent Cover |                     |                        |                    |        |               |          | Percent Substrate |         |        |        |      |      | Visibility (feet) |
|------------|-------------------------|-------------------|-----------|-----------------|---------|---------------|---------------------|------------------------|--------------------|--------|---------------|----------|-------------------|---------|--------|--------|------|------|-------------------|
|            |                         |                   |           |                 |         | Undercut Bank | Instream Vegetation | Overhanging Vegetation | Large Woody Debris | Bubble | Large Boulder | No Cover | Bedrock           | Boulder | Cobble | Gravel | Sand | Silt |                   |
| 2025       |                         |                   |           |                 |         |               |                     |                        |                    |        |               |          |                   |         |        |        |      |      |                   |
| 9/17/2025  | Rubicon                 | Rubicon River Dam | RRD-F1    | Lower           | E-fish  | 0             | 0                   | 2                      | 0                  | 0      | 40            | 58       | 75                | 15      | 8      | 1      | 1    | 0    | Max               |
| 9/17/2025  | Rubicon                 | Rubicon River Dam | RRD-F1    | Upper           | E-fish  | 0             | 0                   | 0                      | 0                  | 0      | 50            | 50       | 65                | 26      | 5      | 2      | 2    | 0    | Max               |
| 9/18/2025  | Rubicon                 | Rubicon River Dam | RRD-F2    | Combined        | E-fish  | 15            | 5                   | 5                      | 5                  | 0      | 2             | 68       | 0                 | 0       | 2      | 20     | 15   | 63   | Max               |
| 9/16/2025  | Little Rubicon          | Buck Island Dam   | BID-F1    | Lower           | E-fish  | 0             | 0                   | 1                      | 0                  | 4      | 15            | 80       | 15                | 75      | 0      | 0      | 10   | 0    | Max               |
| 9/16/2025  | Little Rubicon          | Buck Island Dam   | BID-F1    | Upper           | E-fish  | 5             | 5                   | 5                      | 10                 | 0      | 30            | 45       | 10                | 55      | 0      | 0      | 35   | 0    | Max               |
| 10/7/2025  | Gerle Creek             | Loon Lake Dam     | LLD-F3    | Lower           | E-fish  | 4             | 5                   | 20                     | 2                  | <1     | 0             | 68       | 0                 | 15      | 85     | 0      | 0    | 0    | Max               |
| 10/7/2025  | Gerle Creek             | Loon Lake Dam     | LLD-F3    | Upper           | E-fish  | <1            | <1                  | 20                     | 0                  | 5      | 10            | 65       | 0                 | 10      | 90     | 0      | 0    | 0    | Max               |
| 10/13/2025 | Gerle Creek             | Loon Lake Dam     | LLD-F2    | Lower           | E-fish  | 10            | <1                  | 3                      | 0                  | 3      | 60            | 23       | 0                 | 80      | 15     | 5      | 0    | 0    | Max               |
| 10/13/2025 | Gerle Creek             | Loon Lake Dam     | LLD-F2    | Upper           | E-fish  | 0             | 5                   | 0                      | 0                  | 5      | 30            | 60       | 5                 | 45      | 45     | 3      | 2    | 0    | Max               |
| 10/8/2025  | Gerle Creek             | Gerle Creek Dam   | GCD-F1    | Lower           | E-fish  | 0             | 20                  | 5                      | 0                  | 5      | 10            | 60       | 60                | 5       | 20     | 5      | 0    | 0    | Max               |
| 10/8/2025  | Gerle Creek             | Gerle Creek Dam   | GCD-F1    | Upper           | E-fish  | 2             | 2                   | 3                      | <1                 | 0      | 3             | 90       | 75                | 7       | 10     | 8      | <1   | 0    | Max               |
| 10/9/2025  | South Fork Rubicon      | Robb's Peak Dam   | RPD-F1    | Lower           | E-fish  | <1            | 5                   | 5                      | 0                  | 5      | 0             | 84       | 95                | 3       | 2      | 0      | 0    | 0    | Max               |
| 10/9/2025  | South Fork Rubicon      | Robb's Peak Dam   | RPD-F1    | Upper           | E-fish  | 2             | 5                   | 5                      | 0                  | 3      | 5             | 80       | 90                | 10      | 0      | 0      | 0    | 0    | Max               |
| 10/1/2025  | South Fork Silver Creek | Ice House Dam     | IHD-F1    | Lower           | E-fish  | 0             | 0                   | 4                      | 0                  | 5      | 16            | 75       | 70                | 15      | 0      | 0      | 15   | 0    | Max               |
| 10/1/2025  | South Fork Silver Creek | Ice House Dam     | IHD-F1    | Upper           | E-fish  | 0             | 0                   | 4                      | 0                  | 5      | 15            | 76       | 45                | 25      | 5      | 5      | 10   | 0    | Max               |
| 10/12/2025 | South Fork Silver Creek | Ice House Dam     | IHD-F2    | Lower           | E-fish  | 0             | 5                   | 3                      | 0                  | 10     | 5             | 77       | 70                | 10      | 15     | 5      | 0    | 0    | Max               |
| 10/12/2025 | South Fork Silver Creek | Ice House Dam     | IHD-F2    | Upper           | E-fish  | 0             | 5                   | 5                      | 0                  | 10     | 40            | 40       | 55                | 30      | 10     | 5      | 0    | 0    | Max               |
| 8/18/2025  | Silver Creek            | Junction Dam      | JD-F3     | 1               | Snorkel | 0             | 0                   | 5                      | 0                  | 5      | 30            | 60       | 25                | 50      | 20     | 5      | 0    | 0    | 16.2              |
| 8/18/2025  | Silver Creek            | Junction Dam      | JD-F3     | 2               | Snorkel | 0             | 0                   | 3                      | 5                  | 25     | 5             | 62       | 25                | 25      | 50     | 0      | 0    | 0    | 16.2              |
| 8/18/2025  | Silver Creek            | Junction Dam      | JD-F3     | 3               | Snorkel | 0             | 0                   | 2                      | 0                  | 3      | 15            | 80       | 30                | 35      | 35     | 0      | 0    | 0    | 16.2              |
| 8/18/2025  | Silver Creek            | Junction Dam      | JD-F3     | 4               | Snorkel | 0             | 0                   | 5                      | 0                  | 10     | 5             | 80       | 0                 | 30      | 70     | 0      | 0    | 0    | 16.2              |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 1               | Snorkel | 0             | 0                   | 1                      | 0                  | 1      | 15            | 83       | 15                | 55      | 30     | 0      | 0    | 0    | 29.7              |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 2               | Snorkel | 0             | 0                   | 2                      | 0                  | 25     | 35            | 38       | 5                 | 73      | 20     | 1      | 1    | 0    | 29.7              |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 3               | Snorkel | 0             | 0                   | 0                      | 0                  | 1      | 10            | 89       | 10                | 68      | 20     | 2      | 0    | 0    | 29.7              |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 4               | Snorkel | 0             | 0                   | 0                      | 0                  | 2      | 10            | 88       | 74                | 20      | 5      | 1      | 0    | 0    | 29.7              |
| 8/19/2025  | Silver Creek            | Camino Dam        | CD-F1     | 5               | Snorkel | 0             | 0                   | 0                      | 0                  | 2      | 10            | 88       | 10                | 35      | 50     | 3      | 2    | 0    | 29.7              |



| Date      | Stream              | Reach          | Site Name | Habitat Section | Method  | Percent Cover |                     |                        |                    |        |               |          | Percent Substrate |         |        |        |      |      | Visibility (feet) |
|-----------|---------------------|----------------|-----------|-----------------|---------|---------------|---------------------|------------------------|--------------------|--------|---------------|----------|-------------------|---------|--------|--------|------|------|-------------------|
|           |                     |                |           |                 |         | Undercut Bank | Instream Vegetation | Overhanging Vegetation | Large Woody Debris | Bubble | Large Boulder | No Cover | Bedrock           | Boulder | Cobble | Gravel | Sand | Silt |                   |
| 8/19/2025 | Silver Creek        | Camino Dam     | CD-F1     | 6               | Snorkel | 0             | 0                   | 0                      | 0                  | 20     | 15            | 65       | 15                | 70      | 15     | 0      | 0    | 0    | 29.7              |
| 8/19/2025 | Silver Creek        | Camino Dam     | CD-F1     | 7               | Snorkel | 0             | 0                   | 0                      | 0                  | 2      | 5             | 93       | 50                | 40      | 10     | 0      | 0    | 0    | 29.7              |
| 10/6/2025 | South Fork American | Slab Creek Dam | SCD-F3    | 1               | Snorkel | 3             | 0                   | 5                      | 0                  | 2      | 0             | 90       | 0                 | 95      | 5      | 0      | 0    | 0    | 12.5              |
| 10/6/2025 | South Fork American | Slab Creek Dam | SCD-F3    | 2               | Snorkel | 3             | 0                   | 0                      | 0                  | 3      | 0             | 94       | 15                | 60      | 25     | 0      | 0    | 0    | 12.5              |
| 10/6/2025 | South Fork American | Slab Creek Dam | SCD-F3    | 3               | Snorkel | 0             | 0                   | 0                      | 0                  | 20     | 0             | 80       | 0                 | 80      | 20     | 0      | 0    | 0    | 12.5              |
| 10/6/2025 | South Fork American | Slab Creek Dam | SCD-F3    | 4               | Snorkel | 0             | 0                   | 0                      | 0                  | 1      | 0             | 99       | 0                 | 90      | 10     | 0      | 0    | 0    | 12.5              |
| 9/8/2025  | South Fork American | Slab Creek Dam | SCD-F2    | 1               | Snorkel | 0             | 0                   | 0                      | 0                  | 0      | 15            | 85       | 5                 | 40      | 45     | 5      | 0    | 0    | 19.5              |
| 9/8/2025  | South Fork American | Slab Creek Dam | SCD-F2    | 2               | Snorkel | 0             | 0                   | 5                      | 0                  | 10     | 35            | 50       | 0                 | 88      | 10     | 2      | 0    | 0    | 19.5              |
| 9/8/2025  | South Fork American | Slab Creek Dam | SCD-F2    | 3               | Snorkel | 0             | <1                  | 5                      | 0                  | 25     | 10            | 60       | 0                 | 70      | 30     | 0      | 0    | 0    | 19.5              |
| 9/8/2025  | South Fork American | Slab Creek Dam | SCD-F2    | 4               | Snorkel | 0             | 0                   | 0                      | 0                  | 65     | 5             | 30       | 0                 | 70      | 30     | 0      | 0    | 0    | 19.5              |
| 9/8/2025  | South Fork American | Slab Creek Dam | SCD-F2    | 5               | Snorkel | 0             | 0                   | 5                      | 0                  | 5      | 25            | 65       | 2                 | 95      | 3      | 0      | 0    | 0    | 19.5              |

Notes    < = less than  
          Max = maximum



## **APPENDIX B3**

### **Individual Fish Capture Data**

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**Table B3-1. 2025 Upper American River Project Individual Fish Capture Data.**

| Stream        | Reach       | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 58                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 59                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 128               | 20.6       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 135               | 23.4       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 159               | 43.2       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 121               | 19.6       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 64                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 122               | 17.6       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 59                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 124               | 18.6       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 172               | 49.8       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 116               | 15.6       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 1    | Brown trout   | 255               | 153.8      | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 62                | 2.6        | 1     |

| Stream        | Reach       | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 66                | 3.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 70                | 3.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 54                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 58                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 105               | 11.0       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 123               | 18.0       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 169               | 49.4       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 165               | 48.0       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 111               | 14.0       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 119               | 16.2       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 110               | 15.0       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 181               | 57.0       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 171               | 47.8       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 140               | 26.8       | 1     |

| Stream        | Reach       | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 125               | 20.8       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 114               | 16.4       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 139               | 27.4       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 171               | 48.2       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 156               | 34.6       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 116               | 15.8       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 111               | 14.8       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 69                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 55                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 54                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 63                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 74                | 3.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 74                | 4.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 72                | 3.6        | 1     |



| Stream        | Reach       | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 49                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 58                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 56                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 60                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 60                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 61                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 72                | 4.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 129               | 21.0       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 124               | 19.4       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 129               | 20.0       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 54                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 55                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 112               | 15.0       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 107               | 14.0       | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 2    | Rainbow trout    | 63                | 3.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 2    | Rainbow trout    | 67                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 2    | Rainbow trout    | 171               | 49.2       | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 3    | Rainbow trout    | 60                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 3    | Rainbow trout    | 59                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 3    | Rainbow trout    | 57                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 3    | Rainbow trout    | 68                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 3    | Rainbow trout    | 70                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 3    | Rainbow trout    | 56                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F1 | Upper    | Electrofishing | 3    | Rainbow trout    | 142               | 28.8       | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 72                | 3.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 74                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 68                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 67                | 2.4        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 65                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 69                | 3.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 59                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 56                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 45                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 81                | 5.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 65                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 54                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 55                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 65                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 68                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 71                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 35                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 39                | 0.6        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 62                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 55                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 62                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 54                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 65                | 3.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 72                | 4.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 49                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 53                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 65                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 76                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 61                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 51                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 37                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 81                | 5.0        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 81                | 4.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 61                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 70                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 52                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 60                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 80                | 4.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 48                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 50                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 35                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 31                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 81                | 5.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 71                | 4.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Brown trout      | 76                | 4.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 74                | 3.4        | 1     |



| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 53                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 52                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 62                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 56                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 52                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 24                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 87                | 6.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 38                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 46                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 54                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 89                | 6.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 56                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 50                | 0.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 51                | 1.4        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 73                | 5.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 68                | 3.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 51                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 71                | 4.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 76                | 4.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 61                | 3.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 53                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 55                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 60                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 55                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 60                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 55                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 59                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 39                | 0.6        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 78                | 4.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 33                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 37                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 40                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 67                | 2.9        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 35                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 50                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 63                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 60                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 60                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 53                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 64                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 44                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 34                | 0.6        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 50                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 52                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 22                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 37                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 81                | 4.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 45                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 86                | 5.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 55                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 53                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 48                | 0.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 75                | 5.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 50                | 0.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 51                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 32                | 0.1        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 30                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Brown trout      | 152               | 29.8       | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 74                | 3.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 63                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 48                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 76                | 4.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 70                | 3.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 58                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 52                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 47                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 32                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Brown trout      | 58                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 33                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 32                | 0.8        | 1     |



| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 76                | 4.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 31                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 84                | 5.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Brown trout      | 56                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 31                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 56                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 84                | 4.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 61                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 49                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 54                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 82                | 5.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 56                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 57                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 62                | 2.8        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 35                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 71                | 3.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 63                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 60                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 55                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 40                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 30                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 31                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 84                | 5.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 56                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 55                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 49                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Brown trout      | 50                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 60                | 1.6        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 33                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 53                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 51                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 56                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 67                | 4.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 61                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 71                | 3.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 72                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 54                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 48                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 35                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 26                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 60                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 66                | 2.6        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 71                | 4.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 57                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 61                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 60                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 40                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 53                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 53                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 50                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 44                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 52                | 0.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 66                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 59                | 3.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 55                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 60                | 2.0        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 55                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 38                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 35                | 0.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 27                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 61                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 54                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 56                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 45                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 55                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 48                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 50                | 0.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 47                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 31                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 56                | 1.2        | 1     |



| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 61                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 47                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 46                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 48                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 55                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 58                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 50                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 28                | 0.1        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Rainbow trout    | 49                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 58                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 56                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 45                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 60                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 62                | 2.8        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 70                | 3.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 53                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | Speckled dace    | 52                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 62                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 1    | California roach | 73                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 66                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 70                | 3.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 56                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 74                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 36                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 64                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | --                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 36                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 53                | 1.6        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 37                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 49                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 44                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 53                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 55                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 32                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 50                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 33                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 56                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 56                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 56                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 41                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 35                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 35                | --         | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 31                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 51                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 59                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 58                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 56                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 53                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 33                | 0.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 39                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 28                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 63                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 63                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 36                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 62                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 36                | 1.0        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 38                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 60                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 30                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 28                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 62                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 70                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 60                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 51                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 50                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 30                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 30                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 40                | 0.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 57                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 50                | 1.2        | 1     |



| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 57                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 46                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 71                | 4.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 40                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 50                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 55                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 37                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 63                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 54                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 30                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 58                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 32                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 44                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 45                | 1.0        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 60                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 56                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 64                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 53                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 56                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 56                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 66                | 2.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 56                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 35                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 59                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 53                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 47                | 1.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 36                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 54                | 1.8        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 64                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 51                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 68                | 3.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 53                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 58                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 54                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 56                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 66                | 2.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 60                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 31                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 28                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 61                | 2.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 50                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 57                | 1.6        | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 54                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 71                | 3.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 66                | 2.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 60                | 2.0        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 59                | 1.8        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 50                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 47                | 1.2        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 56                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 51                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 59                | 1.4        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 30                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 60                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 62                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 65                | --         | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 69                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 54                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 56                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 35                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 27                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 70                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 64                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 66                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 66                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 51                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 55                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 43                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 54                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 59                | --         | 1     |



| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 65                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 57                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 58                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 53                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 25                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 59                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 54                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 49                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 50                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 56                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 68                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 59                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 64                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 71                | --         | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 61                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 100               | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 74                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 78                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 70                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Speckled dace    | 35                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 33                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | Brown trout      | --                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 35                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 60                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 62                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 66                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 33                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 2    | California roach | 66                | --         | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 72                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 60                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 61                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 45                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 41                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 53                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 31                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 32                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 42                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 59                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 62                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 27                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 69                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 55                | --         | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 72                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 65                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 70                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 60                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 31                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 59                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 50                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 46                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 61                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 54                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 57                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 57                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 71                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 47                | --         | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 52                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 48                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 45                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 66                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 47                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 32                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 47                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 53                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 50                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 32                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 53                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 47                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Brown trout      | 63                | 1.6        | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 52                | --         | 1     |



| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 37                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 46                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 85                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 56                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 68                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 55                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 47                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 68                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 52                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 35                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 37                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 50                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 61                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 57                | --         | 1     |

| Stream        | Reach       | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|---------------|-------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 50                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 62                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 65                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 35                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 71                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 68                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 62                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 40                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 25                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 50                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 25                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 25                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 28                | --         | 1     |
| Rubicon River | Rubicon Dam | RRD-F2 | Combined | Electrofishing | 3    | California roach | 60                | --         | 1     |

| Stream         | Reach           | Site   | Segment  | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|----------------|-----------------|--------|----------|----------------|------|------------------|-------------------|------------|-------|
| Rubicon River  | Rubicon Dam     | RRD-F2 | Combined | Electrofishing | 3    | California roach | 53                | --         | 1     |
| Rubicon River  | Rubicon Dam     | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 42                | --         | 1     |
| Rubicon River  | Rubicon Dam     | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 51                | --         | 1     |
| Rubicon River  | Rubicon Dam     | RRD-F2 | Combined | Electrofishing | 3    | California roach | 67                | --         | 1     |
| Rubicon River  | Rubicon Dam     | RRD-F2 | Combined | Electrofishing | 3    | Speckled dace    | 52                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower    | Electrofishing | 1    | California roach | 72                | 4.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower    | Electrofishing | 1    | California roach | 74                | 4.2        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower    | Electrofishing | 1    | California roach | 79                | 6.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower    | Electrofishing | 1    | California roach | 42                | 1.6        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower    | Electrofishing | 1    | California roach | 45                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower    | Electrofishing | 1    | California roach | 29                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower    | Electrofishing | 1    | California roach | 25                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower    | Electrofishing | 1    | California roach | 32                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower    | Electrofishing | 1    | California roach | 41                | 0.6        | 1     |

| Stream         | Reach           | Site   | Segment | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|----------------|-----------------|--------|---------|----------------|------|------------------|-------------------|------------|-------|
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 32                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 34                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 79                | 4.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 91                | 8.2        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 75                | 5.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 76                | 5.6        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 85                | 7.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 74                | 4.2        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 76                | 4.2        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 71                | 4.2        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 81                | 5.4        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 68                | 3.4        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 55                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 37                | 1.0        | 1     |

| Stream         | Reach           | Site   | Segment | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|----------------|-----------------|--------|---------|----------------|------|------------------|-------------------|------------|-------|
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 41                | 0.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 40                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 28                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 30                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 41                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 40                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 36                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 35                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 40                | 0.6        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 38                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 30                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 35                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 34                | 1.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 1    | California roach | 29                | 1.0        | 1     |



| Stream         | Reach           | Site   | Segment | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|----------------|-----------------|--------|---------|----------------|------|------------------|-------------------|------------|-------|
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 2    | California roach | 29                | 0.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 2    | California roach | 39                | 1.2        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Lower   | Electrofishing | 3    | California roach | 77                | 5.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 59                | 2.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 92                | 6.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 76                | 5.6        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 44                | 0.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 30                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 61                | 1.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 60                | 2.0        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 73                | 3.4        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 33                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 31                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 26                | --         | 1     |

| Stream         | Reach           | Site   | Segment | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|----------------|-----------------|--------|---------|----------------|------|------------------|-------------------|------------|-------|
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 1    | California roach | 36                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 65                | 2.6        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 38                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 36                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 40                | 0.6        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 50                | 0.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 66                | 2.2        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 34                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 46                | 0.6        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 44                | 0.6        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 45                | 0.8        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 2    | California roach | 36                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 3    | California roach | 26                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 3    | California roach | 65                | 2.2        | 1     |

| Stream         | Reach           | Site   | Segment | Method         | Pass | Species          | Total Length (mm) | Weight (g) | Count |
|----------------|-----------------|--------|---------|----------------|------|------------------|-------------------|------------|-------|
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 3    | California roach | 74                | 4.2        | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 3    | California roach | 43                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 3    | California roach | 26                | --         | 1     |
| Little Rubicon | Buck Island Dam | BID-F1 | Upper   | Electrofishing | 3    | California roach | 30                | --         | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Rainbow trout    | 135               | 22.6       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 166               | 42.6       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 223               | 110.4      | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 160               | 41.2       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 120               | 15.8       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 209               | 87.0       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 68                | 3.2        | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Rainbow trout    | 171               | 40.6       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Rainbow trout    | 195               | 60.4       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 190               | 62.4       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 120               | 16.2       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 65                | 2.6        | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Rainbow trout    | 155               | 26.6       | 1     |
| Gerle Creek    | Look Lake Dam   | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout      | 190               | 62.2       | 1     |

| Stream      | Reach         | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------|---------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout   | 118               | 15.6       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 1    | Rainbow trout | 127               | 17.4       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 1    | Brown trout   | 126               | 18.0       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Rainbow trout | 120               | 14.8       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Rainbow trout | 155               | 30.8       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Rainbow trout | 142               | 23.0       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Brown trout   | 121               | 16.2       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Brown trout   | 160               | 36.6       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Rainbow trout | 94                | 6.2        | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Rainbow trout | 104               | 8.8        | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Brown trout   | 224               | 103.6      | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Brown trout   | 172               | 44.2       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Brown trout   | 165               | 41.2       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Brown trout   | 132               | 19.8       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 3    | Brown trout   | 234               | 121.6      | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 1    | Brown trout   | 165               | 41.0       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 1    | Brown trout   | 300               | 200.2      | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 1    | Brown trout   | 120               | 16.4       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 1    | Brown trout   | 85                | 6.4        | 1     |

| Stream      | Reach         | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------|---------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 1    | Rainbow trout | 195               | 66.6       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 2    | Brown trout   | 105               | 11.0       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 2    | Brown trout   | 192               | 72.2       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 2    | Brown trout   | 164               | 37.6       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 2    | Brown trout   | 199               | 75.2       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 2    | Brown trout   | 120               | 17.0       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 3    | Brown trout   | 223               | 101.8      | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 3    | Brown trout   | 201               | 81.0       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 3    | Brown trout   | 121               | 17.2       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 3    | Rainbow trout | 177               | 61.1       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 3    | Brown trout   | 119               | 15.8       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 3    | Rainbow trout | 147               | 27.2       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Upper   | Electrofishing | 3    | Brown trout   | 70                | 3.4        | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 1    | Brown trout   | 168               | 46.2       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 1    | Brown trout   | 124               | 18.1       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 1    | Rainbow trout | 145               | 27.3       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 1    | Brown trout   | 122               | 18.7       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 1    | Rainbow trout | 145               | 23.8       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 1    | Brown trout   | 282               | 221.4      | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 1    | Brown trout   | 264               | 161.0      | 1     |



| Stream      | Reach         | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------|---------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 1    | Brown trout   | 297               | 215.2      | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 1    | Brown trout   | 304               | 227.3      | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 2    | Brown trout   | 140               | 25.7       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 2    | Rainbow trout | 172               | 40.7       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Lower   | Electrofishing | 2    | Rainbow trout | 96                | 8.6        | 1     |
| Gerle Creek | Look Lake Dam | LLD-F3 | Lower   | Electrofishing | 2    | Rainbow trout | 196               | 60.9       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 71                | 3.1        | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Brown trout   | 115               | 13.7       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 54                | 1.6        | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 68                | 3.0        | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 110               | 11.3       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Brown trout   | 126               | 18.5       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Brown trout   | 334               | 390.0      | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Brown trout   | 284               | 187.2      | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 195               | 59.2       | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Brown trout   | 78                | 5.1        | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Brown trout   | 66                | 3.1        | 1     |
| Gerle Creek | Look Lake Dam | LLD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 65                | 2.6        | 1     |

| Stream      | Reach           | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------|-----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Gerle Creek | Look Lake Dam   | LLD-F2 | Upper   | Electrofishing | 1    | Brown trout   | 81                | 4.4        | 1     |
| Gerle Creek | Look Lake Dam   | LLD-F2 | Upper   | Electrofishing | 1    | Brown trout   | 127               | 18.1       | 1     |
| Gerle Creek | Look Lake Dam   | LLD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 244               | 123.9      | 1     |
| Gerle Creek | Look Lake Dam   | LLD-F2 | Upper   | Electrofishing | 2    | Brown trout   | 126               | 17.0       | 1     |
| Gerle Creek | Look Lake Dam   | LLD-F2 | Upper   | Electrofishing | 2    | Rainbow trout | 171               | 39.5       | 1     |
| Gerle Creek | Look Lake Dam   | LLD-F2 | Upper   | Electrofishing | 2    | Brown trout   | 263               | 156.4      | 1     |
| Gerle Creek | Look Lake Dam   | LLD-F3 | Upper   | Electrofishing | 3    | Rainbow trout | 126               | 25.4       | 1     |
| Gerle Creek | Look Lake Dam   | LLD-F3 | Upper   | Electrofishing | 3    | Rainbow trout | 133               | 19.8       | 1     |
| Gerle Creek | Look Lake Dam   | LLD-F3 | Upper   | Electrofishing | 3    | Brown trout   | 304               | 248.2      | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 110               | 10.2       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 97                | 8.0        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Brown trout   | 156               | 34.0       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 114               | 13.2       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 64                | 2.6        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Brown trout   | 154               | 35.6       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Brown trout   | 230               | 121.4      | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 62                | 2.4        | 1     |

| Stream      | Reach           | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------|-----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 144               | 26.0       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 89                | 6.8        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 66                | 2.8        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 144               | 28.4       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 71                | 3.4        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 106               | 10.6       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 67                | 2.8        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 59                | 2.2        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 133               | 19.2       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 59                | 2.4        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 143               | 26.6       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 72                | 3.4        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 111               | 11.6       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 76                | 3.8        | 1     |

| Stream      | Reach           | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------|-----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 60                | 1.6        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 180               | 51.0       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 69                | 3.2        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 70                | 3.0        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 64                | 2.6        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 54                | 1.6        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 71                | 3.0        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 62                | 2.4        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 71                | 3.2        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 70                | 3.2        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 50                | 1.0        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 60                | 1.8        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 71                | 3.4        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Brown trout   | 90                | 7.2        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Brown trout   | 90                | 7.0        | 1     |

| Stream      | Reach           | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------|-----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 104               | 8.8        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 73                | 3.6        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 59                | 1.8        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 113               | 14.0       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 128               | 19.8       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 60                | 2.4        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 190               | 64.2       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 111               | 13.2       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 64                | 2.0        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 194               | 70.6       | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 69                | 3.2        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 58                | 2.0        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 65                | 2.8        | 1     |
| Gerle Creek | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 67                | 3.6        | 1     |



| Stream             | Reach           | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------------|-----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 64                | 3.0        | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 156               | 32.6       | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 2    | Brown trout   | 160               | 34.2       | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 144               | 26.4       | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 206               | 66.0       | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 71                | 3.2        | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 105               | 10.0       | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 144               | 27.4       | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 3    | Brown trout   | 260               | 173.8      | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 107               | 10.6       | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 55                | 1.4        | 1     |
| Gerle Creek        | Gerle Creek Dam | GCD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 96                | 8.4        | 1     |
| South Fork Rubicon | Robbs Peak Dam  | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 151               | 34.2       | 1     |
| South Fork Rubicon | Robbs Peak Dam  | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 61                | 2.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam  | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 71                | 3.2        | 1     |

| Stream             | Reach          | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------------|----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 67                | 2.8        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 100               | 9.0        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 57                | 1.8        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Brown trout   | 137               | 23.8       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 66                | 4.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Brown trout   | 153               | 32.2       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 151               | 26.2       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 138               | 23.4       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 70                | 3.0        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 161               | 37.6       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 53                | 1.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 176               | 48.8       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 73                | 3.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 59                | 2.2        | 1     |

| Stream             | Reach          | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------------|----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 155               | 34.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 119               | 14.4       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 62                | 2.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 70                | 2.8        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 133               | 20.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 109               | 10.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 61                | 2.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 108               | 11.4       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 53                | 1.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 134               | 21.2       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 142               | 27.2       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 55                | 1.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 115               | 12.4       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 174               | 46.2       | 1     |

| Stream             | Reach          | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------------|----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 159               | 35.4       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 64                | 3.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 62                | 2.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 184               | 57.6       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 150               | 30.4       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 111               | 12.6       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 125               | 17.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 57                | 1.8        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 55                | 1.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 81                | 5.8        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 166               | 37.8       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 54                | 2.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 56                | 1.4        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 56                | 1.4        | 1     |

| Stream             | Reach          | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------------|----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 116               | 14.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Brown trout   | 146               | 29.8       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 73                | 3.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 60                | 2.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 67                | 2.4        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 66                | 3.0        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 60                | 2.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 64                | 3.0        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 142               | 27.6       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 190               | 53.8       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 64                | 2.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 57                | 1.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 56                | 1.8        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 77                | 4.4        | 1     |



| Stream             | Reach          | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------------|----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Brown trout   | 85                | 6.9        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 76                | 4.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 71                | 3.0        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 66                | 2.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 66                | 2.4        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 65                | 2.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 106               | 10.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 65                | 1.4        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 64                | 1.4        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 67                | 2.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 62                | 2.0        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Lower   | Electrofishing | 3    | Brown trout   | 77                | 4.8        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Brown trout   | 260               | 201.0      | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 135               | 24.4       | 1     |

| Stream             | Reach          | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------------|----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 113               | 12.8       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 120               | 15.2       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 118               | 16.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 121               | 18.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Brown trout   | 144               | 30.4       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 132               | 23.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 62                | 2.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 72                | 2.4        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 50                | 1.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 55                | 1.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 56                | 3.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 73                | 2.8        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 59                | 2.2        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 104               | 10.2       | 1     |

| Stream             | Reach          | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------------|----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 50                | 1.4        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 151               | 29.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 110               | 11.8       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 128               | 16.6       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 164               | 35.2       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 66                | 3.0        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 69                | 3.0        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 105               | 9.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 137               | 25.6       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 190               | 58.4       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 112               | 12.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 3    | Brown trout   | 137               | 26.0       | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 66                | 2.6        | 1     |
| South Fork Rubicon | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 69                | 3.4        | 1     |

| Stream                  | Reach          | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------------------|----------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Rubicon      | Robbs Peak Dam | RPD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 65                | 3.0        | 1     |
| South Fork Rubicon      | Robbs Peak Dam | RPD-F2 | Upper   | Electrofishing | 3    | Rainbow trout | 67                | 2.8        | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 99                | 8.2        | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Brown trout   | 330               | 300.6      | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 130               | 19.2       | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 115               | 14.2       | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 145               | 25.6       | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 60                | 2.0        | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 83                | 5.8        | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 136               | 23.6       | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 82                | 5.4        | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 130               | 21.4       | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 83                | 5.6        | 1     |
| South Fork Silver Creek | Ice House Dam  | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 78                | 4.4        | 1     |

| Stream                  | Reach         | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------------------|---------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 81                | 5.0        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 89                | 6.8        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 1    | Rainbow trout | 81                | 4.6        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 66                | 3.0        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 171               | 43.0       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 70                | 3.2        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 71                | 3.6        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 90                | 6.4        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 89                | 6.8        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 84                | 6.0        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 84                | 5.8        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 116               | 13.8       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Brown trout   | 260               | 134.4      | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 2    | Rainbow trout | 69                | 2.8        | 1     |



| Stream                  | Reach         | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------------------|---------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 112               | 12.6       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 69                | 3.2        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Lower   | Electrofishing | 3    | Rainbow trout | 170               | 44.0       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 85                | 5.6        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 123               | --         | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 70                | 3.4        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 66                | 3.4        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 84                | 5.8        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 32                | --         | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 1    | Rainbow trout | 70                | --         | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 1    | Brown trout   | 120               | 17.2       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 140               | 26.2       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 110               | 12.0       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 2    | Rainbow trout | 79                | 3.6        | 1     |

| Stream                  | Reach         | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------------------|---------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 77                | 5.0        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 85                | 5.6        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 76                | 4.4        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 114               | 13.2       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 120               | 16.2       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F1 | Upper   | Electrofishing | 3    | Rainbow trout | 76                | 4.2        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Brown trout   | 151               | 29.4       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout | 122               | 16.0       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout | 202               | 73.9       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout | 90                | 6.7        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout | 60                | 1.6        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout | 180               | 49.5       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Brown trout   | 149               | 30.6       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout | 60                | 2.2        | 1     |

| Stream                  | Reach         | Site   | Segment | Method         | Pass | Species           | Total Length (mm) | Weight (g) | Count |
|-------------------------|---------------|--------|---------|----------------|------|-------------------|-------------------|------------|-------|
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout     | 117               | 14.0       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout     | 99                | 8.7        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout     | 132               | 20.2       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Brown trout       | 95                | 8.2        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Rainbow trout     | 65                | --         | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 1    | Sacramento sucker | 42                | 0.8        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 2    | Rainbow trout     | 117               | 13.3       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 2    | Sacramento sucker | 45                | 0.3        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 2    | Rainbow trout     | 65                | 1.6        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 2    | Sacramento sucker | 41                | --         | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 3    | Brown trout       | 329               | 350.0      | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 3    | Rainbow trout     | 120               | 15.5       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 3    | Rainbow trout     | 65                | 1.5        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 3    | Rainbow trout     | 113               | 11.9       | 1     |

| Stream                  | Reach         | Site   | Segment | Method         | Pass | Species           | Total Length (mm) | Weight (g) | Count |
|-------------------------|---------------|--------|---------|----------------|------|-------------------|-------------------|------------|-------|
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Lower   | Electrofishing | 3    | Rainbow trout     | 182               | 64.1       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout     | 145               | 28.8       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout     | 111               | 12.4       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout     | 142               | 25.7       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Brown trout       | 147               | 29.8       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Sacramento sucker | 140               | 31.9       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout     | 112               | 12.2       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout     | 110               | 11.3       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout     | 100               | 8.4        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout     | 97                | 7.6        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout     | 62                | 2.5        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Brown trout       | 77                | 4.3        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Brown trout       | 86                | 6.0        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout     | 63                | 2.3        | 1     |

| Stream                  | Reach         | Site   | Segment | Method         | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|-------------------------|---------------|--------|---------|----------------|------|---------------|-------------------|------------|-------|
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 63                | 2.4        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 60                | 2.1        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 53                | 1.3        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 52                | --         | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 161               | 350.0      | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 158               | 15.5       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 125               | 1.5        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 100               | 11.9       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 68                | 64.1       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 115               | 4.0        | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 132               | 17.9       | 1     |
| South Fork Silver Creek | Ice House Dam | IHD-F2 | Upper   | Electrofishing | 1    | Rainbow trout | 110               | 11.2       | 1     |
| Silver Creek            | Junction Dam  | JD-F3  | 1 Run   | Snorkel        | --   | Rainbow trout | 0–25              | --         | 3     |
| Silver Creek            | Junction Dam  | JD-F3  | 1 Run   | Snorkel        | --   | Rainbow trout | 25–50             | --         | 2     |



| Stream       | Reach        | Site  | Segment | Method  | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------|--------------|-------|---------|---------|------|---------------|-------------------|------------|-------|
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Rainbow trout | 50–75             | --         | 10    |
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Rainbow trout | 75–100            | --         | 10    |
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Rainbow trout | 100–125           | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Rainbow trout | 125–150           | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Rainbow trout | 150–175           | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Rainbow trout | 175–200           | --         | 9     |
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Rainbow trout | 200–225           | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Rainbow trout | 250–275           | --         | 4     |
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Brown trout   | 225–250           | --         | 1     |
| Silver Creek | Junction Dam | JD-F3 | 1 Run   | Snorkel | --   | Brown trout   | 125–150           | --         | 1     |
| Silver Creek | Junction Dam | JD-F3 | 2 HGR   | Snorkel | --   | Brown trout   | 75–100            | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 2 HGR   | Snorkel | --   | Brown trout   | 225–250           | --         | 1     |
| Silver Creek | Junction Dam | JD-F3 | 2 HGR   | Snorkel | --   | Rainbow trout | 0–25              | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 2 HGR   | Snorkel | --   | Rainbow trout | 50–75             | --         | 4     |
| Silver Creek | Junction Dam | JD-F3 | 2 HGR   | Snorkel | --   | Rainbow trout | 75–100            | --         | 9     |
| Silver Creek | Junction Dam | JD-F3 | 2 HGR   | Snorkel | --   | Rainbow trout | 100–125           | --         | 8     |

| Stream       | Reach        | Site  | Segment  | Method  | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------|--------------|-------|----------|---------|------|---------------|-------------------|------------|-------|
| Silver Creek | Junction Dam | JD-F3 | 2 HGR    | Snorkel | --   | Rainbow trout | 125–150           | --         | 3     |
| Silver Creek | Junction Dam | JD-F3 | 2 HGR    | Snorkel | --   | Rainbow trout | 150–175           | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 2 HGR    | Snorkel | --   | Rainbow trout | 175–200           | --         | 1     |
| Silver Creek | Junction Dam | JD-F3 | 2 HGR    | Snorkel | --   | Rainbow trout | 250–275           | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 3 Pool   | Snorkel | --   | Rainbow trout | 0–25              | --         | 1     |
| Silver Creek | Junction Dam | JD-F3 | 3 Pool   | Snorkel | --   | Rainbow trout | 25–50             | --         | 1     |
| Silver Creek | Junction Dam | JD-F3 | 3 Pool   | Snorkel | --   | Rainbow trout | 50–75             | --         | 8     |
| Silver Creek | Junction Dam | JD-F3 | 3 Pool   | Snorkel | --   | Rainbow trout | 75–100            | --         | 4     |
| Silver Creek | Junction Dam | JD-F3 | 3 Pool   | Snorkel | --   | Rainbow trout | 100–125           | --         | 3     |
| Silver Creek | Junction Dam | JD-F3 | 3 Pool   | Snorkel | --   | Rainbow trout | 125–150           | --         | 9     |
| Silver Creek | Junction Dam | JD-F3 | 3 Pool   | Snorkel | --   | Rainbow trout | 150–175           | --         | 13    |
| Silver Creek | Junction Dam | JD-F3 | 3 Pool   | Snorkel | --   | Rainbow trout | 200–225           | --         | 4     |
| Silver Creek | Junction Dam | JD-F3 | 3 Pool   | Snorkel | --   | Rainbow trout | 275–300           | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Brown trout   | 75–100            | --         | 3     |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Brown trout   | 150–175           | --         | 1     |

| Stream       | Reach        | Site  | Segment  | Method  | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------|--------------|-------|----------|---------|------|---------------|-------------------|------------|-------|
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Brown trout   | 175–200           | --         | 2     |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Brown trout   | 200–225           | --         | 1     |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Rainbow trout | 0–25              | --         | 1     |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Rainbow trout | 25–50             | --         | 11    |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Rainbow trout | 50–75             | --         | 9     |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Rainbow trout | 75–100            | --         | 8     |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Rainbow trout | 100–125           | --         | 11    |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Rainbow trout | 125–150           | --         | 13    |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Rainbow trout | 150–175           | --         | 11    |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Rainbow trout | 175–200           | --         | 5     |
| Silver Creek | Junction Dam | JD-F3 | 4 Riffle | Snorkel | --   | Rainbow trout | 200–225           | --         | 2     |
| Silver Creek | Camino Dam   | CD-F1 | 1 Pool   | Snorkel | --   | Rainbow trout | 25–50             | --         | 1     |
| Silver Creek | Camino Dam   | CD-F1 | 1 Pool   | Snorkel | --   | Rainbow trout | 150–175           | --         | 1     |
| Silver Creek | Camino Dam   | CD-F1 | 2 Riffle | Snorkel | --   | Rainbow trout | 25–50             | --         | 1     |
| Silver Creek | Camino Dam   | CD-F1 | 2 Riffle | Snorkel | --   | Rainbow trout | 75–100            | --         | 1     |

| Stream       | Reach          | Site   | Segment       | Method  | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------------|----------------|--------|---------------|---------|------|---------------|-------------------|------------|-------|
| Silver Creek | Camino Dam     | CD-F1  | 2 Riffle      | Snorkel | --   | Rainbow trout | 125–150           | --         | 1     |
| Silver Creek | Camino Dam     | CD-F1  | 4 Riffle      | Snorkel | --   | Rainbow trout | 50–75             | --         | 1     |
| Silver Creek | Camino Dam     | CD-F1  | 7 Pool        | Snorkel | --   | Rainbow trout | 175–200           | --         | 1     |
| Silver Creek | Camino Dam     | CD-F1  | 7 Pool        | Snorkel | --   | Rainbow trout | 200–225           | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 1 Pocketwater | Snorkel | --   | Rainbow trout | 50–75             | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 1 Pocketwater | Snorkel | --   | Rainbow trout | 175–200           | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 1 Pocketwater | Snorkel | --   | Brown trout   | 300–325           | --         | 2     |
| SFAR         | Slab Creek Dam | SCD-F3 | 1 Pocketwater | Snorkel | --   | Brown trout   | 400–425           | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 2 Pool        | Snorkel | --   | Rainbow trout | 50–75             | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 2 Pool        | Snorkel | --   | Rainbow trout | 75–100            | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 2 Pool        | Snorkel | --   | Rainbow trout | 175–200           | --         | 2     |
| SFAR         | Slab Creek Dam | SCD-F3 | 2 Pool        | Snorkel | --   | Brown trout   | 175–200           | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 2 Pool        | Snorkel | --   | Brown trout   | 325–350           | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 2 Pool        | Snorkel | --   | Brown trout   | 400–425           | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 2 Pool        | Snorkel | --   | Sculpin       | 75–100            | --         | 1     |
| SFAR         | Slab Creek Dam | SCD-F3 | 3 Riffle      | Snorkel | --   | Rainbow trout | 175–200           | --         | 2     |
| SFAR         | Slab Creek Dam | SCD-F3 | 3 Riffle      | Snorkel | --   | Brown trout   | 300–325           | --         | 1     |

| Stream | Reach          | Site   | Segment | Method                       | Pass | Species               | Total Length (mm) | Weight (g) | Count |
|--------|----------------|--------|---------|------------------------------|------|-----------------------|-------------------|------------|-------|
| SFAR   | Slab Creek Dam | SCD-F3 | 4 Run   | Snorkel                      | --   | Rainbow trout         | 75–100            | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F3 | 4 Run   | Snorkel                      | --   | Rainbow trout         | 200–225           | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F3 | 4 Run   | Snorkel                      | --   | Brown trout           | 300–325           | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F3 | 4 Run   | Snorkel                      | --   | Sculpin               | 50–75             | --         | 2     |
| SFAR   | Slab Creek Dam | SCD-F3 | --      | Opportunistic electrofishing | --   | Sculpin               | 41                | 0.8        | 1     |
| SFAR   | Slab Creek Dam | SCD-F3 | --      | Opportunistic electrofishing | --   | Sculpin               | 82                | 6.8        | 1     |
| SFAR   | Slab Creek Dam | SCD-F3 | --      | Opportunistic electrofishing | --   | Sculpin               | 74                | 4.6        | 1     |
| SFAR   | Slab Creek Dam | SCD-F3 | --      | Opportunistic electrofishing | --   | Sculpin               | 65                | 4.0        | 1     |
| SFAR   | Slab Creek Dam | SCD-F3 | --      | Opportunistic electrofishing | --   | Sculpin               | 73                | 5.4        | 1     |
| SFAR   | Slab Creek Dam | SCD-F3 | --      | Opportunistic electrofishing | --   | Sculpin               | 57                | 2.2        | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel                      | --   | Sacramento pikeminnow | 125–150           | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel                      | --   | Sacramento pikeminnow | 175–200           | --         | 3     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel                      | --   | Sacramento pikeminnow | 200–225           | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel                      | --   | Sacramento pikeminnow | 225–250           | --         | 2     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel                      | --   | Sacramento pikeminnow | 250–275           | --         | 3     |



| Stream | Reach          | Site   | Segment | Method  | Pass | Species               | Total Length (mm) | Weight (g) | Count |
|--------|----------------|--------|---------|---------|------|-----------------------|-------------------|------------|-------|
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel | --   | Rainbow trout         | 100–125           | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel | --   | Rainbow trout         | 125–150           | --         | 7     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel | --   | Rainbow trout         | 150–175           | --         | 9     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel | --   | Rainbow trout         | 175–200           | --         | 13    |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel | --   | Rainbow trout         | 200–225           | --         | 4     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel | --   | Rainbow trout         | 225–250           | --         | 8     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel | --   | Rainbow trout         | 300–325           | --         | 3     |
| SFAR   | Slab Creek Dam | SCD-F2 | 2 Run   | Snorkel | --   | Unidentified cyprinid | 25–50             | --         | 20    |
| SFAR   | Slab Creek Dam | SCD-F2 | 3 Run   | Snorkel | --   | Rainbow trout         | 100–125           | --         | 2     |
| SFAR   | Slab Creek Dam | SCD-F2 | 3 Run   | Snorkel | --   | Rainbow trout         | 125–150           | --         | 10    |
| SFAR   | Slab Creek Dam | SCD-F2 | 3 Run   | Snorkel | --   | Rainbow trout         | 150–175           | --         | 6     |
| SFAR   | Slab Creek Dam | SCD-F2 | 3 Run   | Snorkel | --   | Rainbow trout         | 175–200           | --         | 7     |
| SFAR   | Slab Creek Dam | SCD-F2 | 3 Run   | Snorkel | --   | Rainbow trout         | 225–250           | --         | 5     |
| SFAR   | Slab Creek Dam | SCD-F2 | 3 Run   | Snorkel | --   | Rainbow trout         | 275–300           | --         | 1     |

| Stream | Reach          | Site   | Segment  | Method  | Pass | Species               | Total Length (mm) | Weight (g) | Count |
|--------|----------------|--------|----------|---------|------|-----------------------|-------------------|------------|-------|
| SFAR   | Slab Creek Dam | SCD-F2 | 3 Run    | Snorkel | --   | Sacramento sucker     | 200–225           | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 3 Run    | Snorkel | --   | Unidentified cyprinid | 25–50             | --         | 5     |
| SFAR   | Slab Creek Dam | SCD-F2 | 3 Run    | Snorkel | --   | Sculpin               | 25–50             | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 4 Riffle | Snorkel | --   | Rainbow trout         | 50–75             | --         | 3     |
| SFAR   | Slab Creek Dam | SCD-F2 | 4 Riffle | Snorkel | --   | Rainbow trout         | 75–100            | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 4 Riffle | Snorkel | --   | Rainbow trout         | 100–125           | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 4 Riffle | Snorkel | --   | Rainbow trout         | 175–200           | --         | 3     |
| SFAR   | Slab Creek Dam | SCD-F2 | 4 Riffle | Snorkel | --   | Rainbow trout         | 200–225           | --         | 2     |
| SFAR   | Slab Creek Dam | SCD-F2 | 4 Riffle | Snorkel | --   | Rainbow trout         | 275–300           | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 5 Pool   | Snorkel | --   | Rainbow trout         | 50–75             | --         | 2     |
| SFAR   | Slab Creek Dam | SCD-F2 | 5 Pool   | Snorkel | --   | Rainbow trout         | 75–100            | --         | 3     |
| SFAR   | Slab Creek Dam | SCD-F2 | 5 Pool   | Snorkel | --   | Rainbow trout         | 100–125           | --         | 1     |
| SFAR   | Slab Creek Dam | SCD-F2 | 5 Pool   | Snorkel | --   | Rainbow trout         | 150–175           | --         | 15    |
| SFAR   | Slab Creek Dam | SCD-F2 | 5 Pool   | Snorkel | --   | Rainbow trout         | 175–200           | --         | 7     |

| Stream | Reach          | Site   | Segment | Method  | Pass | Species       | Total Length (mm) | Weight (g) | Count |
|--------|----------------|--------|---------|---------|------|---------------|-------------------|------------|-------|
| SFAR   | Slab Creek Dam | SCD-F2 | 5 Pool  | Snorkel | --   | Rainbow trout | 200–225           | --         | 5     |
| SFAR   | Slab Creek Dam | SCD-F2 | 5 Pool  | Snorkel | --   | Rainbow trout | 300–325           | --         | 3     |

Notes: -- = not measured or not applicable  
g = gram  
mm = millimeter  
SFAR = South Fork American River

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## **APPENDIX B4**

### **Fish Population Estimates**



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**Table B4-1. Trout Population Estimates and Fish Capture Data at Electrofishing Sites, 2025.**

| Site   | Section  | Site Length (feet) | Avg. Width (feet) | Avg. Area (square feet) | Species                 | Total Number Captured | Removal Pattern | Number of Trout/Mile | Catchable Trout/Mile (>152 mm) | Trout Density (no. of fish/acre) | Trout Density, 95 Percent Confidence Interval (no. of fish/acre) |                 | Trout Biomass (lbs/acre) | Trout Biomass, 95 Percent Confidence Interval (lbs/acre) |                 |
|--------|----------|--------------------|-------------------|-------------------------|-------------------------|-----------------------|-----------------|----------------------|--------------------------------|----------------------------------|------------------------------------------------------------------|-----------------|--------------------------|----------------------------------------------------------|-----------------|
| RRD-F1 | Combined | 271                | 32                | 8,805                   | Trout (brown & rainbow) | 66                    | 43-12-11        | 1,410                | 159                            | 359                              | 314                                                              | 403             | 13.1                     | 11.5                                                     | 14.7            |
|        | Upper    | 144                | 36                | 5,241                   | Rainbow trout           | 47                    | 30-10-7         | 1,891                | 227                            | 428                              | 366                                                              | 489             | 14.0                     | 12.0                                                     | 16.1            |
|        | Lower    | 128                | 28                | 3,628                   | Trout (brown & rainbow) | 19                    | 13-2-4          | 870                  | 83                             | 252                              | 190                                                              | 314             | 11.5                     | 8.7                                                      | 14.3            |
| RRD-F2 | Combined | 231                | 25                | 5,740                   | Trout (brown & rainbow) | 8                     | 6-1-1           | 190                  | 0                              | 63                               | 52                                                               | 74              | 0.7                      | 0.6                                                      | 0.8             |
|        |          |                    |                   |                         | California roach        | 194                   | 91-74-29        | --                   | --                             | --                               | --                                                               | --              | --                       | --                                                       | --              |
|        |          |                    |                   |                         | Speckled dace           | 227                   | 108-74-45       | --                   | --                             | --                               | --                                                               | --              | --                       | --                                                       | --              |
| BID-F1 | Combined | 279                | 29                | 8,091                   | California roach        | 69                    | 49-13-7         | --                   | --                             | --                               | --                                                               | --              | --                       | --                                                       | --              |
|        | Upper    | 124                | 44                | 5,456                   | California roach        | 29                    | 12-11-6         | --                   | --                             | --                               | --                                                               | --              | --                       | --                                                       | --              |
|        | Lower    | 207                | 14                | 2,898                   | California roach        | 40                    | 37-2-1          | --                   | --                             | --                               | --                                                               | --              | --                       | --                                                       | --              |
| LLD-F3 | Combined | 335                | 23                | 7,586                   | Trout (brown & rainbow) | 46                    | 22-16-8         | 954                  | 424                            | 348                              | 215                                                              | 481             | 32.7                     | 20.2                                                     | 45.2            |
|        | Upper    | 107                | 23                | 2,476                   | Trout (brown & rainbow) | 17                    | 5-5-7           | -- <sup>a</sup>      | -- <sup>a</sup>                | -- <sup>a</sup>                  | -- <sup>a</sup>                                                  | -- <sup>a</sup> | -- <sup>a</sup>          | -- <sup>a</sup>                                          | -- <sup>a</sup> |
|        | Lower    | 228                | 22                | 5,508                   | Trout (brown & rainbow) | 29                    | 17-11-1         | 714                  | 272                            | 265                              | 230                                                              | 301             | 22.4                     | 19.4                                                     | 25.4            |
| LLD-F2 | Combined | 309                | 39                | 12,100                  | Trout (brown & rainbow) | 34                    | 24-7-3          | 604                  | 256                            | 127                              | 116                                                              | 138             | 20.1                     | 18.4                                                     | 21.9            |
|        | Upper    | 211                | 48                | 10,179                  | Trout (brown & rainbow) | 21                    | 15-3-3          | 554                  | 215                            | 95                               | 81                                                               | 108             | 13.4                     | 11.5                                                     | 15.3            |
|        | Lower    | 98                 | 30                | 2,946                   | Trout (brown & rainbow) | 13                    | 9-4-0           | 716                  | 382                            | 196                              | 178                                                              | 215             | 36.4                     | 32.9                                                     | 39.8            |
| GCD-F1 | Combined | 420                | 34                | 14,406                  | Trout (brown & rainbow) | 66                    | 30-18-15        | 1,189                | 87                             | 286                              | 145                                                              | 427             | 10.8                     | 5.5                                                      | 16.1            |
|        | Upper    | 274                | 37                | 10,069                  | Trout (brown & rainbow) | 26                    | 13-5-5          | 551                  | 118                            | 123                              | 71                                                               | 176             | 7.3                      | 5.3                                                      | 9.4             |
|        | Lower    | 147                | 32                | 4,658                   | Trout (brown & rainbow) | 40                    | 17-13-10        | 2,615                | 75                             | 680                              | 21                                                               | 1,338           | 18.2                     | 0.6                                                      | 35.9            |
| RPD-F1 | Combined | 326                | 46                | 14,868                  | Trout (brown & rainbow) | 103                   | 50-31-22        | 2,329                | 161                            | 421                              | 290                                                              | 552             | 13.4                     | 9.2                                                      | 17.5            |
|        | Upper    | 160                | 46                | 7,364                   | Trout (brown & rainbow) | 32                    | 15-9-8          | 1,660                | 154                            | 298                              | 65                                                               | 532             | 12.5                     | 2.7                                                      | 22.4            |



| Site   | Section  | Site Length<br>(feet) | Avg. Width<br>(feet) | Avg. Area<br>(square feet) | Species                 | Total<br>Number<br>Captured | Removal<br>Pattern | Number of<br>Trout/Mile | Catchable<br>Trout/Mile<br>(>152 mm) | Trout<br>Density<br>(no. of<br>fish/acre) | Trout Density,<br>95 Percent<br>Confidence Interval<br>(no. of fish/acre) |       | Trout<br>Biomass<br>(lbs/acre) | Trout Biomass,<br>95 Percent<br>Confidence<br>Interval<br>(lbs/acre) |      |
|--------|----------|-----------------------|----------------------|----------------------------|-------------------------|-----------------------------|--------------------|-------------------------|--------------------------------------|-------------------------------------------|---------------------------------------------------------------------------|-------|--------------------------------|----------------------------------------------------------------------|------|
|        | Lower    | 166                   | 45                   | 7,503                      | Trout (brown & rainbow) | 71                          | 35-22-14           | 3,025                   | 197                                  | 551                                       | 372                                                                       | 729   | 14.9                           | 10.1                                                                 | 19.7 |
| IHD-F1 | Combined | 279                   | 31                   | 8,649                      | Trout (brown & rainbow) | 46                          | 23-14-9            | 1,146                   | 114                                  | 304                                       | 188                                                                       | 421   | 12.6                           | 7.8                                                                  | 17.5 |
|        | Upper    | 130                   | 35                   | 4,550                      | Trout (brown & rainbow) | 17                          | 8-3-6              | 1,667                   | 0                                    | 396                                       | 0                                                                         | 1,395 | 6.5                            | 0.0                                                                  | 22.9 |
|        | Lower    | 149                   | 27                   | 4,023                      | Trout (brown & rainbow) | 29                          | 15-11-3            | 1,188                   | 172                                  | 358                                       | 262                                                                       | 454   | 20.1                           | 14.7                                                                 | 25.5 |
| IHD-F2 | Combined | 366                   | 33                   | 12,002                     | Trout (brown & rainbow) | 46                          | 29-8-7             | 647                     | 61                                   | 163                                       | 155                                                                       | 170   | 8.2                            | 7.8                                                                  | 8.6  |
|        |          |                       |                      |                            | Sacramento Sucker       | 4                           | 2-2-0              | --                      | --                                   | --                                        | --                                                                        | --    | --                             | --                                                                   | --   |
|        | Upper    | 222                   | 33                   | 7,389                      | Trout (brown & rainbow) | 24                          | 16-6-2             | 600                     | 0                                    | 148                                       | 130                                                                       | 167   | 3.9                            | 3.4                                                                  | 4.4  |
|        |          |                       |                      |                            | Sacramento Sucker       | 1                           | 1-0-0              | --                      | --                                   | --                                        | --                                                                        | --    | --                             | --                                                                   | --   |
|        | Lower    | 144                   | 32                   | 4,654                      | Trout (brown & rainbow) | 22                          | 13-2-5             | 859                     | 214                                  | 219                                       | 143                                                                       | 296   | 17.4                           | 11.3                                                                 | 23.4 |
|        |          |                       |                      |                            | Sacramento Sucker       | 3                           | 1-2-0              | --                      | --                                   | --                                        | --                                                                        | --    | --                             | --                                                                   | --   |

Notes: -- = not measured or not applicable  
> = greater than  
lbs = pounds  
mm = millimeter  
<sup>a</sup> Could not be calculated due to poor depletion pattern.

**Table B4-2. Trout Population Estimates and Fish Capture Data at Snorkel Sites, 2025<sup>a</sup>.**

| Site   | Site Length<br>(feet) | Average<br>Width<br>(feet) | Approximate<br>Site Area<br>(square<br>feet) <sup>b</sup> | Species                 | Total Number<br>Observed | Number of<br>Trout/Mile | Catchable<br>Trout/Mile<br>(>152 mm) | Minimum Density<br>(no. of trout/<br>acre) |
|--------|-----------------------|----------------------------|-----------------------------------------------------------|-------------------------|--------------------------|-------------------------|--------------------------------------|--------------------------------------------|
| JD-F3  | 856                   | 44                         | 40,078                                                    | Trout (brown & rainbow) | 205                      | 1,264                   | 401                                  | 223                                        |
|        |                       |                            |                                                           | Rainbow trout           | 193                      | 1,190                   | 364                                  | 210                                        |
|        |                       |                            |                                                           | Brown trout             | 12                       | 74                      | 37                                   | 13                                         |
| CD-F1  | 955                   | 46                         | 43,655                                                    | Rainbow trout           | 8                        | 44                      | 17                                   | 8                                          |
| SCD-F3 | 1,073                 | 44                         | 51,492                                                    | Trout (brown & rainbow) | 18                       | 89                      | 69                                   | 15                                         |
|        |                       |                            |                                                           | Rainbow trout           | 10                       | 49                      | 30                                   | 9                                          |
|        |                       |                            |                                                           | Brown trout             | 8                        | 39                      | 39                                   | 7                                          |
|        |                       |                            |                                                           | Sculpin spp.            | 3                        | --                      | --                                   | --                                         |
| SCD-F2 | --                    | 687                        | 41                                                        | Rainbow trout           | 123                      | 945                     | 707                                  | 199                                        |
|        |                       |                            |                                                           | Sacramento pikeminnow   | 10                       | --                      | --                                   | --                                         |
|        |                       |                            |                                                           | Sacramento sucker       | 1                        | --                      | --                                   | --                                         |
|        |                       |                            |                                                           | Cyprinid spp.           | 25                       | --                      | --                                   | --                                         |
|        |                       |                            |                                                           | Sculpin spp.            | 1                        | --                      | --                                   | --                                         |

Notes: -- = not measured or not applicable  
> = greater than  
mm = millimeter

<sup>a</sup> Confidence intervals and biomass were not calculated for sites surveyed via snorkeling.

<sup>b</sup> Calculated as the sum of individual habitat unit areas. A single habitat unit area is equal to the product of habitat unit length and average habitat unit width.

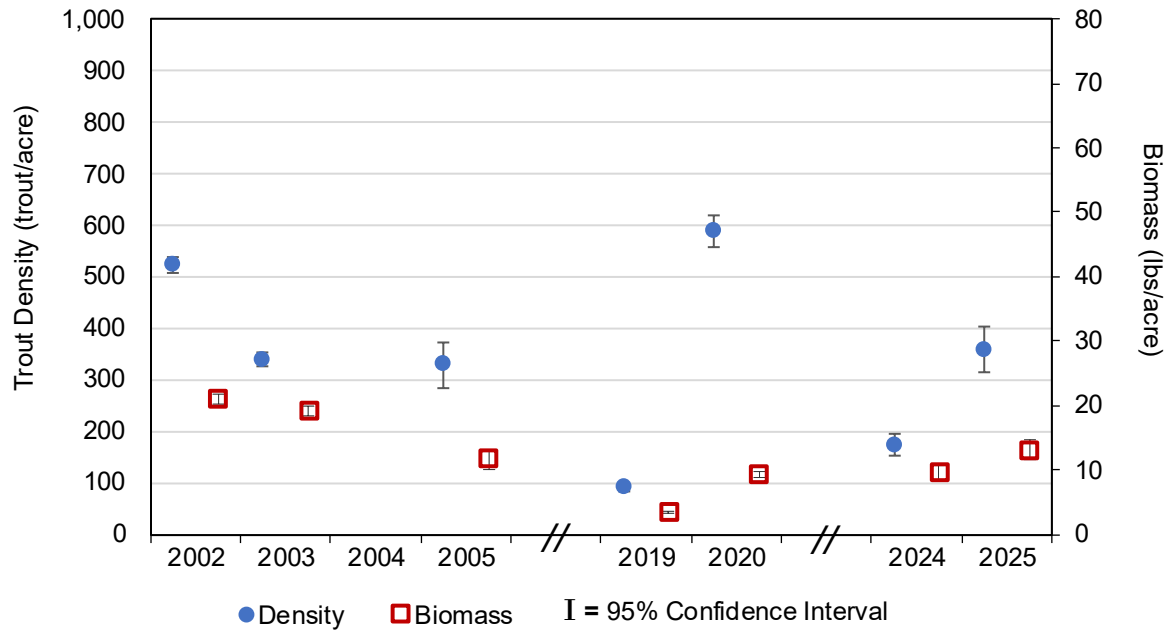
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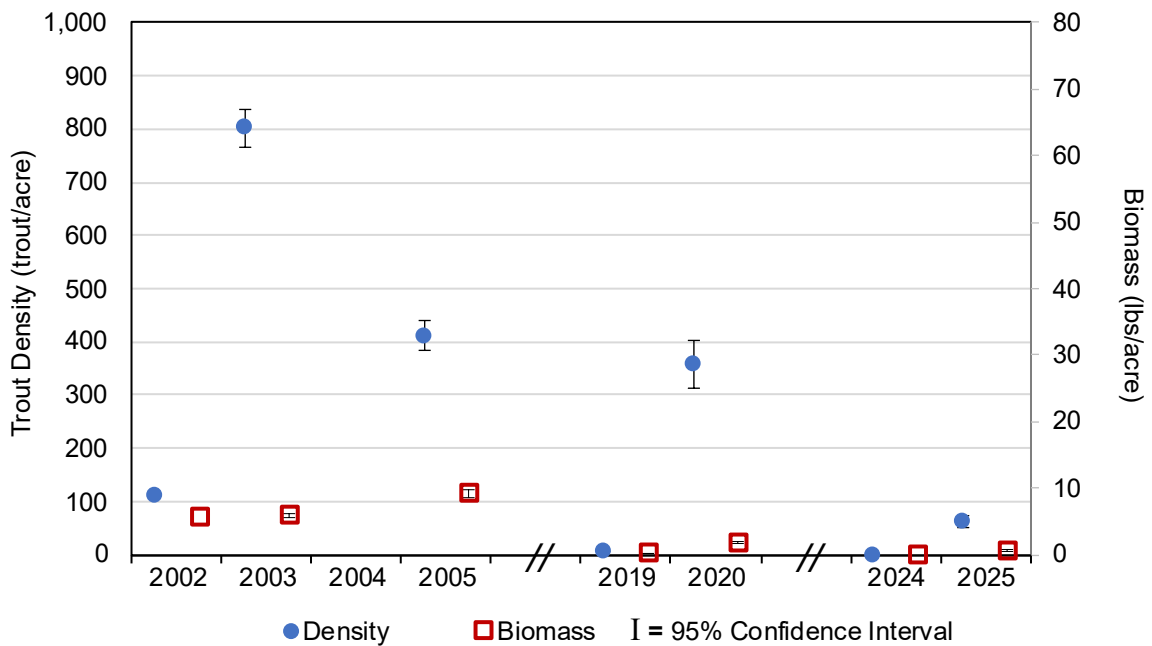
## **APPENDIX B5**

### **Site-Specific Trout Density and Biomass Figures**

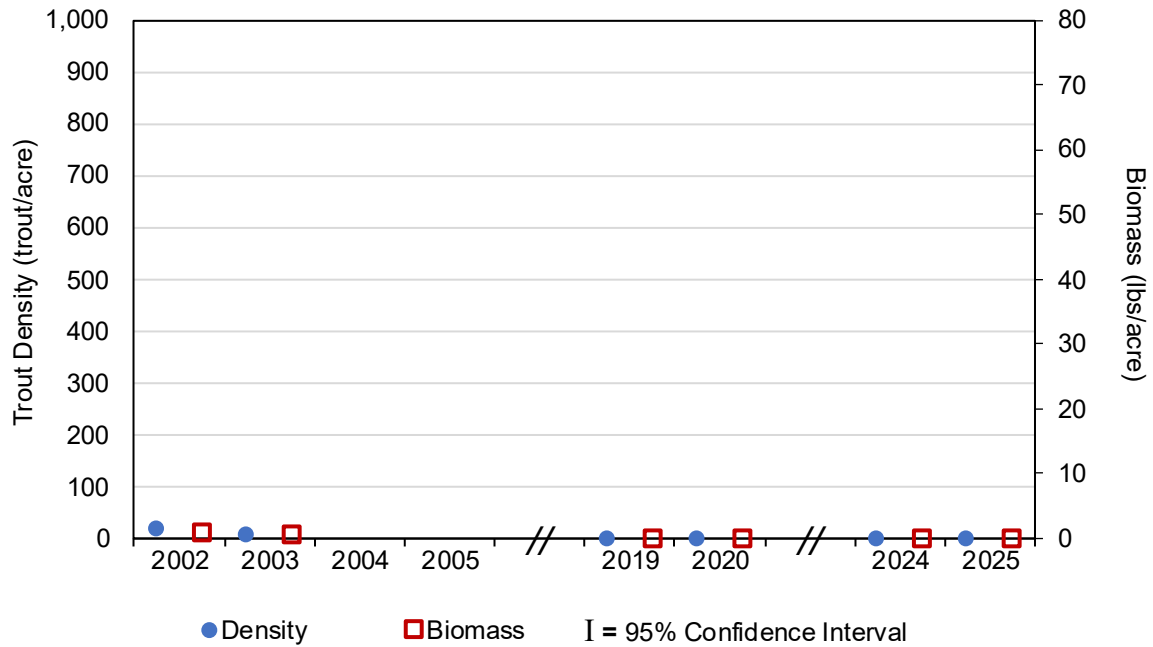
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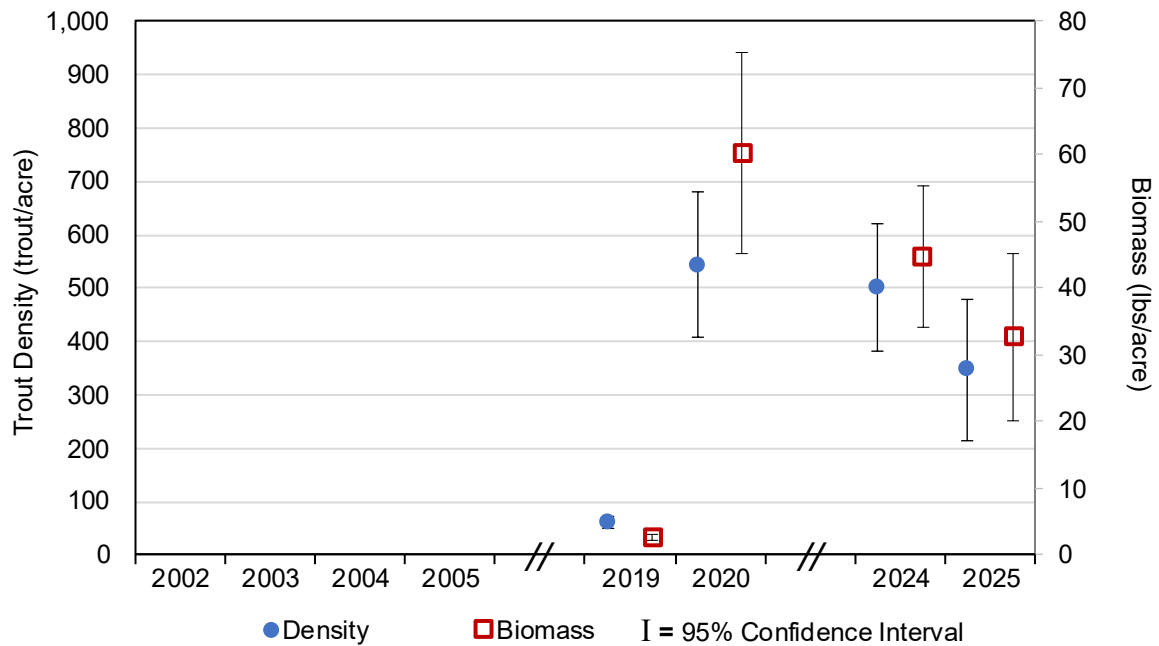
**Figure B5-1. Trout density and biomass at Site RRD-F1, 2002–2025.**



**Figure B5-2. Trout density and biomass at Site RRD-F2, 2002–2025.**

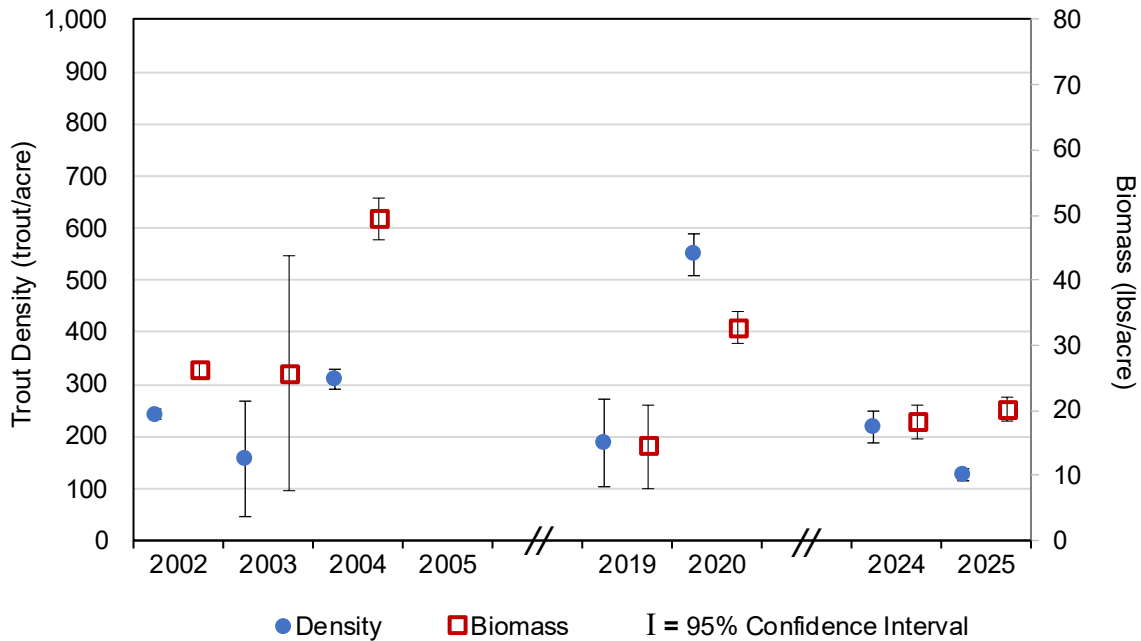


**Figure B5-3. Trout density and biomass at Site BID-F1, 2002–2025.**

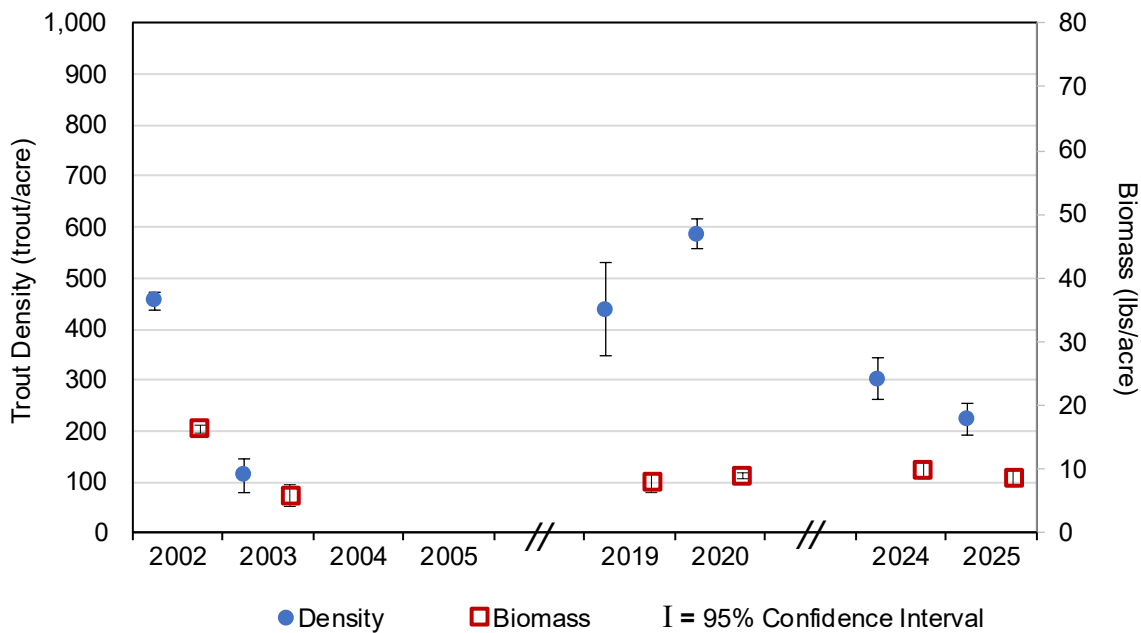


Note: Site not surveyed in 2002–2005.

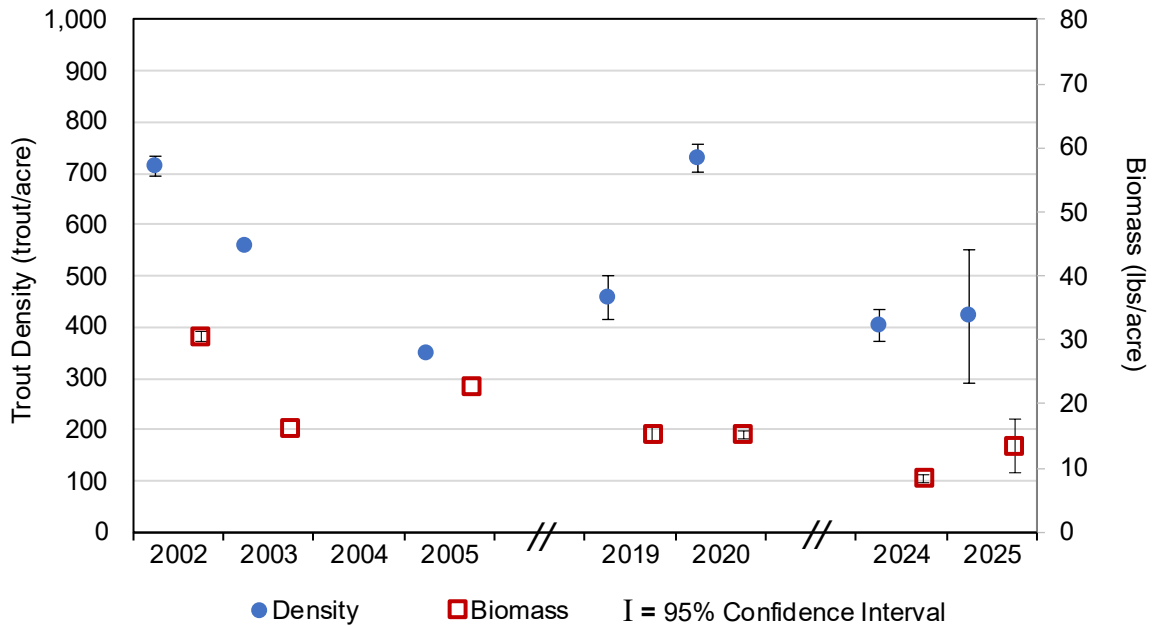
**Figure B5-4. Trout density and biomass at Site LLD-F3, 2019–2025.**



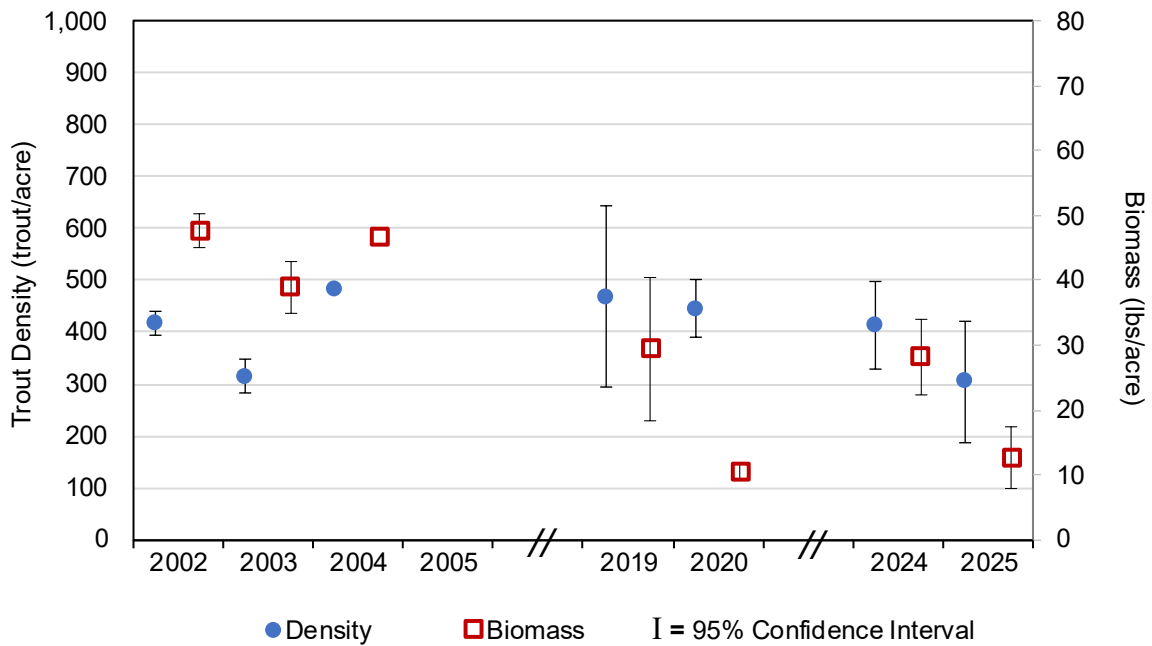
**Figure B5-5. Trout density and biomass at Site LLD-F2, 2002–2025.**



**Figure B5-6. Trout density and biomass at Site GCD-F1, 2002–2025.**

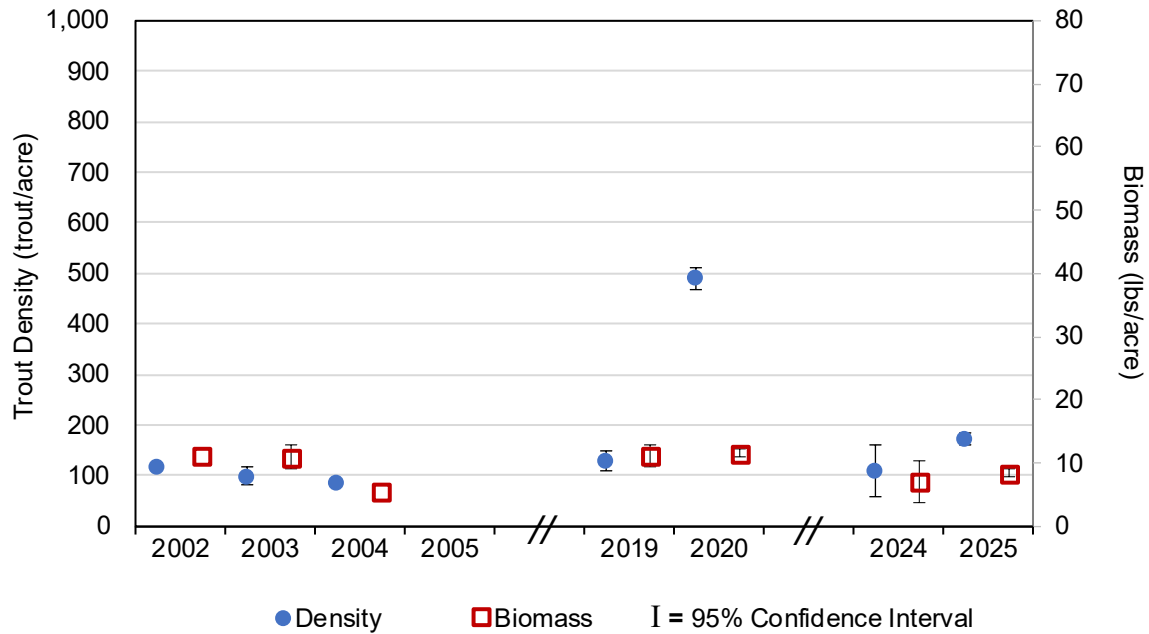


**Figure B5-7. Trout density and biomass at Site RPD-F1, 2002–2025.**



**Figure B5-8. Trout density and biomass at Site IHD-F1, 2002–2025.**





**Figure B5-9. Trout density and biomass at Site IHD-F2, 2002–2025.**

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## **APPENDIX B6**

### **Trout Condition**

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**Table B6-1. Fulton's Condition Factors (*k*-values), 2025.**

| Stream                   | Reach                 | Site   | Year | Rainbow Trout |                         |                | Brown Trout |                         |                |
|--------------------------|-----------------------|--------|------|---------------|-------------------------|----------------|-------------|-------------------------|----------------|
|                          |                       |        |      | Sample Size   | Average <i>k</i> -value | Standard Error | Sample Size | Average <i>k</i> -value | Standard Error |
| Rubicon River            | Rubicon Reservoir Dam | RRD-F1 | 2025 | 65            | 1.02                    | 0.02           | 1           | 0.93                    | --             |
| Rubicon River            | Rubicon Reservoir Dam | RRD-F2 | 2025 | 1             | 0.85                    | --             | 6           | 0.80                    | 0.04           |
| Little Rubicon River     | Buck Island Dam       | BID-F1 | 2025 | 0             | --                      | --             | 0           | --                      | --             |
| Gerle Creek              | Loon Lake Dam         | LLD-F3 | 2025 | 13            | 0.85                    | 0.03           | 33          | 0.94                    | 0.01           |
| Gerle Creek              | Loon Lake Dam         | LLD-F2 | 2025 | 15            | 0.90                    | 0.03           | 19          | 0.92                    | 0.02           |
| Gerle Creek              | Gerle Creek Dam       | GCD-F1 | 2025 | 59            | 0.92                    | 0.02           | 7           | 0.95                    | 0.02           |
| South Fork Rubicon River | Robbs Peak Dam        | RPD-F1 | 2025 | 95            | 0.93                    | 0.02           | 8           | 1.02                    | 0.03           |
| South Fork Silver Creek  | Ice House Dam         | IHD-F1 | 2025 | 40            | 0.94                    | 0.01           | 3           | 0.87                    | 0.07           |
| South Fork Silver Creek  | Ice House Dam         | IHD-F2 | 2025 | 35            | 0.88                    | 0.35           | 8           | 0.92                    | 0.02           |

Note: -- = not applicable

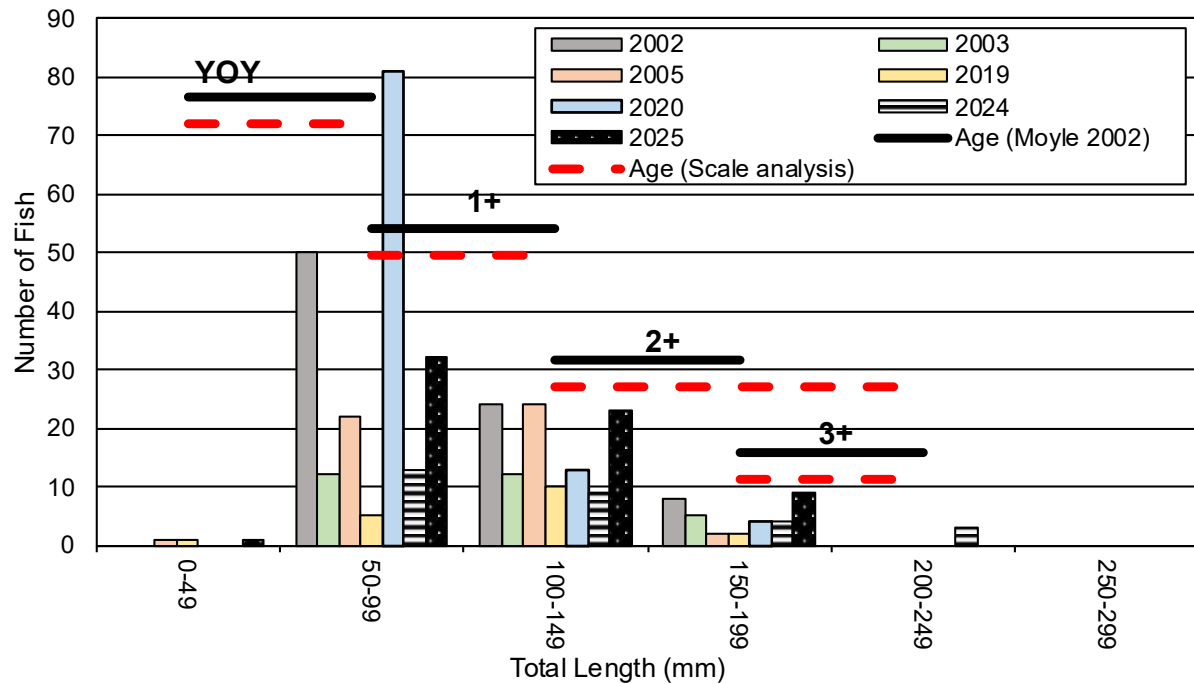
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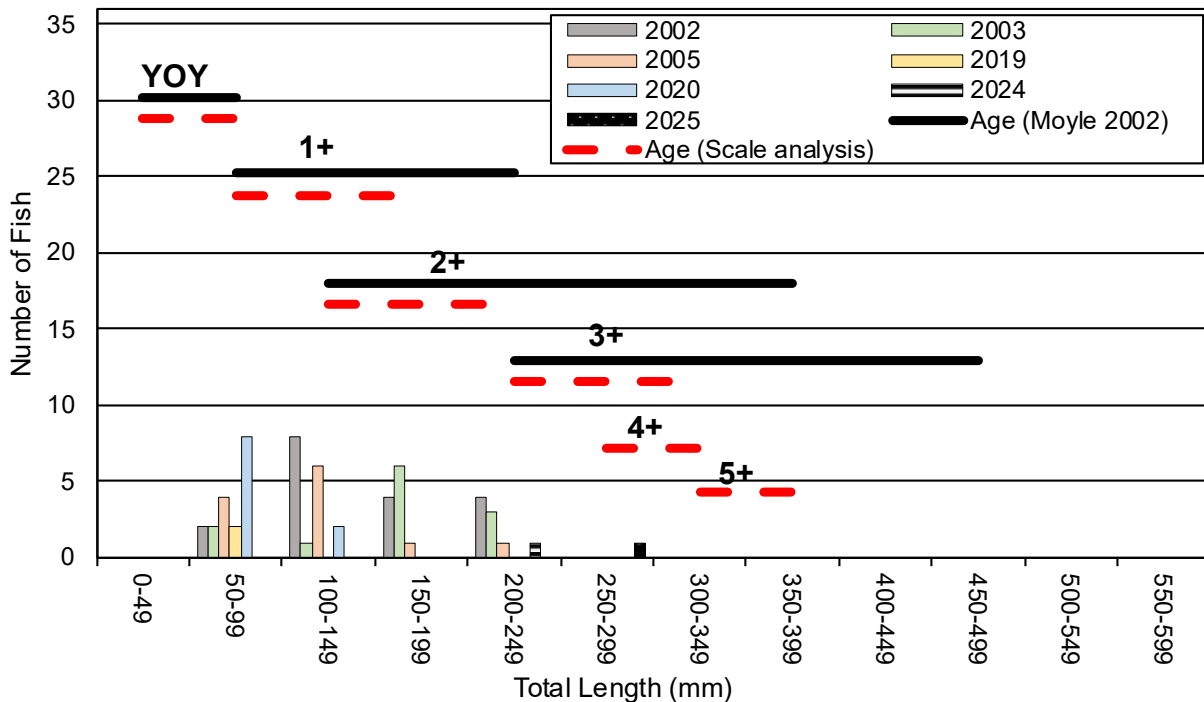
## **APPENDIX B7**

### **Site-Specific Trout Length-Frequency and Age-Class Distributions**

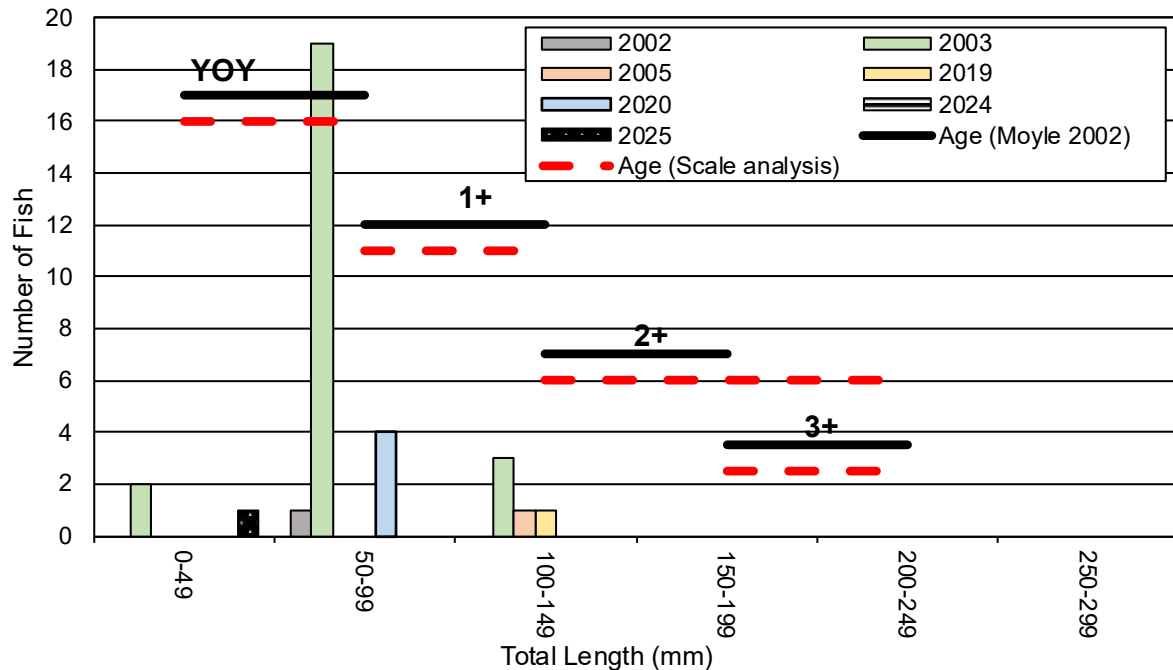
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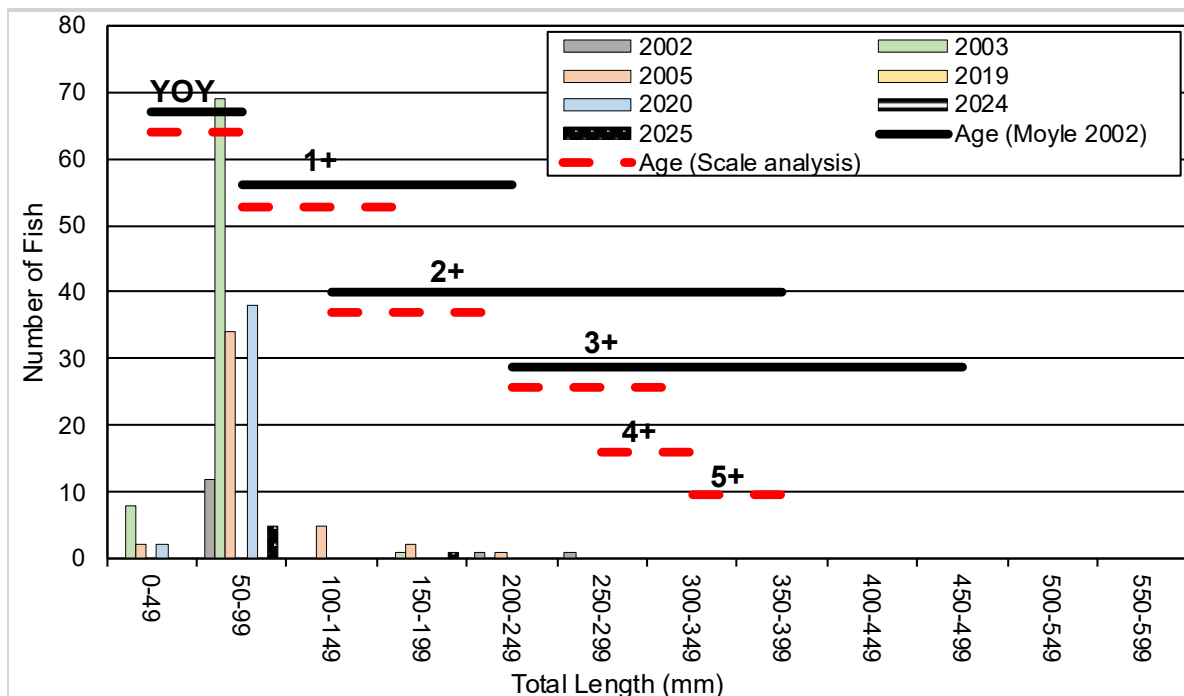
**Figure B7-1. Length-frequency and age-class distribution of rainbow trout at Site RRD-F1, Rubicon River downstream of Rubicon Dam, 2002–2025.**



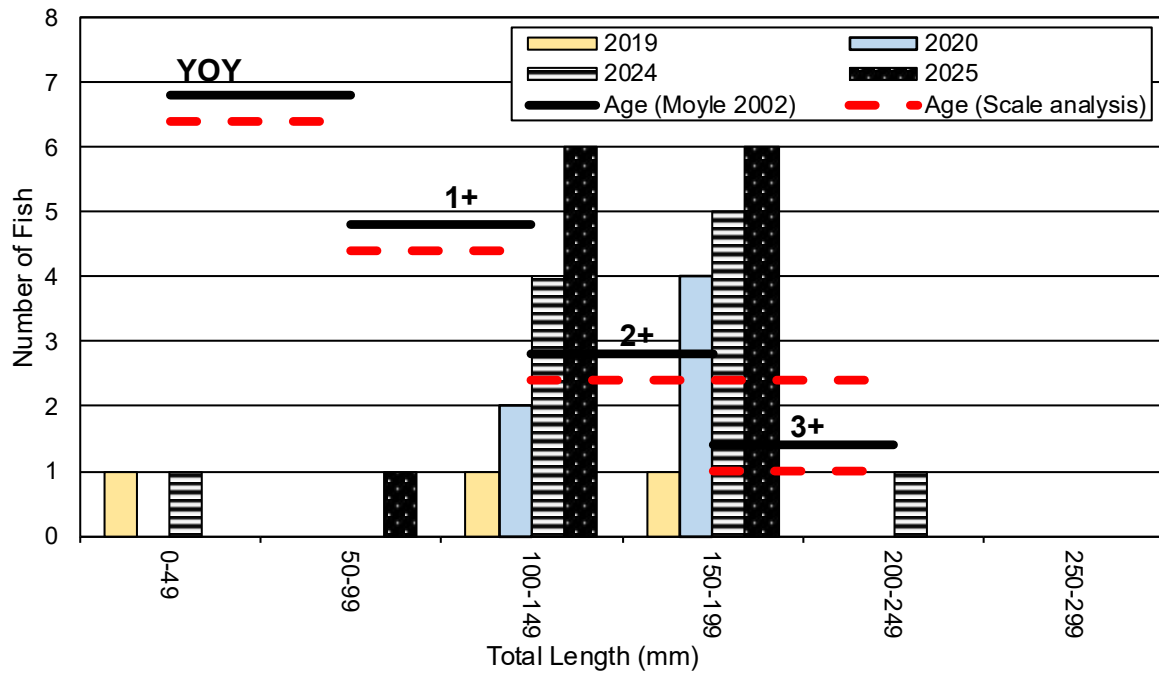
**Figure B7-2. Length-frequency and age-class distribution of brown trout at Site RRD-F1, Rubicon River downstream of Rubicon Dam, 2002–2025.**



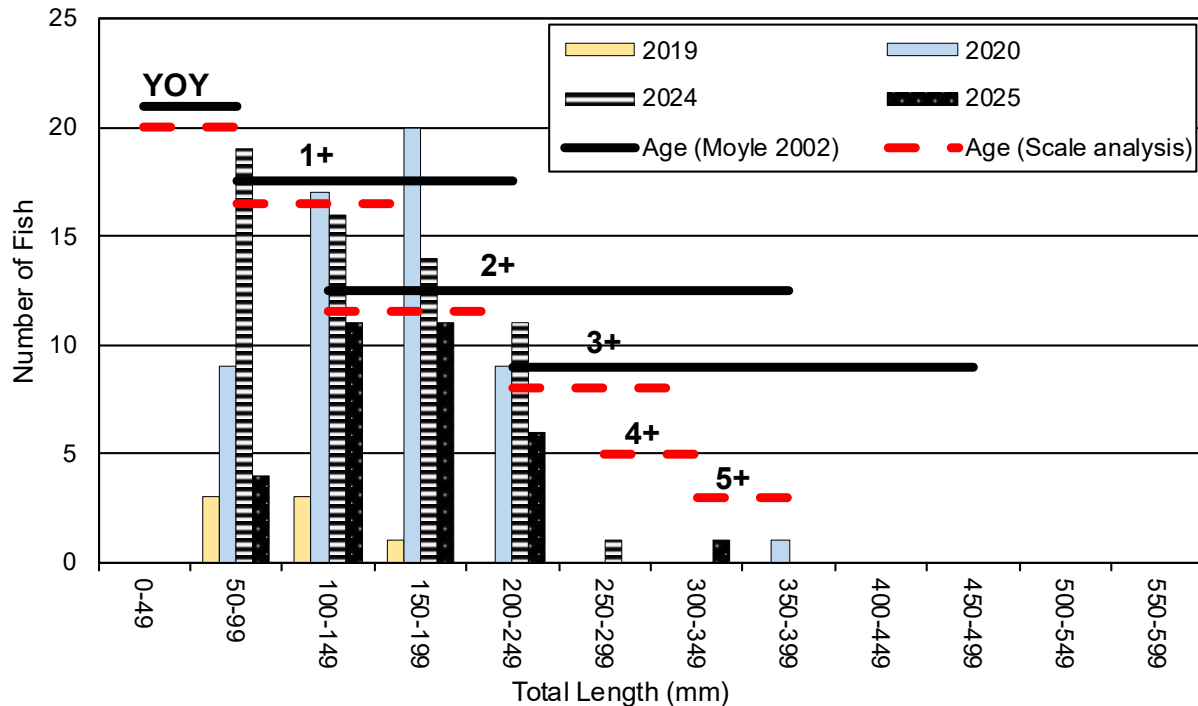
**Figure B7-3. Length-frequency and age-class distribution of rainbow trout at Site RRD-F2, Rubicon River downstream of Rubicon Dam, 2002–2025.**



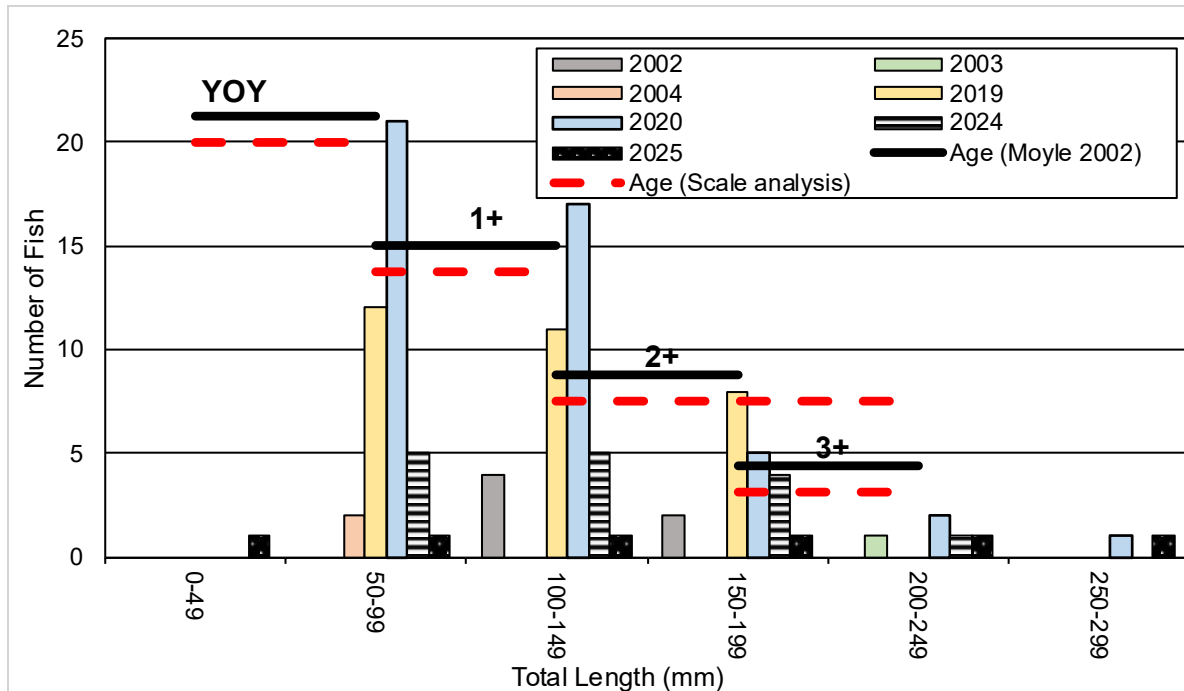
**Figure B7-4. Length-frequency and age-class distribution of brown trout at Site RRD-F2, Rubicon River downstream of Rubicon Dam, 2002–2025.**



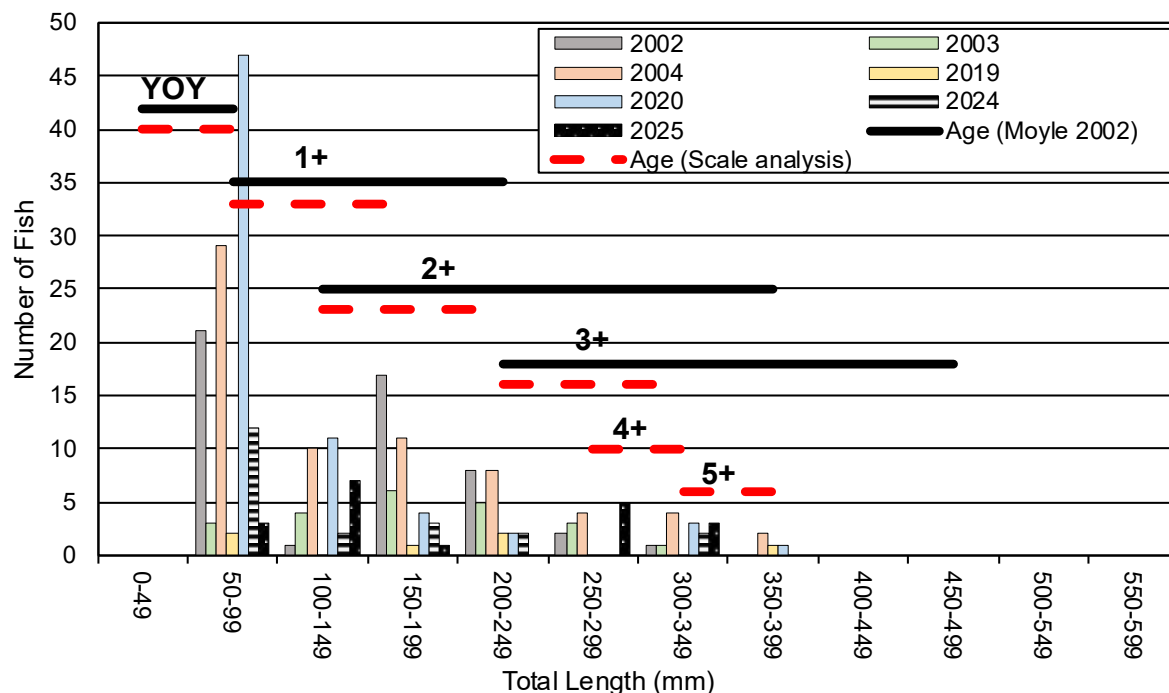
**Figure B7-5. Length-frequency and age-class distribution of rainbow trout at Site LLD-F3, Gerle Creek downstream of Loon Lake Dam, 2019–2025.**



**Figure B7-6. Length-frequency and age-class distribution of brown trout at Site LLD-F3, Gerle Creek downstream of Loon Lake Dam, 2019–2025.**

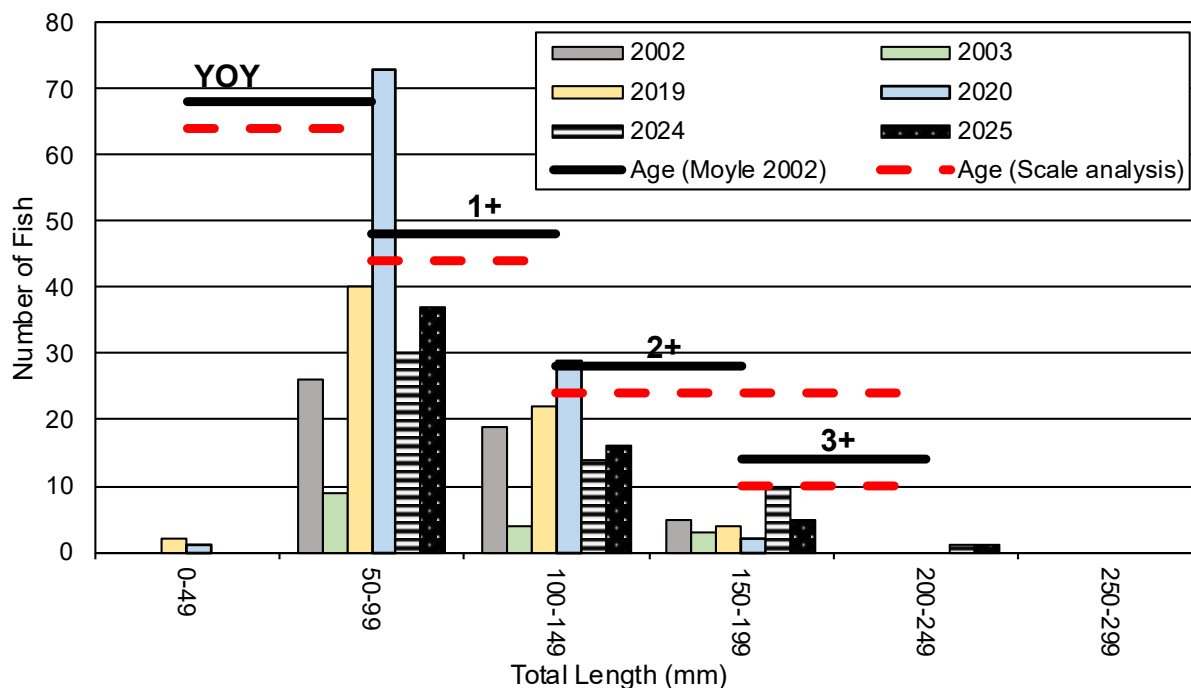


**Figure B7-7. Length-frequency and age-class distribution of rainbow trout at Site LLD-F2, Gerle Creek downstream of Loon Lake Dam, 2002–2025.**

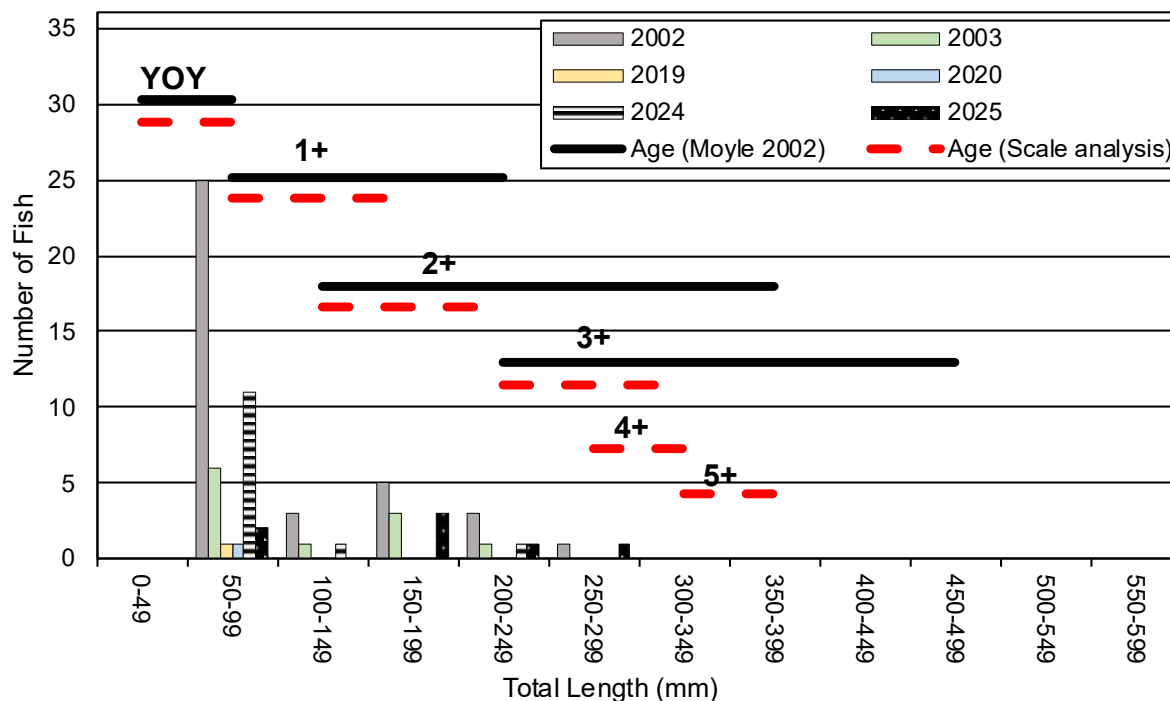


**Figure B7-8. Length-frequency and age-class distribution of brown trout at Site LLD-F2, Gerle Creek downstream of Loon Lake Dam, 2002–2025.**

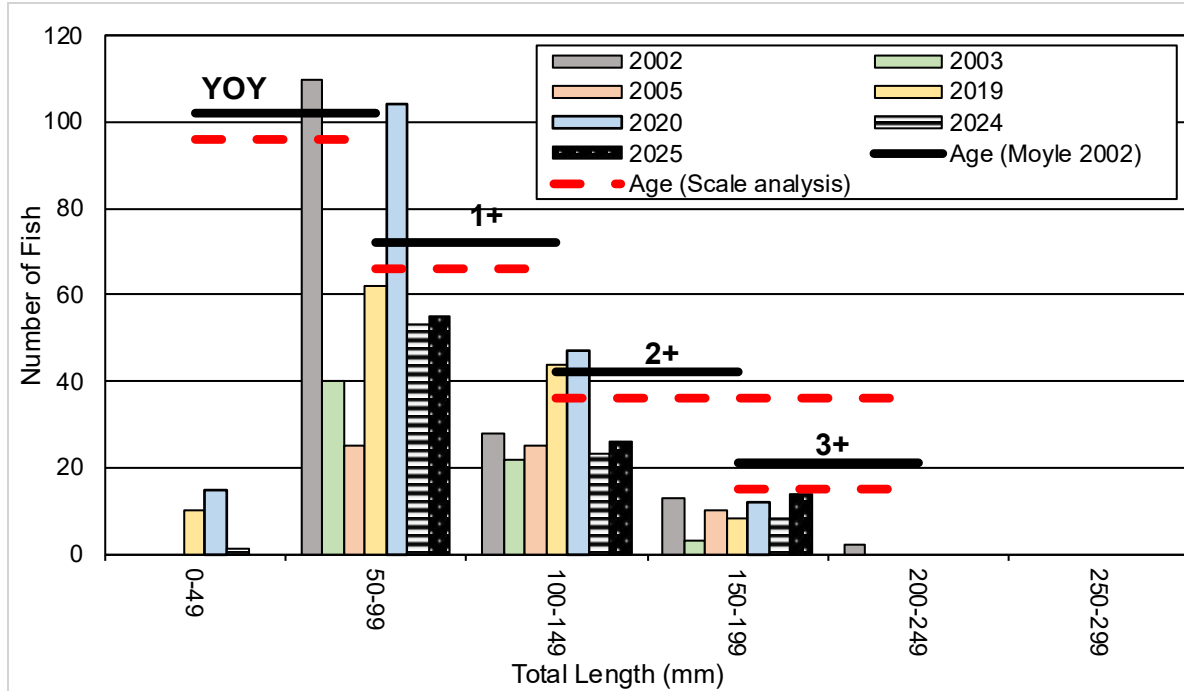




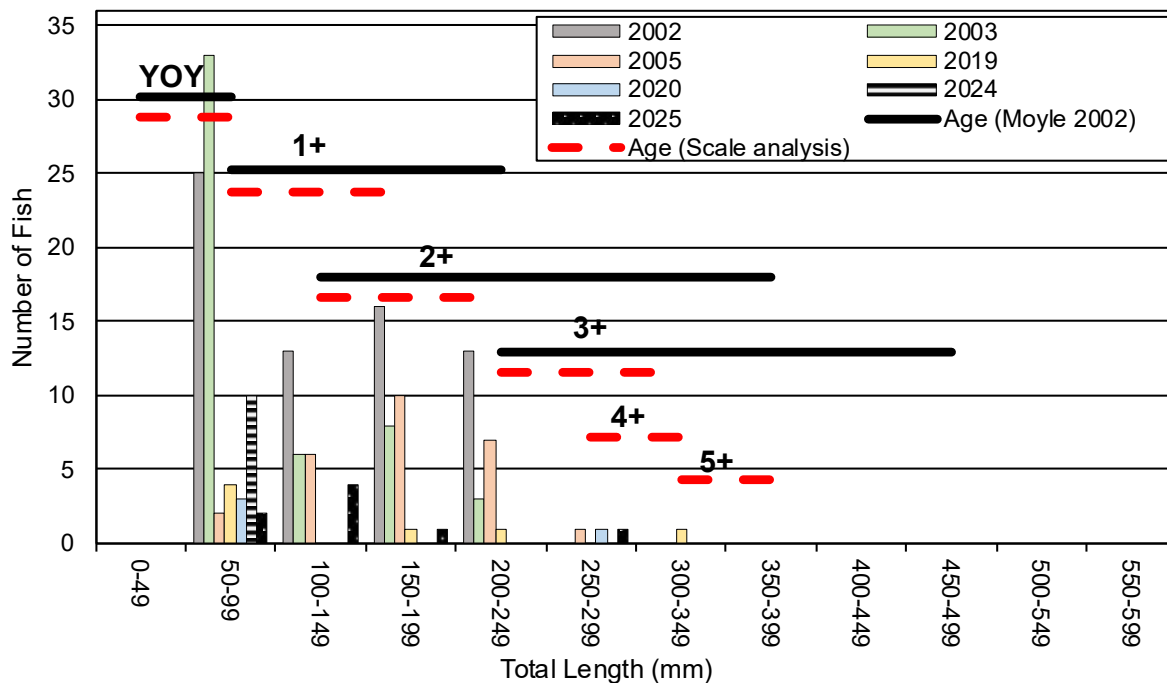
**Figure B7-9. Length-frequency and age-class distribution of rainbow trout at Site GCD-F1, Gerle Creek downstream of Gerle Creek Dam, 2002–2025.**



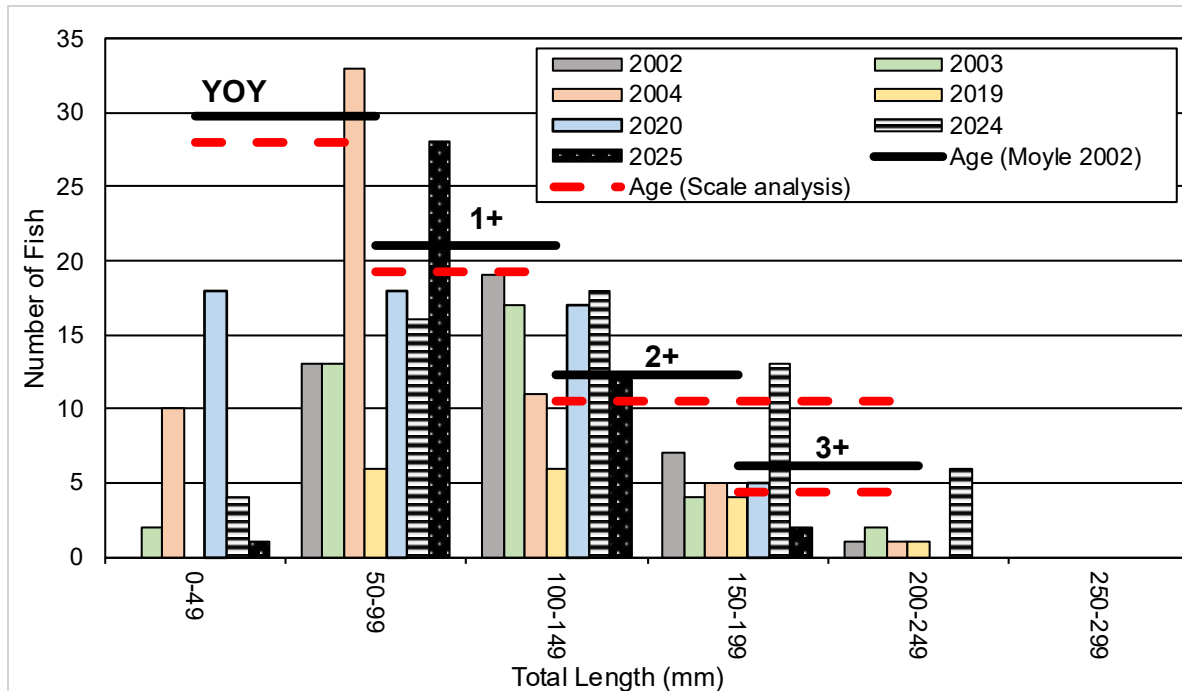
**Figure B7-10. Length-frequency and age-class distribution of brown trout at Site GCD-F1, Gerle Creek downstream of Gerle Creek Dam, 2002–2025.**



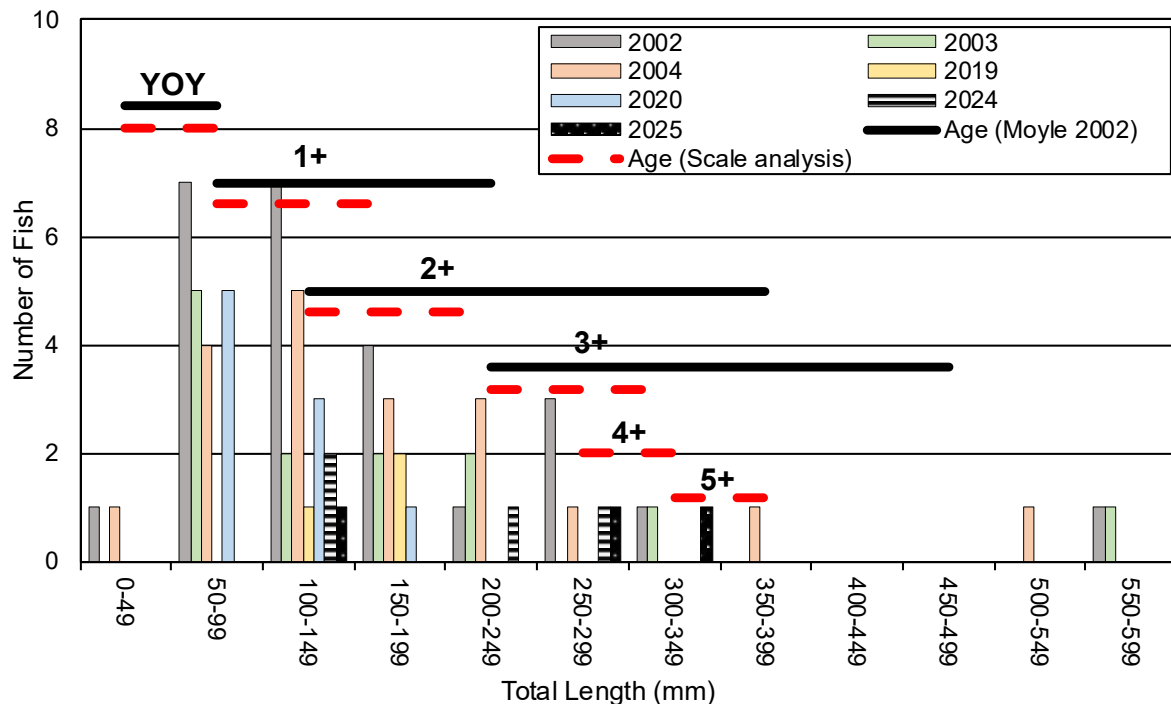
**Figure B7-11. Length-frequency and age-class distribution of rainbow trout at Site RPD-F1, South Fork Rubicon River downstream of Robbs Peak Dam, 2002–2025.**



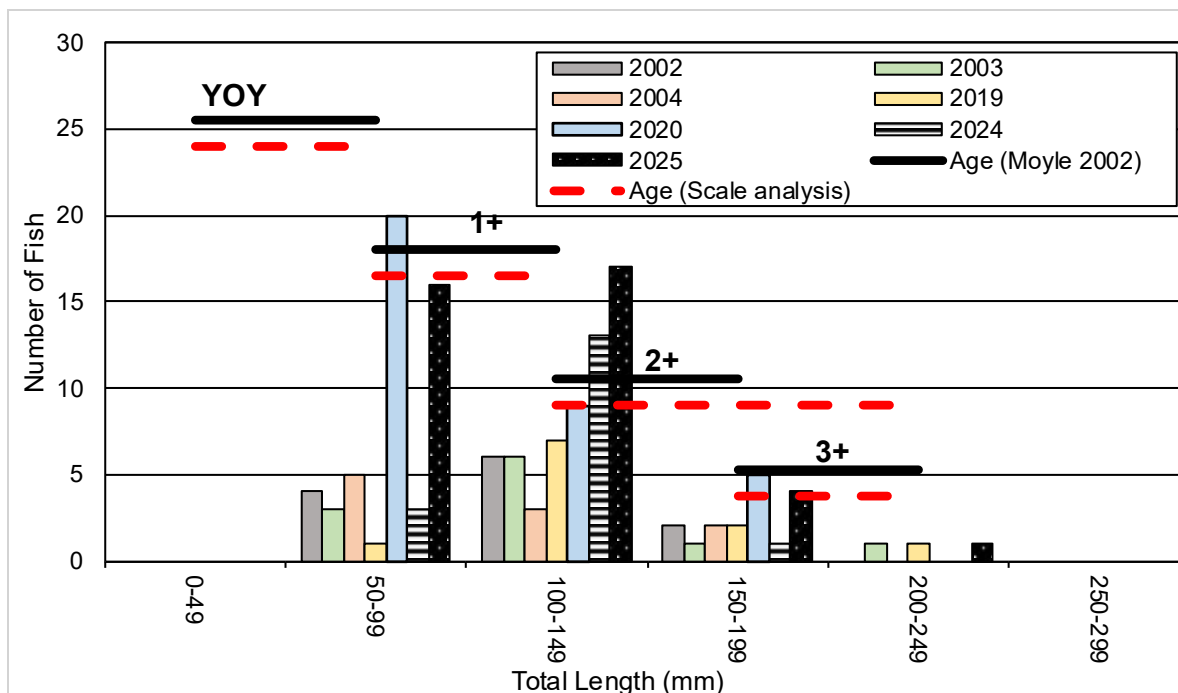
**Figure B7-12. Length-frequency and age-class distribution of brown trout at Site RPD-F1, South Fork Rubicon River downstream of Robbs Peak Dam, 2002–2025.**



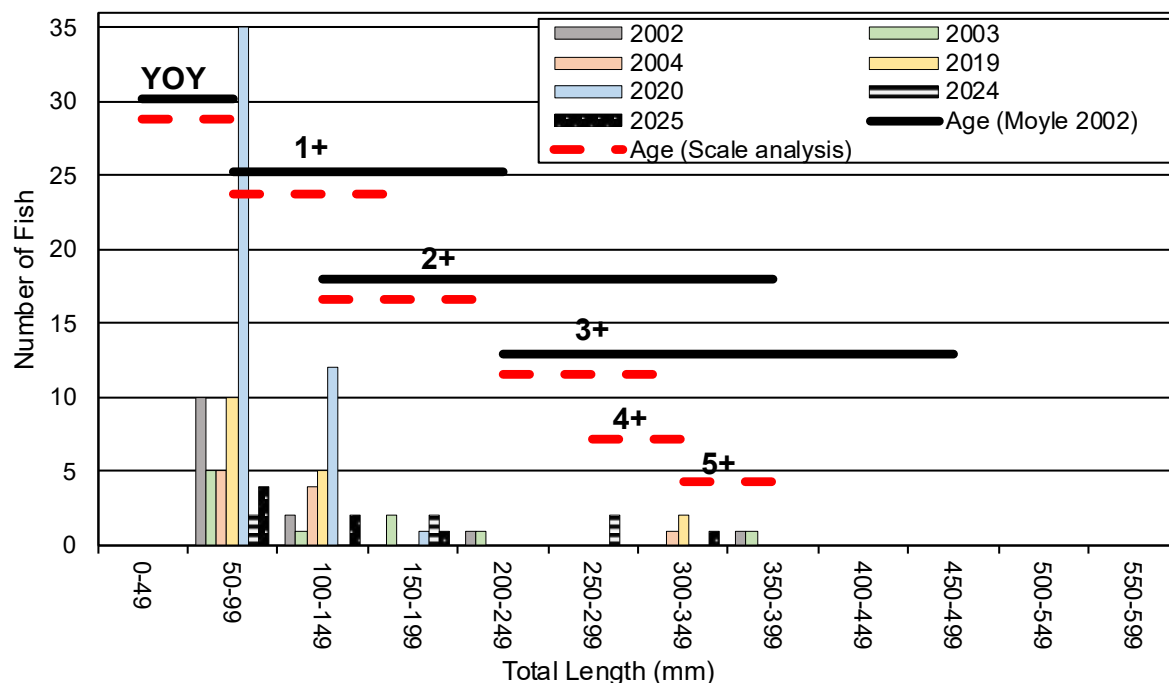
**Figure B7-13. Length-frequency and age-class distribution of rainbow trout at Site IHD-F1, South Fork Silver Creek downstream of Ice House Dam, 2002–2025.**



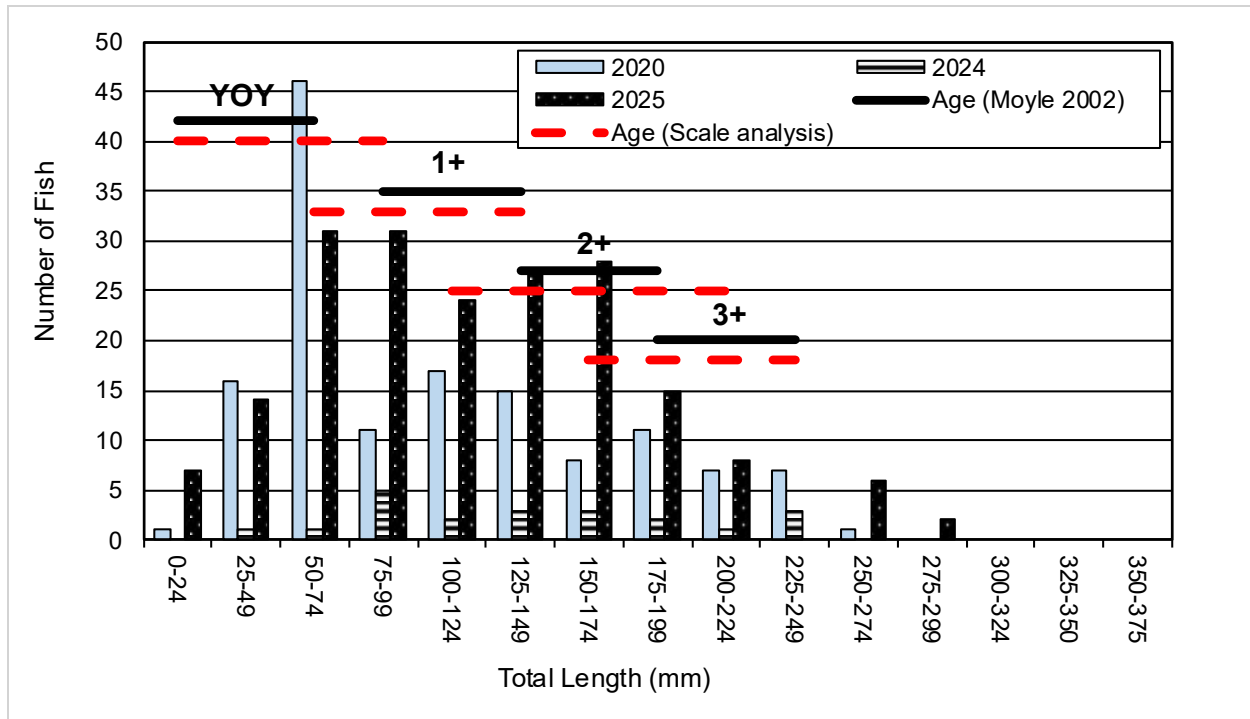
**Figure B7-14. Length-frequency and age-class distribution of brown trout at Site IHD-F1, South Fork Silver Creek downstream of Ice House Dam, 2002–2025.**



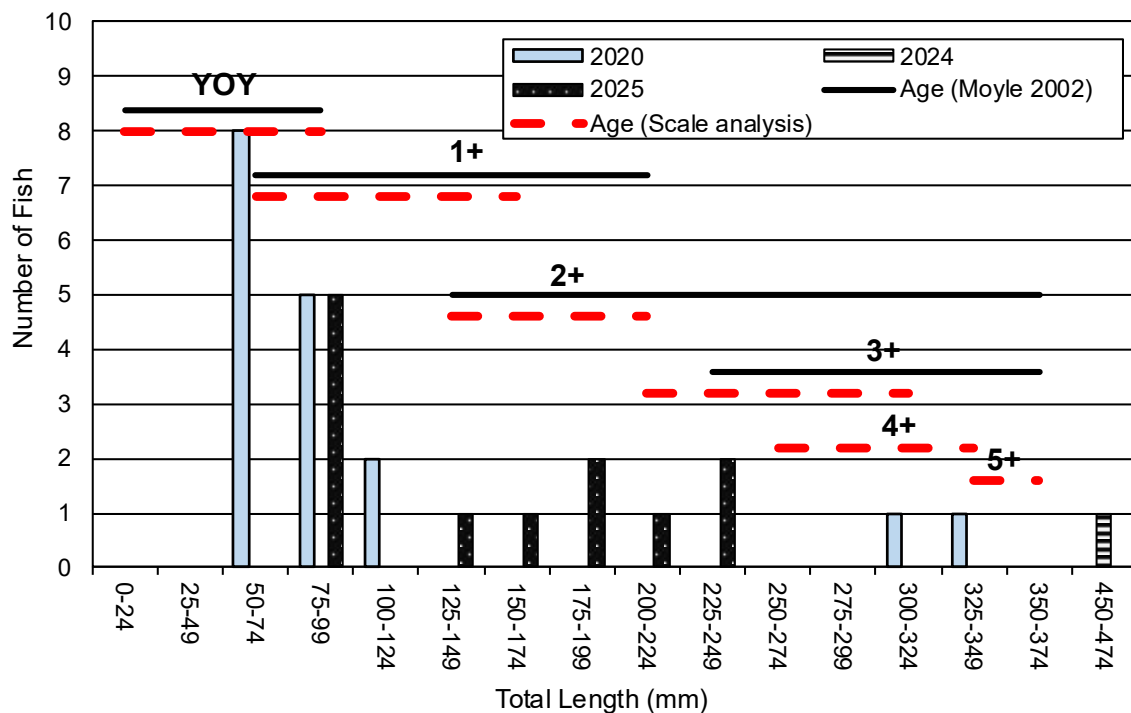
**Figure B7-15. Length-frequency and age-class distribution of rainbow trout at Site IHD-F2, South Fork Silver Creek downstream of Ice House Dam, 2002–2025.**



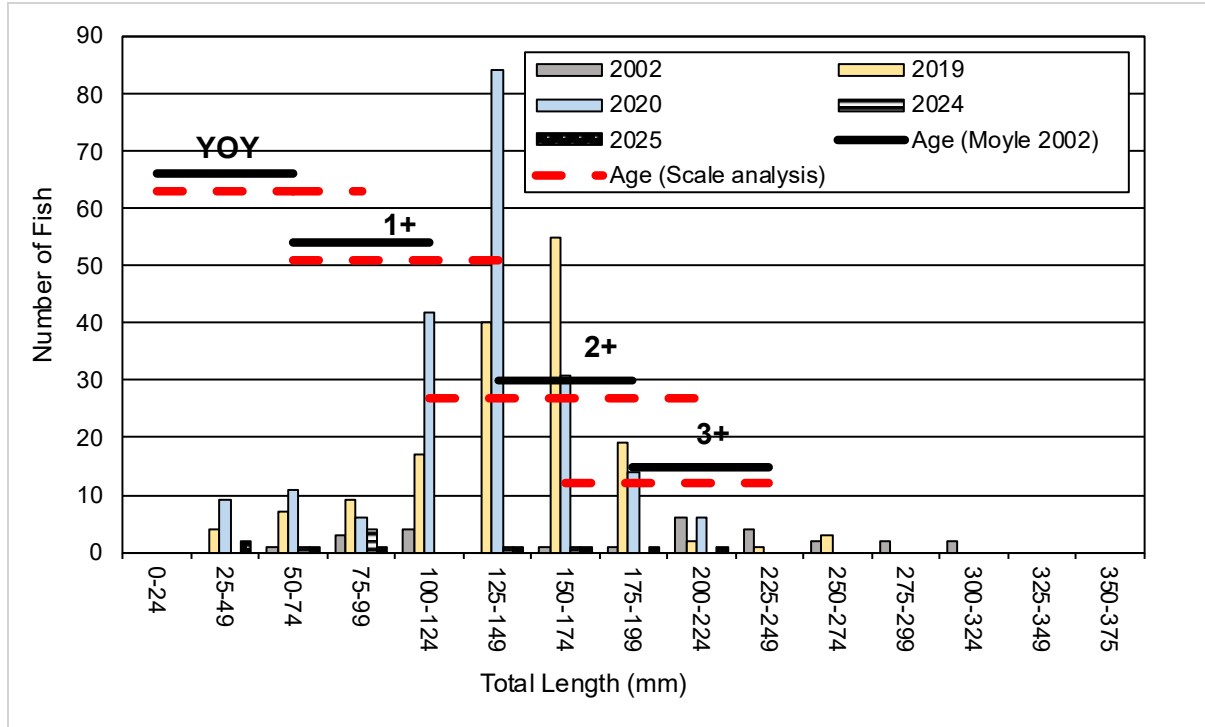
**Figure B7-16. Length-frequency and age-class distribution of brown trout at Site IHD-F2, South Fork Silver Creek downstream of Ice House Dam, 2002–2025.**



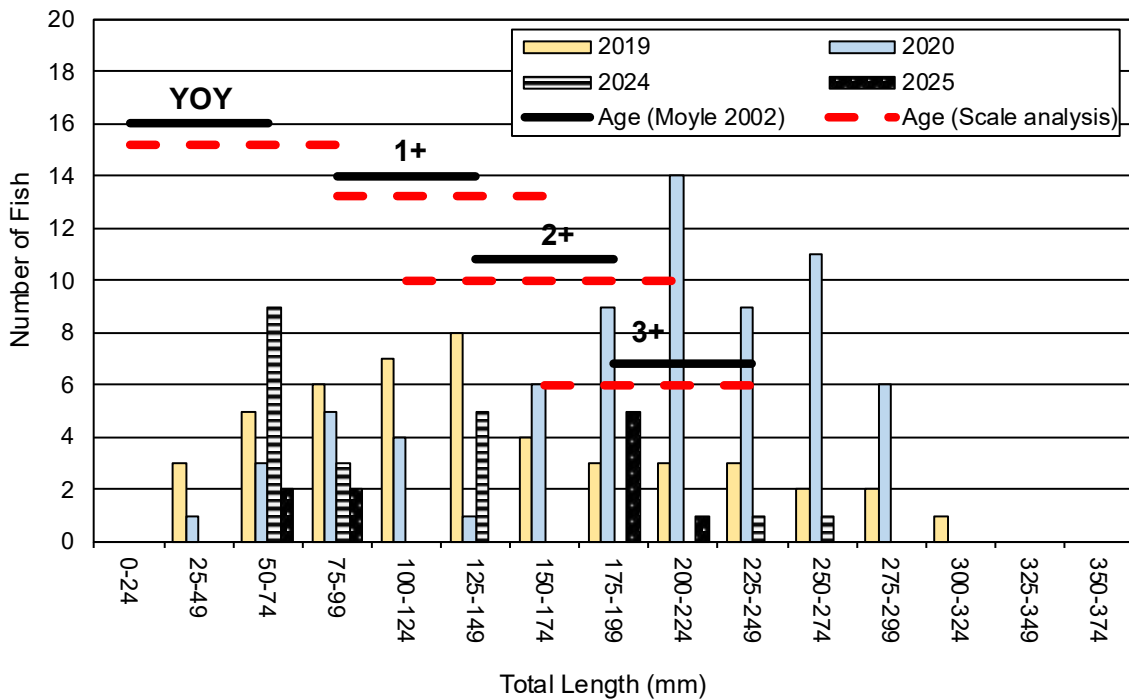
**Figure B7-17. Length-frequency and age-class distribution of rainbow trout at Site JD-F3, Silver Creek downstream of Junction Dam, 2020–2025.**



**Figure B7-18. Length-frequency and age-class distribution of brown trout at Site JD-F3, Silver Creek downstream of Junction Dam, 2020–2025.**

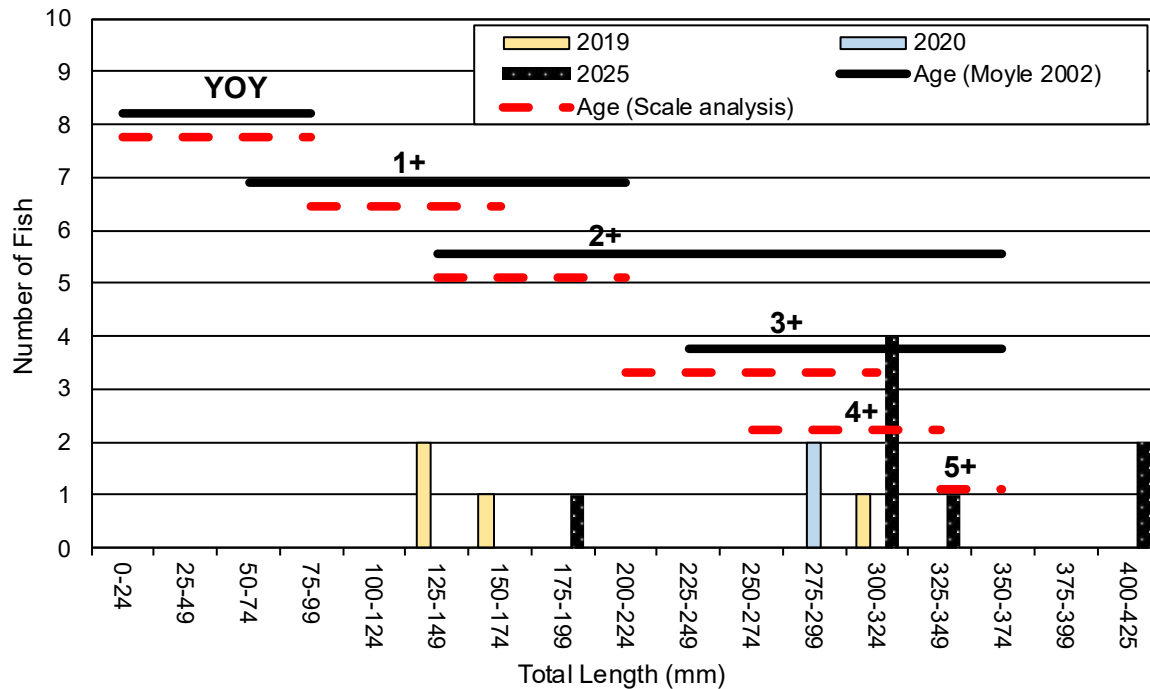


**Figure B7-19. Length-frequency and age-class distribution of rainbow trout at Site CD-F1, Silver Creek downstream of Camino Dam, 2002–2025.**

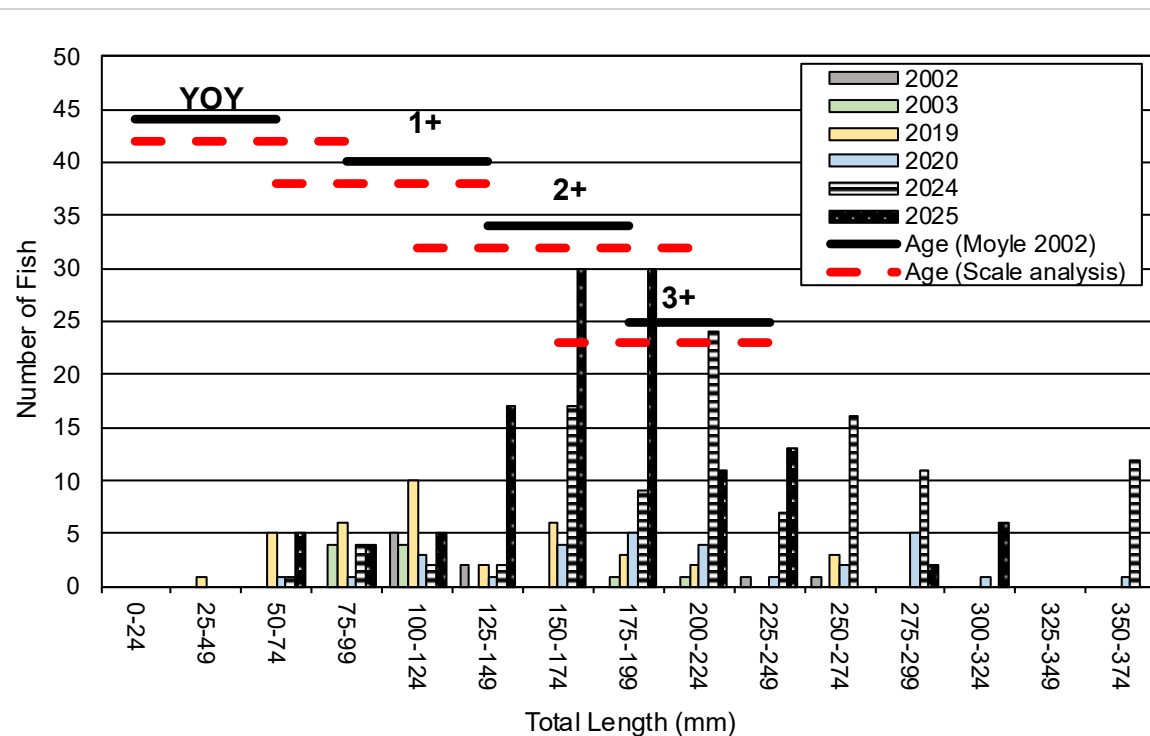


**Figure B7-20. Length-frequency and age-class distribution of rainbow trout at Site SCD-F3, South Fork American River downstream of Slab Creek Dam, 2019–2025.**

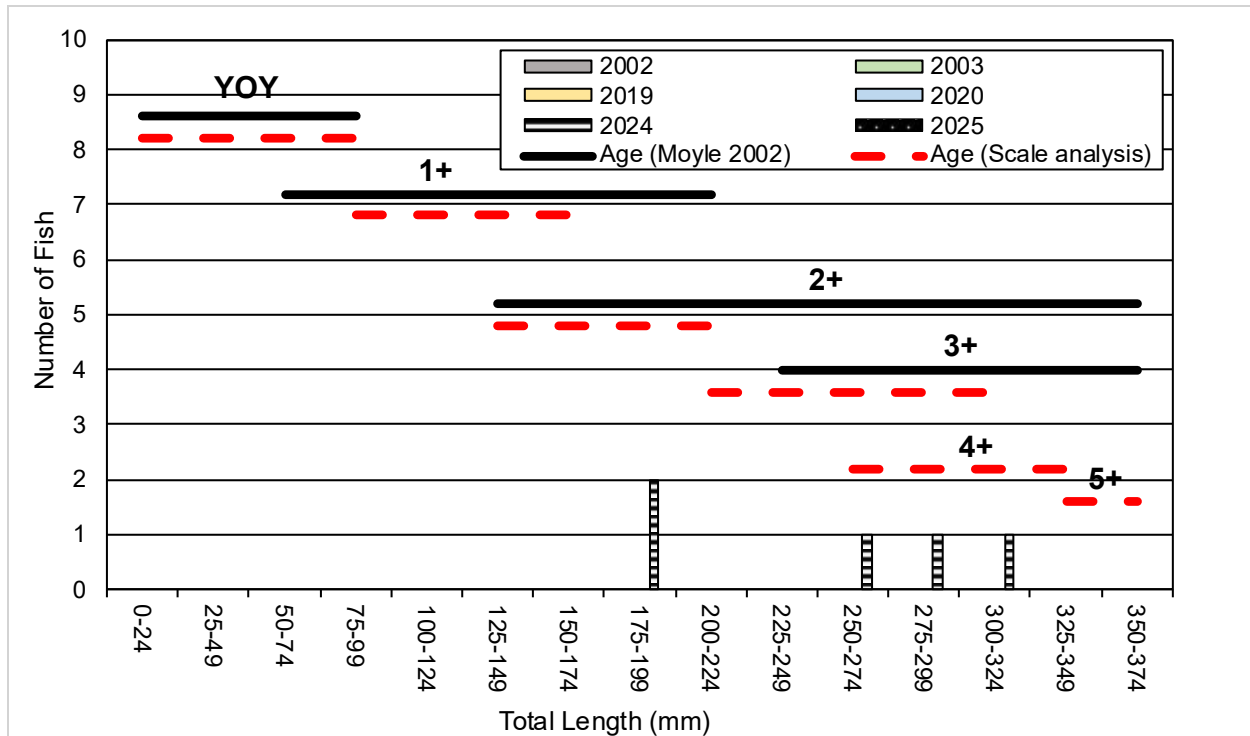




**Figure B7-21. Length-frequency and age-class distribution of brown trout at Site SCD-F3, South Fork American River downstream of Slab Creek Dam, 2019–2020.**



**Figure B7-22. Length-frequency and age-class distribution of rainbow trout at Site SCD-F2, South Fork American River downstream of Slab Creek Dam, 2002–2025.**



**Figure B7-23. Length-frequency and age-class distribution of brown trout at Site SCD-F2, South Fork American River downstream of Slab Creek Dam, 2002–2025.**

**APPENDIX B8**  
**Scale Analysis Data**

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**Table B8-1. Scale Analysis Data, 2025.**

| Species               | Sample ID | Total Length<br>(millimeters) | Weight<br>(grams) | Age<br>Determined<br>from Scale<br>Analysis |
|-----------------------|-----------|-------------------------------|-------------------|---------------------------------------------|
| <b>Site RRD-F1</b>    |           |                               |                   |                                             |
| Rainbow trout         | 2         | 59                            | 1.6               | 0+                                          |
| Rainbow trout         | 4         | 135                           | 23.4              | 2+                                          |
| Rainbow trout         | 5         | 159                           | 43.2              | 2+                                          |
| Rainbow trout         | 8         | 122                           | 17.6              | 1+                                          |
| Rainbow trout         | 12        | 105                           | 11.0              | 1+                                          |
| Rainbow trout         | 13        | 111                           | 14.0              | 1+                                          |
| Rainbow trout         | 15        | 69                            | 3.6               | 0+                                          |
| Rainbow trout         | 17        | 74                            | 3.8               | 0+                                          |
| Rainbow trout         | 18        | 171                           | 49.2              | 2+                                          |
| Rainbow trout         | 19        | 142                           | 28.8              | 2+                                          |
| Brown trout           | 1         | 255                           | 153.8             | 3+                                          |
| <b>Site RRD-F2</b>    |           |                               |                   |                                             |
| Brown trout           | 1         | 76                            | 4.0               | 0+                                          |
| Brown trout           | 2         | 152                           | 29.8              | 1+                                          |
| Brown trout           | 5         | 63                            | 1.6               | 0+                                          |
| <b>Site BID-F1</b>    |           |                               |                   |                                             |
| No salmonids observed |           |                               |                   |                                             |
| <b>Site LLD-F3</b>    |           |                               |                   |                                             |
| Rainbow trout         | 1         | 135                           | 22.6              | 2+                                          |
| Rainbow trout         | 2         | 171                           | 40.6              | 2+                                          |
| Rainbow trout         | 3         | 195                           | 60.4              | 2+                                          |
| Rainbow trout         | 4         | 155                           | 26.6              | 3+                                          |
| Rainbow trout         | 5         | 120                           | 14.8              | 2+                                          |
| Rainbow trout         | 6         | 94                            | 6.2               | 1+                                          |
| Rainbow trout         | 7         | 104                           | 8.8               | 1+                                          |
| Rainbow trout         | 8         | 195                           | 66.6              | 2+                                          |
| Rainbow trout         | 9         | 177                           | 61.1              | 3+                                          |
| Rainbow trout         | 10        | 147                           | 27.2              | 2+                                          |
| Brown trout           | 2         | 223                           | 110.4             | 3+                                          |
| Brown trout           | 5         | 209                           | 87.0              | 3+                                          |

| Species            | Sample ID | Total Length<br>(millimeters) | Weight<br>(grams) | Age<br>Determined<br>from Scale<br>Analysis |
|--------------------|-----------|-------------------------------|-------------------|---------------------------------------------|
| Brown trout        | 6         | 68                            | 3.2               | 0+                                          |
| Brown trout        | 7         | 190                           | 62.4              | 2+                                          |
| Brown trout        | 8         | 160                           | 36.6              | 2+                                          |
| Brown trout        | 9         | 132                           | 19.8              | 1+                                          |
| Brown trout        | 11        | 300                           | 200.2             | 4+                                          |
| Brown trout        | 13        | 105                           | 11.0              | 1+                                          |
| Brown trout        | 14        | 192                           | 72.2              | 2+                                          |
| Brown trout        | 15        | 164                           | 37.6              | 2+                                          |
| Brown trout        | 19        | 201                           | 81.0              | 2+                                          |
| Brown trout        | 20        | 121                           | 17.2              | 1+                                          |
| <b>Site LLD-F2</b> |           |                               |                   |                                             |
| Rainbow trout      | 1         | 145                           | 27.3              | 2+                                          |
| Rainbow trout      | 3         | 172                           | 40.7              | 2+                                          |
| Rainbow trout      | 4         | 96                            | 8.6               | 1+                                          |
| Rainbow trout      | 5         | 196                           | 60.9              | 2+                                          |
| Rainbow trout      | 6         | 71                            | 3.1               | 0+                                          |
| Rainbow trout      | 8         | 110                           | 11.3              | 1+                                          |
| Rainbow trout      | 10        | 244                           | 123.9             | 3+                                          |
| Rainbow trout      | 12        | 126                           | 25.4              | 2+                                          |
| Rainbow trout      | 13        | 133                           | 19.8              | 2+                                          |
| Brown trout        | 1         | 168                           | 46.2              | 2+                                          |
| Brown trout        | 4         | 282                           | 221.4             | 4+                                          |
| Brown trout        | 5         | 264                           | 161.0             | 4+                                          |
| Brown trout        | 6         | 297                           | 215.2             | 4+                                          |
| Brown trout        | 7         | 304                           | 227.3             | 3+                                          |
| Brown trout        | 9         | 115                           | 13.7              | 1+                                          |
| Brown trout        | 11        | 334                           | 390.0             | 5+                                          |
| Brown trout        | 12        | 284                           | 187.2             | 3+                                          |
| Brown trout        | 13        | 78                            | 5.1               | 1+                                          |
| Brown trout        | 14        | 81                            | 4.4               | 0+                                          |
| Brown trout        | 17        | 263                           | 156.4             | 3+                                          |
| Brown trout        | 18        | 304                           | 248.2             | 4+                                          |



| Species            | Sample ID | Total Length<br>(millimeters) | Weight<br>(grams) | Age<br>Determined<br>from Scale<br>Analysis |
|--------------------|-----------|-------------------------------|-------------------|---------------------------------------------|
| <b>Site GCD-F1</b> |           |                               |                   |                                             |
| Rainbow trout      | 2         | 97                            | 8.0               | 1+                                          |
| Rainbow trout      | 3         | 114                           | 13.2              | 1+                                          |
| Rainbow trout      | 4         | 64                            | 2.6               | 0+                                          |
| Rainbow trout      | 6         | 89                            | 6.8               | 1+                                          |
| Rainbow trout      | 8         | 143                           | 26.6              | 2+                                          |
| Rainbow trout      | 10        | 76                            | 3.8               | 0+                                          |
| Rainbow trout      | 11        | 180                           | 51.0              | 2+                                          |
| Rainbow trout      | 12        | 70                            | 3.0               | 0+                                          |
| Rainbow trout      | 13        | 190                           | 64.2              | 3+                                          |
| Rainbow trout      | 15        | 156                           | 32.6              | 2+                                          |
| Rainbow trout      | 18        | 194                           | 64.2              | 2+                                          |
| Brown trout        | 2         | 230                           | 121.4             | 3+                                          |
| Brown trout        | 3         | 90                            | 7.2               | 0+                                          |
| Brown trout        | 5         | 160                           | 34.2              | 1+                                          |
| Brown trout        | 6         | 260                           | 173.8             | 4+                                          |
| <b>Site RPD-F1</b> |           |                               |                   |                                             |
| Rainbow trout      | 2         | 61                            | 2.6               | 0+                                          |
| Rainbow trout      | 3         | 71                            | 3.2               | 1+                                          |
| Rainbow trout      | 4         | 100                           | 9.0               | 1+                                          |
| Rainbow trout      | 5         | 151                           | 26.2              | 2+                                          |
| Rainbow trout      | 6         | 138                           | 23.4              | 2+                                          |
| Rainbow trout      | 7         | 161                           | 37.6              | 2+                                          |
| Rainbow trout      | 8         | 176                           | 48.8              | 3+                                          |
| Rainbow trout      | 9         | 109                           | 10.0              | 1+                                          |
| Rainbow trout      | 10        | 184                           | 57.6              | 3+                                          |
| Rainbow trout      | 11        | 81                            | 5.8               | 1+                                          |
| Rainbow trout      | 13        | 135                           | 24.4              | 2+                                          |
| Rainbow trout      | 15        | 190                           | 58.4              | 3+                                          |
| Brown trout        | 2         | 153                           | 32.2              | 1+                                          |
| Brown trout        | 4         | 85                            | 6.9               | 0+                                          |
| Brown trout        | 5         | 77                            | 4.8               | 0+                                          |

| Species            | Sample ID | Total Length<br>(millimeters) | Weight<br>(grams) | Age<br>Determined<br>from Scale<br>Analysis |
|--------------------|-----------|-------------------------------|-------------------|---------------------------------------------|
| Brown trout        | 6         | 260                           | 201.0             | 4+                                          |
| Brown trout        | 7         | 144                           | 30.4              | 1+                                          |
| Brown trout        | 8         | 137                           | 26.0              | 1+                                          |
| <b>Site IHD-F1</b> |           |                               |                   |                                             |
| Rainbow trout      | 1         | 99                            | 8.2               | 1+                                          |
| Rainbow trout      | 2         | 130                           | 19.2              | 1+                                          |
| Rainbow trout      | 3         | 145                           | 25.6              | 1+                                          |
| Rainbow trout      | 4         | 60                            | 2.0               | 0+                                          |
| Rainbow trout      | 5         | 83                            | 5.6               | 0+                                          |
| Rainbow trout      | 6         | 171                           | 43.0              | 2+                                          |
| Rainbow trout      | 7         | 116                           | 13.8              | 1+                                          |
| Rainbow trout      | 8         | 70                            | 3.4               | 0+                                          |
| Rainbow trout      | 10        | 110                           | 12.0              | 1+                                          |
| Brown trout        | 1         | 330                           | 300.6             | 5+                                          |
| Brown trout        | 2         | 260                           | 134.4             | 3+                                          |
| Brown trout        | 3         | 120                           | 17.2              | 1+                                          |
| <b>Site IHD-F2</b> |           |                               |                   |                                             |
| Rainbow trout      | 2         | 202                           | 73.9              | 2+                                          |
| Rainbow trout      | 3         | 90                            | 6.7               | 1+                                          |
| Rainbow trout      | 5         | 180                           | 49.5              | 2+                                          |
| Rainbow trout      | 6         | 60                            | 2.2               | 0+                                          |
| Rainbow trout      | 8         | 99                            | 8.7               | 1+                                          |
| Rainbow trout      | 9         | 132                           | 20.2              | 1+                                          |
| Rainbow trout      | 11        | 117                           | 13.3              | 1+                                          |
| Rainbow trout      | 13        | 182                           | 64.1              | 2+                                          |
| Rainbow trout      | 14        | 145                           | 28.8              | 2+                                          |
| Rainbow trout      | 15        | 111                           | 12.4              | 1+                                          |
| Brown trout        | 1         | 151                           | 29.4              | 2+                                          |
| Brown trout        | 3         | 95                            | 8.2               | 1+                                          |
| Brown trout        | 4         | 329                           | 350.0             | 4+                                          |
| Brown trout        | 5         | 147                           | 29.8              | 2+                                          |
| Brown trout        | 6         | 77                            | 4.3               | 1+                                          |

**Table B8-2. Age-class Size Ranges Determined by Scale Analysis, 2025.**

| Site          | Age 0+ |                   |     | Age 1+ |                   |     | Age 2+ |                   |     | Age 3+ |                   |     | Age 4+ |                   |     | Age 5+ |                   |     |
|---------------|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|--------|-------------------|-----|
|               | n      | Total Length (mm) |     | n      | Total Length (mm) |     | n      | Total Length (mm) |     | n      | Total Length (mm) |     | n      | Total Length (mm) |     | n      | Total Length (mm) |     |
|               |        | min               | max |        | min               | max |        | min               | max |        | min               | max |        | min               | max |        | min               | max |
| Rainbow Trout |        |                   |     |        |                   |     |        |                   |     |        |                   |     |        |                   |     |        |                   |     |
| RRD-F1        | 3      | 59                | 74  | 3      | 105               | 122 | 4      | 135               | 171 | --     | --                | --  | --     | --                | --  | --     | --                | --  |
| RRD-F2        | --     | --                | --  | --     | --                | --  | --     | --                | --  | --     | --                | --  | --     | --                | --  | --     | --                | --  |
| LLD-F3        | --     | --                | --  | 2      | 94                | 104 | 6      | 120               | 195 | 2      | 155               | 177 | --     | --                | --  | --     | --                | --  |
| LLD-F2        | 1      | 71                | 71  | 2      | 96                | 110 | 5      | 126               | 196 | 1      | 244               | 244 | --     | --                | --  | --     | --                | --  |
| GCD-F1        | 3      | 64                | 76  | 3      | 89                | 114 | 4      | 143               | 194 | 1      | 190               | 190 | --     | --                | --  | --     | --                | --  |
| RPD-F1        | 1      | 61                | 61  | 4      | 71                | 109 | 4      | 135               | 161 | 3      | 176               | 190 | --     | --                | --  | --     | --                | --  |
| IHD-F1        | 3      | 60                | 83  | 5      | 99                | 145 | 1      | 171               | 171 | --     | --                | --  | --     | --                | --  | --     | --                | --  |
| IHD-F2        | 1      | 60                | 60  | 5      | 90                | 132 | 4      | 145               | 202 | --     | --                | --  | --     | --                | --  | --     | --                | --  |
| Brown Trout   |        |                   |     |        |                   |     |        |                   |     |        |                   |     |        |                   |     |        |                   |     |
| RRD-F1        | --     | --                | --  | --     | --                | --  | --     | --                | --  | 1      | 255               | 255 | --     | --                | --  | --     | --                | --  |
| RRD-F2        | 2      | 63                | 76  | 1      | 152               | 152 | --     | --                | --  | --     | --                | --  | --     | --                | --  | --     | --                | --  |
| LLD-F3        | 1      | 68                | 68  | 3      | 105               | 132 | 5      | 160               | 201 | 2      | 209               | 223 | 1      | 300               | 300 | --     | --                | --  |
| LLD-F2        | 1      | 81                | 81  | 2      | 78                | 115 | 1      | 168               | 168 | 3      | 263               | 304 | 4      | 264               | 304 | 1      | 334               | 334 |
| GCD-F1        | 1      | 90                | 90  | 1      | 160               | 160 | --     | --                | --  | 1      | 230               | 230 | 1      | 260               | 260 | --     | --                | --  |
| RPD-F1        | 2      | 77                | 85  | 3      | 137               | 153 | --     | --                | --  | --     | --                | --  | 1      | 260               | 260 | --     | --                | --  |
| IHD-F1        | --     | --                | --  | 1      | 120               | 120 | --     | --                | --  | 1      | 260               | 260 | --     | --                | --  | 1      | 330               | 330 |
| IHD-F2        | --     | --                | --  | 2      | 77                | 95  | 2      | 147               | 151 | --     | --                | --  | 1      | 329               | 329 | --     | --                | --  |

Notes: -- = not measured or not applicable  
mm = millimeter

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## **APPENDIX C1**

### **Benthic Macroinvertebrate Site Photographs**

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Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 18, 2025.

**Figure C1-1. Rubicon River at Site RRD-I2, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 9, 2025.

**Figure C1-2. Gerle Creek at Site LLD-I3, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 9, 2025.

**Figure C1-3. Gerle Creek at Site GCD-I2, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 8, 2025.

**Figure C1-4. South Fork Rubicon River at Site RPD-I2, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 17, 2025.

**Figure C1-5. South Fork Silver Creek at Site IHD-I2, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 10, 2025.

**Figure C1-6. Silver Creek at Site JD-I1, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 10, 2025.

**Figure C1-7. Silver Creek at Site JD-I4, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 11, 2025.

**Figure C1-8. Silver Creek at Site CD-I2, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 12, 2025.

**Figure C1-9. Silver Creek at Site CD-I3, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 11, 2025.

**Figure C1-10. South Fork American River at Site SCD-I1, 2025.**





Facing upstream from Transect A



Facing downstream from Transect F



Facing upstream from Transect F



Facing downstream from Transect K

Note: Photos taken September 17, 2025.

**Figure C1-11. South Fork American River at Site SCD-I3, 2025.**

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**APPENDIX C2**  
**Interlaboratory Quality Control Report**

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DEPARTMENT OF FISH AND WILDLIFE  
AQUATIC BIOASSESSMENT LABORATORY-CHICO  
CALIFORNIA STATE UNIVERSITY, CHICO  
CHICO, CA 95929-0555  
530-898-4792

1 December 2025

Christina Buck  
622 20<sup>th</sup> St. Suite 100  
Sacramento, CA 95811

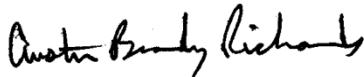
Dear Christina,

Attached are the results of my QC analysis of 1 sample submitted from the SMUD BMI Biomonitoring 2025 project. The results are presented in four summary tables. This QC analysis was performed in accordance with the Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT)'s Standard Taxonomic Effort Document (STE) 28 February 2025 version (Post, Rehn and Sandberg, 2025). Measurement quality objectives (MQO) calculations were made according to SWAMP protocols (Rehn et al., 2015).

There were no taxonomic discrepancies encountered during the QC analysis.

I welcome any questions or comments you may have concerning this report.

Sincerely,



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## Literature Cited

- Rehn, A. C., J. Slusark, and M. A. Sigala. 2015. Standard operating procedures for external quality control of benthic macroinvertebrate taxonomy data collected for stream bioassessment in California. California State Water Resources Control Board Surface Water Ambient Monitoring Program (SWAMP) Bioassessment, SWAMP-SOP-2015-0002.  
[http://www.waterboards.ca.gov/water\\_issues/programs/swamp/data\\_management\\_resources/docs/bmi\\_ext\\_qc\\_sop\\_070115.pdf](http://www.waterboards.ca.gov/water_issues/programs/swamp/data_management_resources/docs/bmi_ext_qc_sop_070115.pdf) (accessed 9 March 2017).
- Post, Doug, Andrew Rehn and John Sandberg. 2025. Southwest Association of Freshwater Invertebrate Taxonomists (SAFIT) Standard Taxonomic Effort (STE) for the Identification of Aquatic Benthic Macroinvertebrates Used in Freshwater Bioassessment in California. Version: 28 February 2025.  
<https://safit.org/downloads/> (accessed 1 October 2025)

## **APPENDIX C3**

### **Benthic Macroinvertebrate Taxonomic List**



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**Table C3-1. List of Benthic Macroinvertebrate Taxa Identified by Site for Samples Collected from the Upper American River Project in 2025.**

| Phylum          | Class        | Order          | Family           | Final ID                        | Tolerance Value <sup>1</sup> | Functional Feeding Group <sup>2</sup> | Total Count |             |                   |             |             |             |            |            |            |            |             |             |                   |
|-----------------|--------------|----------------|------------------|---------------------------------|------------------------------|---------------------------------------|-------------|-------------|-------------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|-------------------|
|                 |              |                |                  |                                 |                              |                                       | Site RRD-I2 | Site LLD-I3 | Site LLD-I3 (rep) | Site GCD-I2 | Site RPD-I2 | Site IHD-I2 | Site JD-I1 | Site JD-I4 | Site CD-I2 | Site CD-I3 | Site SCD-I1 | Site SCD-I3 | Site SCD-I3 (rep) |
| Platyhelminthes | Turbellaria  | --             | --               | Turbellaria                     | 4                            | P                                     | --          | --          | 1                 | --          | --          | 8           | 21         | 1          | --         | --         | 11          | --          | --                |
| Nemertea        | Enopla       | Hoplonemertea  | Tetrastemmatidae | <i>Prostoma</i>                 | 8                            | P                                     | --          | --          | --                | --          | --          | --          | --         | --         | 2          | 4          | 1           | 22          | 28                |
| Mollusca        | Bivalvia     | Veneroida      | Sphaeriidae      | <i>Pisidium</i>                 | 8                            | CF                                    | --          | 7           | --                | 10          | --          | 1           | --         | 8          | --         | --         | --          | 3           | 4                 |
| Mollusca        | Gastropoda   | Sorbeoconcha   | Pleuroceridae    | <i>Juga</i>                     | 7                            | SC                                    | --          | --          | --                | --          | --          | --          | --         | 24         | 2          | --         | --          | --          | --                |
| Mollusca        | Gastropoda   | Basommatophora | Physidae         | <i>Physa</i>                    | 8                            | SC                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | 6           | 2                 |
| Mollusca        | Gastropoda   | Basommatophora | Planorbidae      | <i>Gyraulus</i>                 | 8                            | SC                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | 1           | --                |
| Mollusca        | Gastropoda   | Basommatophora | Planorbidae      | <i>Menetus opercularis</i>      | 6                            | SC                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | 1           | --                |
| Mollusca        | Gastropoda   | Basommatophora | Planorbidae      | <i>Ferrissia</i>                | 6                            | SC                                    | --          | --          | --                | --          | --          | --          | --         | 1          | --         | --         | --          | --          | --                |
| Annelida        | Oligochaeta  | --             | --               | Oligochaeta                     | 5                            | CG                                    | 12          | 5           | 10                | 8           | 8           | 35          | 71         | 70         | 14         | 46         | 4           | 218         | 218               |
| Arthropoda      | Arachnida    | Acari          | Hydryphantidae   | <i>Protzia</i>                  | 8                            | P                                     | --          | 3           | 1                 | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda      | Arachnida    | Acari          | Hygrobatidae     | <i>Atractides</i>               | 8                            | P                                     | --          | --          | --                | --          | --          | 1           | --         | --         | --         | 1          | 2           | 3           | 2                 |
| Arthropoda      | Arachnida    | Acari          | Hygrobatidae     | <i>Hygrobates</i>               | 8                            | P                                     | 1           | 1           | 1                 | 1           | --          | --          | --         | --         | 3          | 4          | --          | 25          | 15                |
| Arthropoda      | Arachnida    | Acari          | Lebertiidae      | <i>Lebertia</i>                 | 8                            | P                                     | 5           | 1           | 6                 | 6           | --          | 13          | 4          | 7          | 9          | 6          | 4           | 76          | 95                |
| Arthropoda      | Arachnida    | Acari          | Limnesiidae      | <i>Limnesia</i>                 | 5                            | P                                     | --          | --          | --                | --          | --          | --          | --         | --         | 1          | --         | --          | 22          | 10                |
| Arthropoda      | Arachnida    | Acari          | Mideopsidae      | <i>Mideopsis</i>                | 5                            | P                                     | --          | --          | --                | 2           | --          | --          | --         | --         | 2          | --         | --          | --          | --                |
| Arthropoda      | Arachnida    | Acari          | Sperchontidae    | <i>Sperchon</i>                 | 8                            | P                                     | 2           | 5           | --                | --          | 2           | 1           | --         | 1          | --         | 4          | 2           | 5           | 8                 |
| Arthropoda      | Arachnida    | Acari          | Sperchontidae    | <i>Sperchonopsis</i>            | 8                            | P                                     | 1           | --          | --                | --          | --          | 2           | --         | --         | 1          | 1          | 4           | --          | 1                 |
| Arthropoda      | Arachnida    | Acari          | Torrenticolidae  | Testudacarus                    | 5                            | P                                     | --          | --          | --                | --          | --          | --          | 1          | --         | --         | 1          | --          | --          | --                |
| Arthropoda      | Arachnida    | Acari          | Torrenticolidae  | Torrenticolidae                 | 5                            | P                                     | --          | 1           | 3                 | 4           | --          | --          | --         | 2          | 2          | --         | 1           | --          | --                |
| Arthropoda      | Arachnida    | Acari          | Torrenticolidae  | <i>Torrenticola</i>             | 5                            | P                                     | 10          | 20          | 22                | 48          | 5           | --          | 1          | 16         | 5          | --         | --          | --          | 1                 |
| Arthropoda      | Ostracoda    | --             | --               | Ostracoda                       | 8                            | CG                                    | --          | --          | --                | 21          | --          | 1           | 1          | --         | --         | --         | --          | 1           | --                |
| Arthropoda      | Malacostraca | Amphipoda      | Crangonyctidae   | <i>Crangonyx</i>                | 4                            | CG                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | 44          | 28                |
| Arthropoda      | Malacostraca | Amphipoda      | Hyaellidae       | <i>Hyaella</i>                  | 8                            | CG                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | 8           | --                |
| Arthropoda      | Malacostraca | Isopoda        | Asellidae        | Asellidae                       | 8                            | CG                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | 8           | --          | --                |
| Arthropoda      | Malacostraca | Decapoda       | Astacidae        | <i>Pacifastacus leniusculus</i> | 6                            | OM                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | 1           | 2           | 3                 |
| Arthropoda      | Insecta      | Ephemeroptera  | Ameletidae       | <i>Ameletus</i>                 | 0                            | CG                                    | 5           | 3           | 3                 | 2           | --          | 4           | 1          | 15         | --         | --         | --          | 1           | --                |
| Arthropoda      | Insecta      | Ephemeroptera  | Baetidae         | <i>Baetidae</i>                 | 5                            | CG                                    | --          | --          | 2                 | 2           | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda      | Insecta      | Ephemeroptera  | Baetidae         | <i>Acentrella insignificans</i> | 4                            | CG                                    | --          | --          | --                | --          | --          | --          | --         | --         | 2          | 4          | --          | --          | --                |
| Arthropoda      | Insecta      | Ephemeroptera  | Baetidae         | <i>Anafroptilum</i>             | 2                            | CG                                    | 2           | 1           | 2                 | 3           | --          | 2           | --         | 1          | --         | --         | --          | 2           | 1                 |

| Phylum     | Class   | Order         | Family          | Final ID                          | Tolerance Value <sup>1</sup> | Functional Feeding Group <sup>2</sup> | Total Count |             |                   |             |             |             |            |            |            |            |             |             |                   |
|------------|---------|---------------|-----------------|-----------------------------------|------------------------------|---------------------------------------|-------------|-------------|-------------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|-------------------|
|            |         |               |                 |                                   |                              |                                       | Site RRD-I2 | Site LLD-I3 | Site LLD-I3 (rep) | Site GCD-I2 | Site RPD-I2 | Site IHD-I2 | Site JD-I1 | Site JD-I4 | Site CD-I2 | Site CD-I3 | Site SCD-I1 | Site SCD-I3 | Site SCD-I3 (rep) |
| Arthropoda | Insecta | Ephemeroptera | Baetidae        | <i>Baetis alius</i>               | 5                            | CG                                    | 12          | 2           | 6                 | 11          | 27          | 1           | --         | 73         | 2          | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Baetidae        | <i>Baetis flavistriga</i> complex | 4                            | CG                                    | 3           | 2           | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Baetidae        | <i>Baetis piscatoris</i> comp.    | 5                            | CG                                    | 4           | --          | --                | --          | --          | --          | --         | 4          | 2          | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Baetidae        | <i>Baetis tricaudatus</i> complex | 6                            | CG                                    | 29          | 14          | 27                | 27          | 61          | 68          | 3          | 38         | 18         | 70         | 126         | 5           | 11                |
| Arthropoda | Insecta | Ephemeroptera | Baetidae        | <i>Diphetor hageni</i>            | 5                            | CG                                    | 2           | 3           | 2                 | --          | --          | 1           | --         | 2          | 2          | 8          | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Baetidae        | <i>Procloeon</i>                  | 4                            | CG                                    | --          | --          | --                | --          | --          | --          | --         | 1          | 2          | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Ephemerellidae  | <i>Attenella</i>                  | 2                            | CG                                    | --          | --          | --                | --          | --          | 1           | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Ephemerellidae  | <i>Caudatella</i>                 | 1                            | CG                                    | --          | 2           | --                | 1           | 24          | 13          | --         | 5          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Ephemerellidae  | <i>Caudatella hystrix</i>         | 1                            | CG                                    | --          | --          | 6                 | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Ephemerellidae  | <i>Drunella doddsi</i>            | 0                            | CG                                    | --          | 3           | 2                 | --          | --          | 1           | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Ephemerellidae  | <i>Drunella flavilinea</i>        | 0                            | CG                                    | --          | --          | --                | --          | --          | --          | 1          | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Ephemerellidae  | <i>Drunella grandis</i>           | 0                            | CG                                    | --          | --          | --                | --          | --          | 8           | --         | 1          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Ephemerellidae  | <i>Ephemerella</i>                | 1                            | CG                                    | 33          | 51          | 27                | 18          | 2           | --          | --         | 23         | 1          | 3          | 17          | 1           | 2                 |
| Arthropoda | Insecta | Ephemeroptera | Ephemerellidae  | <i>Serratella</i>                 | 2                            | CG                                    | --          | --          | --                | --          | --          | 60          | 10         | 2          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Heptageniidae   | <i>Cinygma</i>                    | 2                            | SC                                    | 1           | --          | --                | 2           | --          | 11          | 12         | 1          | --         | 2          | 4           | 5           | --                |
| Arthropoda | Insecta | Ephemeroptera | Heptageniidae   | <i>Cinygmula</i>                  | 4                            | SC                                    | 39          | 23          | 16                | 6           | 1           | 1           | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Heptageniidae   | <i>Ecdyonurus criddlei</i>        | 3                            | SC                                    | 1           | --          | --                | 1           | --          | --          | --         | 3          | 1          | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Heptageniidae   | <i>Epeorus</i>                    | 0                            | SC                                    | 5           | 12          | 15                | 1           | --          | 2           | 1          | 5          | 1          | 6          | --          | --          | 1                 |
| Arthropoda | Insecta | Ephemeroptera | Heptageniidae   | <i>Ironodes</i>                   | 3                            | SC                                    | 33          | 12          | 12                | 4           | 5           | 1           | 9          | 18         | --         | 6          | 2           | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Heptageniidae   | <i>Rhithrogena</i>                | 0                            | SC                                    | --          | 1           | 2                 | --          | --          | 4           | --         | --         | --         | 1          | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Leptohyphidae   | <i>Tricorythodes</i>              | 4                            | CG                                    | 1           | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | 1           | --                |
| Arthropoda | Insecta | Ephemeroptera | Leptophlebiidae | <i>Leptophlebiidae</i>            | 4                            | CG                                    | --          | 15          | --                | 61          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Leptophlebiidae | <i>Neoleptophlebia</i>            | 4                            | CG                                    | 33          | --          | 10                | --          | --          | 17          | 9          | 21         | 14         | 5          | 22          | --          | --                |
| Arthropoda | Insecta | Ephemeroptera | Leptophlebiidae | <i>Paraleptophlebia</i>           | 4                            | CG                                    | --          | --          | 1                 | --          | --          | 2           | 10         | --         | 15         | 1          | 2           | 1           | --                |
| Arthropoda | Insecta | Plecoptera    | Capniidae       | Capniidae                         | 1                            | SH                                    | 1           | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera    | Chloroperlidae  | <i>Suwallia</i>                   | 1                            | P                                     | --          | --          | --                | --          | --          | 1           | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera    | Chloroperlidae  | <i>Sweltsa</i>                    | 1                            | P                                     | 10          | 9           | 7                 | 9           | --          | 17          | 3          | 1          | 2          | --         | --          | 4           | 4                 |

| Phylum     | Class   | Order       | Family           | Final ID                           | Tolerance Value <sup>1</sup> | Functional Feeding Group <sup>2</sup> | Total Count |             |                   |             |             |             |            |            |            |            |             |             |                   |
|------------|---------|-------------|------------------|------------------------------------|------------------------------|---------------------------------------|-------------|-------------|-------------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|-------------------|
|            |         |             |                  |                                    |                              |                                       | Site RRD-I2 | Site LLD-I3 | Site LLD-I3 (rep) | Site GCD-I2 | Site RPD-I2 | Site IHD-I2 | Site JD-I1 | Site JD-I4 | Site CD-I2 | Site CD-I3 | Site SCD-I1 | Site SCD-I3 | Site SCD-I3 (rep) |
| Arthropoda | Insecta | Plecoptera  | Leuctridae       | <i>Despaxia augusta</i>            | 0                            | SH                                    | --          | --          | --                | --          | --          | --          | 6          | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Leuctridae       | <i>Moselia infuscata</i>           | 0                            | SH                                    | --          | --          | --                | --          | --          | --          | 1          | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Leuctridae       | <i>Paraleuctra</i>                 | 0                            | SH                                    | 1           | --          | --                | --          | --          | 1           | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Nemouridae       | <i>Malenka</i>                     | 2                            | SH                                    | --          | 1           | --                | --          | --          | 10          | 21         | 2          | 11         | 8          | 9           | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Nemouridae       | <i>Zapada cinctipes</i>            | 2                            | SH                                    | 38          | 41          | 35                | 23          | 22          | 37          | 15         | 23         | 1          | 2          | 1           | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Nemouridae       | <i>Zapada frigida</i>              | 2                            | SH                                    | --          | 1           | --                | 10          | --          | 4           | 4          | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Nemouridae       | <i>Zapada oregonensis</i> group    | 2                            | SH                                    | --          | 1           | 1                 | 1           | 4           | 7           | 5          | 1          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Peltoperlidae    | <i>Yoraperla</i>                   | 1                            | SH                                    | --          | 2           | --                | 6           | 16          | 93          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Perlidae         | <i>Calineuria californica</i>      | 2                            | P                                     | 12          | 5           | 4                 | 9           | --          | --          | --         | 8          | 1          | 2          | 4           | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Perlidae         | <i>Hesperoperla pacifica</i>       | 2                            | P                                     | --          | --          | 1                 | 3           | 2           | --          | 2          | --         | 3          | 1          | --          | --          | 1                 |
| Arthropoda | Insecta | Plecoptera  | Perlodidae       | <i>Isoperla</i>                    | 2                            | P                                     | 3           | 1           | 2                 | 1           | 2           | --          | --         | --         | 1          | 11         | 3           | 1           | --                |
| Arthropoda | Insecta | Plecoptera  | Perlodidae       | <i>Kogotus/Rickera</i>             | 2                            | P                                     | --          | --          | --                | --          | --          | 6           | 2          | 1          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Perlodidae       | <i>Perlinodes aurea</i>            | 2                            | P                                     | --          | --          | 1                 | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Perlodidae       | <i>Skwala</i>                      | 2                            | P                                     | 1           | 2           | --                | --          | --          | --          | --         | --         | --         | --         | 1           | --          | --                |
| Arthropoda | Insecta | Plecoptera  | Taeniopterygidae | Taeniopterygidae                   | 2                            | OM                                    | 4           | 1           | --                | --          | --          | --          | --         | --         | 2          | 3          | 6           | 21          | 12                |
| Arthropoda | Insecta | Trichoptera | Apataniidae      | <i>Apatania</i>                    | 1                            | SC                                    | 1           | 8           | 4                 | 4           | 1           | 3           | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Brachycentridae  | <i>Amiocentrus aspilus</i>         | 3                            | CG                                    | --          | 4           | 5                 | --          | --          | --          | --         | 1          | --         | --         | 3           | --          | --                |
| Arthropoda | Insecta | Trichoptera | Brachycentridae  | <i>Micrasema</i>                   | 1                            | MH                                    | 9           | 74          | 62                | 9           | 32          | 2           | --         | 2          | --         | 1          | 47          | 1           | --                |
| Arthropoda | Insecta | Trichoptera | Calamoceratidae  | <i>Heteroplectron californicum</i> | 1                            | SH                                    | 3           | --          | --                | 6           | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Glossosomatidae  | <i>Agapetus</i>                    | 0                            | SC                                    | 1           | --          | 1                 | --          | --          | --          | --         | 1          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Glossosomatidae  | <i>Glossosoma</i>                  | 1                            | SC                                    | 7           | 8           | 6                 | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Helicopsychidae  | <i>Helicopsyche</i>                | 3                            | SC                                    | 3           | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Hydropsychidae   | <i>Arctopsyche</i>                 | 1                            | P                                     | 1           | 1           | 1                 | --          | 9           | --          | --         | 2          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Hydropsychidae   | <i>Cheumatopsyche</i>              | 5                            | CF                                    | --          | --          | --                | --          | --          | --          | --         | --         | 2          | 7          | 35          | 4           | 7                 |
| Arthropoda | Insecta | Trichoptera | Hydropsychidae   | <i>Hydropsyche</i>                 | 4                            | CF                                    | 17          | 7           | 15                | 1           | 12          | --          | --         | 12         | 2          | 5          | 36          | 9           | 7                 |
| Arthropoda | Insecta | Trichoptera | Hydroptilidae    | <i>Agraylea</i>                    | 8                            | PH                                    | 6           | 3           | 3                 | 2           | 8           | --          | --         | --         | --         | --         | 2           | --          | --                |
| Arthropoda | Insecta | Trichoptera | Hydroptilidae    | <i>Hydroptila</i>                  | 6                            | PH                                    | 2           | 8           | 2                 | 29          | 48          | --          | 5          | 23         | 122        | 72         | 37          | 10          | 8                 |

| Phylum     | Class   | Order       | Family            | Final ID                           | Tolerance Value <sup>1</sup> | Functional Feeding Group <sup>2</sup> | Total Count |             |                   |             |             |             |            |            |            |            |             |             |                   |
|------------|---------|-------------|-------------------|------------------------------------|------------------------------|---------------------------------------|-------------|-------------|-------------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|-------------------|
|            |         |             |                   |                                    |                              |                                       | Site RRD-I2 | Site LLD-I3 | Site LLD-I3 (rep) | Site GCD-I2 | Site RPD-I2 | Site IHD-I2 | Site JD-I1 | Site JD-I4 | Site CD-I2 | Site CD-I3 | Site SCD-I1 | Site SCD-I3 | Site SCD-I3 (rep) |
| Arthropoda | Insecta | Trichoptera | Hydroptilidae     | <i>Ochrotrichia</i>                | 4                            | PH                                    | --          | --          | 2                 | 1           | 9           | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Lepidostomatidae  | <i>Lepidostoma</i>                 | 1                            | SH                                    | 14          | 18          | 27                | 23          | --          | 1           | 8          | 13         | 1          | --         | 10          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Leptoceridae      | <i>Ceraclea</i>                    | 3                            | OM                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | 1                 |
| Arthropoda | Insecta | Trichoptera | Leptoceridae      | <i>Mystacides</i>                  | 4                            | OM                                    | 1           | 1           | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Limnephilidae     | <i>Dicosmoecus atripes</i>         | 1                            | OM                                    | 1           | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Philopotamidae    | <i>Dolophilodes</i>                | 2                            | CF                                    | --          | 1           | --                | --          | 1           | --          | --         | 1          | 1          | --         | 1           | --          | --                |
| Arthropoda | Insecta | Trichoptera | Philopotamidae    | <i>Wormaldia</i>                   | 3                            | CF                                    | 15          | --          | 3                 | 4           | --          | --          | --         | --         | 1          | 32         | 12          | 1           | --                |
| Arthropoda | Insecta | Trichoptera | Phryganeidae      | <i>Yphria californica</i>          | 1                            | P                                     | --          | --          | --                | --          | --          | 2           | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Polycentropodidae | <i>Polycentropus</i>               | 6                            | P                                     | 1           | --          | --                | 9           | --          | --          | 2          | 1          | 1          | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Rhyacophilidae    | <i>Rhyacophila</i>                 | 0                            | P                                     | --          | 2           | 3                 | --          | 1           | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Rhyacophilidae    | <i>Rhyacophila betteni</i> group   | 1                            | P                                     | 1           | --          | 4                 | --          | --          | 3           | --         | 1          | --         | --         | 2           | --          | --                |
| Arthropoda | Insecta | Trichoptera | Rhyacophilidae    | <i>Rhyacophila brunnea</i> group   | 1                            | P                                     | 2           | 4           | 5                 | 1           | 3           | --          | --         | 1          | --         | 1          | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Rhyacophilidae    | <i>Rhyacophila hyalinata</i> group | 1                            | P                                     | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | 1           | --                |
| Arthropoda | Insecta | Trichoptera | Rhyacophilidae    | <i>Rhyacophila sibirica</i> group  | 0                            | P                                     | --          | --          | --                | --          | --          | 2           | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Trichoptera | Sericostomatidae  | <i>Gumaga</i>                      | 3                            | SH                                    | 6           | 6           | 1                 | 8           | --          | --          | --         | 4          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Hemiptera   | Corixidae         | <i>Corixidae</i>                   | 8                            | P                                     | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | 1                 |
| Arthropoda | Insecta | Odonata     | Coenagrionidae    | Coenagrionidae                     | 7                            | P                                     | --          | --          | --                | --          | --          | --          | --         | --         | 2          | 3          | --          | 5           | --                |
| Arthropoda | Insecta | Odonata     | Coenagrionidae    | <i>Argia</i>                       | 7                            | P                                     | --          | --          | --                | 1           | --          | --          | --         | --         | --         | --         | --          | 4           | 1                 |
| Arthropoda | Insecta | Odonata     | Cordulegastridae  | <i>Cordulegaster dorsalis</i>      | 3                            | P                                     | --          | 1           | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Odonata     | Gomphidae         | <i>Octogomphus specularis</i>      | 4                            | P                                     | --          | 2           | 2                 | 8           | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Megaloptera | Corydalidae       | <i>Orohermes crepusculus</i>       | 0                            | P                                     | 2           | --          | 1                 | 2           | --          | 6           | --         | 2          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Megaloptera | Sialidae          | <i>Sialis</i>                      | 4                            | P                                     | --          | --          | --                | 13          | --          | --          | --         | 1          | --         | --         | --          | --          | 1                 |
| Arthropoda | Insecta | Lepidoptera | Pyrilidae         | <i>Petrophila</i>                  | 5                            | SC                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | 10          | 3                 |
| Arthropoda | Insecta | Coleoptera  | Dytiscidae        | <i>Oreodytes picturatus</i>        | 5                            | P                                     | 3           | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Coleoptera  | Dytiscidae        | <i>Stictotarsus</i>                | 5                            | P                                     | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | 1                 |



| Phylum     | Class   | Order      | Family          | Final ID                       | Tolerance Value <sup>1</sup> | Functional Feeding Group <sup>2</sup> | Total Count |             |                   |             |             |             |            |            |            |            |             |             |                   |
|------------|---------|------------|-----------------|--------------------------------|------------------------------|---------------------------------------|-------------|-------------|-------------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|-------------------|
|            |         |            |                 |                                |                              |                                       | Site RRD-I2 | Site LLD-I3 | Site LLD-I3 (rep) | Site GCD-I2 | Site RPD-I2 | Site IHD-I2 | Site JD-I1 | Site JD-I4 | Site CD-I2 | Site CD-I3 | Site SCD-I1 | Site SCD-I3 | Site SCD-I3 (rep) |
| Arthropoda | Insecta | Coleoptera | Elmidae         | <i>Ampumixis dispar</i>        | 4                            | CG                                    | --          | 1           | 2                 | --          | 2           | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Coleoptera | Elmidae         | <i>Cleptelmis addenda</i>      | 4                            | CG                                    | 16          | 2           | 3                 | 1           | 14          | 9           | --         | 1          | 7          | 5          | --          | 1           | --                |
| Arthropoda | Insecta | Coleoptera | Elmidae         | <i>Dubiraphia</i>              | 6                            | CG                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | 1           | 1                 |
| Arthropoda | Insecta | Coleoptera | Elmidae         | <i>Heterlimnius</i>            | 4                            | CG                                    | --          | --          | --                | --          | --          | 7           | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Coleoptera | Elmidae         | <i>Optioservus</i>             | 4                            | SC                                    | 4           | --          | --                | --          | 1           | --          | --         | --         | 5          | 7          | --          | --          | --                |
| Arthropoda | Insecta | Coleoptera | Elmidae         | <i>Ordobrevia nubifera</i>     | 4                            | SC                                    | 2           | 4           | --                | 6           | --          | --          | --         | 6          | 15         | 4          | --          | --          | --                |
| Arthropoda | Insecta | Coleoptera | Elmidae         | <i>Zaitzevia parvula</i>       | 4                            | SC                                    | 6           | 15          | 9                 | 4           | --          | --          | --         |            | 5          | 1          | --          | --          | --                |
| Arthropoda | Insecta | Coleoptera | Elmidae         | <i>Zaitzevia posthonia</i>     | 4                            | SC                                    | --          | --          | --                | --          | --          | --          | --         | 3          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Coleoptera | Psephenidae     | <i>Eubrianax edwardsii</i>     | 4                            | SC                                    | 14          | 1           | --                | --          | --          | --          | --         | --         | 1          | --         | --          | 1           | --                |
| Arthropoda | Insecta | Diptera    | Ceratopogonidae | <i>Atrichopogon</i>            | 6                            | CG                                    | --          | --          | --                | --          | --          | --          | --         | --         | 1          | 1          | --          | 1           | --                |
| Arthropoda | Insecta | Diptera    | Ceratopogonidae | <i>Bezzia/Palpomyia</i>        | 6                            | P                                     | --          | 5           | 3                 | --          | --          | --          | --         | --         | 1          | --         | --          | --          | --                |
| Arthropoda | Insecta | Diptera    | Ceratopogonidae | <i>Dasyhelea</i>               | 6                            | CG                                    | --          | --          | --                | --          | --          | --          | --         | --         | 1          | --         | --          | --          | --                |
| Arthropoda | Insecta | Diptera    | Ceratopogonidae | Probezzia                      | 6                            | P                                     | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | 1                 |
| Arthropoda | Insecta | Diptera    | Chironominae    | Chironominae                   | 6                            | CG                                    | 122         | 111         | 133               | 99          | 14          | 45          | 133        | 91         | 209        | 153        | 58          | 67          | 84                |
| Arthropoda | Insecta | Diptera    | Diamesinae      | Diamesinae                     | 2                            | CG                                    | --          | 2           | --                | 6           | --          | 2           | 2          | 1          | 11         | 4          | 11          | 6           | 6                 |
| Arthropoda | Insecta | Diptera    | Orthocladiinae  | Orthocladiinae                 | 5                            | CG                                    | 15          | 42          | 48                | 40          | 106         | 72          | 222        | 57         | 60         | 86         | 62          | 36          | 33                |
| Arthropoda | Insecta | Diptera    | Tanypodinae     | Tanypodinae                    | 7                            | P                                     | 9           | 5           | 7                 | 19          | 4           | 5           | 11         | 13         | 29         | 26         | 9           | 3           | 3                 |
| Arthropoda | Insecta | Diptera    | Dixidae         | <i>Dixa</i>                    | 2                            | CG                                    | --          | 1           | 1                 | --          | --          | --          | --         | 1          | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Diptera    | Empididae       | Clinocerinae                   | 6                            | P                                     | --          | 4           | 2                 | 1           | --          | --          | --         | 1          | 1          | 3          | --          | --          | --                |
| Arthropoda | Insecta | Diptera    | Empididae       | Chelifera                      | 6                            | P                                     | --          | 1           | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Diptera    | Empididae       | <i>Hemerodromia</i>            | 6                            | P                                     | --          | --          | --                | --          | --          | --          | --         | --         | 7          | 6          | 1           | 3           | 5                 |
| Arthropoda | Insecta | Diptera    | Empididae       | <i>Neoplasta</i>               | 6                            | P                                     | --          | 3           | --                | --          | --          | 13          | 1          | 1          | 3          | --         | 4           | --          | --                |
| Arthropoda | Insecta | Diptera    | Empididae       | <i>Trichoclinocera</i>         | 6                            | P                                     | --          | --          | --                | --          | --          | --          | 1          | 1          | --         | --         | 1           | 1           | --                |
| Arthropoda | Insecta | Diptera    | Simuliidae      | <i>Simulium</i>                | 6                            | CF                                    | 6           | 25          | 34                | 8           | 159         | 13          | 5          | 11         | 3          | 10         | 52          | 1           | 12                |
| Arthropoda | Insecta | Diptera    | Stratiomyidae   | <i>Caloparyphus/Euparyphus</i> | 8                            | CG                                    | --          | --          | --                | --          | --          | --          | --         | --         | 1          | --         | --          | --          | --                |
| Arthropoda | Insecta | Diptera    | Tabanidae       | Tabanidae                      | 8                            | P                                     | --          | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | 1                 |
| Arthropoda | Insecta | Diptera    | Tipulidae       | <i>Antocha</i>                 | 3                            | CG                                    | 1           | --          | 1                 | --          | 3           | --          | --         | --         | --         | 1          | 7           | --          | --                |

| Phylum     | Class   | Order   | Family    | Final ID           | Tolerance Value <sup>1</sup> | Functional Feeding Group <sup>2</sup> | Total Count |             |                   |             |             |             |            |            |            |            |             |             |                   |
|------------|---------|---------|-----------|--------------------|------------------------------|---------------------------------------|-------------|-------------|-------------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|-------------------|
|            |         |         |           |                    |                              |                                       | Site RRD-I2 | Site LLD-I3 | Site LLD-I3 (rep) | Site GCD-I2 | Site RPD-I2 | Site IHD-I2 | Site JD-I1 | Site JD-I4 | Site CD-I2 | Site CD-I3 | Site SCD-I1 | Site SCD-I3 | Site SCD-I3 (rep) |
| Arthropoda | Insecta | Diptera | Tipulidae | <i>Cryptolabis</i> | 3                            | SH                                    | 6           | 1           | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Diptera | Tipulidae | <i>Dicranomyia</i> | 6                            | SH                                    | --          | --          | --                | --          | --          | --          | --         | --         | --         | 1          | --          | --          | --                |
| Arthropoda | Insecta | Diptera | Tipulidae | <i>Dicranota</i>   | 3                            | P                                     | --          | 1           | --                | 2           | --          | 2           | --         | --         | 1          | --         | --          | --          | --                |
| Arthropoda | Insecta | Diptera | Tipulidae | Hesperoconopa      | 1                            | CG                                    | 2           | --          | --                | --          | --          | --          | --         | --         | --         | --         | --          | --          | --                |
| Arthropoda | Insecta | Diptera | Tipulidae | <i>Hexatoma</i>    | 2                            | P                                     | --          | 1           | --                | 1           | --          | --          | --         | --         | --         | --         | --          | --          | --                |

Note: -- = no data  
rep = replicate

<sup>1</sup> Tolerance values range from 0–10 and reflect the taxon's sensitivity to perturbations in water and habitat quality; as values increase, sensitivity decreases. Source: Richards and Rogers (2011).

<sup>2</sup> Functional feeding groups: CF = collector-filterer, CG = collector-gatherer, MH = macrophyte-herbivore, OM = omnivore, P = predator, PH = piercer-herbivore, SC = scraper, SH = shredder

## **APPENDIX C4**

### **Benthic Macroinvertebrate Metric Values**

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**Table C4-1. Biological Metric Values for BMI Samples Collected for the Upper American River Project, 2025.**

| Metric                                  | Site RRD-I2 | Site LLD-I3 | Site LLD-I3 (rep) | Site GCD-I2 | Site RPD-I2 | Site IHD-I2 | Site JD-I1 | Site JD-I4 | Site CD-I2 | Site CD-I3 | Site SCD-I1 | Site SCD-I3 | Site SCD-I3 (rep) |
|-----------------------------------------|-------------|-------------|-------------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|-------------------|
| <b>Richness</b>                         |             |             |                   |             |             |             |            |            |            |            |             |             |                   |
| Taxonomic richness <sup>1</sup>         | 61          | 66          | 58                | 56          | 32          | 50          | 34         | 57         | 54         | 45         | 41          | 45          | 38                |
| EPT taxa                                | 41          | 38          | 38                | 33          | 21          | 32          | 21         | 34         | 25         | 22         | 22          | 16          | 11                |
| Ephemeroptera taxa                      | 15          | 14          | 15                | 13          | 6           | 17          | 9          | 16         | 11         | 10         | 6           | 7           | 4                 |
| Plecoptera taxa                         | 8           | 10          | 7                 | 8           | 5           | 9           | 9          | 6          | 7          | 6          | 6           | 3           | 3                 |
| Trichoptera taxa                        | 18          | 14          | 16                | 12          | 10          | 6           | 3          | 12         | 7          | 6          | 10          | 6           | 4                 |
| Coleoptera taxa                         | 6           | 5           | 3                 | 3           | 3           | 2           | 0          | 3          | 5          | 4          | 0           | 3           | 2                 |
| Predator taxa                           | 16          | 22          | 20                | 19          | 8           | 15          | 11         | 18         | 20         | 15         | 15          | 14          | 18                |
| ET taxa                                 | 33          | 28          | 31                | 25          | 16          | 23          | 12         | 28         | 18         | 16         | 16          | 13          | 8                 |
| Shredder taxa <sup>1</sup>              | 6.8         | 5.7         | 2.9               | 5.0         | 2.0         | 4.7         | 4.8        | 4.0        | 2.5        | 2.8        | 2.9         | 0.0         | 0.0               |
| <b>Composition</b>                      |             |             |                   |             |             |             |            |            |            |            |             |             |                   |
| EPT index (%)                           | 60          | 57          | 53                | 49          | 48          | 62          | 22         | 49         | 34         | 40         | 61          | 10.5        | 8.8               |
| EPT taxa (%) <sup>1</sup>               | 67          | 58          | 67                | 60          | 68          | 65          | 66         | 61         | 46         | 53         | 58          | 38          | 30                |
| Sensitive EPT index (%)                 | 35          | 44          | 39                | 24          | 20          | 48          | 17         | 22         | 4.4        | 13         | 20          | 5.9         | 3.5               |
| Shannon diversity index                 | 3.30        | 3.24        | 3.14              | 3.29        | 2.56        | 3.03        | 2.20       | 3.11       | 2.50       | 2.70       | 2.88        | 2.55        | 2.37              |
| Dominant taxon (%)                      | 20          | 18          | 22                | 16          | 26          | 15          | 37         | 14         | 34         | 24         | 20          | 34          | 35                |
| Non-insect taxa (%)                     | 10          | 12          | 12                | 14          | 9.4         | 16          | 18         | 16         | 19         | 18         | 24          | 33          | 34                |
| Clinger taxa (%) <sup>1</sup>           | 57          | 55          | 63                | 57          | 80          | 58          | 46         | 60         | 48         | 59         | 57          | 50          | 41                |
| Coleoptera taxa (%) <sup>1</sup>        | 11.3        | 8.2         | 5.9               | 6.2         | 10          | 5.1         | 0.0        | 6.0        | 11         | 10         | 0.0         | 6.5         | 4.7               |
| <b>Tolerance</b>                        |             |             |                   |             |             |             |            |            |            |            |             |             |                   |
| Tolerance value                         | 3.9         | 3.6         | 3.8               | 4.5         | 4.7         | 3.5         | 4.7        | 4.6        | 5.5        | 5.3        | 4.7         | 5.6         | 5.8               |
| Intolerant organisms (%)                | 27          | 41          | 36                | 23          | 20          | 49          | 16         | 18         | 5.9        | 7.2        | 19          | 6.7         | 4.3               |
| Intolerant taxa (%)                     | 41          | 42          | 43                | 39          | 41          | 54          | 47         | 42         | 22         | 29         | 32          | 22          | 18                |
| Intolerant individuals (%) <sup>1</sup> | 27          | 43          | 36                | 32          | 19          | 48          | 15         | 18         | 4.1        | 6.6        | 17          | 5.8         | 3.5               |
| Tolerant organisms (%)                  | 2.5         | 3.2         | 1.8               | 6.6         | 1.6         | 3.1         | 0.8        | 2.5        | 2.6        | 3.2        | 3.7         | 23          | 25                |
| Tolerant taxa (%)                       | 8.2         | 9.1         | 6.9               | 8.9         | 6.3         | 12          | 5.9        | 5.3        | 9.3        | 13         | 17          | 22          | 26                |
| <b>Functional Feeding Groups</b>        |             |             |                   |             |             |             |            |            |            |            |             |             |                   |
| Collector-gatherers (%)                 | 48          | 42          | 47                | 49          | 43          | 56          | 77         | 65         | 59         | 62         | 51          | 61          | 62                |
| Collector-filterers (%)                 | 6.3         | 6.4         | 8.4               | 3.8         | 28          | 2.3         | 0.8        | 5.1        | 1.5        | 8.6        | 22          | 2.8         | 4.8               |
| Collector individuals (%)               | 55          | 49          | 56                | 53          | 71          | 58          | 77         | 70         | 60         | 70         | 73          | 64          | 66                |
| Scrapers (%)                            | 19          | 13          | 11                | 4.6         | 1.3         | 3.5         | 3.6        | 9.8        | 4.9        | 4.3        | 1.0         | 3.7         | 1.0               |
| Predators (%)                           | 11          | 13          | 12                | 23          | 4.6         | 13          | 8.1        | 10         | 13         | 12         | 8.0         | 27          | 29                |



| Metric                                         | Site RRD-I2 | Site LLD-I3 | Site LLD-I3 (rep) | Site GCD-I2 | Site RPD-I2 | Site IHD-I2 | Site JD-I1 | Site JD-I4 | Site CD-I2 | Site CD-I3 | Site SCD-I1 | Site SCD-I3 | Site SCD-I3 (rep) |
|------------------------------------------------|-------------|-------------|-------------------|-------------|-------------|-------------|------------|------------|------------|------------|-------------|-------------|-------------------|
| Shredders (%)                                  | 11          | 11          | 10                | 13          | 6.9         | 25          | 9.9        | 6.8        | 2.1        | 1.7        | 3.2         | 0.0         | 0.0               |
| Other (%)                                      | 3.8         | 14          | 11                | 6.7         | 16          | 0.32        | 0.83       | 4.0        | 20         | 12         | 15          | 5.3         | 3.9               |
| Non-gastropod scraper (%)                      | 19          | 13          | 11                | 4.6         | 1.3         | 3.5         | 3.6        | 5.9        | 4.6        | 4.3        | 1.0         | 2.5         | 0.64              |
| Indices                                        |             |             |                   |             |             |             |            |            |            |            |             |             |                   |
| California Stream Condition Index <sup>2</sup> | 1.22        | 1.22        | 1.21              | 1.05        | 0.87        | 0.99        | 0.76       | 1.03       | 0.93       | 0.93       | 0.84        | 0.63        | 0.53              |

Notes: CSCI = California Stream Condition Index  
EPT = Ephemeroptera, Plecoptera, and Trichoptera  
ET = Ephemeroptera and Trichoptera  
Rep = replicate

<sup>1</sup> Metrics used for the CSCI (Rehn et al. 2015). Metric values reported in the table may differ from metric values calculated through the CSCI computational iterations due to different subsample sizes.  
<sup>2</sup> CSCI categories of biological condition (Rehn et al. 2015): ≥ 0.92 = likely intact condition, 0.91 to 0.80 = possibly altered condition, 0.79 to 0.63 = likely altered condition, ≤ 0.62 = very likely altered condition.

## **APPENDIX D1**

### **Incidental Observations of Avian Species in the Study Area (2016–2025)**

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**Table D1-1. Incidental Observations of Avian Species in the Study Area, 2016–2025.**

| Common Name              | Scientific Name                        |
|--------------------------|----------------------------------------|
| Cackling goose           | <i>Branta hutchinsii</i>               |
| Canada goose             | <i>Branta canadensis</i>               |
| Cinnamon teal            | <i>Spatula cyanoptera</i>              |
| Mallard                  | <i>Anas platyrhynchos</i>              |
| Bufflehead               | <i>Bucephala albeola</i>               |
| Common goldeneye         | <i>Bucephala clangula</i>              |
| Common merganser         | <i>Mergus merganser</i>                |
| Mountain quail           | <i>Oreortyx pictus</i>                 |
| Pied-billed grebe        | <i>Podilymbus podiceps</i>             |
| Red-necked grebe         | <i>Podiceps grisegena</i>              |
| Eared grebe              | <i>Podiceps nigricollis</i>            |
| Western grebe            | <i>Aechmophorus occidentalis</i>       |
| Band-tailed pigeon       | <i>Patagioenas fasciata</i>            |
| Mourning dove            | <i>Zenaida macroura</i>                |
| Common nighthawk         | <i>Chordeiles minor</i>                |
| Vaux's swift             | <i>Chaetura vauxi</i>                  |
| Killdeer                 | <i>Charadrius vociferus</i>            |
| Spotted sandpiper        | <i>Actitis macularius</i>              |
| California gull          | <i>Larus californicus</i>              |
| Common loon              | <i>Gavia immer</i>                     |
| Double-crested cormorant | <i>Nannopterum auritum</i>             |
| Great blue heron         | <i>Ardea herodias</i>                  |
| Turkey vulture           | <i>Cathartes aura</i>                  |
| Osprey                   | <i>Pandion haliaetus</i>               |
| Sharp-shinned hawk       | <i>Accipiter striatus</i>              |
| Cooper's hawk            | <i>Accipiter cooperii</i>              |
| American goshawk         | <i>Accipiter atricapillus</i>          |
| Red-tailed hawk          | <i>Buteo jamaicensis</i>               |
| Great horned owl         | <i>Bubo virginianus</i>                |
| California spotted owl   | <i>Strix occidentalis occidentalis</i> |
| Belted kingfisher        | <i>Megasceryle alcyon</i>              |
| Red-breasted sapsucker   | <i>Sphyrapicus ruber</i>               |

| Common Name                   | Scientific Name                   |
|-------------------------------|-----------------------------------|
| Downy woodpecker              | <i>Dryobates pubescens</i>        |
| Hairy woodpecker              | <i>Dryobates villosus</i>         |
| White-headed woodpecker       | <i>Dryobates albolarvatus</i>     |
| Northern flicker              | <i>Colaptes auratus</i>           |
| Pileated woodpecker           | <i>Dryocopus pileatus</i>         |
| American kestrel              | <i>Falco sparverius</i>           |
| Peregrine falcon              | <i>Falco peregrinus</i>           |
| Olive-sided flycatcher        | <i>Contopus cooperi</i>           |
| Western wood-pewee            | <i>Contopus sordidulus</i>        |
| Dusky flycatcher              | <i>Empidonax oberholseri</i>      |
| Western flycatcher            | <i>Empidonax difficilis</i>       |
| Black phoebe                  | <i>Sayornis nigricans</i>         |
| Cassin's vireo                | <i>Vireo cassinii</i>             |
| Warbling vireo                | <i>Vireo gilvus</i>               |
| Steller's jay                 | <i>Cyanocitta stelleri</i>        |
| Clark's nutcracker            | <i>Nucifraga columbiana</i>       |
| American crow                 | <i>Corvus brachyrhynchos</i>      |
| Common raven                  | <i>Corvus corax</i>               |
| Mountain chickadee            | <i>Poecile gambeli</i>            |
| Tree swallow                  | <i>Tachycineta bicolor</i>        |
| Violet-green swallow          | <i>Tachycineta thalassina</i>     |
| Northern rough-winged swallow | <i>Stelgidopteryx serripennis</i> |
| Barn swallow                  | <i>Hirundo rustica</i>            |
| Bushtit                       | <i>Psaltirparus minimus</i>       |
| Golden-crowned kinglet        | <i>Regulus satrapa</i>            |
| Red-breasted nuthatch         | <i>Sitta canadensis</i>           |
| White-breasted nuthatch       | <i>Sitta carolinensis</i>         |
| Brown creeper                 | <i>Certhia americana</i>          |
| Rock wren                     | <i>Salpinctes obsoletus</i>       |
| American dipper               | <i>Cinclus mexicanus</i>          |
| Mountain bluebird             | <i>Sialia currucoides</i>         |
| Townsend's solitaire          | <i>Myadestes townsendi</i>        |
| Hermit thrush                 | <i>Catharus guttatus</i>          |
| American robin                | <i>Turdus migratorius</i>         |

| Common Name            | Scientific Name                   |
|------------------------|-----------------------------------|
| Evening grosbeak       | <i>Coccothraustes vespertinus</i> |
| Purple finch           | <i>Haemorhous purpureus</i>       |
| Cassin's finch         | <i>Haemorhous cassinii</i>        |
| Pine siskin            | <i>Spinus pinus</i>               |
| Chipping sparrow       | <i>Spizella passerina</i>         |
| Fox sparrow            | <i>Passerella iliaca</i>          |
| Dark-eyed junco        | <i>Junco hyemalis</i>             |
| California towhee      | <i>Melospiza crissalis</i>        |
| Rufous-crowned sparrow | <i>Aimophila ruficeps</i>         |
| Green-tailed towhee    | <i>Pipilo chlorurus</i>           |
| Spotted towhee         | <i>Pipilo maculatus</i>           |
| Red-winged blackbird   | <i>Agelaius phoeniceus</i>        |
| Brown-headed cowbird   | <i>Molothrus ater</i>             |
| Brewer's blackbird     | <i>Euphagus cyanocephalus</i>     |
| Orange-crowned warbler | <i>Leiothlypis celata</i>         |
| Nashville warbler      | <i>Leiothlypis ruficapilla</i>    |
| Macgillivray's warbler | <i>Geothlypis tolmiei</i>         |
| Yellow warbler         | <i>Setophaga petechia</i>         |
| Yellow-rumped warbler  | <i>Setophaga coronata</i>         |
| Hermit warbler         | <i>Setophaga occidentalis</i>     |
| Wilson's warbler       | <i>Cardellina pusilla</i>         |
| Western tanager        | <i>Piranga ludoviciana</i>        |
| Black-headed grosbeak  | <i>Pheucticus melanocephalus</i>  |



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## **APPENDIX D2**

### **California Department of Fish and Wildlife 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 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 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 [askalos@dfg.ca.gov](mailto:askalos@dfg.ca.gov). Electronic forms can be found at [http://www.dfg.ca.gov/wildlife/nongame/survey\\_monitor.html](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:** 2025

**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 (*Calocedrus decurrens*) **Year Last Used:** 2024

**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).

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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                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|---------------------------------|--------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cooper Walton<br>Annabelle Howe | 03.26.25<br>11:30–13:40  | <b><u>Early Breeding Season Survey:</u></b> <ul style="list-style-type: none"><li>• 12:37: Adult BAEA (female) visible on nest in incense cedar (<i>Calocedrus decurrens</i>) on S shore of reservoir.</li><li>• 13:40: Adult BAEA (female) remained on nest.</li><li>• Low level of recreational activity with no evidence of BAEA disturbance.</li></ul>                                                                                                                                                                                            |
| Cooper Walton<br>Camille Hymes  | 5.13.2025<br>13:50–14:35 | <b><u>Mid-Breeding Season Survey:</u></b> <ul style="list-style-type: none"><li>• 13:53: Adult BAEA flew in from E and landed on branch above nest.</li><li>• 13:58: Adult BAEA departed nest, landed on ground ~600 feet W of nest, and then flew to perch in fir near nest tree.</li><li>• 14:01: Adult BAEA departed perch in fir, landed on nest, and began feeding two BAEA nestlings.</li><li>• 14:35: Adult BAEA and two BAEA nestlings remained on nest.</li><li>• No recreational activity observed, no BAEA disturbance observed.</li></ul> |



| Observers                                    | Date                                                     | Observations/Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|----------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cooper Walton<br>Camille Hymes<br>Krista Orr | 6.30.2025<br>17:45–20:40                                 | <p><b><u>Late Breeding Season Survey:</u></b></p> <ul style="list-style-type: none"> <li>• 17:45: Juvenile BAEA perched on nest, flapping wings intermittently.</li> <li>• 18:45: Juvenile BAEA hopped to branch adjacent to nest while vocalizing and flapping wings.</li> <li>• 20:30: Adult BAEA perched in incense cedar immediately W of nest tree.</li> <li>• 20:40: Juvenile BAEA remained on nest, adult BAEA remained in perch.</li> <li>• Moderate recreational activity observed with no evidence of BAEA disturbance.</li> </ul>                                                                                                                  |
| Bethany Leach<br>Cameron Mclaughlin          | 7.16.2025<br>11:10–14:05                                 | <p><b><u>Additional Reproductive Status Check:</u></b></p> <ul style="list-style-type: none"> <li>• 11:16: Juvenile BAEA perched on nest.</li> <li>• 12:02: Adult BAEA flew in from W and landed on nest.</li> <li>• 12:13: Adult BAEA departed nest and flew W out of sight.</li> <li>• 12:45: Adult BAEA flew in from SE, circled, and landed on nest.</li> <li>• 12:54: Juvenile BAEA and adult BAEA feeding in nest.</li> <li>• 13:12: Juvenile BAEA flapping wings.</li> <li>• 13:23: Adult BAEA departed nest and flew E out of sight.</li> <li>• 13:27–13:58: Juvenile branching immediately adjacent to nest, flapping wings, and hopping.</li> </ul> |
| Bethany Leach<br>Cameron Mclaughlin          | 7.24.2025<br>16:30–17:00<br><br>7.25.2025<br>10:10–11:10 | <p><b><u>Additional Reproductive Status Check:</u></b></p> <p><b><u>7.24.25</u></b></p> <ul style="list-style-type: none"> <li>• No BAEA present during 30 minutes of observation of nest and surrounding area.</li> </ul> <p><b><u>7.25.25</u></b></p> <ul style="list-style-type: none"> <li>• 10:19–10:29: Adult BAEA circling NW of the Auxiliary Dam, then flying N out of sight.</li> <li>• 10:35: Adult BAEA perched in prominent Douglas fir (<i>Pseudotsuga menziesii</i>) on ridge W of nest tree.</li> <li>• Nest remained empty during the entire hour of observation.</li> </ul>                                                                 |

**SUMMARY:**

**A. Successful Nestlings: 1    No. of young known fledged: 0    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:** Nest initially observed in 2022 with successful nesting (one fledged juvenile). Nesting attempt initiated in 2023, before nest structure was severely damaged and attempt was abandoned. Successful nesting attempt with a single fledged juvenile in 2024.

**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](mailto: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 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 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 [askalos@dfg.ca.gov](mailto:askalos@dfg.ca.gov). Electronic forms can be found at [http://www.dfg.ca.gov/wildlife/nongame/survey\\_monitor.html](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:** 2025

**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 (*Pinus ponderosa*) **Year Last Used:** 2024

**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.

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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<br>Annabelle Howe | 3.26.2025<br>14:23–16:26 | <b><u>Early Breeding Season Survey (field visit supplemental to nest camera):</u></b> <ul style="list-style-type: none"><li>• 14:35: Adult BAEA vocalizations heard from nest.</li><li>• 14:41: Adult BAEA (female) vocalizations heard repeatedly from nest in response to pair of ravens (<i>Corvus corax</i>) flying in the area. Adult BAEA (male) flew in from NE, chased ravens, and landed in sugar pine (<i>Pinus lambertina</i>) near nest.</li><li>• 14:47: Adult BAEA (male) departed sugar pine perch, circled nest, and flew W across reservoir.</li><li>• 14:55: Adult BAEA (male) landed on nest, adult BAEA (female) vocalizing from nest.</li><li>• 14:57: Adult BAEA pair at nest, adult BAEA (female) rearranging nest material.</li><li>• 15:14: Adult BAEA pair remained on nest.</li><li>• 15:52: Adult BAEA perched in prominent sugar pine with snag top on Granlee's Point.</li><li>• 16:09: Immature BAEA (second year) flew N along shoreline near Tells Creek Inlet and E out of sight.</li><li>• 16:26: Adult BAEA remained on sugar pine perch on Granlee's Point.</li><li>• No recreational activity observed, no BAEA disturbance observed.</li></ul> |

| Observers                      | Date (Time)              | Observations/Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------------|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cooper Walton<br>Camille Hymes | 5.13.2025<br>13:20–16:05 | <p><b><u>Mid-Breeding Season Survey</u></b> (<i>field visit supplemental to nest camera</i>):</p> <ul style="list-style-type: none"> <li>• 15:20: Adult BAEA perched near top of previously referenced sugar pine on Granlee’s Point.</li> <li>• 15:25: Second adult BAEA flew in vocalizing, landed on higher branch in the same sugar pine. Pair perched near mass of sticks in crook of large branch, indicating a nesting attempt. Observers confirmed via nest camera that a third BAEA adult was present concurrently at the Sunset Campground nest.</li> <li>• 15:50: Adult BAEA departed perch, flying out of sight N across reservoir.</li> <li>• 15:58: Second adult BAEA departed perch, flying out of sight NE over reservoir.</li> <li>• No recreational activity observed, no BAEA disturbance observed.</li> </ul> |



| Observers                                    | Date (Time)            | Observations/Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|----------------------------------------------|------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Cooper Walton<br>Camille Hymes<br>Krista Orr | 7.1.2025<br>7:00–13:45 | <p><u>Late Breeding Season Survey (nest camera non-operational):</u></p> <ul style="list-style-type: none"> <li>• 07:00: Adult BAEA (male) vocalizing from nest tree.</li> <li>• 07:15: Juvenile BAEA perched on nest.</li> <li>• 07:50: Adult BAEA (male) flew NE from nest and landed in sugar pine on shoreline.</li> <li>• 07:55: Adult BAEA (male) flew W from perch and landed in second sugar pine. Adult BAEA (female) flew E from initial sugar pine perch out of sight toward Granlee's Point.</li> <li>• 08:05–08:15: Juvenile BAEA on nest flapping wings repeatedly.</li> <li>• 08:40: Adult BAEA (male) left perch, flew to snag closer to water.</li> <li>• 08:58: Adult BAEA (male) departed perch in snag, flew S over nest and out of sight towards Jones Fork Inlet.</li> <li>• 09:50–13:05: Juvenile BAEA remained in nest at Sunset Campground flapping wings, preening, and branching.</li> <li>• 11:00: Mass of sticks in sugar pine on Granlee's Point appeared re-arranged since mid-breeding season survey.</li> <li>• 11:10: Adult BAEA vocalizations heard from NE edge of Granlee's Point ~800 feet from previously referenced sugar pine.</li> <li>• 11:20: Adult BAEA pair perched in ponderosa pine (<i>Pinus ponderosa</i>) at water's edge on NE side of Granlee's Point.</li> <li>• 11:25: Adult BAEA pair flew N from perch over reservoir, then circled SE and out of sight.</li> <li>• 12:20: Adult BAEA flew SW to NE over inlet W of Granlee's Point, chasing pair of ravens.</li> <li>• 13:40: Evidence of recent predation (dense cluster of feathers, scattered bones) of juvenile BAEA observed near base of nest tree in Sunset Campground.</li> <li>• Significant recreational activity observed with no evidence of BAEA disturbance.</li> </ul> |

| Observers                           | Date (Time)            | Observations/Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-------------------------------------|------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bethany Leach<br>Cameron Mclaughlin | 7.16.25<br>08:45–10:22 | <p><b><u>Additional Reproductive Status Check (nest camera non-operational):</u></b></p> <ul style="list-style-type: none"> <li>• 08:49: Juvenile BAEA flapping wings on branch above nest.</li> <li>• 08:54: Juvenile BAEA flew E from nest, landing in tree adjacent to nest tree.</li> <li>• 08:59 Juvenile BAEA departed perch, landing in sugar pine ~120 feet SE of nest tree.</li> <li>• 09:20 Adult BAEA flew from SE and landed on nest.</li> <li>• 09:23 Juvenile BAEA departed perch and landed on nest with Adult BAEA.</li> <li>• 09:26: Adult BAEA flew ~150 feet NW from nest and landed in sugar pine.</li> <li>• 09:38 Juvenile BAEA flew SE from nest and out of sight.</li> <li>• Significant recreational activity observed with no evidence of BAEA disturbance.</li> </ul> |

**SUMMARY:**

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

**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. Successful attempts in 2023 and 2024 with two fledged juveniles each year.

**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).

## **APPENDIX E1**

### **2025 Hardhead Monitoring Supplemental Information**

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## 1.0 BEACH SEINE RESULTS

### 1.1 DESCRIPTION AND METHODS

Calibration and additional species identification of smaller cyprinid species was conducted on 8 September 2025 at Site 5 (River Mile 2.3) in slow pool habitat on the left descending margin. Capture of fish was completed by using an approximately 25-foot-wide by 6-foot-tall, 0.25-inch-mesh seine. One surveyor held one end of the net while standing on the shore, and another surveyor walked towards the thalweg. The net would then be slowly walked upstream, then back towards the shore creating a semi-circular ‘bag’ that was slowly drawn up on shore. Captured fish were placed in aerated buckets, identified to species, measured for fork and total length, and weighed before release.

#### 1.1.1 Results

Thirty-five hardhead were captured ranging in size from 23 to 136 millimeters (mm) in total length. Additionally, two sculpin were also captured, ranging in total length from 31 to 35 mm (Table E1-1; Figures E1-1 through E1-3).

**Table E1-1. Fish species captured during beach seining in the South Fork American River at Site 5, River Mile 2.3.**

| Species  | Fork Length (mm) | Total Length (mm) | Weight (grams) | Notes     | Photo ID  |
|----------|------------------|-------------------|----------------|-----------|-----------|
| Hardhead | 37               | 39                | 0.4            |           | 9573      |
| Hardhead | 30               | 34                | 0.3            |           |           |
| Hardhead | 109              | 119               | 12.1           |           | 9577–9579 |
| Hardhead | 123              | 136               | 16.5           |           | 9580–9582 |
| Hardhead | 31               | 35                | 0.4            |           | 9585      |
| Hardhead | 21               | 23                | 0.2            | mortality |           |
| Hardhead | 28               | 31                | 0.2            |           |           |
| Sculpin  |                  | 35                | 0.4            |           |           |
| Hardhead | 29               | 32                | 0.2            |           |           |
| Hardhead | 66               | 75                | 3.4            |           |           |
| Hardhead | 57               | 64                | 1.8            |           |           |
| Hardhead |                  | 25–50             |                | Count=25  |           |
| Sculpin  |                  | 31                |                |           |           |

Note: mm = millimeter





**Figure E1-1. Hardhead, photo ID 9573.**



**Figure E1-2. Hardhead with photo of frenum, photo ID 9577.**





**Figure E1-3. Hardhead with photo of maxillary bone not extending beyond the front of the eye, photo ID 9579.**

## 2.0 ANALYSIS OF VARIANCE RESULTS OF MEAN DAILY TEMPERATURES

### 2.1 MEAN DAILY TEMPERATURES BY MONTH FROM APRIL TO SEPTEMBER

**Table E1-2. Analysis of Variance Results of Mean Daily Water Temperatures by Month in the South Fork American River Downstream of Slab Creek Dam for all Water Year Types.<sup>1</sup>**

| Month     | Pre-License Mean Temperature (°C) | License Implementation Mean Temperature (°C) | df  | Mean Square | F-statistic | p-value |
|-----------|-----------------------------------|----------------------------------------------|-----|-------------|-------------|---------|
| April     | 12.5                              | 10.8                                         | 359 | 8.9         | 67.4        | <0.001  |
| May       | 16.6                              | 13.3                                         | 371 | 31.6        | 166.4       | <0.001  |
| June      | 20.2                              | 16.9                                         | 389 | 41.4        | 238.1       | <0.001  |
| July      | 22.2                              | 19.5                                         | 401 | 16.4        | 666.5       | <0.001  |
| August    | 20.1                              | 18.4                                         | 412 | 4.7         | 269.8       | <0.001  |
| September | 17.1                              | 15.7                                         | 419 | 1.4         | 89.2        | <0.001  |

Note: °C = degree Celsius  
df = degree of freedom  
USGS = U.S. Geological Survey

<sup>1</sup> Water temperature data are from USGS gage 11443500 (South Fork American River). Complete temperature data were unavailable for 2005–2012 and 2017.

## 2.2 MEAN DAILY TEMPERATURES BY MONTH, WATER YEAR COMPARISON

**Table E1-3. Analysis of Variance Results of Mean Daily Water Temperatures by Month from Comparable Water Year Types in South Fork American River Downstream of Slab Creek Dam.<sup>1</sup>**

| Below Normal Water Years |                                   |                                    |     |             |             |         |
|--------------------------|-----------------------------------|------------------------------------|-----|-------------|-------------|---------|
| Month                    | Pre-License Mean Temperature (°C) | Post-License Mean Temperature (°C) | df  | Mean Square | F-statistic | p-value |
| April                    | 10.0                              | 10.4                               | 179 | 5.0         | 4.1         | 0.054   |
| May                      | 14.1                              | 12.8                               | 185 | 42.2        | 14.5        | <0.001  |
| June                     | 18.8                              | 17.0                               | 179 | 76.3        | 29.9        | <0.001  |
| July                     | 21.8                              | 19.6                               | 185 | 124.4       | 84.5        | <0.001  |
| August                   | 20.3                              | 18.5                               | 184 | 88.9        | 83.1        | <0.001  |
| September                | 18.0                              | 15.6                               | 179 | 154.2       | 90.5        | <0.001  |
| Dry Water Years          |                                   |                                    |     |             |             |         |
| Month                    | Pre-License Mean Temperature (°C) | Post-License Mean Temperature (°C) | df  | Mean Square | F-statistic | p-value |
| April                    | 13.4                              | 10.6                               | 118 | 171.1       | 38.9        | <0.001  |
| May                      | 17.5                              | 14.8                               | 122 | 159.8       | 73.3        | <0.001  |
| June                     | 20.6                              | 18.4                               | 118 | 105.1       | 53.3        | <0.001  |
| July                     | 22.2                              | 19.8                               | 122 | 134.3       | 243.8       | <0.001  |
| August                   | 20.0                              | 18.3                               | 13  | 65.0        | 72.3        | <0.001  |
| September                | 16.9                              | 15.9                               | 119 | 24.1        | 10.7        | 0.001   |

Note: °C = degree Celsius  
df = degree of freedom  
USGS = U.S. Geological Survey

<sup>1</sup> Water temperature data are from USGS gage 11443500 (South Fork American River). Complete temperature data were unavailable for 2005–2012 and 2017.

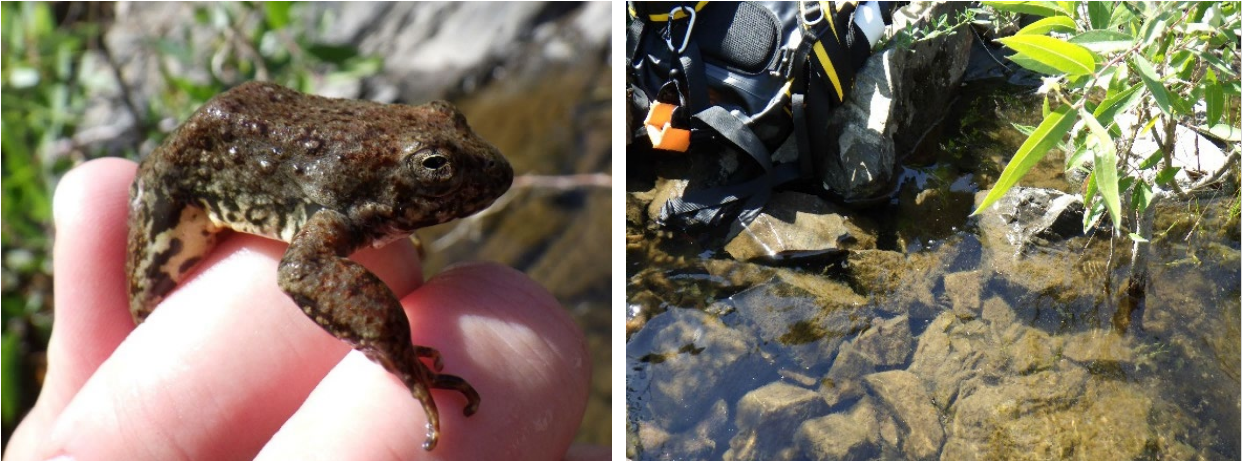
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## **APPENDIX F1**

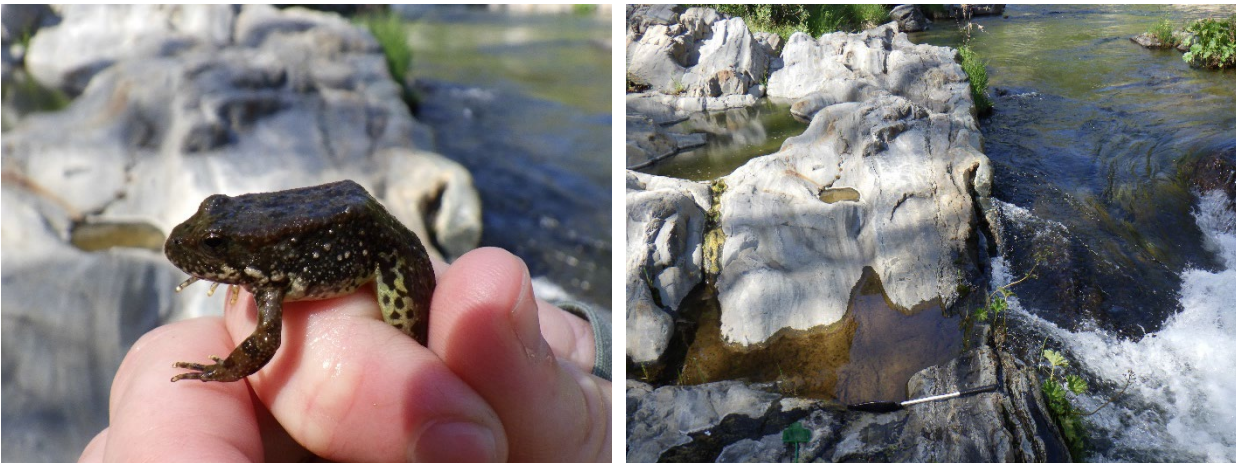
### **Foothill Yellow-Legged Frog Photographs**



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**Figure F1-1. Adult male (42 mm, Frog ID No. 1) (left) and habitat (right), Site CD-A3, 10 June 2025.**



**Figure F1-2. Subadult (34 mm, Frog ID No. 2) (left) and habitat (right), Site CD-A3, 10 June 2025.**



**Figure F1-3. Adult male (35 mm, Frog ID No. 3) (left) and habitat (right), Site CD-A3, 3 September 2025.**





**Figure F1-4. Subadult (uncaptured, Frog ID No. 4) and basking location (left and right), Site CD-A3, 3 September 2025.**



**Figure F1-5. Subadult (31 mm, Frog ID A) (left) and individual in habitat (right), Camino Adit near Site CD-A3, 10 June 2025.**



**Figure F1-6. Adult female (37 mm, Frog ID B) (left) and individual in habitat (right), Camino Adit near Site CD-A3, 10 June 2025.**





**Figure F1-7. Subadult (34 mm, Frog ID A) (recapture from 10 June survey), Camino Adit near Site CD-A3, 7 July 2025.**



**Figure F1-8. Adult male (38 mm, Frog ID D), Camino Adit near Site CD-A3, 4 August 2025.**



**Figure F1-9. Adult female (46 mm, Frog ID B) (recapture from 10 June survey), Camino Adit, 4 August 2025.**





**Figure F1-10. Adult female (47 mm Frog ID B) (left) and individual in habitat (right) (recapture from 10 June and 4 August surveys), Camino Adit, 3 September 2025.**



**Figure F1-11. Adult female (47 mm Frog ID E), Camino Adit, 3 September 2025.**



**Figure F1-12. Subadult (34 mm, Frog ID A) (recapture from 10 June and 7 July surveys), Camino Adit, 3 September 2025.**





**Figure F1-13. Adult male (41 mm, Frog ID D) (left) and individual in habitat (right) (recapture from 4 August survey), Camino Adit, 3 September 2025.**



**Figure F1-14. Adult male (49 mm, Frog ID F) (left) and habitat (right), tributary to Silver Creek near Site CD-A3, 7 July 2025.**



**Figure F1-15. Adult male (49 mm, Frog ID No. 2) (left) and habitat (right), Site CD-A4, 6 August 2025.**



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## **APPENDIX F2**

### **Representative Habitat Photographs for Monitoring Sites and Incidental Search Locations**

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**Figure F2-1. Representative photo highlighting suitable foothill yellow-legged frog habitat, looking downstream, Site CD-A3, 10 June 2025.**



**Figure F2-2. Run habitat and bedrock banks with willow and alder on margins, looking downstream, Site CD-A3, 4 August 2025.**





**Figure F2-3. Shallow edgewater bedrock pool habitat, looking upstream, Site CD-A3, 10 June 2025.**



**Figure F2-4. Small stream segment flowing from the Camino Adit (opportunistic search location), looking upstream, 4 August 2025.**





**Figure F2-5. Small stream segment flowing from the Camino Adit (opportunistic search location), looking downstream, 3 September 2025.**



**Figure F2-6. Representative habitat at the tributary to Silver Creek (opportunistic search location), looking toward left bank, 7 July 2025.**



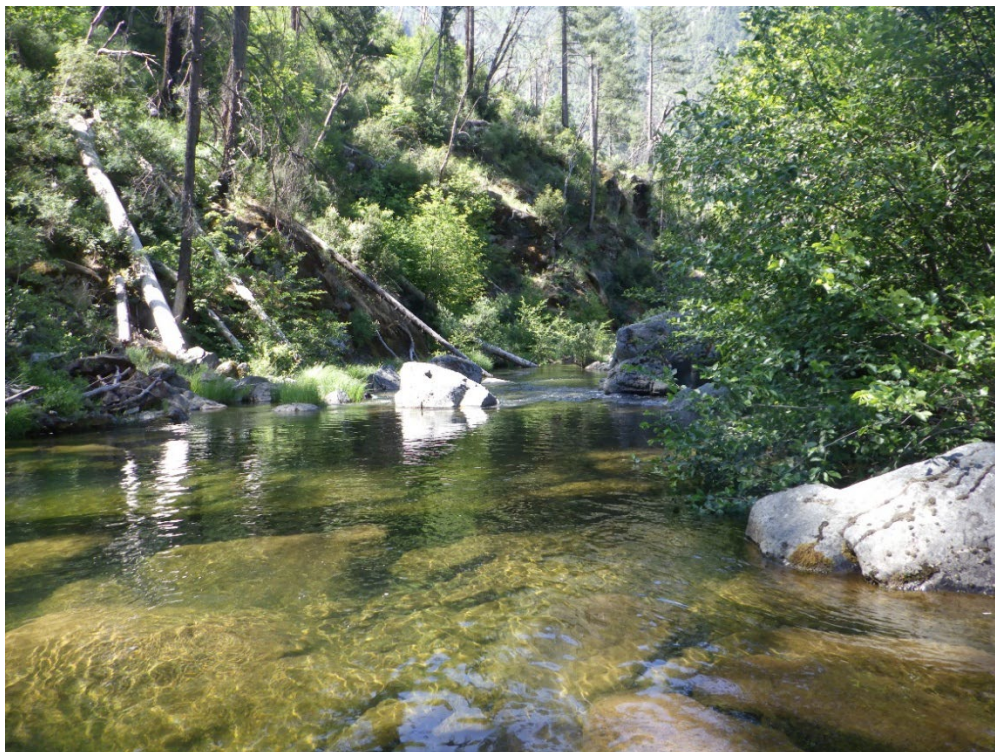


**Figure F2-7. Representative habitat at the tributary to Silver Creek (opportunistic search location), looking downstream, 3 September 2025.**



**Figure F2-8. Representative photo highlighting suitable foothill yellow-legged frog habitat, looking upstream, Site CD-A4, 3 September 2025.**





**Figure F2-9. Glide habitat, looking downstream, Site CD-A4, 11 June 2025.**



**Figure F2-10. Braided channel habitat and riparian vegetation, looking upstream, Site CD-A4, 1 September 2025.**





**Figure F2-11. Representative photo highlighting western pond turtle habitat, looking downstream, Site SCD-A1, 8 July 2025.**



**Figure F2-12. Cobble bar habitat, looking downstream, Site SCD-A1, 8 July 2025.**





**Figure F2-13. Deep, slow-moving pool habitat, looking downstream, Site SCD-A1, 5 August 2025.**



**Figure F2-14. Braided backwater habitat with sedge, looking downstream, Site SCD-A1, 4 September 2025.**

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## **APPENDIX F3**

### **Western Pond Turtle Photographs and Length Measurements at Site SCD-A1**

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**Figure F3-1. Adult female (163 mm, Turtle ID No. 1) (left) and habitat (right), 13 June 2025.**



**Figure F3-2. Adult female (148 mm, Turtle ID No. 2) (left) and habitat (right), 8 July 2025.**



**Figure F3-3. Adult male (158 mm, Turtle ID No. 3) (left) and habitat (right), 8 July 2025.**

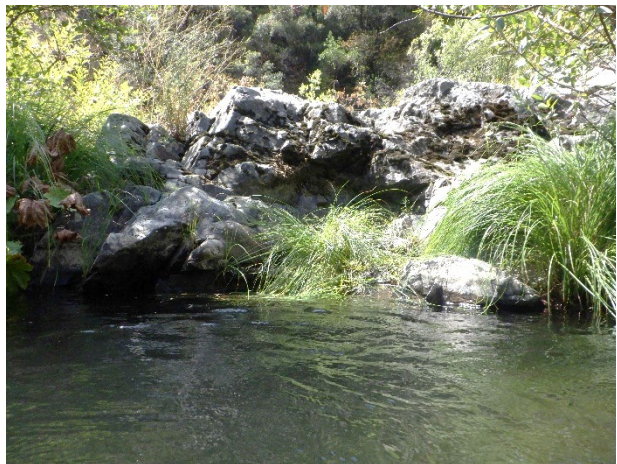




**Figure F3-4. Juvenile (108 mm, Turtle ID No. 4) (left) and habitat (right), 5 August 2025.**



**Figure F3-5. Adult female (130 mm, Turtle ID No. 5) (left) and habitat (right), 5 August 2025.**



**Figure F3-6. Adult female (121 mm, Turtle ID No. 7) (left) and habitat (right), 4 September 2025.**





**Figure F3-7. Adult male (121 mm, Turtle ID No.8) (left) and habitat (right), 4 September 2025.**



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## **APPENDIX F4**

### **Non-Target Amphibian and Aquatic Reptile Species Photographs**

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**Figure F4-1. American bullfrog tadpoles, Site SCD-A1, 4 September 2025.**



**Figure F4-2. American bullfrog egg mass, Site SCD-A1, 12 June 2025.**





**Figure F4-3. Sierran treefrog tadpole, Site SCD-A1, 12 June 2025.**



**Figure F4-4. Juvenile Sierra garter snakes, Site CD-A4 (left) (3 September) and Site SCD-A1 (right) (4 September), 2025.**



**Figure F4-5. Adult common garter snake, Site SCD-A1, 8 July 2025.**



**APPENDIX G1**  
**Bear Encounter Forms**

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**6. Location of encounter:**

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

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

1 BEAR LARGE

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

SITTING IN MY CAMPSITE

**9. Did you react to the bear?**

SHINED MY LIGHT

**10. How did the bear react to your response?**

IT SLOWLY LEFT

**11. Was human food present?**

- |                                                                                     |                         |
|-------------------------------------------------------------------------------------|-------------------------|
| a. <input checked="" type="radio"/> Some food/trash NOT in bear resistant container | d. Food hung in tree    |
| b. All food/trash in bear resistant container                                       | e. Some food in vehicle |
| c. No food present/odor only                                                        | f. Unknown              |

**12. Did the bear eat any human food?**

- a. No   b. Yes (what?) NO
- c. Unknown

**13. Did the bear damage property?**

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

**14. Did the bear(s) harm anyone?**

- a. No   b. Yes\* (describe) NO

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

MY DOG ALERTED. IT SHOWED NO  
FEAR OF MY DOG

\* 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.





Date: 7-27-25

PACIFIC DEV. REC MGR. (USFS/camp host)



## 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: ER

#### 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: 1

(number of people who encountered the bear)

5. Time of encounter: Month: 7 Day: 10 Year: 2025 Time: 2:00 am pm



**6. Location of encounter:**

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

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

3 bears, black, cubs w mom

**8. Did the bear(s) harm anyone?**

a. No b. Yes\* (describe) NO

**9. What were you doing before you saw the bear?**

camping

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

looking at us, sniffing, looking for food

\* 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.

**11. How did the bear react to you?**

Tried coming up until we made noise

**12. What did you do then?**

bang pans, honk horns

**13. How did the bear react to your response?**

It left

**14. How close did you come to the bear (how many feet)?**

25 yards

**15. Was human food present?**

- |                                         |                      |
|-----------------------------------------|----------------------|
| a. Food not in bear resistant container | d. Food hung in tree |
| b. Food in bear resistant container     | e. No food present   |
| c. Food odor only                       | f. Unknown           |

**16. Did the bear eat any human food?**

- a. No b. Yes (what?) \_\_\_\_\_  
c. Unknown

**17. Did the bear damage property?**

- a. No b. Yes (list property and estimate costs) \_\_\_\_\_

**18. Details of bear-human interaction (optional):**

It started coming down the hill then  
all the campers made noise.







**For office use only:**

Date: 8-8-25 \_\_\_\_\_ (USFS/camp host)



## 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. Forms also can be dropped off at the Pacific Ranger Station at 7887 Highway 50, Pollock Pines, CA 95726.

**1. Person(s) involved:**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: California

Zip code: \_\_\_\_\_ Phone: \_\_\_\_\_

Country: \_\_\_\_\_

**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:** Multiple Campsites

(number of people who encountered the bear)

**5. Time of encounter:** Month: 8 Day: 3 Year: 26 Time: 4:30 am/pm  
4:45



**6. Location of encounter:**

- |                                                      |                                        |
|------------------------------------------------------|----------------------------------------|
| a. Airport Flat campground                           | o. Northshore RV campground            |
| b. Angel Creek day use area                          | p. Pleasant campground                 |
| c. Azalea Cove campground                            | q. Red Fir group campground            |
| d. Big Silver group campground                       | r. Strawberry Point campground         |
| e. Camino Cove campground                            | s. Sunset campground/boat launch       |
| f. Fashoda campground                                | t. Union Valley bike trail             |
| g. Gerle Creek campground complex                    | u. Wench Creek campground              |
| h. Ice House campground/<br>boat launch/day use area | v. Wench Creek group campground        |
| i. Jones Fork campground                             | w. West Point campground/boat launch   |
| j. Junction Reservoir boat launch                    | x. Wolf Creek campground               |
| k. Lone Rock campground                              | y. Wolf Creek group campground         |
| l. Loon Lake campground/boat ramp                    | z. Yellowjacket campground/boat launch |
| m. Loon Lake chalet                                  | Other <u>Northwind #9</u>              |
| n. Northshore campground                             |                                        |

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

1 Adult Brownish

**8. Did the bear(s) harm anyone?**

a. No b. Yes\* (describe) no

**9. What were you doing before you saw the bear?**

sleeping

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

Tearing the side off trailer

\* 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.

**11. How did the bear react to you?**

he didn't care

**12. What did you do then?**

we stayed in tent 5 feet from trailer

**13. How did the bear react to your response?**

Dog bark and scared him

**14. How close did you come to the bear** (how many feet)?

8ft

**15. Was human food present?**

- |                                                                          |                      |
|--------------------------------------------------------------------------|----------------------|
| <input checked="" type="radio"/> a. Food not in bear resistant container | d. Food hung in tree |
| b. Food in bear resistant container                                      | e. No food present   |
| c. Food odor only                                                        | f. Unknown           |

**16. Did the bear eat any human food?**

- |            |                                            |
|------------|--------------------------------------------|
| a. No      | b. Yes (what?) <u>he may have ate meat</u> |
| c. Unknown |                                            |

**17. Did the bear damage property?**

- |       |                                                         |
|-------|---------------------------------------------------------|
| a. No | b. Yes (list property and estimate costs) <u>200.00</u> |
|-------|---------------------------------------------------------|

**18. Details of bear-human interaction** (optional):

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_







**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. Forms also can be dropped off at the Pacific Ranger Station at 7887 Highway 50, Pollock Pines, CA 95726.

**1. Person(s) involved:**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_

Phone: \_\_\_\_\_ State: \_\_\_\_\_

Zip code: \_\_\_\_\_

Country: \_\_\_\_\_

**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: 17 Year: 25 Time: 1:45 am/pm

8-17-25 1:45 am



**6. Location of encounter:**

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

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

1 BIG Black BEAR

**8. Did the bear(s) harm anyone?**

a. No b. Yes\* (describe) NO

**9. What were you doing before you saw the bear?**

Listening

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

walking by me.

\* 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.

**11. How did the bear react to you?**

Just walked by.

**12. What did you do then?**

Went inside tent.

**13. How did the bear react to your response?**

continued walked away

**14. How close did you come to the bear (how many feet)?**

10 feet

**15. Was human food present?**

- |                                         |                                                     |
|-----------------------------------------|-----------------------------------------------------|
| a. Food not in bear resistant container | d. Food hung in tree                                |
| b. Food in bear resistant container     | <input checked="" type="radio"/> e. No food present |
| c. Food odor only                       | f. Unknown                                          |

**16. Did the bear eat any human food?**

- a. No b. Yes (what?) \_\_\_\_\_  
☒ c. Unknown

**17. Did the bear damage property?**

- a. No b. Yes (list property and estimate costs) \_\_\_\_\_

**18. Details of bear-human interaction (optional):**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_







**For office use only:**

Date: 8-24-25

P (USFS/camp host)



## 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. Forms also can be dropped off at the Pacific Ranger Station at 7887 Highway 50, Pollock Pines, CA 95726.

### 1. Person(s) involved:

Name: \_\_\_\_\_

Address: \_\_\_\_\_

City: \_\_\_\_\_ State: \_\_\_\_\_

Zip code: \_\_\_\_\_ Phone: \_\_\_\_\_

Country: \_\_\_\_\_

### 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: 1

(number of people who encountered the bear)

5. Time of encounter: Month: Aug Day: 23 Year: 25 Time: 10pm am/pm



**6. Location of encounter:**

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

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

1, cub, would guess 1-2 yrs sm. black

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

on trail coming towards us

**9. Did you react to the bear?**

No

**10. How did the bear react to your response?**

Saw us, turned and ran away

**11. Was human food present?**

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

**12. Did the bear eat any human food?**

- a. No   b. Yes (what?) NA
- c. Unknown

**13. Did the bear damage property?**

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

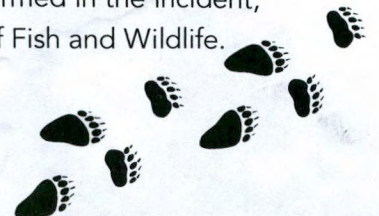
**14. Did the bear(s) harm anyone?**

- a. No   b. Yes\* (describe) \_\_\_\_\_

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

We were walking too quietly, bear cub came around corner down trail heading up. Saw us, ran away quickly.

\* 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: \_\_\_\_\_ *1 r dog Tucker*

**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:** *1*  
(number of people who encountered the bear)

**5. Time of encounter:** Month: *9* Day: *30* Year: *25* Time: *11* *(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 Gerle Creek Bridge

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

1 small black

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

walking across outside of camp

9. Did you react to the bear?

yes

10. How did the bear react to your response?

Heard

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/odor 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?) Trash Floor Backpack
- c. Unknown

13. Did the bear damage property?

- a. No

b. Yes (list property and estimate costs) \$100

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: 7-6-25 Sun.

Notes: \_\_\_\_\_



## 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:** 8  
(number of people who encountered the bear)

**5. Time of encounter:** Month: 7 Day: 4 Year: 2005 Time: 3 pm

6. Location of encounter:

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

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

1 adolescent black bear

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

Walking in the woods near camp site #4

9. Did you react to the bear?

banged pots + pans yelling "Hey Bear!"

10. How did the bear react to your response?

Ran away

11. Was human food present?

- |                                                                                     |                         |
|-------------------------------------------------------------------------------------|-------------------------|
| <input checked="" type="radio"/> a. Some food/trash NOT in bear resistant container | d. Food hung in tree    |
| b. All food/trash in bear resistant container                                       | e. Some food in vehicle |
| c. No food present/odor only                                                        | f. Unknown              |

12. Did the bear eat any human food?

- |                                        |                      |
|----------------------------------------|----------------------|
| <input checked="" type="radio"/> a. No | b. Yes (what?) _____ |
| c. Unknown                             |                      |

13. Did the bear damage property?

- |                                        |                                                 |
|----------------------------------------|-------------------------------------------------|
| <input checked="" type="radio"/> a. No | b. Yes (list property and estimate costs) _____ |
|----------------------------------------|-------------------------------------------------|

14. Did the bear(s) harm anyone?

- |                                        |                          |
|----------------------------------------|--------------------------|
| <input checked="" type="radio"/> a. No | b. Yes* (describe) _____ |
|----------------------------------------|--------------------------|

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

Just a curious + scared young black bear

\* 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.







# 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: \_\_\_\_\_

(number of people who encountered the bear)

5. Time of encounter: Month: 7 Day: 24 Year: 25 Time: 4pm am/pm

#### For office use only:

Report collected by: \_\_\_\_\_ (USFS/camp host) Date:

8-2-25

Notes: \_\_\_\_\_

**APPENDIX G2**  
**Bear Encounter Summary**

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

2025 Results Summary - Compiled by Chris Faubion, SMUD

| 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                                                                        |
|---------|----------------|-------------------------------------------|----------------|---------------------------|-----------------------------|------------------------------------|-------------------------------------------------------------------|--------------------------------------------------|----------------------------|-------------------------|---------------------------------------------------------------------------------|
|         | camp host      | camping-developed campground              | na             | 7/24/25 4:00 PM           | Jones Fork Campground       | 1 adolescent                       | Walking in the woods near camp site #4.                           | Some food/trash NOT in bear resistant container. | No                         | No                      | Just curious + scared young black bear.                                         |
|         | visitor        | camping-undeveloped campground/wilderness | 8              | 7/4/25 3:00 AM            | Gerle Creek Bridge          | 1 small black bear                 | Walking toward outside of camp.                                   | Some food/trash NOT in bear resistant container. | Yes                        | Yes - Back pack ~ \$100 |                                                                                 |
|         | visitor        | camping-developed campground              | 1              | 9/30/25 11:00 AM          | Union Valley Bike Trail     | 1 Cub                              | On trail walking towards us.                                      | No                                               | No                         | No                      | We were walking quietly, bear cub came around the corner, saw us, and ran away. |
|         | visitor        | na                                        | 1              | 8/23/25 10:00 PM          | Strawberry Point Campground | 1 big black bear                   | Walking by me.                                                    | No                                               | No                         | No                      | Bear came within 10 ft and walked away.                                         |
|         | visitor        | camping-developed campground              | 2              | 8/17/25 1:45 AM           | Northwind Campground        | 1 adult                            | Tearing the side off trailer.                                     | Some food/trash NOT in bear resistant container. | Yes - may have eaten meat. | Yes - trailer ~ \$200   | We stayed in tent 5 ft from trailer. Dog barked and scared him off at 8 ft.     |
|         | visitor        | camping-developed campground              | multiple camps | 8/3/25 4:30 AM            | Jones Fork Campground       | 3 bears - two cubs; one mom        | Looking at us, sniffing, looking for food.                        | No food present/odor only                        | Unknown                    | No                      | Started coming down the hill then all the campers made noise.                   |
|         | visitor        | na                                        | 1              | 7/10/25 2:00 AM           | Northwind Campground        | 1 bear large                       | Sitting in my campsite. Shined my light at it and it slowly left. | Some food/trash NOT in bear resistant container. | No                         | No                      | My dog alerted. It showed no fear of my dog.                                    |

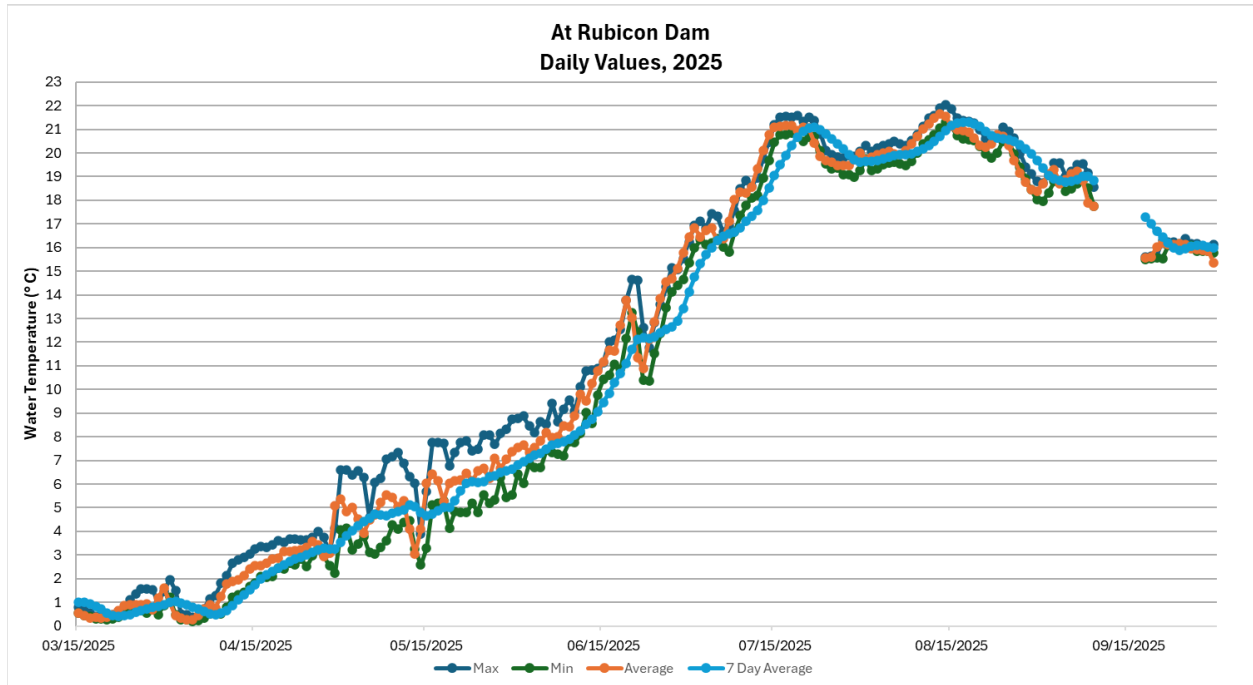
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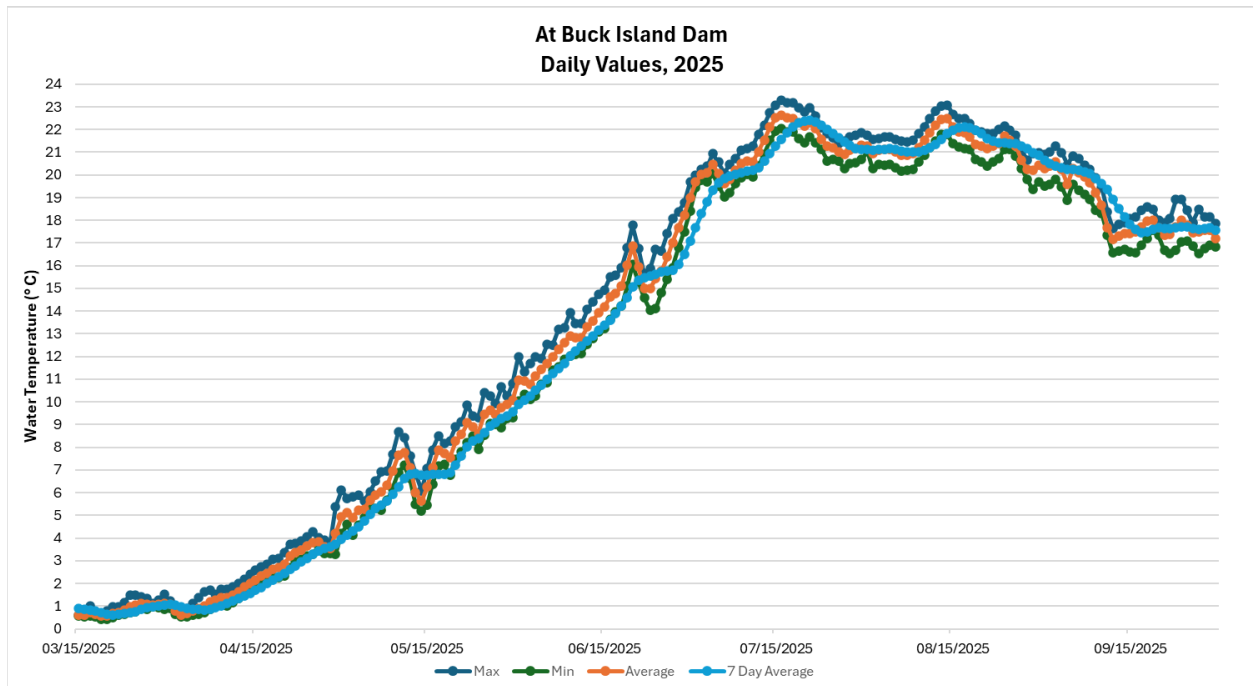
## **APPENDIX H**

### **2025 Water Temperature Graphs**

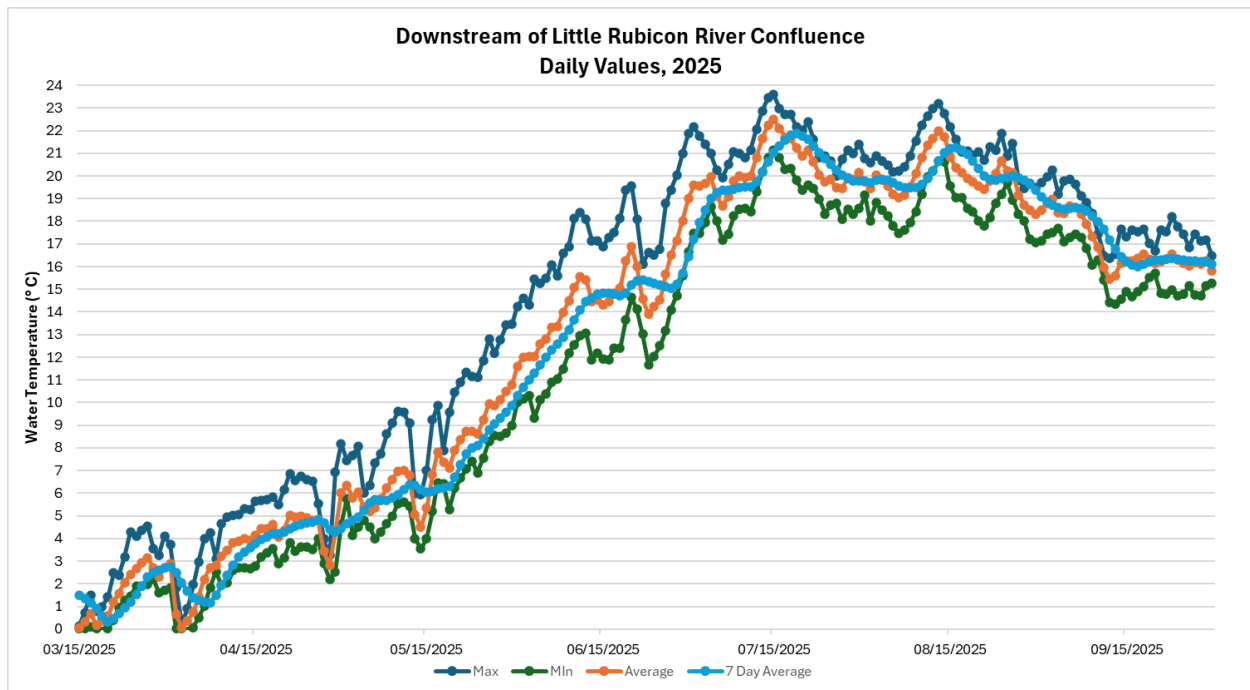
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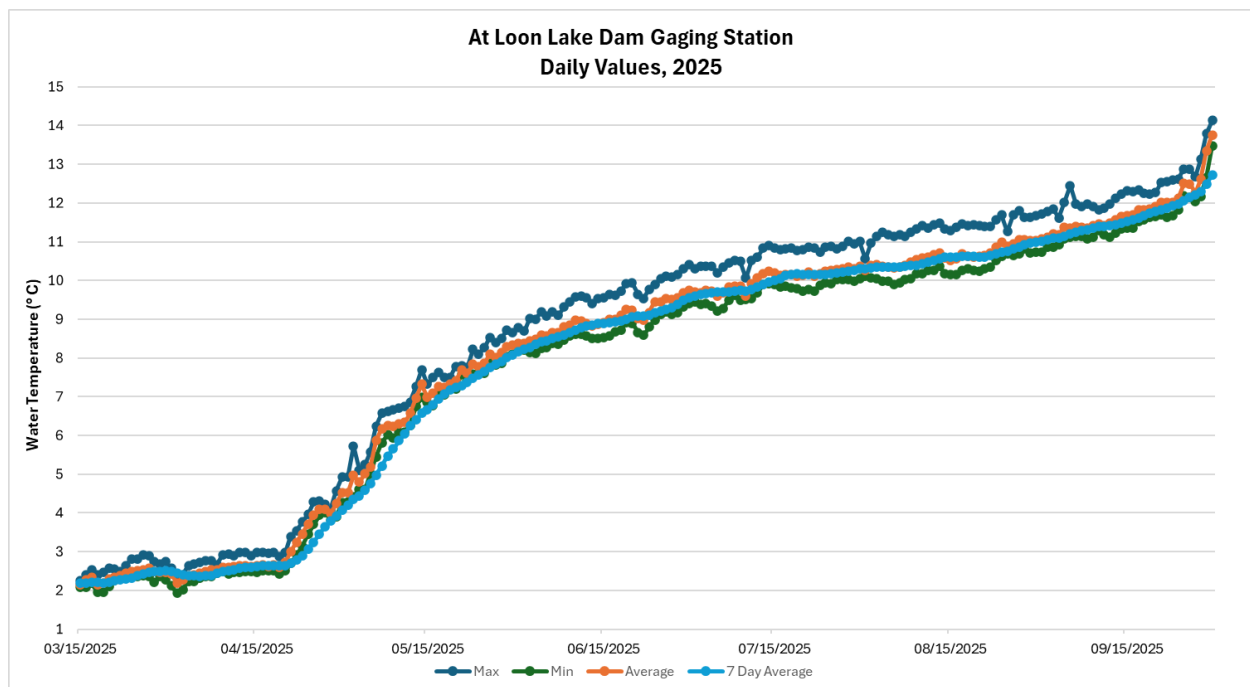
**Figure H-1. Rubicon River immediately below Rubicon Reservoir Dam (Site RR5).**



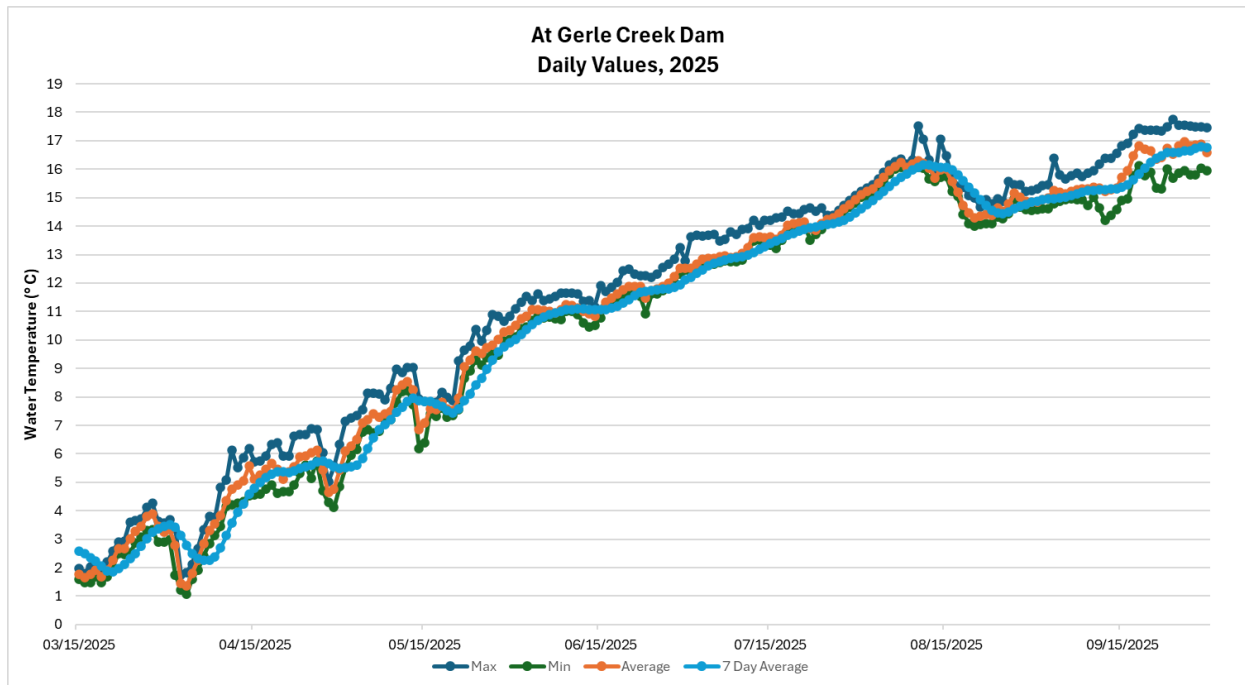
**Figure H-2. Little Rubicon River immediately below Buck Island Reservoir Dam (Site LRR3).**



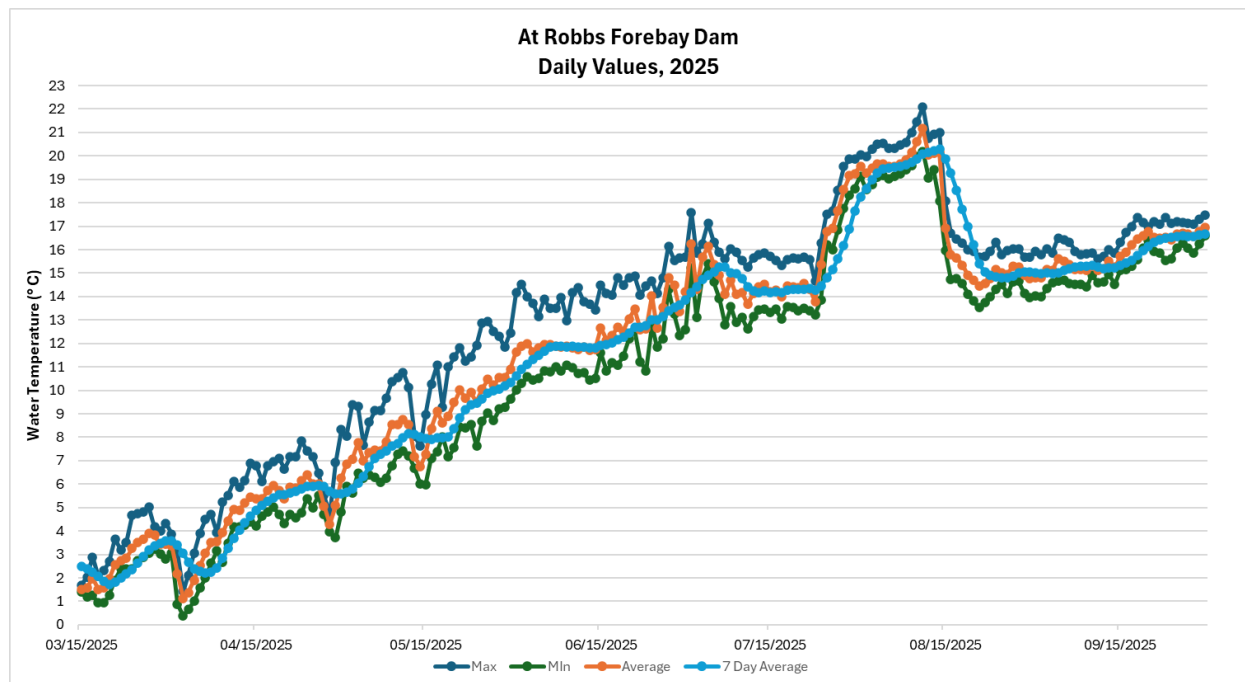
**Figure H-3. Rubicon River below confluence of Little Rubicon River at the Project boundary (Site RR1).**



**Figure H-4. Gerle Creek immediately below Loon Lake Reservoir Dam (Site GC7).**

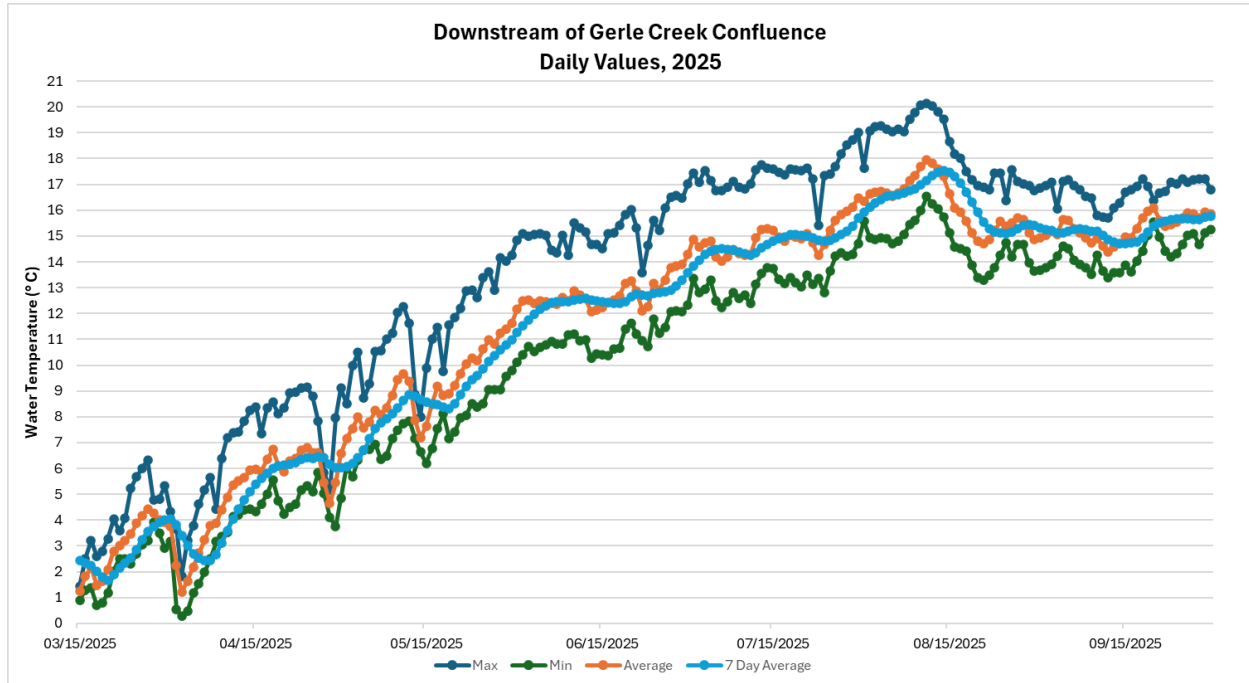


**Figure H-5. Gerle Creek immediately below Gerle Creek Reservoir Dam (Site GC8).**

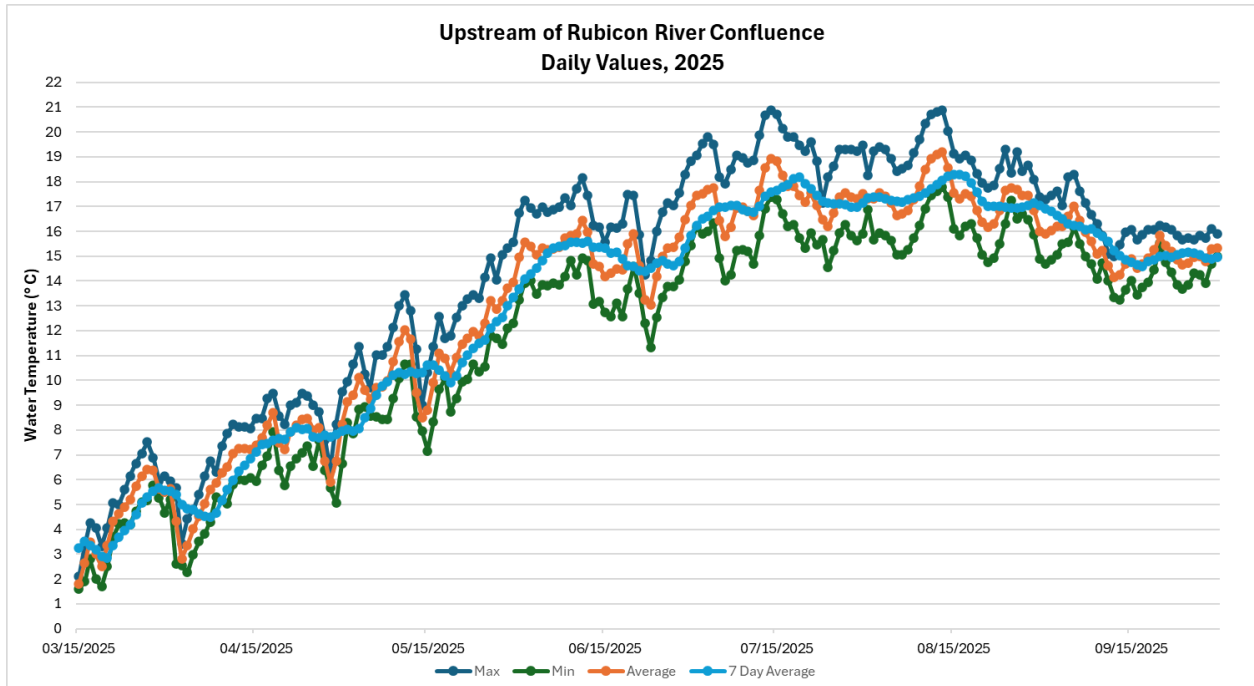


**Figure H-6. South Fork Rubicon River immediately below Robbs Peak Reservoir Dam (Site SFRR5).**

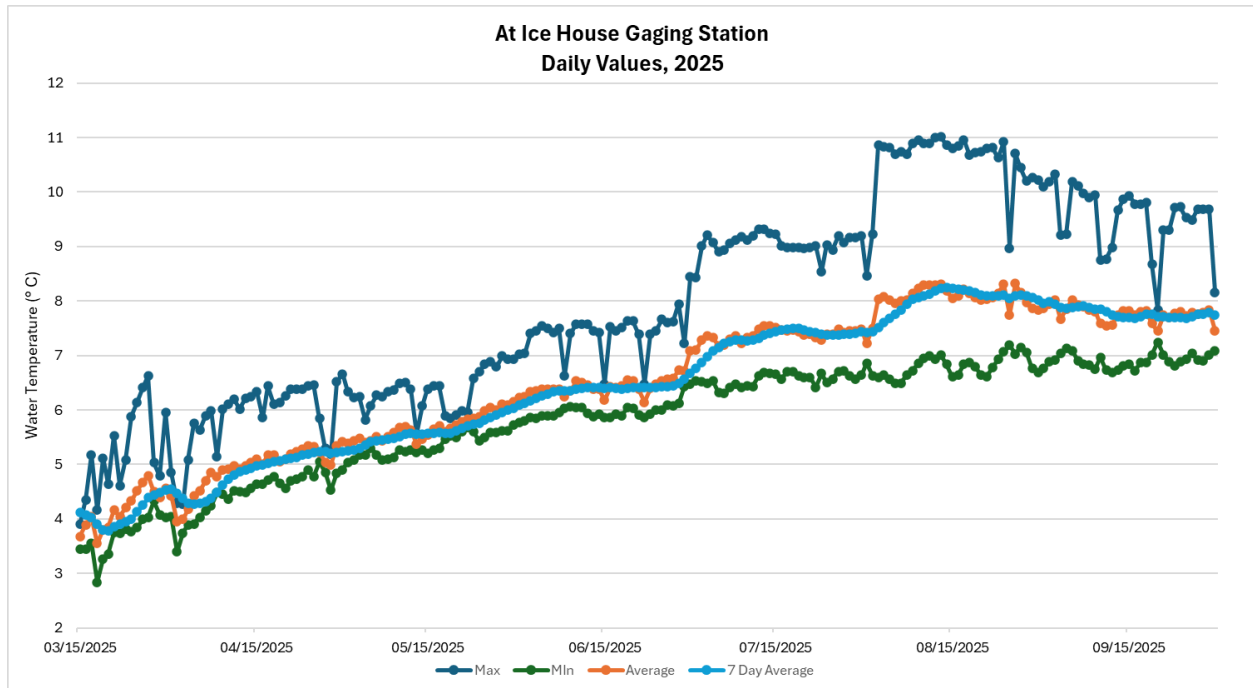




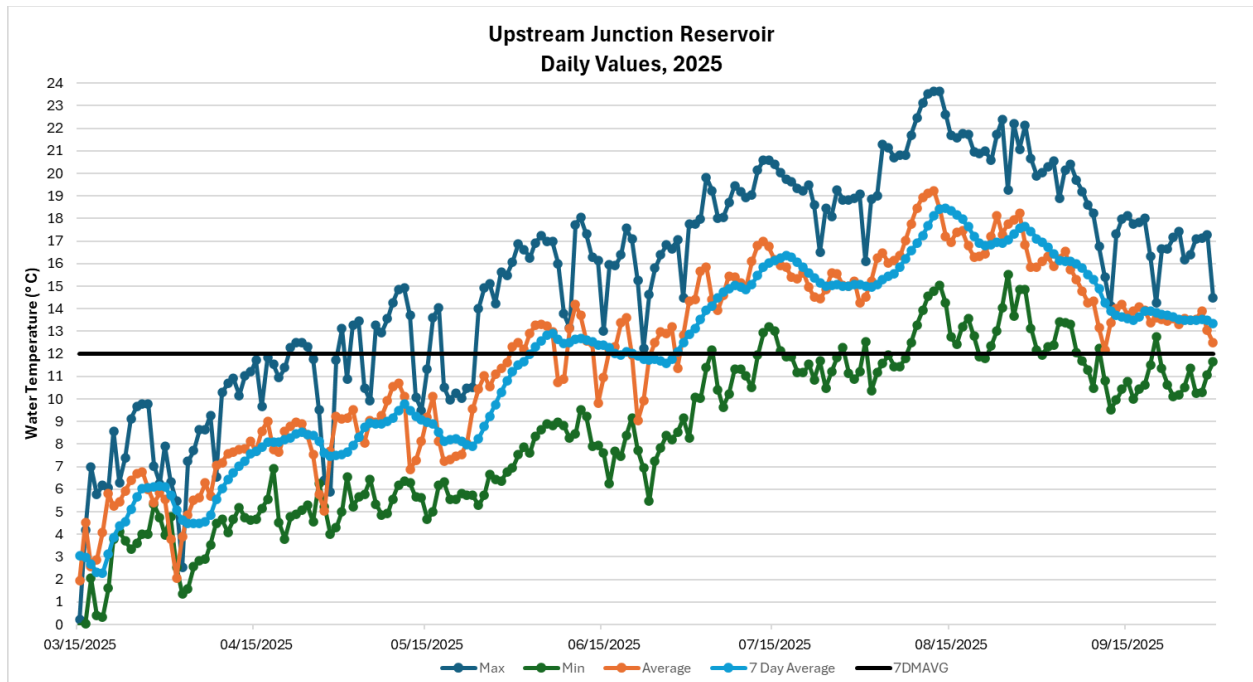
**Figure H-7. South Fork Rubicon River below confluence of Gerle Creek (Site SFRR6).**



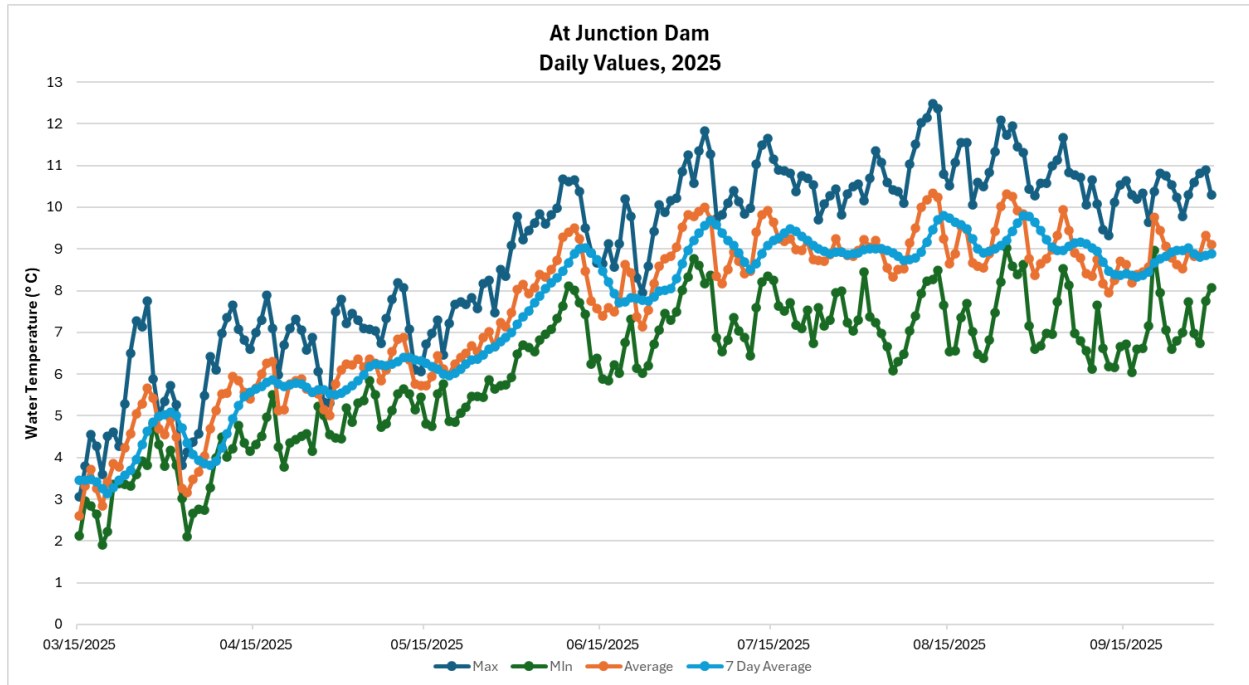
**Figure H-8. South Fork Rubicon River immediately upstream of confluence with the Rubicon River (Site SFRR7).**



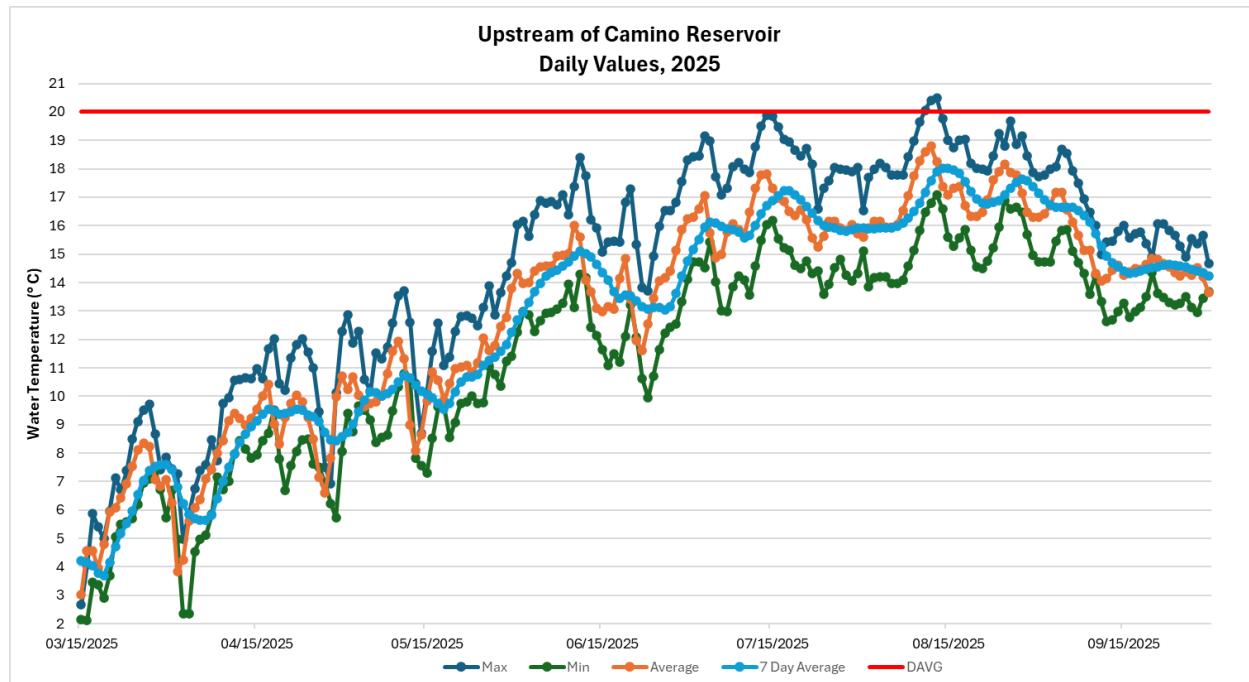
**Figure H-9. South Fork Silver Creek immediately below Ice House Reservoir Dam (Site SFSC7).**



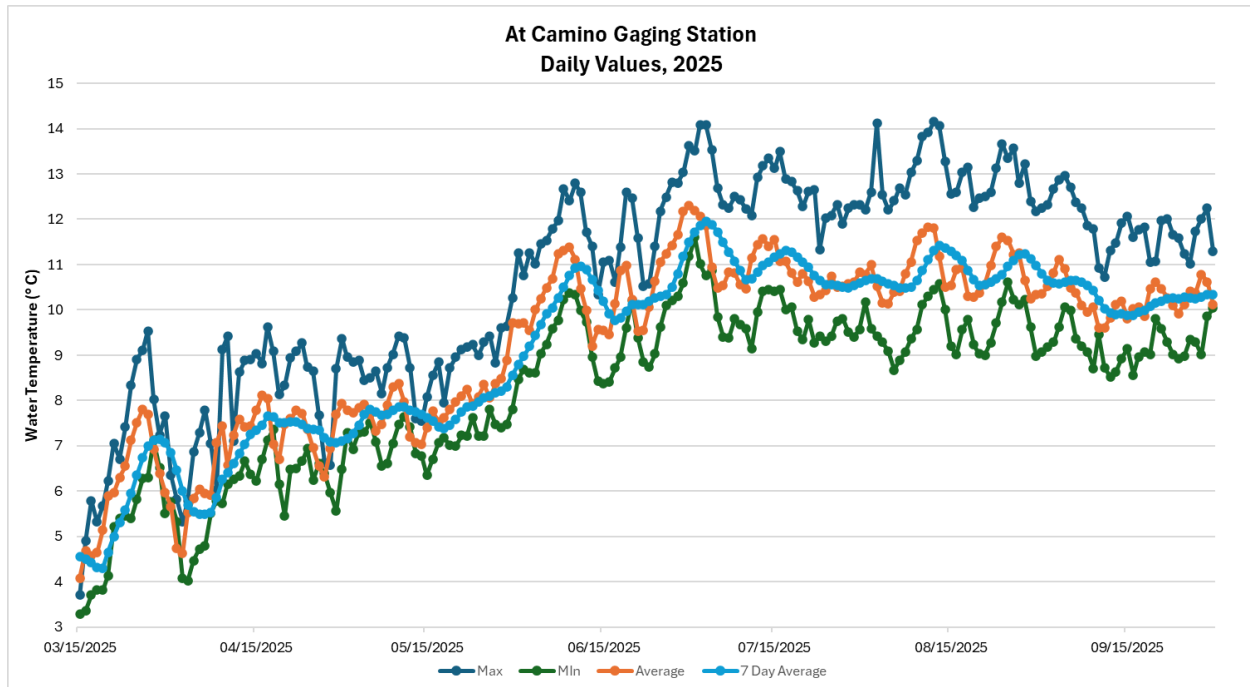
**Figure H-10. South Fork Silver Creek immediately upstream of Junction Reservoir (Site SFSC8).**



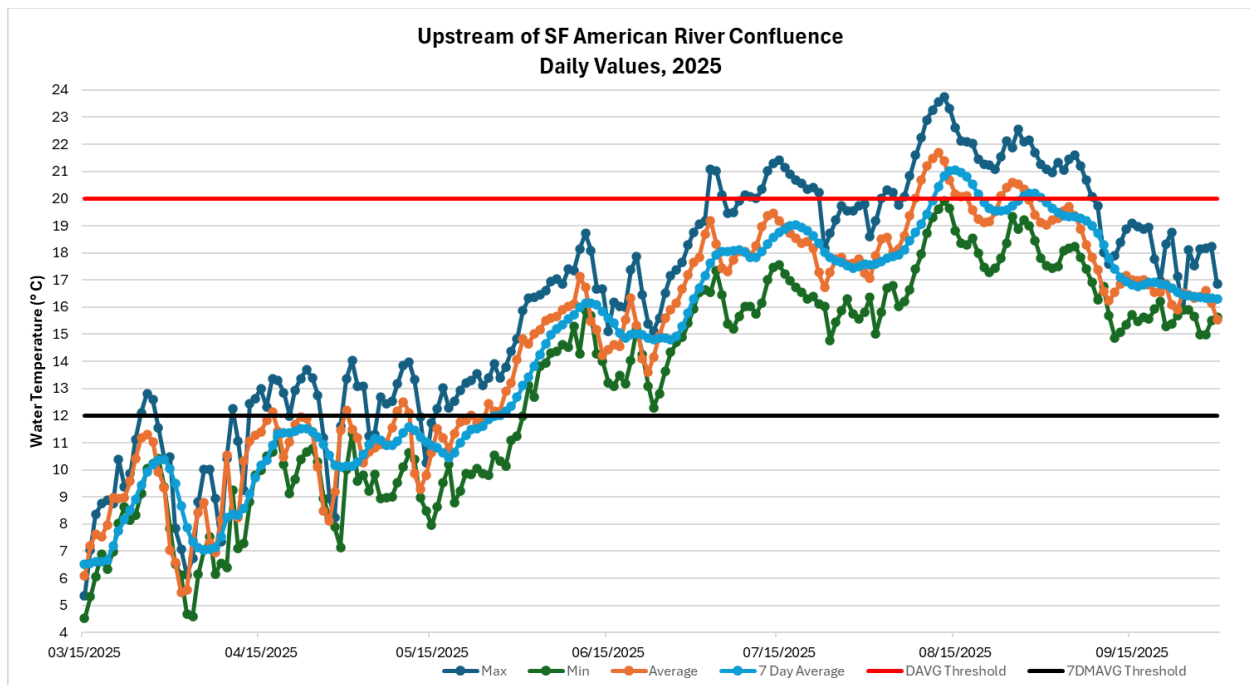
**Figure H-11. Silver Creek immediately below Junction Reservoir Dam (Site SC5).**



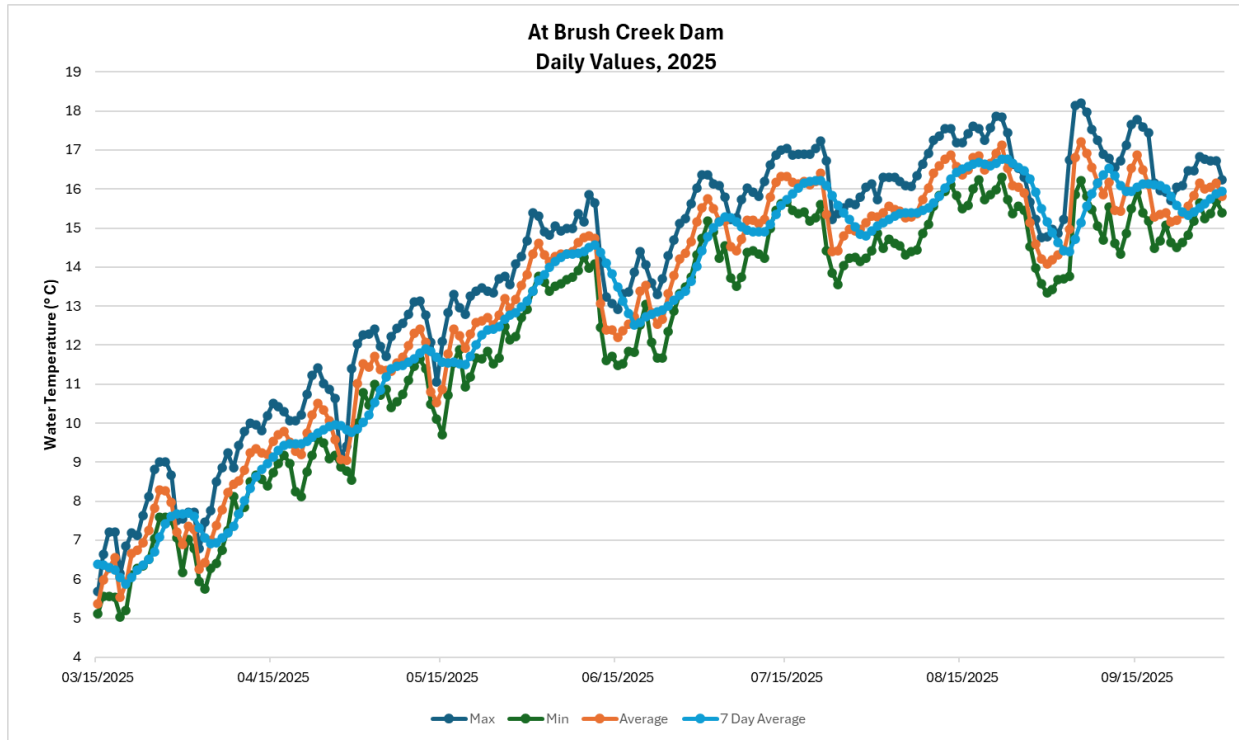
**Figure H-12. Silver Creek immediately above Camino Reservoir Dam (Site SC6).**



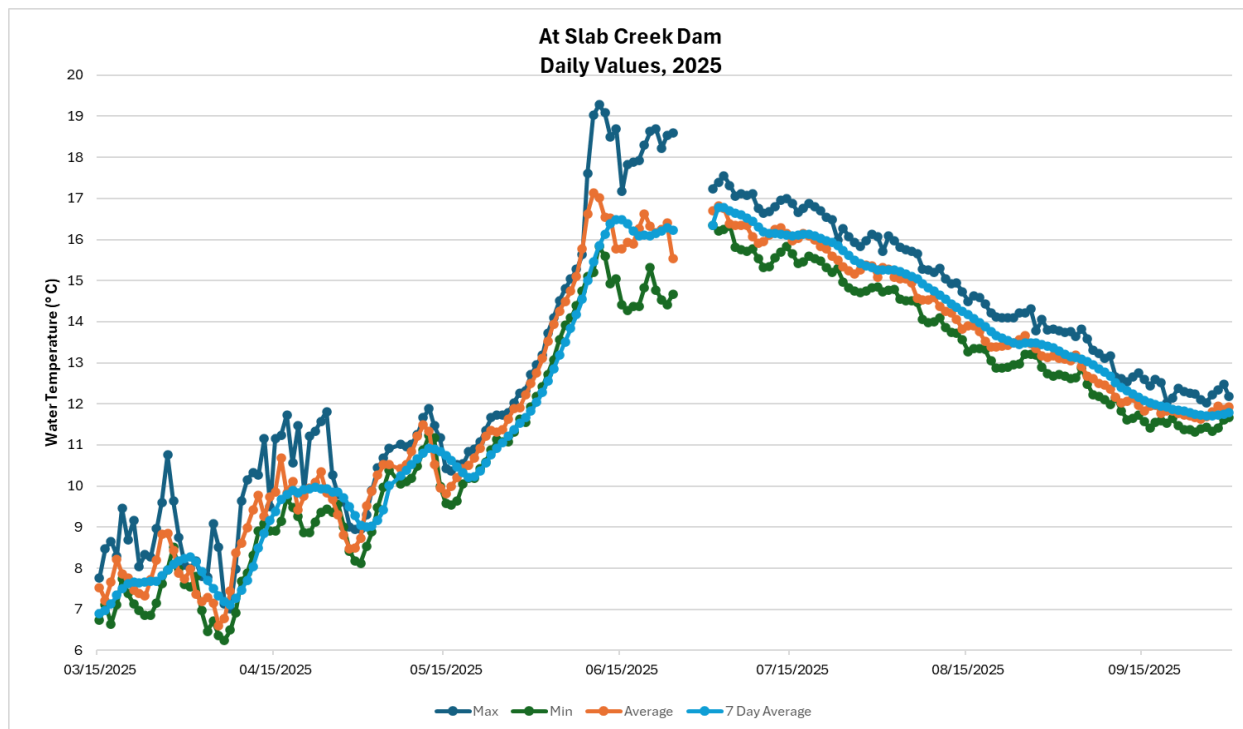
**Figure H-13. Silver Creek immediately below Camino Reservoir Dam (Site SC7).**



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

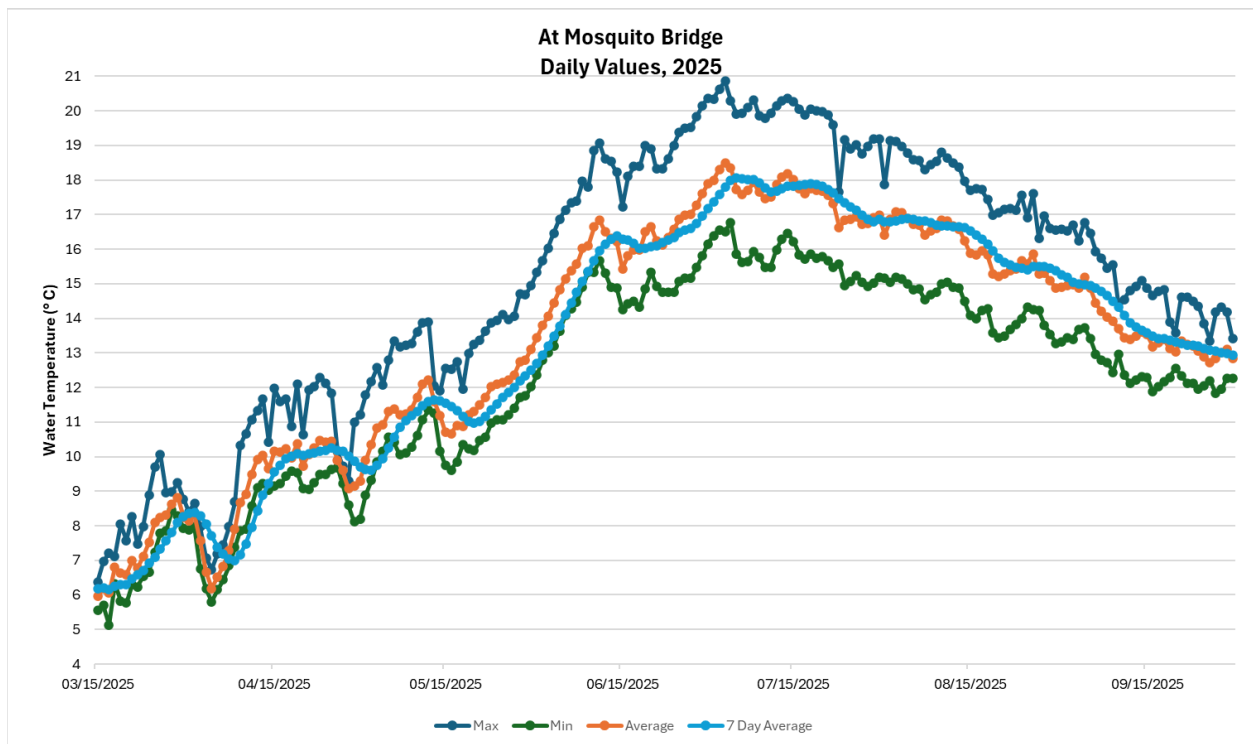


**Figure H-15. Brush Creek immediately below Brush Creek Reservoir Dam (Site BC4).**

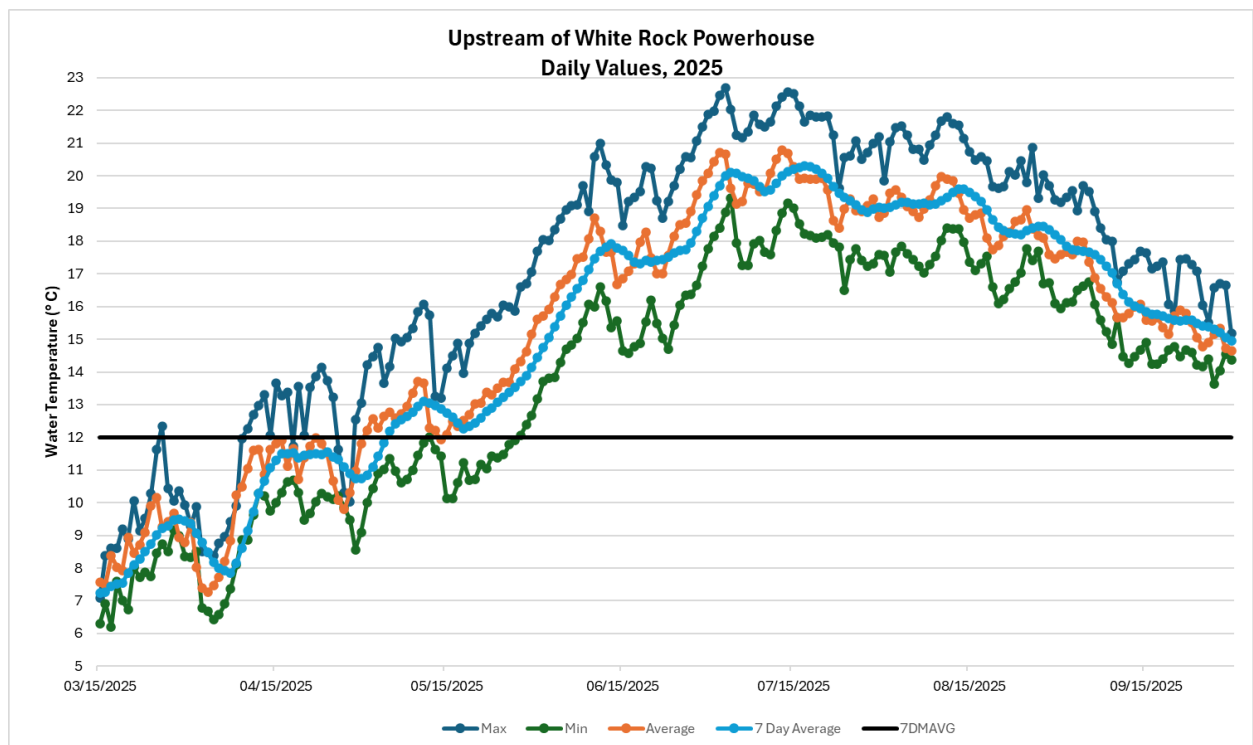


**Figure H-16. South Fork American River immediately below Slab Creek Reservoir Dam (Site SFAR13).**

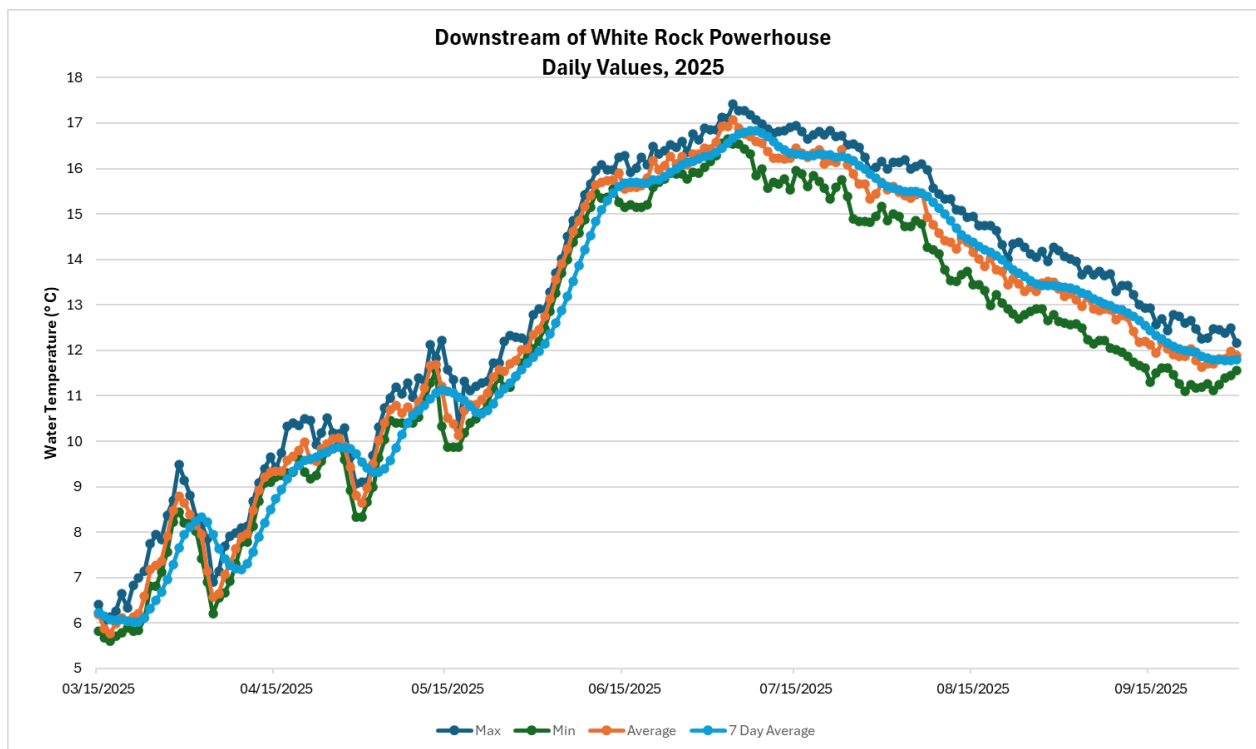




**Figure H-17. South Fork American River at Mosquito Road (SFAR7).**



**Figure H-18. South Fork American River approximately 0.5 mile upstream of White Rock Powerhouse (SFAR15).**



**Figure H-19. South Fork American River below White Rock Powerhouse (SFAR16).**