



Executive Policy Committee

Steve Haugen, KRWA

David Merritt, KRCD

Gerald Hatler, CDFW

Steve Haugen
Executive Officer
559.266.0767

4888 E. Jensen Ave
Fresno, CA 93725

**KINGS RIVER FISHERIES MANAGEMENT PROGRAM
ANNUAL TECHNICAL REPORT
Water Year 2024 - 2025**



Prepared by Technical Steering Committee

Steve Haugen (member)
Matthew Meadows (alternate)
KINGS RIVER WATER ASSOCIATION

Soua Vang (member)
Lori Werner (alternate)
KINGS RIVER CONSERVATION DISTRICT

Brian Beal (member)
Kenneth Johnson (alternate)
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE

Issued: June 24, 2026

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1.0 INTRODUCTION	2
1.1 ADMINISTRATIVE ACTIVITIES.....	2
1.2 ANNUAL TECHNICAL REPORT	4
2.0 HYDROLOGY AND OPERATIONS.....	4
2.1 RESERVOIR INFLOW.....	4
2.2 RESERVOIR STORAGE	6
2.3 RESERVOIR RELEASES	7
2.4 TELEMETRY SYSTEM	11
2.5 EXHIBIT “C” AND “D” FLOWS	11
2.6 SUMMARY	12
3.0 WATER QUALITY	12
3.1 RESERVOIR WATER QUALITY.....	12
3.2 RIVER WATER QUALITY.....	14
3.3 SUMMARY	16
4.0 HABITAT ENHANCEMENT.....	17
4.1 RIVER	17
4.2 PINE FLAT RESERVOIR	18
5.0 FISH STOCKING.....	18
5.1 INCUBATOR	18
5.1.1 Round 1 Rearing Period: January 8 – February 20, 2025	19
5.1.2 Round 2 Rearing Period: February 25 – April 10, 2025	20
5.2 SUPPLEMENTAL STOCKING.....	21
5.3 CDFW STOCKING	22
5.3.1 Fingerlings.....	22
5.3.2 Sub-Catchable Trout.....	23
5.3.3 Catchable Trout.....	23
5.3.4 Super-Catchable Trout	24
5.3.5 Trophy Trout.....	24
6.0 MONITORING.....	25
6.1 FALL FISH POPULATION SURVEY IN THE LOWER KINGS RIVER	25
6.2 THORBURN CHANNEL.....	28
6.3 LOWER KINGS RIVER ANGLER CREEL SURVEY	30
7.0 PUBLIC EDUCATION AND OUTREACH	30
7.1 WEBSITE.....	30
7.2 HYDROLOGY AND TEMPERATURE REPORT	31
7.3 INCUBATOR TOURS.....	31
7.4 RIVER CLEAN-UP	31

7.5 FISHING REGULATION SIGNS	32
8.0 MAINTENANCE ACTIVITIES	32
8.1 INCUBATOR BUILDING.....	32
8.2 THORBURN CHANNEL.....	33
9.0 DEVELOPMENT OF A LONG-TERM IMPLEMENTATION PLAN	33
REFERENCES	34

**APPENDIX A: PINE FLAT RESERVOIR TEMPERATURE AND DISSOLVED OXYGEN
PROFILES, OCTOBER 2024 – SEPTEMBER 2025**

LIST OF FIGURES

FIGURE 2-1: ANNUAL INFLOW INTO PINE FLAT RESERVOIR FROM OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	6
FIGURE 2-2: AVERAGE DAILY STORAGE IN PINE FLAT RESERVOIR FROM OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	7
FIGURE 2-3: AVERAGE DAILY DISCHARGE FROM PINE FLAT INTO THE KINGS RIVER FROM OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	8
FIGURE 2-4: AVERAGE DAILY FLOW OF KINGS RIVER AT PIEDRA FROM OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	9
FIGURE 2-5: AVERAGE DAILY FLOW IN DENNIS CUT FROM OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	9
FIGURE 2-6: AVERAGE DAILY FLOW OF KINGS RIVER TO FRESNO WEIR FROM OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	10
FIGURE 2-7: AVERAGE DAILY FLOW OF KINGS RIVER BELOW FRESNO WEIR FROM OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	10
FIGURE 3-1: PINE FLAT RESERVOIR PROFILE, OCTOBER 1, 2024.	13
FIGURE 3-2: DAILY AVERAGE WATER TEMPERATURE AT THE ACOE BRIDGE, OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	14
FIGURE 3-3: DAILY AVERAGE WATER TEMPERATURE AT FRESNO WEIR, OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	15
FIGURE 3-4: DAILY AVERAGE DISSOLVED OXYGEN CONTENT AT THE ACOE BRIDGE, OCTOBER 1, 2024 THROUGH SEPTEMBER 30, 2025.	16
FIGURE 5-1: AVERAGE DAILY WATER AND AIR TEMPERATURES AND KINGS RIVER INSTREAM FLOWS, SHOWING THE ONSET OF SWIM-UP FRY AND OPTIMAL AND LETHAL THRESHOLDS BY LIFE STAGE (WOYNAROVICH ET AL. 2011).	20
FIGURE 5-2: AVERAGE DAILY WATER AND AIR TEMPERATURES AND KINGS RIVER INSTREAM FLOWS, SHOWING THE ONSET OF SWIM-UP FRY AND OPTIMAL AND LETHAL THRESHOLDS BY LIFE STAGE (WOYNAROVICH ET AL. 2011).	21
FIGURE 6-1: ANNUAL FISH POPULATION SURVEY SITES IN THE KINGS RIVER SINCE 2007 AND THEIR RESPECTIVE KRFMP MANAGEMENT ZONES.	26
FIGURE 6- 2: SACRAMENTO HITCH COLLECTED ON DECEMBER 4, 2024 IN THE AVO SITE SURVEY SITE.	27

LIST OF TABLES

TABLE 1-1: ESTIMATE OF KRWA IN-KIND SUPPORT FOR THE KRFMP, OCTOBER 1, 2024 – SEPTEMBER 30, 2025.....	3
TABLE 1-2: ESTIMATE OF KRCD IN-KIND SUPPORT FOR THE KRFMP, OCTOBER 1, 2024 – SEPTEMBER 30, 2025.....	3
TABLE 1-3: ESTIMATE OF CDFW IN-KIND SUPPORT FOR THE KRFMP, OCTOBER 1, 2024 – SEPTEMBER 30, 2025.....	4
TABLE 1-4: ESTIMATE OF VOLUNTEER HOURS FOR THE KRFMP, OCTOBER 1, 2024 – SEPTEMBER 30, 2025.	4
TABLE 2-1: KINGS RIVER BASIN CALCULATED ANNUAL RUNOFF BY WATER YEAR, OCTOBER – SEPTEMBER.	5
TABLE 2-2: EXHIBIT “C” TARGET FLOWS (CFS) FROM THE FRAMEWORK AGREEMENT.	11
TABLE 5-1: EGG INCUBATION, HATCH SUCCESS, FRY RELEASE, RELEASE ZONES, AND ESTIMATED SURVIVORSHIP FOR THE TROUT INCUBATOR.....	19
TABLE 5-2: SUMMARY OF 2024-2025 KRFMP AND KRCD SUPPLEMENTAL STOCKING BY CALAVERAS TROUT FARM. ALL STOCKED WERE CATCHABLE SIZE.....	22
TABLE 5-3: CDFW FINGERLING SIZED TROUT STOCKED IN 2025.	22
TABLE 5-4: CDFW SUB-CATCHABLE SIZED TROUT STOCKED IN 2025.....	23
TABLE 5-5: CDFW CATCHABLE SIZED TROUT STOCKED IN 2025.	23
TABLE 5-6: CDFW SUPER-CATCHABLE SIZED TROUT STOCKED IN 2025.....	24
TABLE 5-7: CDFW TROPHY SIZED TROUT STOCKED IN 2025.	24
TABLE 6-1: SUMMARY RESULTS, ANNUAL FALL FISH POPULATION SURVEY, 2024.	28
TABLE 6-2: SUMMARY RESULTS, THORBURN CHANNEL FALL FISH POPULATION SURVEY, 2024. .	29
TABLE 7-1: ORGANIZATIONS AND CLASSES PROVIDED WITH TOURS OF THE KRFMP TROUT INCUBATOR DURING THE 2025 SEASON.	31
TABLE 7-2: LOCATION, NUMBER OF VOLUNTEERS, AND QUANTITY OF TRASH REMOVED DURING THE 2024-2025 REPORTING PERIOD.	32

EXECUTIVE SUMMARY

The Kings River Water Association, Kings River Conservation District, and California Department of Fish and Wildlife have jointly implemented habitat and trout population enhancement projects and conducted monitoring programs in the lower Kings River and Pine Flat Reservoir. These efforts have been carried out pursuant to the Kings River Fisheries Management Program (KRFMP) Framework Agreement, which was originally approved on May 28, 1999, with the financial commitment subsequently extended for additional ten-year periods on June 26, 2009, and again on May 28, 2019. The Framework Agreement includes actions intended to protect and enhance fishery habitat within the lower Kings River and Pine Flat Reservoir. Implementation of these actions is overseen by the Technical Steering Committee, with approval from the Executive Policy Committee. This annual technical report compiles and synthesizes information related to habitat enhancement projects, trout population enhancement activities, and monitoring efforts conducted under the KRFMP. The reporting period covered includes Water Year 2025 (October 1, 2024, through September 30, 2025) and CDFW stocking activities for Calendar Year 2025.

Key Elements of the program include:

- In-kind support from agencies and volunteers totaled 3,815 hours;
- Kings River runoff in Water Year 2025 was 73% of average, approximately 1.6 million-acre-feet;
- An Exhibit “D” enhanced minimum flow period was provided;
- Most instream flow targets met as outlined in the Framework Agreement, except for occurrences outlined in Section 2;
- Continued implementation of a supplemental Rainbow Trout stocking plan in addition to CDFW annual stocking allotment, catchable or larger size class stocking from all sources in the Kings River below Pine Flat dam totaled 48,800 pounds (112,103 fish);
- Incubated 277,000 rainbow trout eggs in the incubator building;
- Annual fish population survey in the Kings River and Thorburn Channel survey completed;
- Three field trips were hosted;
- Eleven Clean-Up events were held.

1.0 INTRODUCTION

The Kings River Water Association (KRWA), Kings River Conservation District (KRCD), and the California Department of Fish and Wildlife (CDFW) have jointly implemented habitat and trout population enhancement projects and conducted monitoring programs in the lower Kings River and Pine Flat Reservoir. These efforts have been carried out in accordance with the Kings River Fisheries Management Program (KRFMP) Framework Agreement, originally approved on May 28, 1999. The Framework Agreement outlines actions intended to protect and enhance fishery habitat within the lower Kings River and Pine Flat Reservoir. Implementation of these actions is overseen by the Technical Steering Committee (TSC) and authorized and approved by the Executive Policy Committee (ExCom). This annual technical report summarizes activities conducted under the KRFMP between October 2024 and September 2025, as well as CDFW stocking activities completed in Calendar Year 2025, including the following:

- Monitoring hydrology and operations including inflow to Pine Flat Reservoir, reservoir storage, reservoir releases, operation of remote sensing telemetry systems, turbine bypass operation, and activities to implement enhanced winter flows for fishery habitat as outlined in Exhibits “C” and “D” of the Framework Agreement;
- Monitoring water quality including water temperature and dissolved oxygen within Pine Flat Reservoir and the lower Kings River, compliance with dissolved oxygen requirements within the lower river, and planning and monitoring water temperature conditions at the completion of the irrigation season;
- Fish stocking by the CDFW, KRFMP and KRCD supplemental stocking, and continued contributions of rainbow trout fry produced from the incubator building.

The annual report provides a project management structure for reviewing and prioritizing existing and proposed activities, fish stocking, and implementation of other elements contained in the Framework Agreement. Results of the fishery and habitat monitoring program are intended to provide a technical and scientific framework for identifying design criteria and priorities for determining the appropriate scale and location of habitat enhancement projects, linkages among potential projects to maximize biological benefits and reduce cost, identify priorities for habitat enhancement project locations, and identify potential opportunities for expanding enhancement projects through funding augmentation from collaborative grant applications from state, federal, and private funding sources. In addition, one of the key objectives of the annual report improves coordination and communication among the parties involved in implementing various elements of the Framework Agreement, and to facilitate a process for reviewing and evaluating the performance of management actions in achieving the overall goals of the KRFMP.

1.1 Administrative Activities

Along with the financial commitment, in-kind support from KRFMP agencies is estimated below. In-kind support may include staff time for data collection, weir management, analysis, reporting, water operations, meetings, and other administrative activities which vary by agency. The following tables show estimates of agency in-kind support for October 1, 2024 through September 30, 2025: KRWA (Table 1-1), KRCD (Table 1-2), CDFW (Table 1-3). Estimated in-kind support from agencies for the KRFMP was 3,237 hours or about 1.56 Full-Time Equivalent (FTE). Additionally, volunteers involved with assisting the KRFMP are vital for the program success, providing approximately 787 hours of service (Table 1-4).

The in-kind support does not account for CDFW fish stocking or the loss of water supply and storage loss for temperature control pool management. Section 5 outlines stocking activities related to the KRFMP. In 2025, CDFW’s catchable trout allotment for the Kings River, Avocado Lake and Pine Flat Reservoir was 33,700 pounds (\$150,302) of catchable size rainbow trout of which the Lower Kings River received 18,000 pounds, Avocado Lake received 3,400 pounds, and Pine Flat Reservoir received 12,300 pounds. Avocado Lake received an additional 1,000 pounds (\$4,460) of Super Catchable rainbow trout and 2,500 pounds (\$11,450) of Trophy size rainbow trout. Pine Flat Reservoir received an additional 3,000 pounds of sub-catchable brown trout (\$13,380). The upper Kings River received 1,050 pounds (\$4,683) of sub-catchable brown trout. Kings River below Pine Flat reservoir received an additional 2,700 pounds (\$12,042) of sub-catchable rainbow trout, 1,000 pounds (\$4,460) sub-catchable brown trout, 1,500 pounds (\$6,690) of super-catchable rainbow trout and 6,000 pounds (\$26,760) of trophy trout. Total pounds of all trout planted in the Upper Kings River, Pine Flat Reservoir, Lower Kings River and Avocado Lake was 52,450 pounds (\$233,927).

Table 1-1: Estimate of KRWA in-kind support for the KRFMP, October 1, 2024 – September 30, 2025.

KRFMP Support Activity	Hours/Year	Days/Year	FTE
Weir Management (Dennis Cut)	115	14.4	0.06
Weir Management (Fresno Weir)	140	17.5	0.07
Fall Population Survey	120	15.0	0.06
Incubator Operation	15	1.9	0.01
Incubator Fry Release	0	0.0	0.00
River Clean-Up	9	1.1	0.00
River Operations	120	15.0	0.06
Internal Water Accounting	120	15.0	0.06
Administrative Activities	400	50.0	0.19
Total In-Kind Support	1039	129.9	0.50

Table 1-2: Estimate of KRCD in-kind support for the KRFMP, October 1, 2024 – September 30, 2025.

KRFMP Support Activity	Hours/Year	Days/Year	FTE
Administrative	709	88.6	0.34
Education Outreach	135	16.9	0.06
Fall Population Survey	364	45.5	0.18
Fishing Access Maintenance	12	1.5	0.01
Incubator Fry Release	16	2.0	0.01
Incubator Maintenance	4	0.5	0.00
Incubator Operation	128	16.0	0.06
Pine Flat Reservoir Profile	99	12.4	0.05
River Clean-up	54	6.8	0.03
Thorburn Maintenance	20	2.5	0.01
Total In-Kind Support	1541	192.6	0.74

Table 1-3: Estimate of CDFW in-kind support for the KRFMP, October 1, 2024 – September 30, 2025.

KRFMP Support Activity	Hours/Year	Days/Year	FTE
Fall Population Survey	273	34.1	0.13
Administrative Activities	384	48	0.18
Total In-Kind Support	657	82.1	0.32

Table 1-4: Estimate of volunteer hours for the KRFMP, October 1, 2024 – September 30, 2025.

KRFMP Support Activity	Hours/Year	Days/Year	FTE
Fall Population Survey	354	44.3	0.17
Incubator Fry Release	88	11.0	0.04
Incubator Operation	86	10.8	0.04
Public Advisory Group	52	6.5	0.03
River Clean-up	207	25.9	0.10
Total In-Kind Support	787	98.4	0.38

1.2 Annual Technical Report

Interested parties and stakeholders, including the KRFMP ExCom, KRFMP Public Advisory Group (PAG), resource and water agencies, local angling groups, and others have expressed interest in the information being collected as part of the KRFMP's monitoring program. Preparation and distribution of an Annual Technical Report has been identified as a useful method of conveying information regarding the program status and monitoring results to interested parties.

2.0 HYDROLOGY AND OPERATIONS

Section 2 outlines hydrologic conditions for hydrologic or Water Year 2025, October 1, 2024 through September 30, 2025, including general hydrology and details regarding target flows as outlined in the KRFMP. The temperature control pool has been maintained above 100,000 acre-feet, a storage volume unavailable to water users.

2.1 Reservoir Inflow

Daily average inflow into Pine Flat Reservoir from October 1, 2024 through September 30, 2025, are shown in Figure 2-1. Inflow into Pine Flat Reservoir is characterized by high seasonal and inter-annual variability reflecting variation in precipitation, snowpack, and runoff within the watershed. Kings River inflow into Pine Flat averaged 1,614 cfs, ranging from 193 to 7,126 cfs. Table 2-1 shows the Kings River calculated annual runoff and the corresponding percent of average water year for the past 26 years; This year included in this report is bold text. Water Year 2025 was below average runoff, at 73% of average. Roughly 1.2-million-acre-feet of water was yielded from the Kings basin, which on average yields about 1.7-million-acre-feet.

Table 2-1: Kings River Basin calculated annual runoff by water year, October – September.

Water Year (Oct-Sept)	Annual Runoff (TAF)	Percent Water Year
2000	1,534	91%
2001	1,010	60%
2002	1,141	67%
2003	1,426	84%
2004	1,050	62%
2005	2,531	149%
2006	2,952	174%
2007	679	40%
2008	1,216	72%
2009	1,348	80%
2010	2,062	122%
2011	3,318	196%
2012	826	49%
2013	691	41%
2014	537	32%
2015	361	21%
2016	1,253	74%
2017	4,096	242%
2018	1,275	75%
2019	2,177	128%
2020	913	54%
2021	396	23%
2022	786	46%
2023	4,509	266%
2024	1,615	95%
2025	1,234	73%

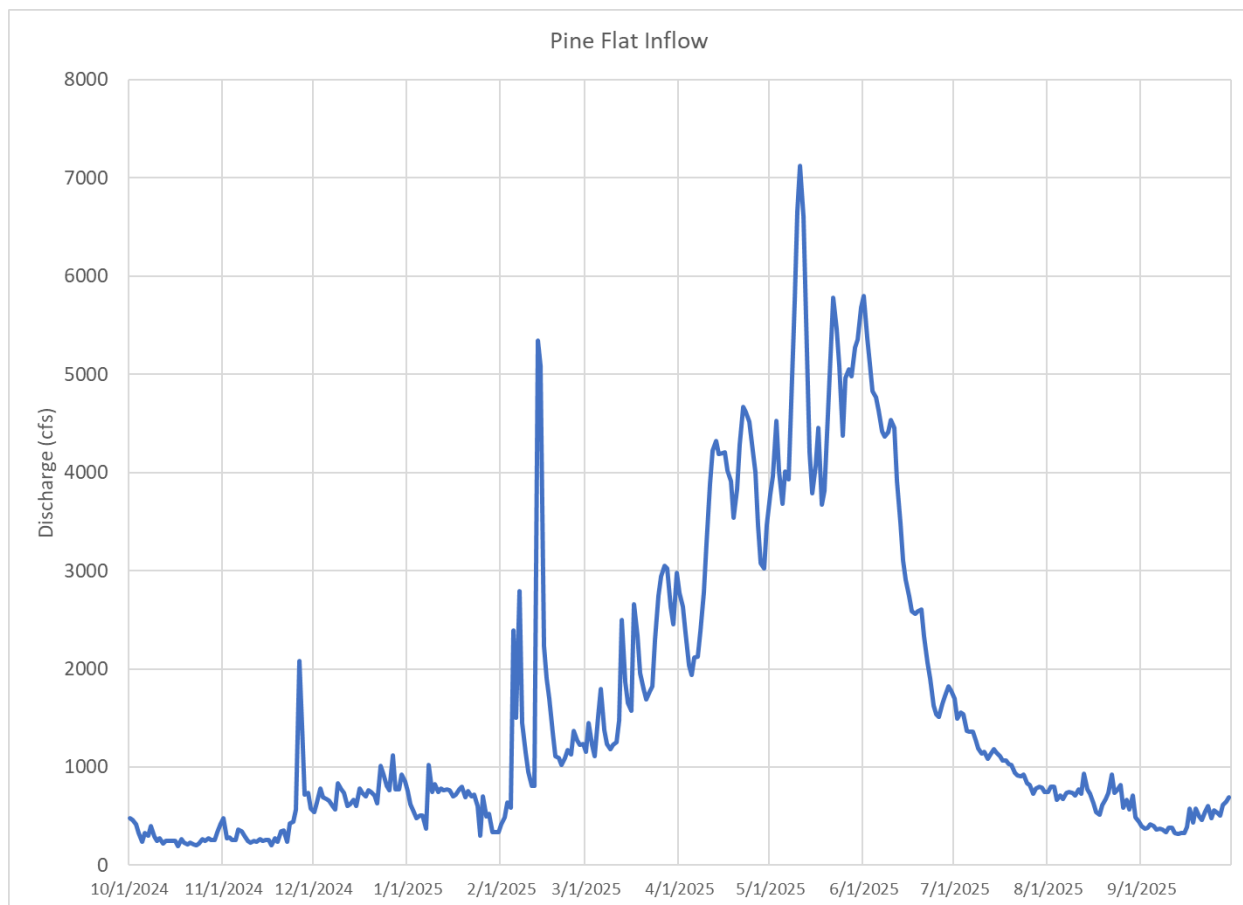


Figure 2-1: Annual inflow into Pine Flat Reservoir from October 1, 2024 through September 30, 2025.

2.2 Reservoir Storage

Daily reservoir water storage volume in Pine Flat Reservoir from October 1, 2024 through September 30, 2025 is shown in Figure 2-2. Reservoir storage reflects the combined effects of reservoir inflow, releases from Pine Flat Reservoir to the lower Kings River, and evaporation. As part of the Framework Agreement, a voluntary 100,000 acre-feet temperature control pool was established. Pine Flat reservoir storage was maintained above the temperature control pool during this report period. Having carried over storage from 2024, the minimum storage in Pine Flat, 219,590 acre-feet, did not occur until the last month of the water year September 19, 2025. No flood release requirement was made by the Army Corps of Engineers in 2025. Prior flood releases occurred in water years 2005, 2006, 2011, 2017, 2019, 2023, and 2024. Maximum storage in Pine Flat, 859,923 acre-feet, occurred on July 4, 2025.

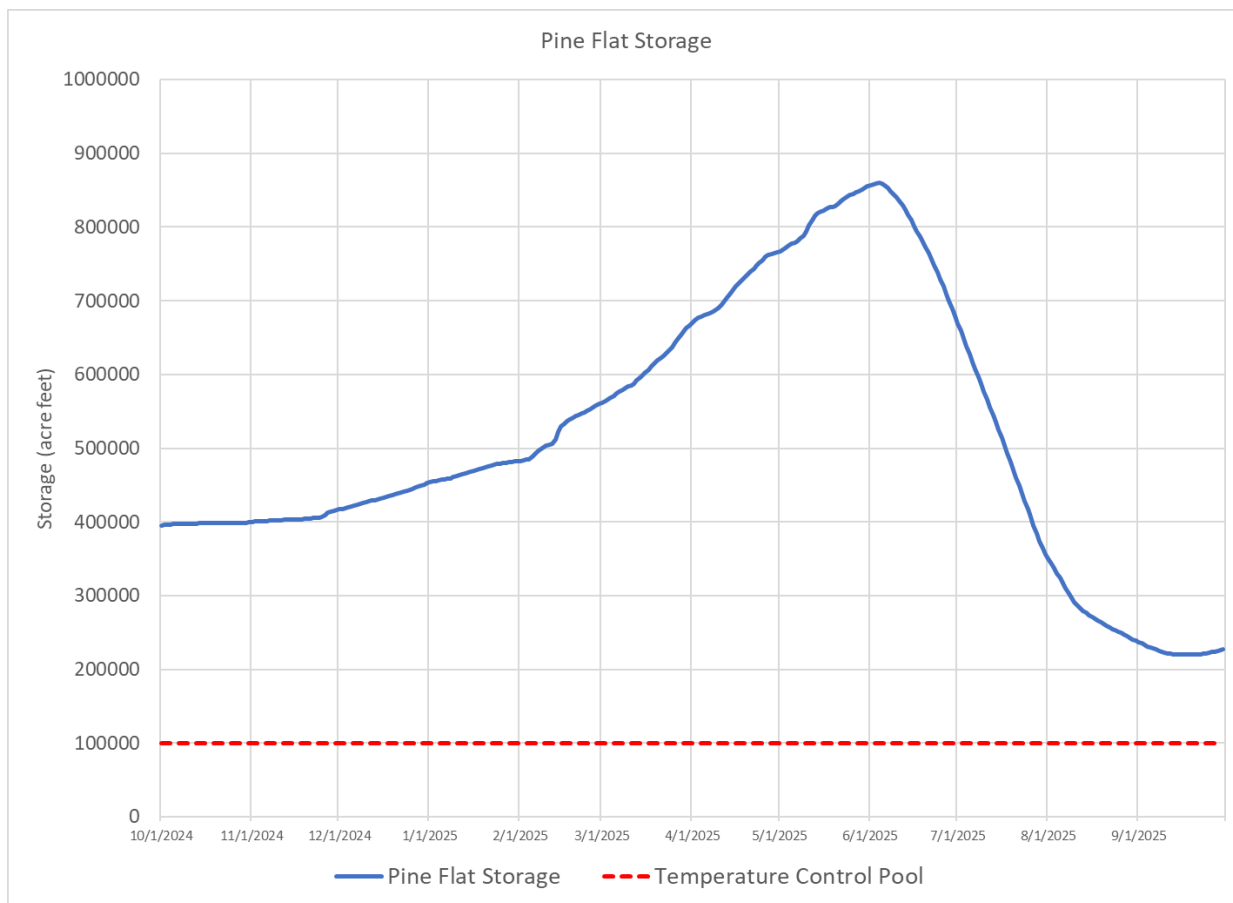


Figure 2-2: Average daily storage in Pine Flat Reservoir from October 1, 2024 through September 30, 2025.

2.3 Reservoir Releases

The Framework Agreement established minimum instream Exhibit “C” and Exhibit “D” flow releases from Pine Flat Reservoir (Figure 2-3), flow at Piedra (Figure 2-4), in Dennis Cut (Figure 2-5), to Fresno Weir (Figure 2-6) and below Fresno Weir (Figure 2-7) to support resident fish populations in the lower river (Table 2-2).

Water discharge from Pine Flat Reservoir to the lower Kings River shows high variability within the year as shown in Figure 2-3, with the lowest flows in the fall and winter months and higher flows in the spring and summer. Average daily discharge from Pine Flat in the lower Kings River from October 1, 2024 through September 30, 2025 ranged from 67 to 6,840 cfs, all above target flows. The average discharge from Pine Flat was 1,824 cfs during the report period.

Daily average Kings River flow at Piedra from October 1, 2024 through September 30, 2025 ranged from 135 to 6,840 cfs, all above target flows (Figure 2-4). Flow at Piedra averaged 1,837 cfs during the report period.

Daily average flow at Dennis Cut from October 1, 2024 through September 30, 2025 ranged from 5 to 117 cfs, all above target flows (Figure 2-5). Flow at Dennis Cut averaged 50 cfs during the report period (Figure 2-5).

Target flow to Fresno Weir followed Exhibit “D” ‘section 2’ from October 1, 2024 till March 31, 2025 (see Section 2.5) and Exhibit “C” flow schedule thereafter (Table 2-2), due to preceding year conditions in Water Year 2024. Daily average Kings River flow to Fresno Weir from October 1, 2024 through September 30, 2025 was 1,507 cfs, ranging from 121 to 5,894 cfs (Figure 2-6). Several departures from target flows occurred: six days in November 2024 and one day in March 2025, all within the enhanced minimum flow period. When final data were processed and collected the target departures were discovered. On November 1, 7, 8, 27, 28, and 29, 2024 flow to Fresno Weir was 124, 124, 125, 127, 123, and 121 cfs, respectively. On March 22, 2025 flow to Fresno Weir was 127 cfs. The average flow for the months of November and March were 133 and 189 cfs, respectively. Real-time observations of flow indicated that targets were met. However, final data of all discharge ratings and diversions shifted the values below target number. In March, this was compounded by Mill Creek flow variability and a rating table adjustment for Mill Creek.

Daily average flow below Fresno Weir from October 1, 2024 through September 30, 2025 ranged from 39 to 3,565 cfs (Figure 2-7). Flow below Fresno Weir averaged 739 cfs during the report period. One departure from target flows occurred during the report period, November 7, 2024, flow below Fresno Weir was 39 cfs. The average flow for the month of November was 50 cfs. Real-time observations of flow indicated that target was met. However, final data of all discharge ratings shifted the value below target number by 1 cfs. An additional cfs was also diverted into Dennis Cut on that day.

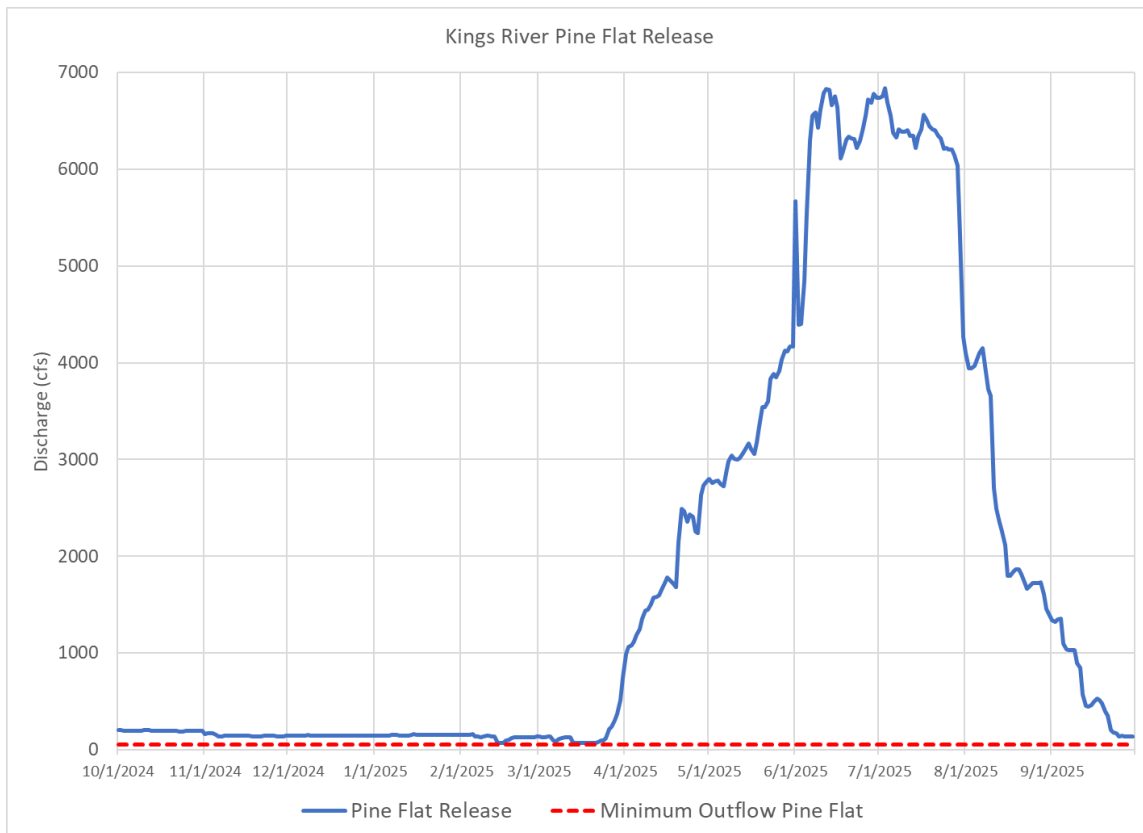


Figure 2-3: Average daily discharge from Pine Flat into the Kings River from October 1, 2024 through September 30, 2025.

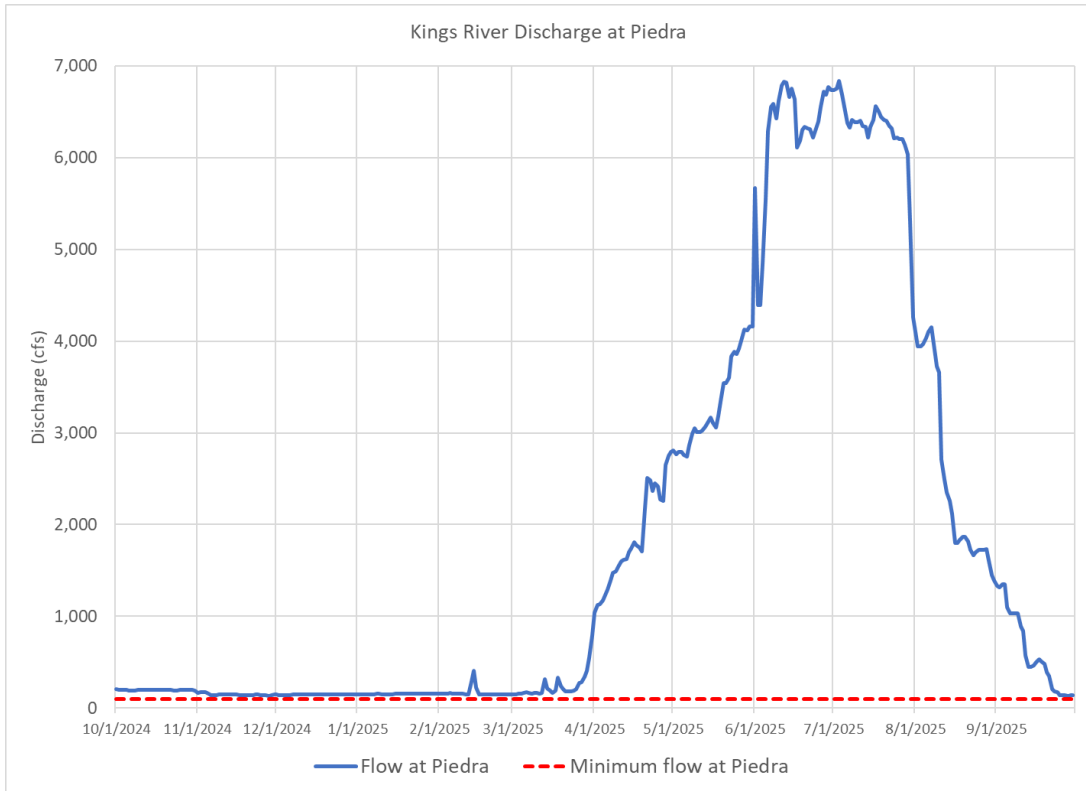


Figure 2-4: Average daily flow of Kings River at Piedra from October 1, 2024 through September 30, 2025.

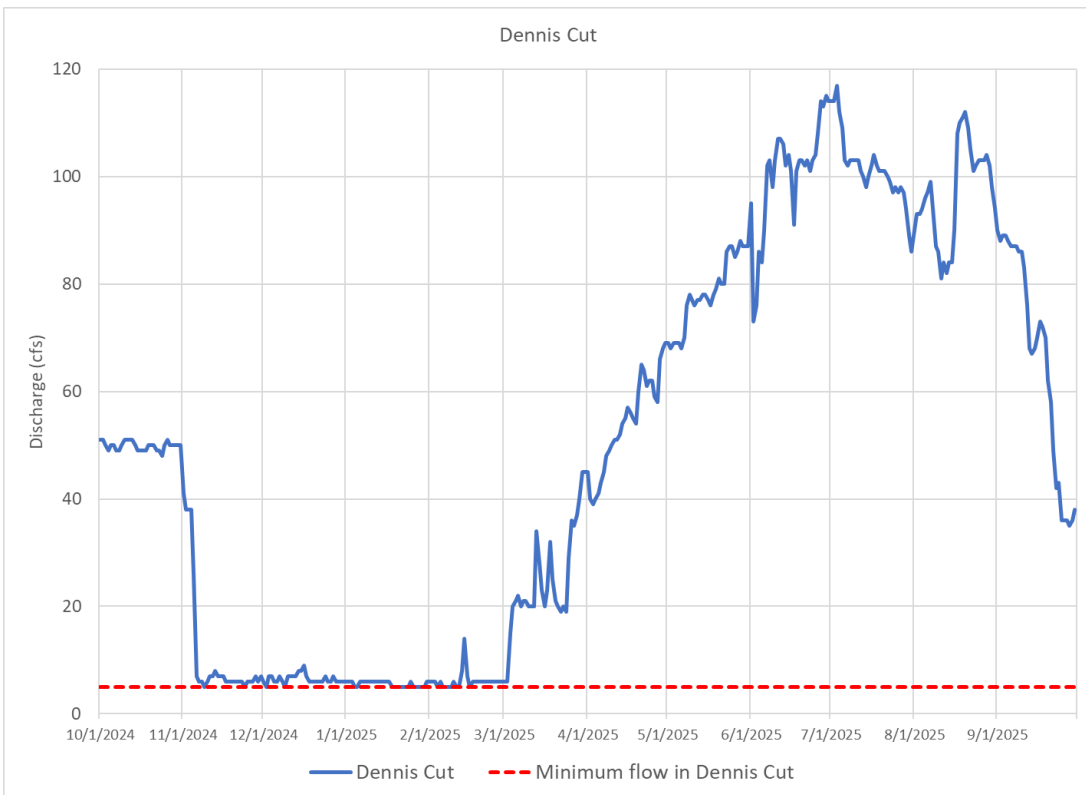


Figure 2-5: Average daily flow in Dennis Cut from October 1, 2024 through September 30, 2025.

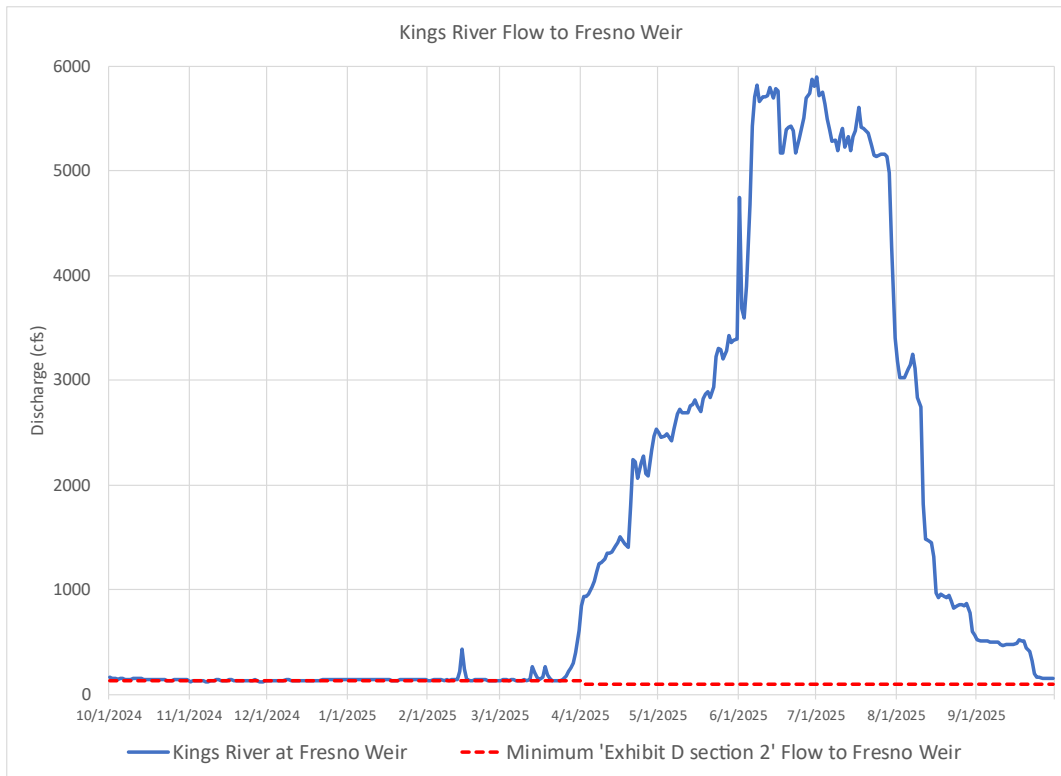


Figure 2-6: Average daily flow of Kings River to Fresno Weir from October 1, 2024 through September 30, 2025.

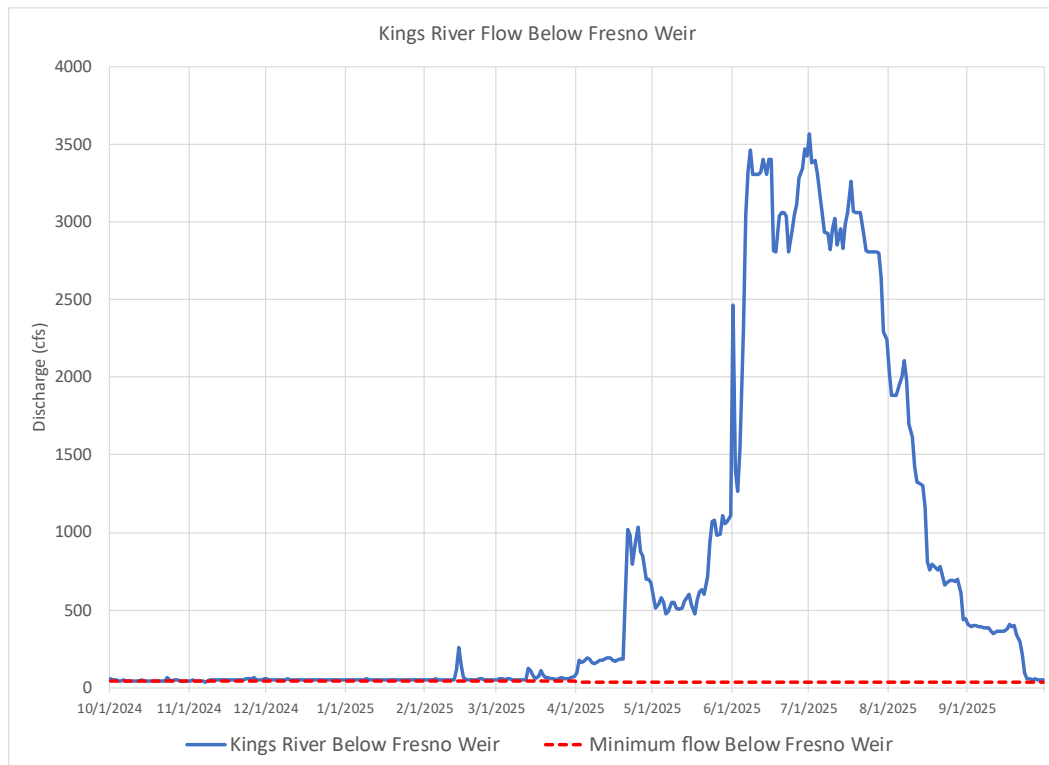


Figure 2-7: Average daily flow of Kings River below Fresno Weir from October 1, 2024 through September 30, 2025.

2.4 Telemetry System

Use of real-time flow monitoring stations below Fresno Weir and at Dennis Cut continued. These systems provide data that supports informed decisions on water temperature and flow management after completing the irrigation and delivery season when elevated water temperatures may impact habitat quality within the lower river.

2.5 Exhibit “C” and “D” Flows

Minimum flow targets are dependent on prior water year runoff volumes. Exhibit “D” ‘section 2’ flows were triggered by the near average Water Year in 2024, with approximately 1.6-million-acre-feet of runoff, 95% of normal, occurring between October 1, 2023 through September 30, 2024. Exhibit “D” ‘section 2’ flow requirements are observed when the preceding water year exceeds 1,555,000 acre-feet, but is less than 2,100,000 acre-feet. The minimum flow targets also increase when the preceding water year runoff exceeds 2,100,000 acre-feet. The “enhanced minimum flow period” at Fresno Weir (130 cfs to Fresno Weir) for Water Year 2025, began when the minimum flow to Fresno Weir would otherwise have fallen below 130 cfs through March 31, 2025. Irrigation flows were reduced to these levels to Fresno Weir starting in October 2024. On April 1, 2025 target flows reverted to Exhibit “C” flows for the remainder of the Water Year (Table 2-2). However, irrigation demand had already started to exceed the minimum target in February and March of 2024 (Figure 2-6).

Table 2-2: Exhibit “C” Target Flows (cfs) from the Framework Agreement.

Exhibit “C” flows	Oct 1 - Nov 15	Nov 16 - Mar 31	Apr 1 - Sept 30
Required from Pine Flat	50	50	50
Total flow at Piedra	100	100	100
Minimum in Dennis Cut	5	5	5
Minimum to Fresno Weir	95	95	95
Water divertible to China Slough	10	5	15
Required over Fresno Weir	40	45	35

2.6 Summary

Hydrologic conditions, Pine Flat Reservoir operations and flows within the lower river during Water Year 2025 are characterized by high seasonal variability characteristic of the Kings River watershed and water supply operations, following a close-to-average preceding Water Year and a nearly median runoff Water Year within the season. Carryover storage from the preceding year influence irrigation demand. Sub-median runoff conditions during the season, coupled with carryover storage, allowed for some late season irrigation and higher flows in the fall than would have otherwise occurred. Findings and recommendations regarding hydrology and operations for this reporting period include:

- Pine Flat Reservoir operations were successful in maintaining the temperature control pool in the reservoir above the minimum level specified in the Framework Agreement;
- Daily average discharge from Pine Flat, Kings River flow at Piedra, and flow in Dennis Cut demonstrated 100% compliance with the instream flow targets as outlined in the Framework Agreement, with most days greatly exceeding these targets;
- Daily average flow to Fresno Weir and over Fresno Weir had several deviations from the instream flow targets as outlined in the Framework Agreement, with most days greatly exceeding these targets;
- A real-time telemetry system provided information on flow at Fresno Weir and Dennis Cut that is available for monitoring and managing conditions within the lower river as part of the fishery program;
- Flow levels representing Exhibit “D” ‘section 2’ and Exhibit “C” flow schedules were observed during WY 2025;
- Kings River runoff in Water Year 2025 was 1,233,569 acre-feet, which will initiate Exhibit “C” flow in Water Year 2026.

3.0 WATER QUALITY

Water quality monitoring as part of the KRFMP has focused on measuring water temperature and dissolved oxygen, key parameters that directly influence habitat quality for fish and macroinvertebrates in Pine Flat Reservoir and the lower Kings River.

3.1 Reservoir Water Quality

Reservoir water temperature and dissolved oxygen are monitored monthly throughout the year. Reservoir profile data are used during fall temperature-control operations following the irrigation season to support suitable thermal conditions for trout and other fish species in the lower Kings River. Water temperatures at dam and power plant outlets are monitored in real time to evaluate reservoir releases into the lower river. When available, blending colder water from lower reservoir strata with well-oxygenated water from the turbine bypass can improve tailrace habitat conditions beyond what would otherwise occur. Blending operations to maintain habitat conditions were not implemented during this reporting period.

Vertical profiles of water temperature and dissolved oxygen in Pine Flat Reservoir are collected regularly. An example reservoir profile is shown in Figure 3-1, and monthly vertical temperature and dissolved oxygen profiles collected during the reporting period are provided in Appendix A. Reservoir profiles exhibit a typical seasonal pattern, with thermal stratification developing in

spring and intensifying through summer as a distinct hypolimnion (cold bottom layer) and epilimnion (warm surface layer) form. Temperatures become nearly uniform throughout the water column during late fall and winter. During the reporting period, thermal stratification was most pronounced in October and from May through September. The most isothermal conditions occurred between December and February. Although many reservoirs experience turnover during late fall or winter, Pine Flat Reservoir did not undergo turnover during this reporting period. Dissolved oxygen concentrations exceeded 7.0 milligrams per liter throughout much of the reservoir from February through April and were generally above 7.0 milligrams per liter in January and from May through July.

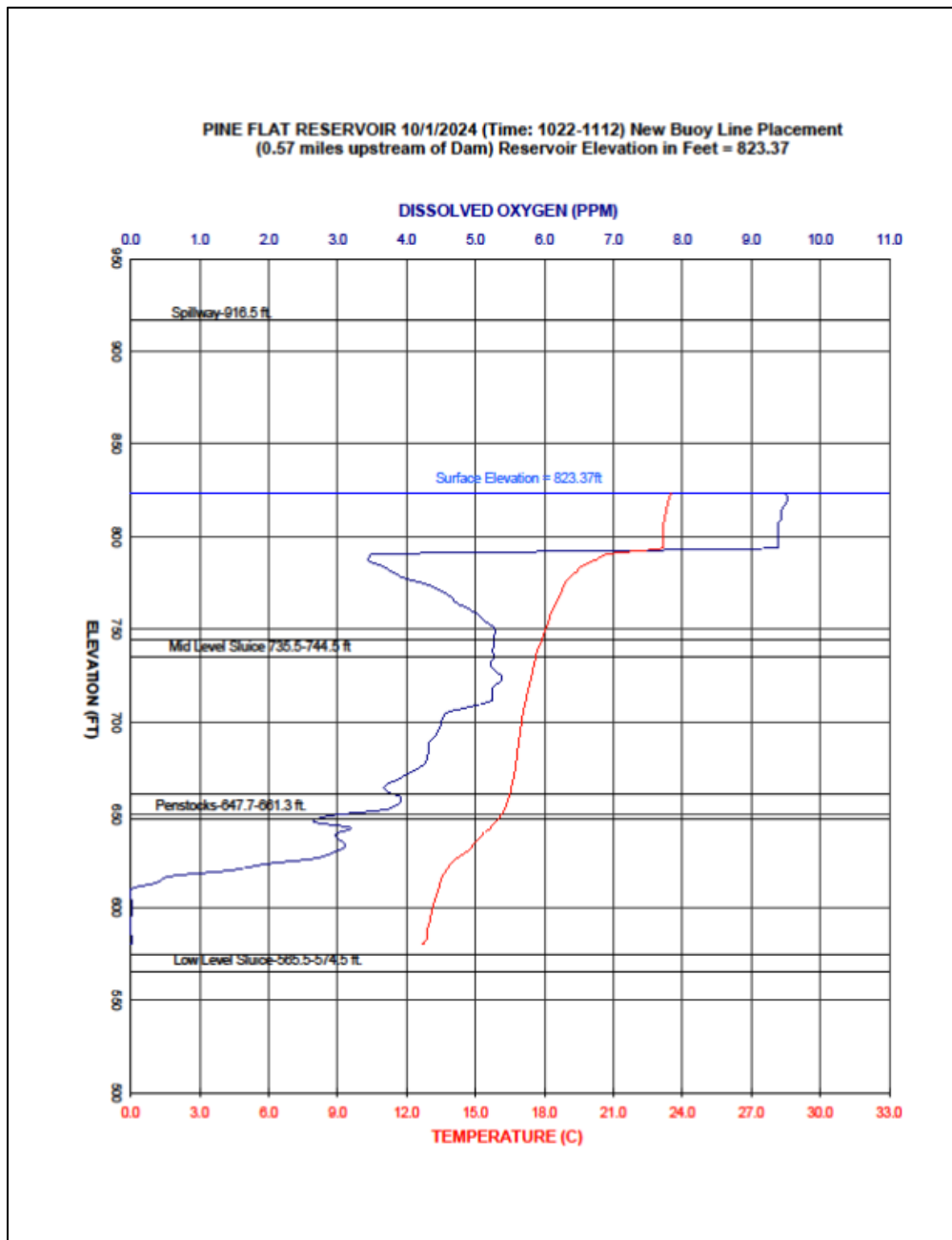


Figure 3-1: Pine Flat Reservoir Profile, October 1, 2024.

3.2 River Water Quality

Water temperature and dissolved oxygen in the lower Kings River are continuously monitored at the Army Corps of Engineers (ACOE) Bridge, located approximately 0.6 miles downstream of Pine Flat Dam, using a Eureka Manta water-quality sonde. Water temperature is also monitored at Fresno Weir using a stilling well within the weir pool. Although these locations do not directly measure main-current temperatures, they provide reliable, real-time data collection throughout the season.

Average daily water temperatures in the lower Kings River are presented for the ACOE Bridge (Figure 3-2) and Fresno Weir (Figure 3-3). Recorded water temperature at the ACOE Bridge during the reporting period ranged from a minimum of 9.0°C to a maximum of 24.0°C, with an annual average of 13.6°C. The annual minimum, maximum, and average water temperatures recorded at Fresno Weir were 11.0°C, 25.0°C, and 15.5°C, respectively. Throughout the season, daily average water temperature at Fresno Weir was approximately 1.9°C higher than at ACOE Bridge. However, daily average water temperature at Fresno Weir were recorded as much as 8.4°C higher and 1.5°C lower than at ACOE Bridge.

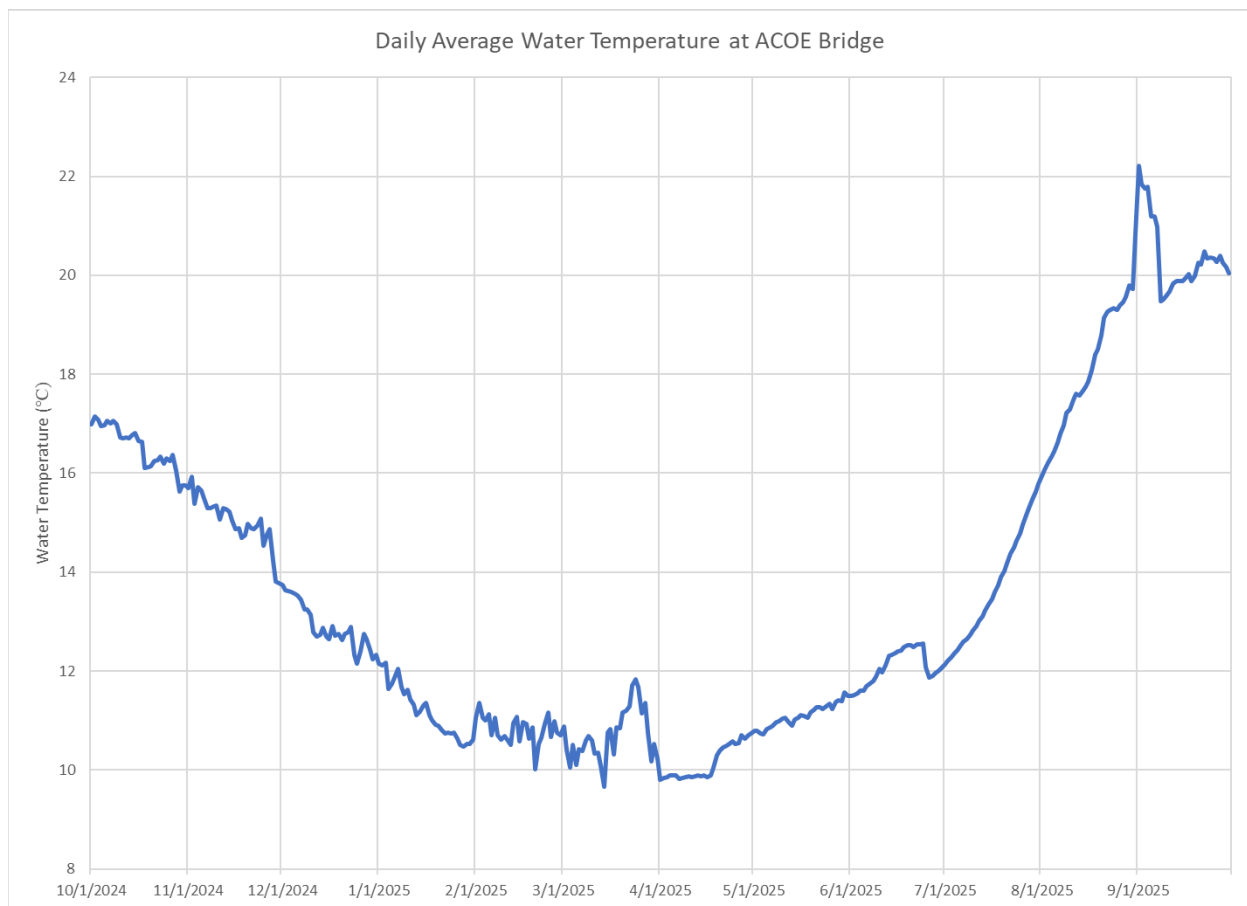


Figure 3-2: Daily average water temperature at the ACOE Bridge, October 1, 2024 through September 30, 2025

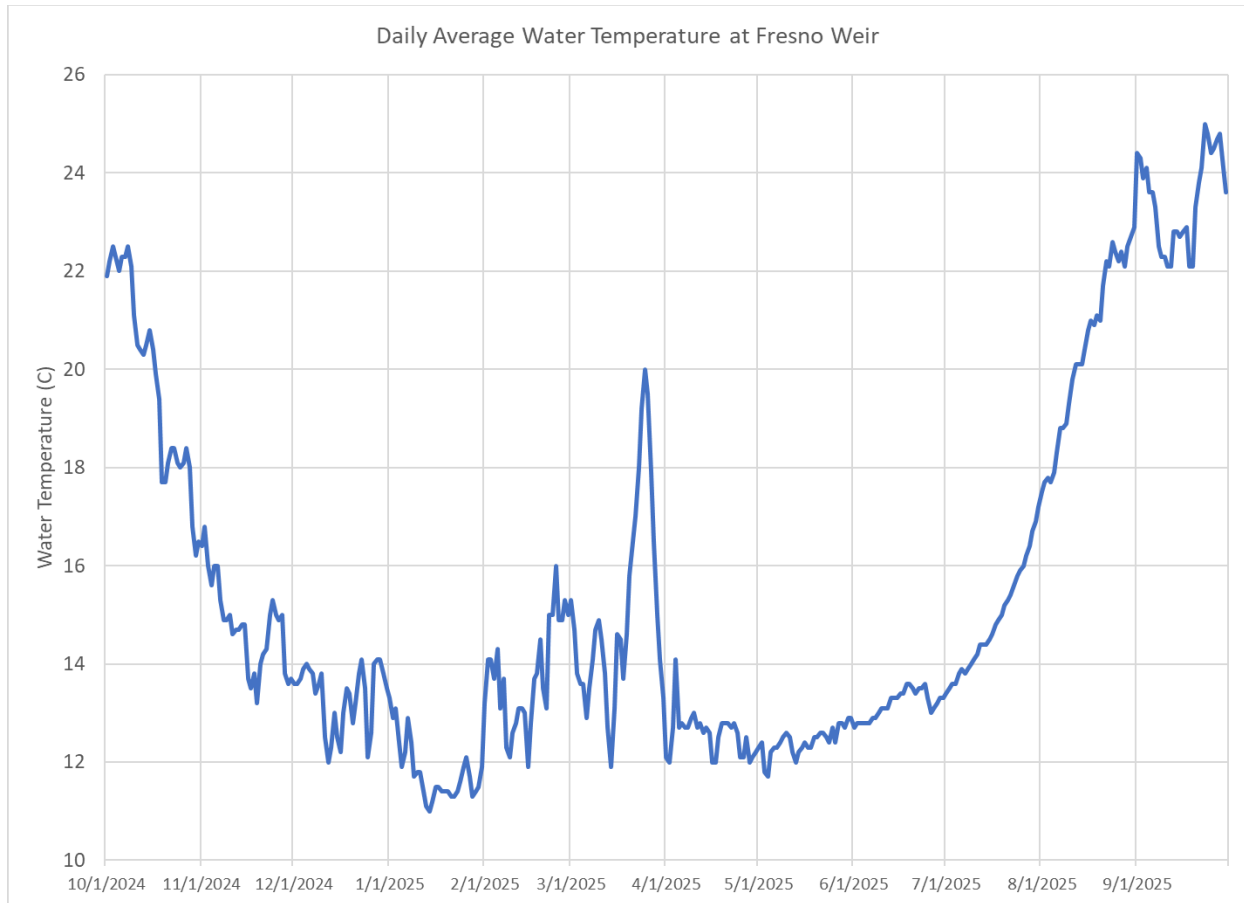


Figure 3-3: Daily average water temperature at Fresno Weir, October 1, 2024 through September 30, 2025.

River water temperatures follow a seasonal pattern, with the coolest conditions occurring in winter and early spring and gradually warming through spring and summer. The greatest seasonal increase typically occurs in late summer and early fall following the end of the irrigation season. For much of the year, diel temperature variation, the difference between daily minimum and maximum temperatures, is lowest immediately downstream of Pine Flat Dam and increases with distance downstream in the lower river. However, as air temperatures cool in the fall and early winter, this pattern reverses, with cooler temperatures often recorded at Fresno Weir than at the ACOE Bridge.

Notably during this reporting period, the Garnet Wildfire within the Kings River watershed upstream of Pine Flat Reservoir required de-energization of transmission lines used by the Pine Flat Power Plant between the afternoon of August 31 and the evening of September 7 to support firefighting activities. As a result, power generation was suspended and reservoir release operations shifted. Prior to the shutdown, most releases occurred at the penstock level, through either the turbine bypass or the generators, with approximately 18% routed through the warmer mid-level gates. Following the shutdown, releases shifted to an approximately equal split between the penstock level (via the turbine bypass) and the mid-level gates, resulting in an increase in river temperatures from approximately 20°C to nearly 24°C within nine hours. Over subsequent days, downstream water demand declined and dam outflows were adjusted, with 54-70% of releases routed through the penstock level via the turbine bypass, with the remaining releases through the

mid-level gates. Elevated downstream temperatures persisted until power generation resumed and all releases returned to the penstock level.

During this reporting period, dissolved oxygen concentrations in the lower Kings River remained within ranges suitable for resident fish and macroinvertebrate communities. Daily average dissolved oxygen concentrations recorded at the ACOE Bridge are presented in Figure 3-4. Dissolved oxygen was monitored using a Eureka Manta sonde with an accuracy of ± 0.1 mg/L. Recorded concentrations ranged from a minimum of 7.0 mg/L to a maximum of 12.7 mg/L. Daily average concentrations remained at or above 7.0 mg/L throughout the reporting period, with an annual average of 9.1 mg/L.

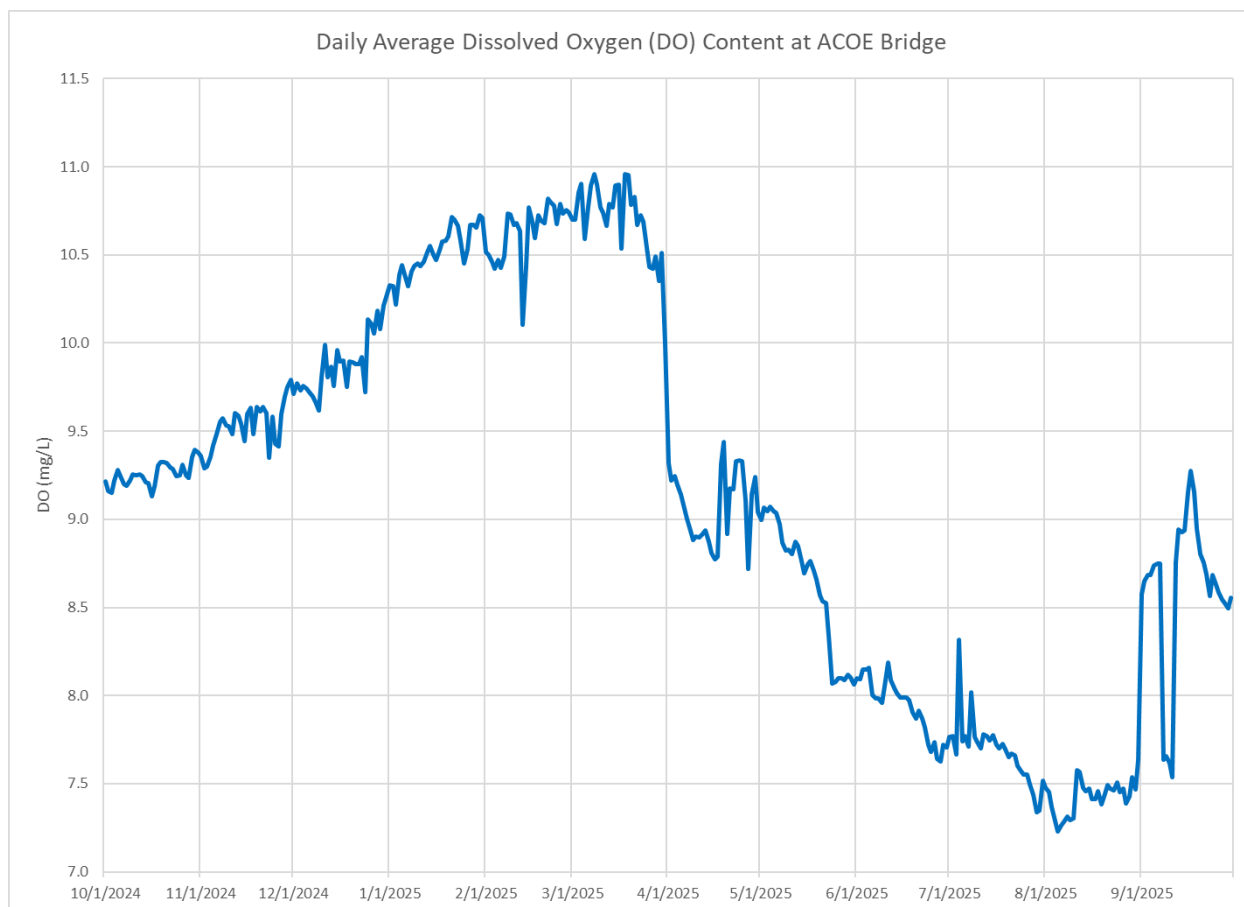


Figure 3-4: Daily average dissolved oxygen content at the ACOE Bridge, October 1, 2024 through September 30, 2025.

As a condition of the Federal Energy Regulatory Commission (FERC), under Project License P-2741, KRCD is required to maintain a minimum dissolved oxygen concentration of 7.0 mg/L at the ACOE Bridge when the power plant is in operation to protect fish and other aquatic organisms in the lower Kings River. KRCD met all license operating and monitoring requirements throughout this reporting period.

3.3 Summary

Water quality monitoring within Pine Flat Reservoir and the lower Kings River during Water Year

2025 have shown:

- Vertical profiles of temperature and dissolved oxygen collected in Pine Flat Reservoir show a typical seasonal pattern, with thermal stratification developing in spring, peaking from May through October, and more uniform temperatures during winter months. The reservoir did not experience turnover during the reporting period. Dissolved oxygen concentrations generally remained above 7.0 mg/L throughout much of the reservoir, particularly from February through April and during much of the remainder of the year;
- River water temperatures exhibit a seasonal pattern, remaining coolest in winter and early spring and increasing through spring and summer, with the largest warming typically occurring in late summer and early fall. Diel temperature variation is lowest near Pine Flat Dam and increases downstream for most of the year, though this pattern reverses during fall and early winter, when cooler temperatures are often observed at Fresno Weir compared to the ACOE Bridge;
- Aeration and mixing of reservoir releases effectively maintained suitable temperature and dissolved oxygen conditions in the lower river, with daily average dissolved oxygen levels remaining at or above 7.0 mg/L throughout the year;
- Under FERC Project License P-2741, KRCB is required to maintain dissolved oxygen levels of at least 7.0 mg/L at the ACOE Bridge during power plant operations, a requirement that was fully met throughout the reporting period;

4.0 HABITAT ENHANCEMENT

A primary goal of the KRFMP is to enhance the quality and availability of habitat for a range of fish and macroinvertebrate species within Pine Flat Reservoir and the lower Kings River. Habitat enhancement projects planned and/or implemented during the year as part of the KRFMP are summarized below.

4.1 River

In 2018, Cramer Fish Sciences was contracted to develop a two-dimensional hydraulic model to quantify the seasonal availability of spawning and rearing habitat by flow rate, identify locations for future habitat enhancement projects, and develop weighted habitat suitability models. The final report was submitted to the KRFMP in September 2019 and is intended to guide future habitat enhancement efforts within the rainbow trout tailwater fishery. Study findings identified a substantial lack of spawning-sized gravel within seasonally inundated areas, channelization, fewer than optimal pool-to-riffle transitions, and limited habitat availability for young-of-year fish. In 2021, Cramer Fish Sciences was subsequently contracted to prepare a technical memorandum and advance the following habitat enhancement projects to the 30% design level:

- Site ID 1 – Gravel augmentation or injection below the Pine Flat Bridge
 - This project entails the injection/placement of gravel for rainbow trout below the Pine Flat Bridge and will help replenish the coarse sediment supply immediately below Pine Flat Dam. Dependent on concept development gravel may be injected into high flow releases or augmented through riffle and bar construction. Key components to be identified include identifying available gravel sources, sediment augmentation volume, potential constraints, and feasibility of construction methods.

- Site ID 6 – Thorburn Channel enhancements
 - This project would enhance juvenile rearing habitat for rainbow trout in the Thorburn Channel considering alterations to the intake structure and grading of the channel. This project will examine if structure removal benefits habitat performance and/or if modifications to the side channel’s topography could improve physical habitat and water temperature.

These documents were completed and accepted into the program at the end of the 2022 reporting period. These projects remain on hold pending available grant funding to complete project design and construction.

4.2 Pine Flat Reservoir

The KRFMP budgets for projects to enhance and/or benefit the fishery created within Pine Flat Reservoir. The Pine Flat Army Corps of Engineers staff have been instrumental in helping the program discern the size, type, and locations of such projects. In addition, the Army Corps of Engineers has provided the necessary personnel and logistic resources needed to ensure project completion. No habitat projects were undertaken to benefit the fishery in the program year. KRFMP plans to continue working with CDFW and the Army Corps of Engineers throughout the foreseeable future.

5.0 FISH STOCKING

Rainbow trout stocking in the Kings River consists of KRFMP and KRCD supplemental stocking, incubator releases, and CDFW stocking allocations. The supplemental stocking program initiated by the KRFMP in fall 2018 continued during this reporting period and was further augmented by KRCD. In addition, KRFMP incubated rainbow trout eggs and released fry into the lower Kings River. CDFW allotment for the Kings River for 2025 included: sub-catchable brown trout and rainbow trout, catchable rainbow trout, super-catchable rainbow trout and trophy rainbow trout were planted in the Lower Kings River, below Pine Flat Dam. The upper Kings River, above Pine Flat Reservoir, received a sub-catchable brown trout allotment. Pine Flat Reservoir received a catchable rainbow trout and sub-catchable brown trout allotment. No fingerling Chinook salmon were planted in Pine Flat Reservoir in 2025. Avocado Lake received catchable, super-catchable and trophy trout allotments of rainbow trout.

5.1 Incubator

The incubator building has run seasonally since November 2012. Maintenance has been facilitated by KRCD staff as well as volunteers interested in the fishery and the Kings River. During the 2024 – 2025 program year diploid rainbow trout eggs were purchased from Cold Springs Trout Farm, with two incubation periods completed. Table 5-1 summarizes the incubation periods, number of eggs incubated, estimated hatch success, a conservative estimate of the number of fry released, percentage of fry released into both the Put & Take and Catch & Release Zones, and the estimated number of fish which survive to catchable size. Trout fry were released at multiple locations within the fishery management area, and were between 4 to 6 weeks of age, and approximately 1 inch long.

Table 5-1: Egg incubation, hatch success, fry release, release zones, and estimated survivorship for the trout incubator.

Incubation Period	Number of Eggs	Estimated Hatch	Est. Fry Released^a	Put & Take Zone	Catch & Release Zone	Estimated Harvest^b
1/8/2025-2/20/2025	140,000	91%	83,000	49%	51%	830
2/25/2025-4/10/2025	137,000	91%	72,000	40%	60%	720

^aestimate is believed to be conservative measure, real number likely higher

^bassumes 1% survivorship from egg to catchable sized trout

5.1.1 Round 1 Rearing Period: January 8 – February 20, 2025

During the first rearing period, a total of 140,000 rainbow trout eggs were incubated. An estimated 91% of the eggs successfully hatched, resulting in a conservative estimate of 83,000 trout fry released into the Kings River, with 49% released into the Put & Take Zone and 51% into the Catch & Release Zone. Forty-two volunteers contributed approximately 113 hours in support of trout rearing and release activities.

Water temperature conditions within the incubator remained within optimal ranges for egg incubation and sac-fry development (7°C-12.5°C), and swim-up fry (7°C-20°C) during the monitored period. Due to a programming error, incubator temperature data were collected for only 31 of the 44 rearing days; nonetheless, recorded temperatures closely tracked those observed in the Kings River tailrace and supported successful development. Sac-fry transitioned to the swim-up stage on January 30, approximately 23 days after incubation began (Figure 5-1).

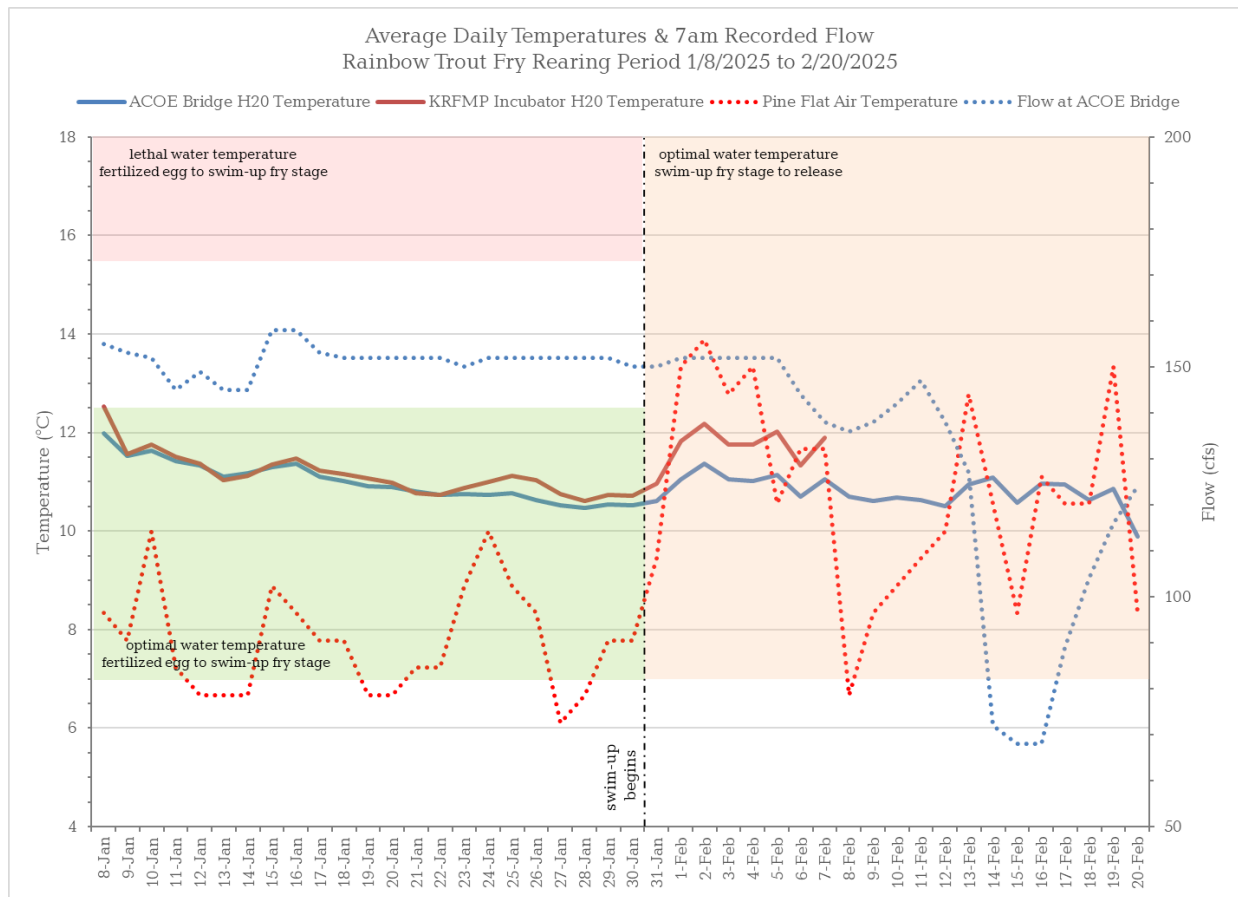


Figure 5-1: Average daily water and air temperatures and Kings River instream flows, showing the onset of swim-up fry and optimal and lethal thresholds by life stage (Woynarovich et al. 2011).

5.1.2 Round 2 Rearing Period: February 25 – April 10, 2025

During the second rearing period of the 2025 season, 137,000 rainbow trout eggs were incubated. An estimated 91% of eggs successfully hatched, resulting in a conservative estimate of 72,000 trout fry released into the Kings River, with 40% released into the Put & Take Zone and 60% in the Catch & Release Zone. Nineteen volunteers contributed an estimated 61 hours in support of trout rearing and release activities.

Water temperatures within the incubator remained within optimal ranges for trout development throughout the monitored period and were comparable to temperatures in the Kings River tailrace. Sac-fry transitioned to the swim-up stage on March 21, approximately 25 days after incubation began (Figure 5-2).

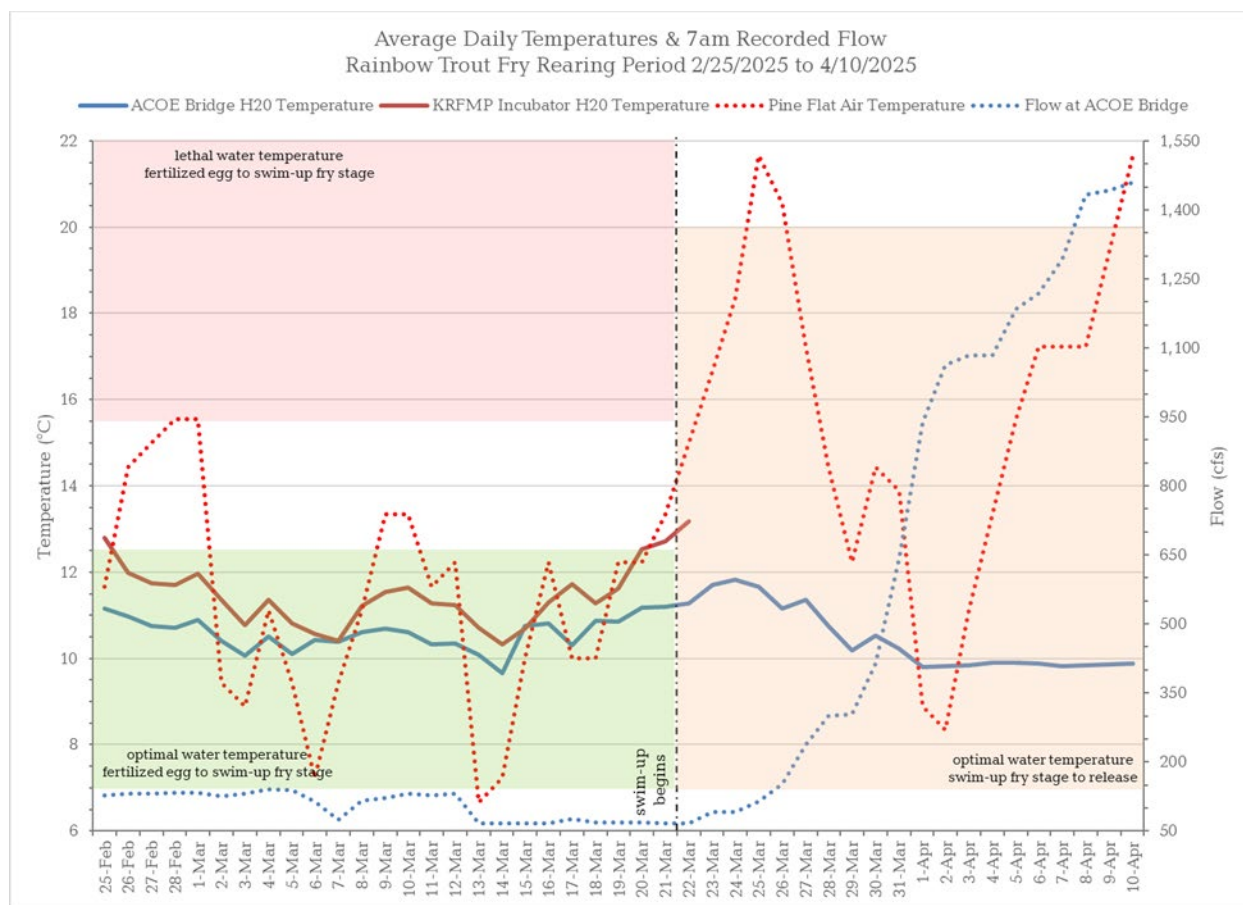


Figure 5-2: Average daily water and air temperatures and Kings River instream flows, showing the onset of swim-up fry and optimal and lethal thresholds by life stage (Woynarovich et al. 2011).

5.2 Supplemental Stocking

In 2017, the KRFMP developed a supplemental rainbow trout stocking plan for the tailwater fishery below Pine Flat Dam. The plan emphasizes stocking diploid rainbow trout, when available, with increased deliveries during the fall and winter months when river flows and temperatures are most favorable for angler success. The objective is to maintain a hatchery-produced, catchable-size trout population capable of sustaining current angler pressure in both put-and-take and catch-and-release zones. The plan was fully approved in May 2018, and Calaveras Trout Farm (CTF), a private aquaculture facility in Snelling, California, was awarded a renewable three-year contract to supply between 30,000 (10,000 pounds) and 50,000 (16,600 pounds) catchable diploid rainbow trout annually from October through March. Catchable trout typically measure 9–10 inches in fork length and average three fish per pound.

During the 2024–2025 reporting period, the KRFMP contracted with Calaveras Trout Farm to provide catchable-size trout averaging 3.0 fish per pound. In addition, KRCD contracted separately with CTF to supplement CDFW and KRFMP stocking efforts with similar diploid catchable trout. Both KRFMP and KRCD supplemental stocking activities are included in this report. Stocking occurred between October 2024 and May 2025.

KRFMP stocking goals allocate approximately 75% of supplemental trout to the Put-and-Take

Zone (Reach 1) and 25% to the Catch-and-Release Zone (Reach 2). KRCD-funded stocking follows a 60% allocation to Reach 1 and 40% to Reach 2. Total pounds and number of fish delivered are summarized in Table 5-2.

Table 5-2: Summary of 2024-2025 KRFMP and KRCD supplemental stocking by Calaveras Trout Farm. All stocked were catchable size.

Month	Reach 1				Reach 2				KRFMP + KRCD		
	KRFMP		KRCD		KRFMP		KRCD		Total		Average
	# lb	# fish	# lb	# fish	# lb	# fish	# lb	# fish	# lb	# fish	fish/lb
October	1,200	3,600	200	600	400	1,200	300	900	2,100	6,300	3.00
November	1,500	4,500	900	2,700	500	1,500	600	1,800	3,500	10,500	3.00
December	1,650	4,950	1,950	5,850	550	1,650	1,050	3,150	5,200	15,600	3.00
January	1,500	4,500	1,200	3,600	500	1,500	800	2,400	4,000	12,000	3.00
February	1,500	4,500	900	2,700	500	1,500	600	1,800	3,500	10,500	3.00
March	1,500	4,500	600	1,800	500	1,500	400	1,200	3,000	9,000	3.00
April	0	0	600	1,800	0	0	400	1,200	1,000	3,000	3.00
May	0	0	600	1,800	0	0	400	1,200	1,000	3,000	3.00
Total	8,850	26,550	6,950	20,850	2,950	8,850	4,550	13,650	23,300	69,900	3.00

5.3 CDFW Stocking

The CDFW annual stocking between January 1 – December 31, 2025 are summarized here. CDFW provided hatchery grown salmonids in several different size categories to the Kings River below Pine Flat Reservoir (29,200 pounds, 76,583 trout), the upper Kings River, above Pine Flat Reservoir (1,050 pounds, 10,500 trout), Pine Flat Reservoir (15,300 pounds, 61,960 trout), and Avocado Lake (6,900 pounds, 7,857 trout). These numbers do not include the supplemental fish provided for the KRFMP. Details for each size class are summarized below.

5.3.1 Fingerlings

Fingerling trout are defined as trout that are 16.1 or more fish/pound and are generally less than 4 inches in length. Table 5-3 details stocking of sub-catchable trout. No fingerling rainbow trout or brown trout were stocked in the Kings River, below Pine Flat Reservoir, Pine Flat Reservoir nor the upper Kings River in 2025.

Table 5-3: CDFW fingerling sized trout stocked in 2025.

Water	Species	Fingerlings	
		Year	
		2025	
		# Trout	Pounds
Kings River below Pine Flat Reservoir	Rainbow/Brown Trout	0	0.0
Pine Flat Reservoir	Rainbow/Brown Trout	0	0.0
Upper Kings River, above Pine Flat Reservoir	Rainbow/Brown Trout	0	0.0
Total		0	0.0

5.3.2 Sub-Catchable Trout

Sub-catchable rainbow trout stocked by CDFW are generally 4-6 inches long. Table 5-4 details stocking of sub-catchable trout in 2025. The Kings River below Pine flat Reservoir received 2,700 pounds (25,380 trout) of sub-catchable size rainbow trout and 1,000 pounds (9,000 trout) of sub-catchable size brown trout. Pine Flat Reservoir received 3,000 pounds (32,400 trout) of sub-catchable brown trout. The Upper Kings River received 10 pounds (1,050 trout) of sub-catchable brown trout.

Table 5-4: CDFW sub-catchable sized trout stocked in 2025.

Water	Species	Sub-Catchables	
		Year	
		2025	
		# Trout	Pounds
Kings River below Pine Flat Reservoir	Brown Trout	9,000	1,000
	Rainbow Trout	25,380	2,700
Pine Flat Reservoir	Brown Trout	32,400	3,000
Upper Kings River	Brown Trout	1,050	10
	Rainbow Trout	0	0
Total		67,830	6,710

5.3.3 Catchable Trout

Catchable trout (2 fish per pound) are stocked either once or twice per week during the non-irrigation period (roughly October through March) and once each week during the irrigation season when flows are high. Table 5-5 details stocking of catchable size trout. A total of 18,000 pounds (40,377 rainbow trout) of catchable size rainbow trout were stocked in the lower Kings River during 2025. Pine Flat received a total of 12,300 pounds (29,560 rainbow trout) and Avocado Lake received a total of 3,400 pounds (6,820 rainbow trout) of catchable size trout. The Upper Kings River did not receive an allotment of catchable trout in 2025.

Table 5-5: CDFW catchable sized trout stocked in 2025.

Water	Species	Catchables	
		Year	
		2025	
		# Trout	Pounds
Kings River below Pine Flat Reservoir	Rainbow Trout	40,377	18,000
Pine Flat Reservoir	Rainbow Trout	29,560	12,300
Upper Kings River	Rainbow Trout	0	0
Avocado Lake	Rainbow Trout	6,820	3,400
Total		76,757	33,700

5.3.4 Super-Catchable Trout

Super-catchable size trout are defined as trout greater than one pound and less than 3.00 pounds. Table 5-6 details stocking of super-catchable size trout. Kings River below Pine Flat Reservoir received a total of 1,500 pounds (663 rainbow trout) and Avocado Lake received 1,000 pounds (462 rainbow trout) of super-catchable trout in 2025. Pine Flat Reservoir and Upper Kings River did not receive an allotment of super catchable trout.

Table 5-6: CDFW super-catchable sized trout stocked in 2025.

Water	Species	Super-Catchables	
		Year	
		2025	
		# Trout	Pounds
Kings River below Pine Flat Reservoir	Rainbow Trout	663	1,500
Pine Flat Reservoir	Rainbow Trout	0	0
Avocado Lake	Rainbow Trout	462	1,000
Total		1,125	2,500

5.3.5 Trophy Trout

Trophy size trout are defined as trout greater than 2.99 pounds each. Table 5-7 details stocking of trophy size trout. Kings River below Pine Flat Reservoir received a total of 6,000 pounds (1,163 rainbow trout) and Avocado Lake received 2,500 pounds (575 rainbow trout) of trophy rainbow trout in 2025. Pine Flat Reservoir and Upper Kings River did not receive an allotment of trophy trout.

Table 5-7: CDFW trophy sized trout stocked in 2025.

Water	Species	Trophy	
		Year	
		2025	
		# Trout	Pounds
Kings River below Pine Flat Reservoir	Rainbow Trout	1,163	6,000
Avocado Lake	Rainbow Trout	575	2,500
Total		1,738	8,500

6.0 MONITORING

Section G (1)(k) of the Framework Agreement “Development of Criteria/Monitoring” calls for the agencies to carry out a monitoring program to determine the effects of various elements of the KRFMP and the overall status of the fishery. Water temperature and dissolved oxygen monitoring remain a priority. The KRFMP is also dedicated to continuing its annual fish population surveys in the fall.

6.1 Fall Fish Population Survey in the Lower Kings River

Long-term baseline fisheries monitoring in the lower Kings River is conducted under the Kings River Fisheries Management Program (KRFMP) to assess: (1) fish community composition, abundance, and condition; (2) overall biomass; (3) abundance and distribution of hatchery and wild rainbow trout; and (4) overwinter survival, size, and age structure of rainbow trout populations. Surveys are conducted by KRFMP agency staff with assistance from local volunteers.

Electro-fishing has been used to monitor fish populations in the Kings River since 1983 by KRCD and California Department of Fish and Wildlife (CDFW) biologists. Although methods have evolved, surveys since 2007 have employed a multi-pass depletion approach using backpack electro-shockers and block nets placed at the upstream and downstream ends of each 300-foot study reach. This approach provides rigorous estimates of species composition and abundance and allows population trends to be evaluated through repeated sampling of the same sites. Monitoring is conducted at six sites within the three upper management reaches of the lower Kings River (Figure 6-1).

Reach One, extending from Pine Flat Dam to Cobbles Weir, is managed primarily as a put-and-take trout fishery, allowing the daily take of up to five trout between the ACOE Bridge and Cobbles Weir. The area upstream of the ACOE Bridge has been closed to fishing by Homeland Security order since September 2001. In addition, fishing is prohibited within the Thorburn Channel and a 200-foot radius of the channel outlet under CDFW regulations. Reach Two (Cobbles Weir to Fresno Weir) and the upper portion of Reach Three (Fresno Weir to Highway 180) are managed as catch-and-release trout fisheries, with zero take allowed and prohibitions on bait and barbed hooks. The remainder of Reach Three, extending to the Reedley Narrows gauging station, functions as an opportunistic trout fishery due to periodically unsuitable water temperatures which exist for trout downstream of Fresno Weir.

All captured fish were identified to the lowest practicable taxon, weighed, and measured for total length; trout were measured for fork length. Rainbow trout were categorized as hatchery-origin or wild based on visual assessment of fin condition. Consistent with CDFW (2010), wild trout are defined as individuals born and completing their life cycle in the wild, regardless of parental origin. Since 1983, KRCD has relied on fin condition to distinguish origin, classifying trout with intact fins as wild and those with missing or abraded fins as hatchery fish. Some misclassification is possible due to morphological similarities among naturally produced trout, incubator-origin fish, and hatchery trout that persist across seasons.

Previous fisheries population survey reports are available in the KRFMP document library ([Reports and Documents](#)).

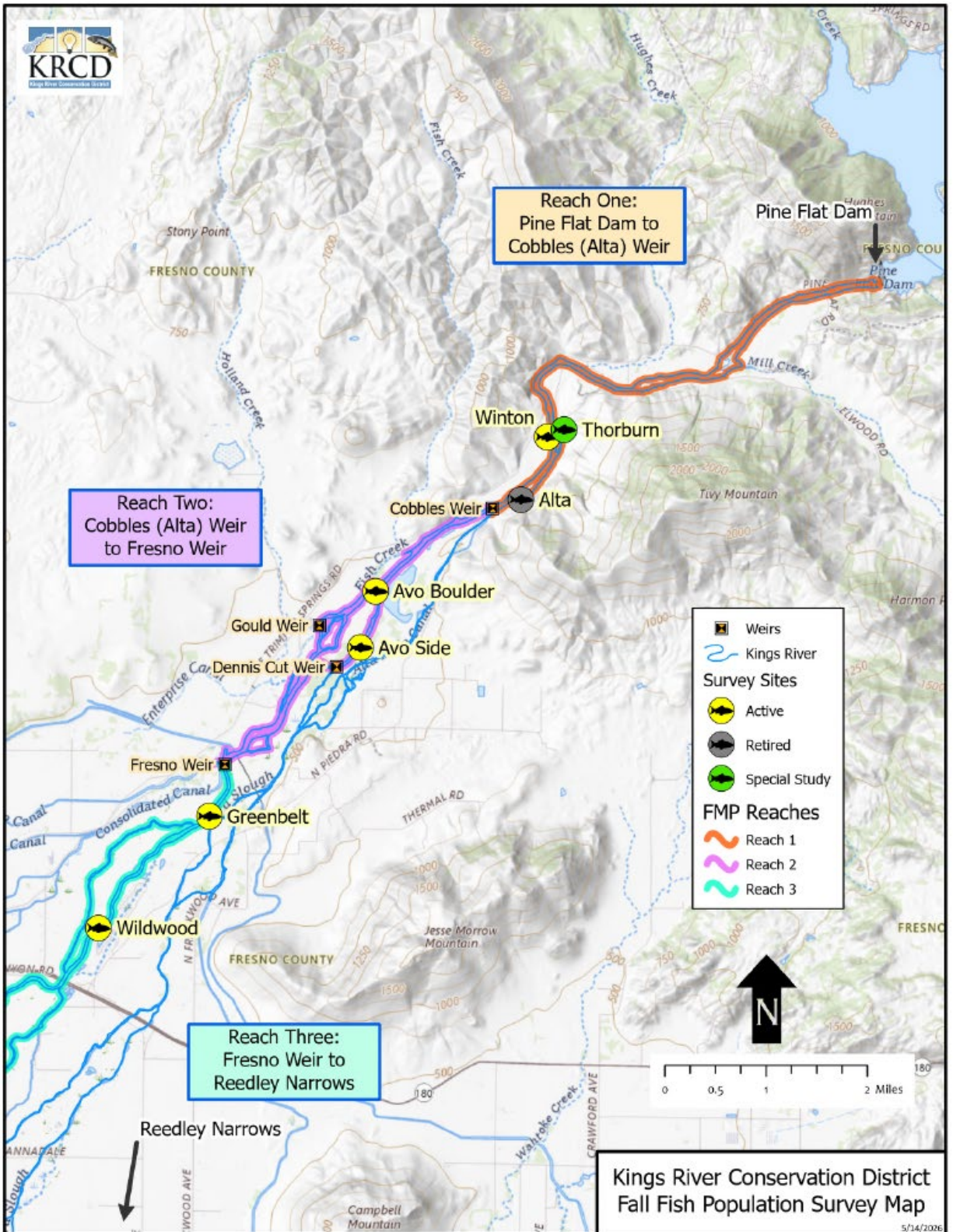


Figure 6-1: Annual Fish Population survey sites in the Kings River since 2007 and their respective KRFPMP management zones.

During this reporting period, fish population surveys were conducted at five sites between November 20 and December 5, 2024 (Figure 6-1). The historical Alta site, retired in 2023 due to ongoing safety concerns, was not sampled. A total of 3,939 fish were collected, with complete data obtained for 3,667 individuals and entered into MicroFish 3.0 for analysis. Species composition results reflect the total catch, whereas all other analyses are based on fish entered into MicroFish 3.0.

Native fishes overwhelmingly dominated the assemblage, comprising 99.7% of total abundance and 93.8% of biomass; introduced species accounted for the remainder. Although species abundance varied among sites, the assemblage continued to be dominated by native Sacramento sucker, sculpin, lamprey, and California roach. This community is characteristic of a low-elevation valley floor fish assemblage consistent with the pikeminnow–hardhead–sucker assemblage described by Moyle (2002). Trout were detected but represented less than 1% of the assemblage, as expected for a low-elevation, low-gradient system. Of note, a single Sacramento hitch captured in the Avo Side site was identified (Figure 6-2). This minnow, endemic to the Central Valley had been documented in the 1980s by other researchers sampling further downstream in the Reedley area. This was the first documented record for KRCD or the KRFMP.



Figure 6-2: Sacramento hitch collected on December 4, 2024 in the Avo Side survey site. (A) Image showing dorsal fin and mouth characteristics. (B) Lateral view illustrating overall body form and coloration.

Juvenile life stages were collected for all native taxa except three-spine stickleback, indicating successful reproduction. Three-spine stickleback typically live no more than one year, and individuals from the annual cohort would have reached adulthood by the time of sampling.

For each species captured, multiple metrics were calculated for each 300-foot sample site. Field data were entered into MicroFish 3.0 to generate species and site-specific totals for catch, population estimates, and biomass. Population estimates were used to calculate fish-per-mile values. For species collected during the 2024 survey, species composition, length distributions, and site-specific ranges for population estimates, fish per mile, and biomass are summarized in Table 6-1.

Table 6-1: Summary results, Annual Fall Fish Population survey, 2024.

Species Collected	Species Composition (%)	Range across Survey Sites ^a			Length (in)
		Population Estimates ^b	Fish per Mile (estimated)	Biomass (lb)	
Sacramento Sucker	37.34	139-791	2,446-13,922	4.2-153.2	1-23
Sculpin sp.	30.08	29-554	510-9,750	0.5-9.0	1-7
Lamprey sp.	15.03	4-1,174	70-20,662	0.03-2.2	1-8
California Roach	8.50	17-393	299-4,858	0.2-1.3	1-7
Sacramento Pikeminnow	4.90	26-118	458-2,077	0.2-1.0	1-6
Three-spine Stickleback	3.25	6-99	106-1,742	0.01-0.1	1-3
Rainbow Trout - "Wild"	0.58	0-13	0-229	0-1.8	4-12
Rainbow Trout - Hatchery ^c	0.23	0-18	0-317	0-17.0	9-21
Catfish sp. ^c	0.05	0-1	0-18	0-0.02	2-4
Sacramento Hitch	0.03	0-1	0-18	0-0.07	5.9

^aRange of values across sampled reaches between Pine Flat Dam & Highway 180, this should not be interpreted as all the fish between Pine Flat Dam and Highway 180

^bConfidence intervals for each site are provided in the Results and Discussion section of this report

^c Introduced (non-native to the watershed or hatchery reared trout)

Trout condition was also evaluated, and all trout captured during the 2024 survey were found to be in good condition.

Fish populations naturally fluctuate over time. Although native species currently dominate the assemblage below Pine Flat Dam, years with warmer release temperatures and reduced or prolonged low flows may favor introduced species. Observed variations in species composition likely reflect a combination of environmental and anthropogenic influences rather than any single factor.

6.2 Thorburn Channel

The Thorburn Channel is a 2,200-foot-long anthropogenic channel located on private property, for which the Kings River Conservation District (KRCDD) holds a 50-year easement. Fishing is prohibited year-round within the channel and within 200 feet of its confluence with the Kings

River. Constructed in program year 2000, the channel was designed to provide spawning and rearing habitat for Kings River fish populations. Channel features include a headgate structure that regulates inflow from the Kings River, placed spawning gravel and large woody debris, and a k-rail used to form a rearing pool prior to re-entry into the river. Subsequent high-flow flood releases have resulted in substantial sediment deposition within the channel.

The survey was conducted within a 300-foot reach of the Thorburn Channel proposed for future habitat enhancement. Data collected will serve as pre-activity monitoring for a proposed project intended to improve channel function by removing the existing headgate structure and k-rail and potentially modifying channel grading and contours to maintain flow and reduce sediment accumulation. Instream flow measured immediately upstream of the surveyed reach was 0.13 cubic feet per second (cfs), as recorded by the Kings River Water Association (KRWA) on November 19, 2024.

The reach was characterized by shallow water depths ranging from 1 to 8 inches and channel widths of approximately 1 to 6 feet. Emergent vegetation, large woody debris, and occasional boulders were present throughout the reach. Fine sediment, often soft and locally deep, was the dominant substrate, although small gravel was observed in portions of the thalweg along with scattered large cobble.

A total of 527 fish representing four species were collected during the survey and recorded in MicroFish 3.0 for analysis. Native species dominated the assemblage, comprising 98.5% of total abundance and 98.9% of total biomass. Species composition, population estimates, estimated fish per mile, biomass, and length data are summarized in Table 6-2.

Table 6-2: Summary results, Thorburn Channel Fall Fish Population Survey, 2024.

Thorburn Channel: November 19, 2024					
Species Collected	Species Composition (%)	Population Estimate	Fish per Mile (estimated)	Biomass (lb)	Length (in)
Three-spine Stickleback	88.4	568	9,997	0.377	1-3
Sacramento Sucker	8.0	42	739	0.137	1-4
Lamprey	2.1	11	194	0.018	2-4
Western Mosquitofish ^a	1.5	9	158	0.006	1-2

^a Introduced (non-native to the watershed)

The presence and abundance of fish during the survey indicated that Thorburn Channel provided suitable habitat for juvenile Sacramento suckers, lamprey, adult and immature three-spine stickleback, and western mosquitofish. Lamprey age class was not determined at capture; however, habitat conditions supported both adult and larval life stages. Much of the surveyed reach consisted of soft sediments more suitable for larval lamprey than the fine gravel preferred by spawning adults. The shallow, slow-moving water likely excluded large piscivorous fish, while emergent vegetation provided cover from predation. Three-spine stickleback typically live less than one year, and the presence of multiple size classes suggests that spawning habitat was available within the channel. Observed western mosquitofish were likely adults, as males reach maturity at approximately 0.75 inches and females at about 1 inch at first pregnancy (Moyle 2002). It is

unknown whether a self-sustaining resident population exists within Thorburn Channel or whether these fish were introduced through the Consolidated Mosquito Abatement District, which stocks standing water at landowner request for vector control within its service area, including the Kings River downstream of Pine Flat Dam.

Continued annual monitoring at this site will document temporal changes in the fish assemblage, capturing both pre- and post-project conditions as channel modifications are implemented and channel function responds over time.

6.3 Lower Kings River Angler Creel Survey

CDFW implemented an angler creel survey in January through March 2020 to evaluate the effectiveness of the supplemental stocking program on the Kings River, below Pine Flat Reservoir. The surveyed reach started at the ACOE bridge and extended downstream to the Greenbelt parking lot. The reach was divided into 3 sections: Section 1 – ACOE bridge downstream to Piedra Bridge. Section 2 – Piedra Bridge downstream to Cobbles Weir. Section 3 – Cobbles Weir downstream to Greenbelt parking lot. Sections 1 and 2 are the traditional put-and-take reach and Section 3 is the catch-and-release reach. The three sections surveyed are historical sections used in past angler surveys. CDFW purchased Floy Tags in 2023 to run a tagging study, using supplemental stocked fish, concurrent with the Creel Survey. Five-thousand five hundred Floy Tags were purchased in eleven different colors (500 per color). Creel surveys were not performed in 2024-2025 due to insufficient staffing needs.

7.0 PUBLIC EDUCATION AND OUTREACH

7.1 Website

KRCD staff maintained and updated the [KRFMP website](#) throughout the year. The website provides access to program reports and documents, project information, a photo gallery, contact and volunteer pages, and links to relevant fisheries and watershed resources

During this reporting period, the CDFW confirmed the presence of nutria in the Kings River in western Fresno and Kings counties. CDFW deployed camera traps and traps to remove detected individuals as part of its ongoing [Nutria Eradication Program](#). Information regarding nutria detections and management actions was gathered and broadly disseminated to Kings River agencies and the public through meetings and [Flood Resources](#) materials posted on the KRCD website.

During this reporting period, golden mussels (*Limnoperna fortunei*) were confirmed to have been introduced into California waterways. The species was first detected in October 2024 in the Sacramento–San Joaquin Delta, O’Neill Forebay, and the California Aqueduct, and has since been documented as far south as San Diego County. Locally, golden mussels were detected in September 2025 on the Bass Avenue Bridge over the Delta-Mendota Canal, creating potential for introduction into the Fresno Slough portion of the Kings River. To date, introductions are believed to have occurred through State Water Project deliveries; therefore, all waters receiving Delta water are considered at risk of infestation. Although the California Department of Fish and Wildlife (CDFW) currently classifies the Kings River watershed as “low risk” for golden mussel

establishment, based in part on known calcium concentrations in Pine Flat Reservoir and upstream waterbodies, introduction remains possible through recreational users who fail to properly clean, drain, and dry watercraft or equipment after visiting infested waters. If golden mussels were introduced into the Kings River watershed, it is unknown whether conditions would support long-term establishment, as environmental thresholds for colonization are not fully understood. The Fresno Slough portion of the Kings River is typically dry except during flood releases or periods of irrigation demand; seasonal drying and desiccation would likely prevent long-term establishment, though short-term infestations could pose complications for local water delivery infrastructure during extended wet periods. Additional information on golden mussels and prevention measures is available on CDFW's [Golden Mussel](#) information page.

7.2 Hydrology and Temperature Report

For operational monitoring, KRWA uses a real-time telemetry system to track water temperature and streamflow at Fresno Weir. During the summer and fall of dry hydrologic years, data from the lower Kings River are typically compiled into weekly reports and distributed by KRWA to members of the PAG and other interested parties. These reports summarize flows in the lower river and tributary streams, as well as flow and temperature trends relevant to habitat quality. Copies of these reports are maintained on file at KRWA. No reports were distributed during this reporting period.

7.3 Incubator Tours

Three tours were hosted at the incubator during this reporting period (Table 7-1). Topics covered during tour events include a general overview of the purpose and history of the trout rearing program, the trout lifecycle, and the role of trout in the local ecosystem.

Table 7-1: Organizations and classes provided with tours of the KRFMP Trout Incubator during the 2025 season.

Date	Organization
01/23/2025	Kings River High School - Environmental Science Class (Civic Engagement Project)
01/24/2025	SJV Water - Monserrat Solis
02/19/2025	Buchanan High School - Career and Technical education class - environmental sustainab

7.4 River Clean-Up

Beginning in July 2021, KRFMP member agencies partnered with the Kings River Conservancy, the U.S. Army Corps of Engineers (ACOE), the County of Fresno, and the PAG to conduct monthly, targeted clean-ups at various locations along the Kings River. Clean-up events typically occurred on the third Saturday of each month from 8:30 a.m. to 10:00 a.m., with public participation encouraged. Volunteers removed trash and graffiti from riverbanks, improving recreational aesthetics while reducing hazards to the ecosystem, wildlife, and other river users. The September 2025 clean-up was coordinated in support of the ACOE's annual Public Lands Day event, with partner agencies providing staff assistance. A summary of clean-up activities is provided in Table 7-2.

Table 7-2: Location, number of volunteers, and quantity of trash removed during the 2024-2025 reporting period.

Date	Location	# Volunteers (Agency Staff & Public)	Trash Bags Collected
10/19/2024	North Riverside Access Park & south side of Kings River	8	8 bags
11/16/2024	Between Thorburn Channel & Cobbles Weir	17	17 bags + 1 truckload of roofing materials
12/21/2024	Between Thorburn Channel & Cobbles Weir	5	8 bags + 1 truckload of roofing materials
1/18/2025	Avocado Lake Park	27	18 bags
2/15/2025	North Riverside Access Park and south side of Kings River	13	12 bags
3/15/2025	Winton Park	19	13 bags
4/19/2025	Between Thorburn Channel and Cobbles Weir	13	11 bags + 2 tires
5/17/2025	KRCD All Access Area	14	9
6/21/2025	Sycamore Point Public Fishing Access	13	10
7/19/2025	Kings River Wildlife Area & Northside River Access Park	11	9
8/16/2025	Winton Park	9	7
9/20/2025	USACE National Public Lands Day	N/A	N/A

7.5 Fishing Regulation Signs

General regulation signs are posted throughout Reach 1 between the Army Corps of Engineers Bridge and Cobbles Weir. Special regulation signs are posted in Reach 2, and fishing-closure signs are posted upstream of the Army Corps of Engineers Bridge and within the Thorburn Channel. Signs are located to ensure visibility to individuals accessing or using the river and near areas where fish stocking occurs. During this reporting period, KRFMP supported regulatory enforcement by providing graffiti removal wipes to personnel with jurisdiction along the Kings River and by replacing signs that were damaged, missing, or no longer legible.

8.0 MAINTENANCE ACTIVITIES

8.1 Incubator Building

While in operation, weekday operation and maintenance of the incubator facility are conducted by KRCD and KRWA staff. Public volunteers support facility operations on weekends, holidays, and occasional weekdays by providing care to developing trout fry. Staff and volunteers also

participate in planting trout fry into the river. During this reporting period, the two one-horsepower, 35-gallon-per-minute pumps, motors, and Yaskawa variable frequency drives installed in December 2023 operated as expected.

8.2 Thorburn Channel

The headgate has remained open since April 2023 to accommodate irrigation flows and facilitate the flushing of accumulated sediment from the Thorburn Channel. Pursuant to the easement agreement between the Kings River Conservation District and the Kings River Conservancy, KRCD flood maintenance staff regraded the access and levee roads, trimmed vegetation, and removed a downed oak limb immediately upstream of the k-rail. Planned maintenance activities during the next reporting period to maintain continuous connectivity with the main channel include removal of a beaver dam near the channel mouth, monthly vegetation clearing at the headgate, and manual sediment removal as needed.

9.0 DEVELOPMENT OF A LONG-TERM IMPLEMENTATION PLAN

Section G(1) of the Framework Agreement includes elements addressing adaptive management (Section 1b); stream temperature monitoring (Section 1d); funding for habitat enhancement projects (Section 1f); enforcement, education, and awareness program (Section 1i); stocking program (Section 1j); development of criteria/monitoring (Section 1k); and access (Section 1p). The Annual Implementation Plan helps to provide guidance, prioritize activities and the allocation of expenditures, and coordinate among the parties to facilitate efficient implementation of these elements of the Framework Agreement. The Long Term Implementation Plans (formerly 10 Year Plans): (1) provide a project management structure for reviewing and prioritizing proposed habitat enhancement activities, fish stocking, and other elements of the Framework Agreement; (2) identify the objectives and methods to be used to assess the overall response of trout and other species for use in evaluating achievement of the Kings River aquatic resource goals as identified in Section 1a of the Framework Agreement; and (3) provide a framework for the experimental design and evaluation of specific enhancement activities (e.g., enhancement projects funded under the Framework Agreement, fish stocking and supplementation, pulse flows for temperature management, etc.) within the context of the overall goals and activities being implemented through the Framework Agreement. Results of monitoring and evaluation activities serve, in part, as the basis for the adaptive management element of the Framework Agreement (Section 1b) and for identifying changes in program priorities, or the allocation of resources from one program element to another. The Long-Term Implementation Plan is a “living plan” that is reviewed by the TSC, Public and ExCom on an annual basis and revised as projects and elements of the program are implemented and as new scientific information becomes available.

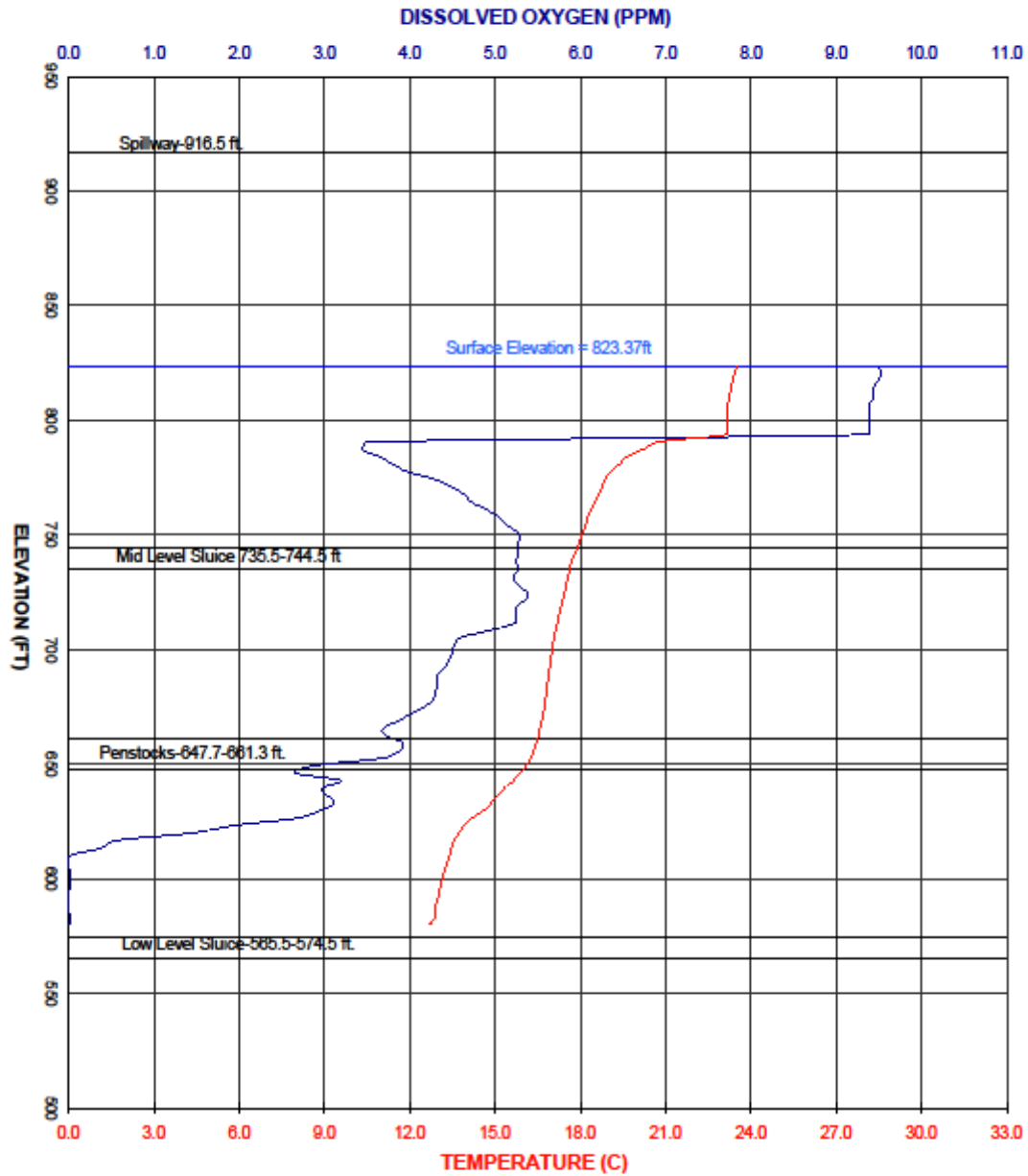
REFERENCES

- Brown, L. R., and P. B. Moyle. 1987. Survey of the fishes of the mid-elevation streams of the San Joaquin Valley. Draft Report for California Department of Fish & Game Contract C-20607. June 1987.
- California Department of Fish and Wildlife (CDFW). 2010. Appendix L, Glossary of Terms “native trout”, “non-native trout”, and “wild trout”. Pages L1-L9 in Final CDFW Hatchery EIR/EIS. <https://wildlife.ca.gov/Fishing/Hatcheries/EIR>
- California Department of Fish and Wildlife (CDFW). 2026. California’s Invaders: Golden Mussel. California Department of Fish and Wildlife; [accessed May 8, 2026]. <https://wildlife.ca.gov/Conservation/Invasives/Species/Golden-Mussel>.
- California Department of Fish and Wildlife (CDFW). 2026. Discovery of invasive nutria in California. California Department of Fish and Wildlife; [accessed May 8, 2026]. <https://wildlife.ca.gov/Conservation/Invasives/Species/Nutria/Infestation>
- Cramer Fish Sciences (CFS). 2019. Lower Kings River fishery habitat characterization and identification of habitat enhancement opportunities: A study by Cramer Fish Sciences for the Kings River Fishery Management Program. September 27, 2019. <https://krfmp.org/wp-content/uploads/2017/05/LKR-Habitat-2019.pdf>
- Kings River Conservation District (KRCDD). 2025. Kings River, Below Pine Flat Dam: Report of Results from the Fall Population Electro-Fishing Survey, 2024. Kings River Conservation District Environmental Resource Division. July 2025. https://krfmp.org/wp-content/uploads/2025/07/2024-E-fish-Report_FINAL.pdf
- Kings River Conservation District (KRCDD). 2025. Flood Resources; [accessed May 8, 2026]. <https://krdd.org/flood-resources/>.
- Kings River Fisheries Management Program (KRFMP). 1999. Kings River Fisheries Management Program Framework Agreement. https://krfmp.org/wp-content/uploads/2024/06/FMP_FrameworkAgreement1999.pdf
- Moyle, P. B. 2002. Inland Fishes of California: Revised and Expanded. University of California Press. Berkeley, California. 502 pp.
- Woyanovich, A., G. Hoitsy, and T. Moth-Poulsen. 2011. Small-scale rainbow trout Farming. FAO Fisheries and Aquaculture Technical Paper 561.

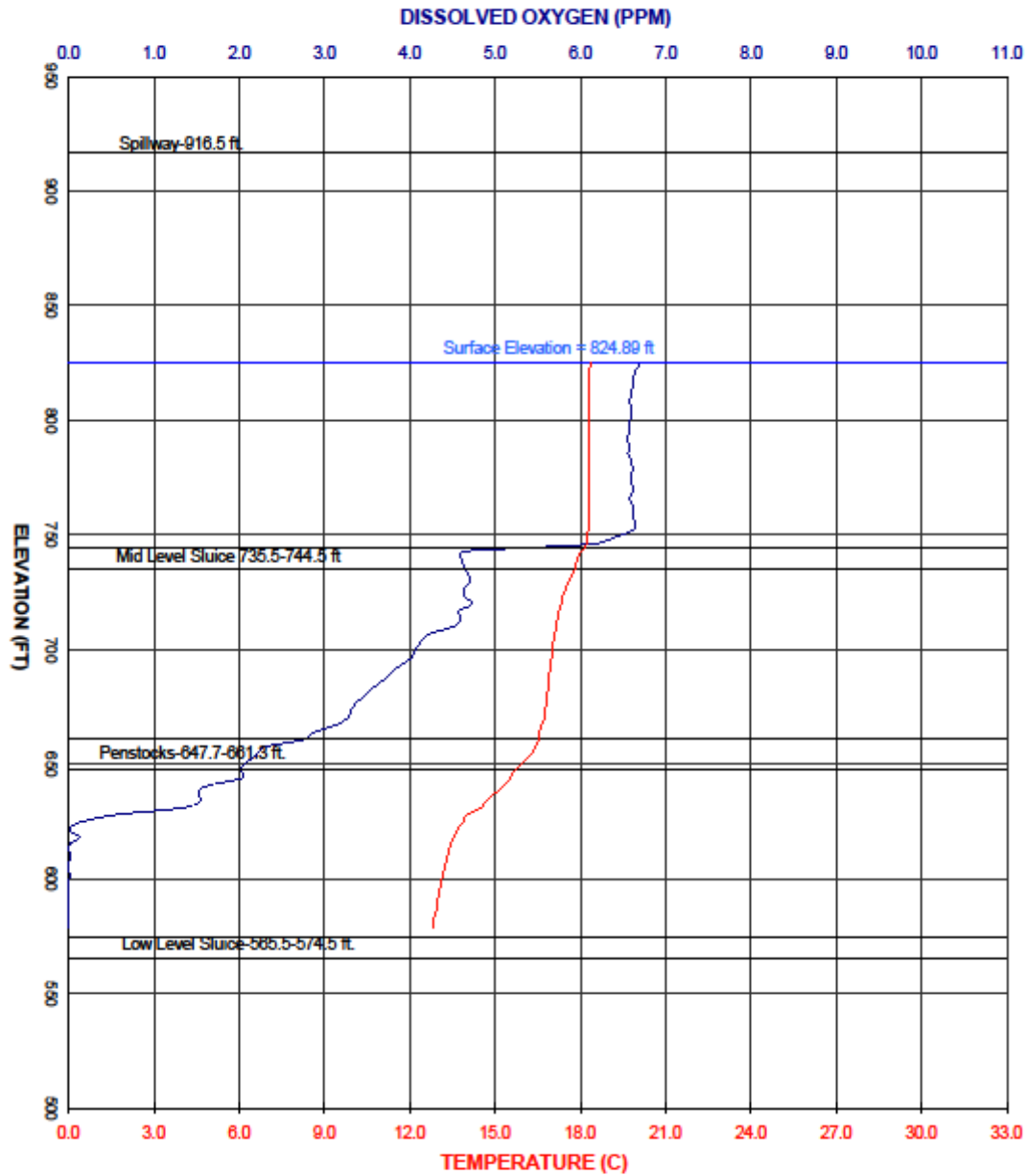
APPENDIX A

Pine Flat Reservoir Temperature and Dissolved Oxygen Profiles
October 2024 – September 2025

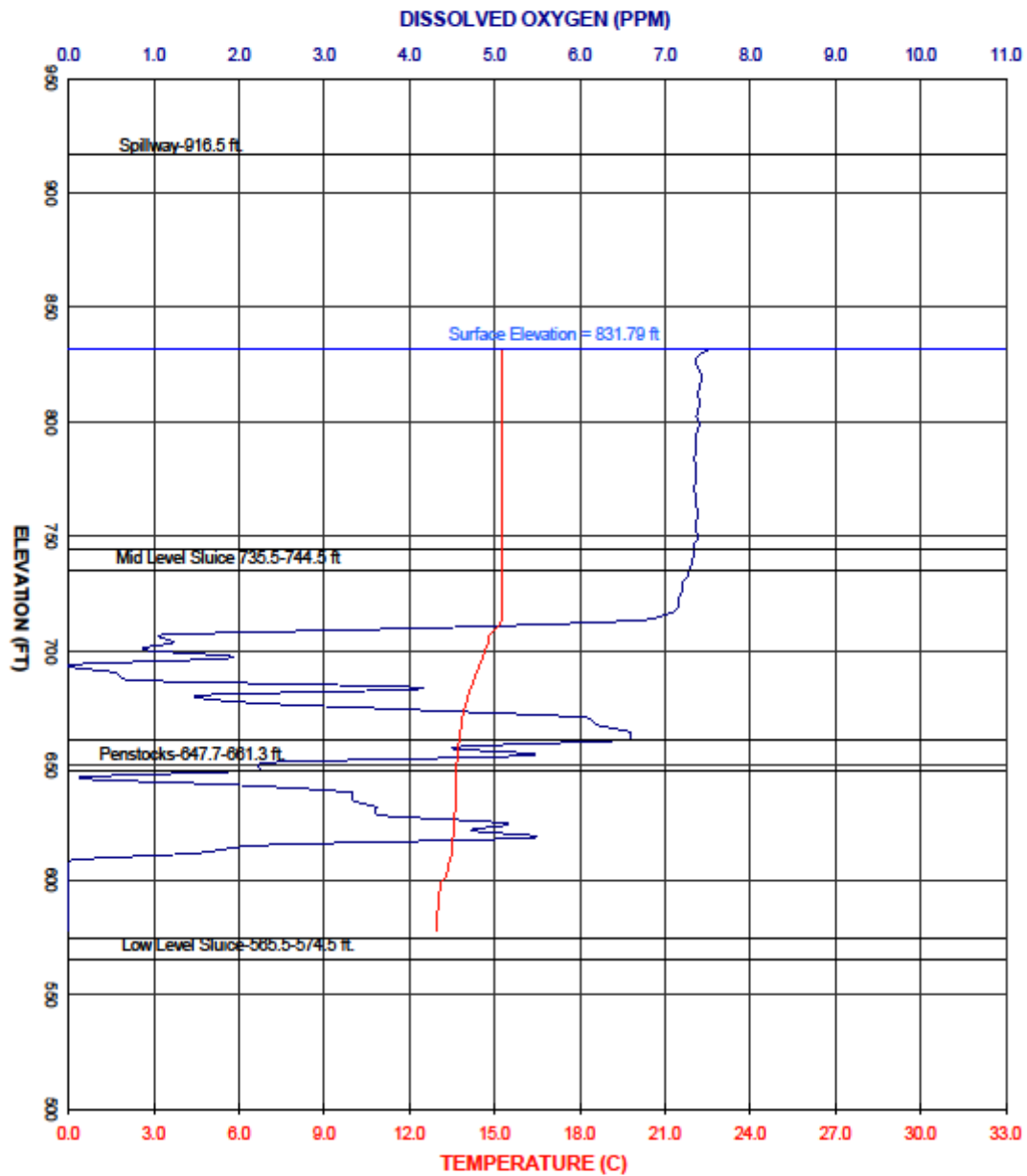
PINE FLAT RESERVOIR 10/1/2024 (Time: 1022-1112) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 823.37



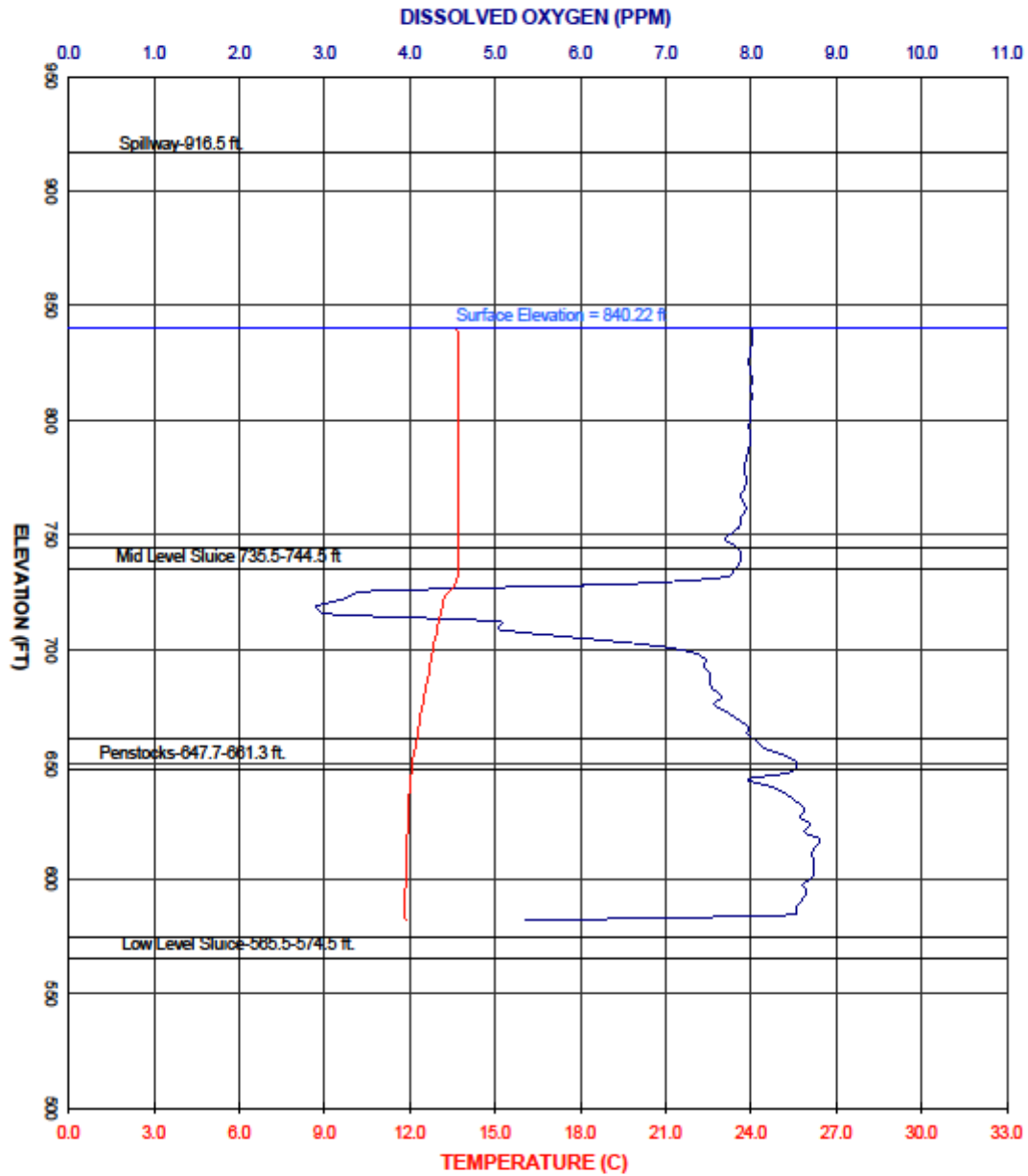
PINE FLAT RESERVOIR 11/5/2024 (Time: 1005-1243) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 824.89



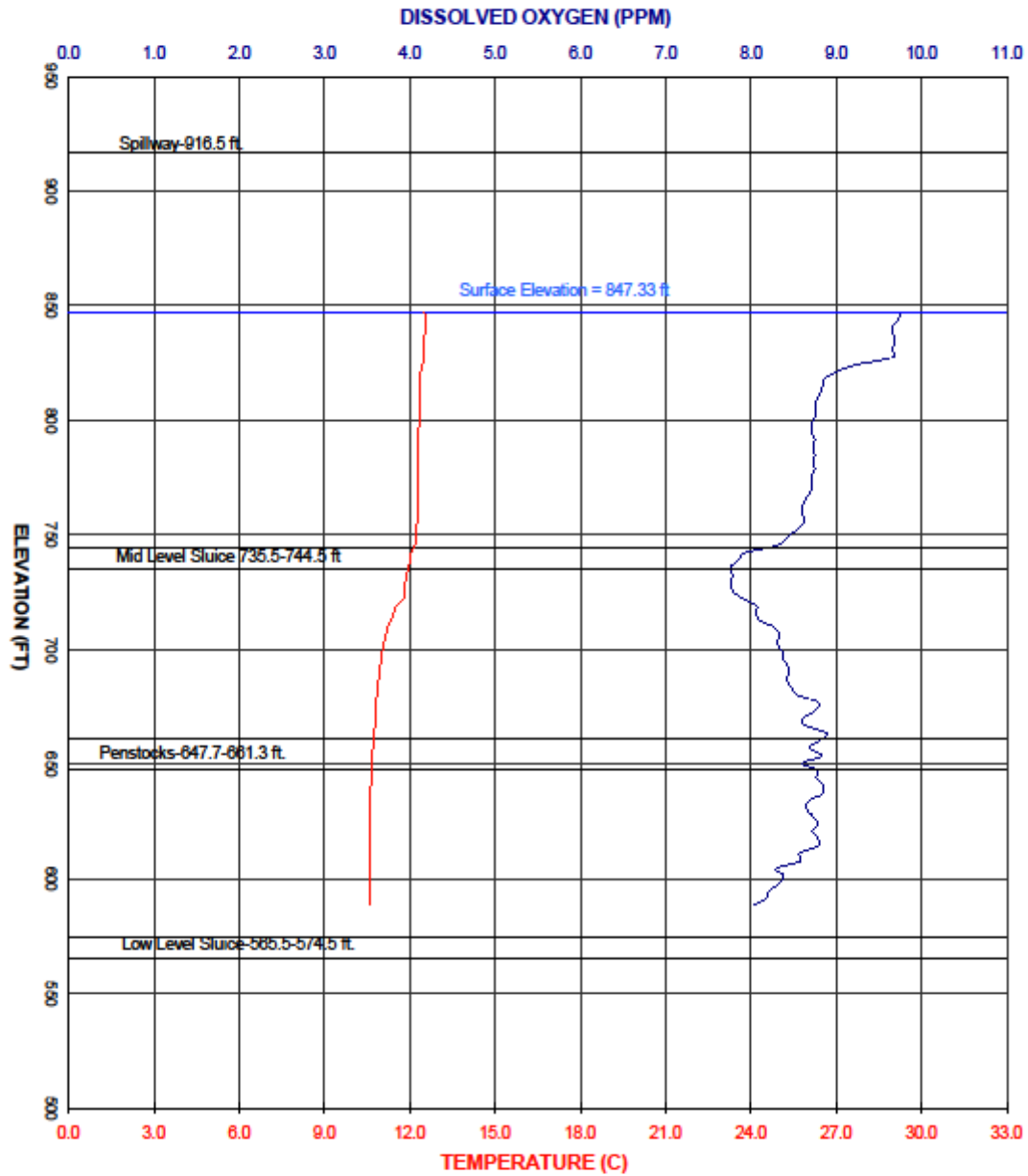
**PINE FLAT RESERVOIR 12/10/2024 (Time: 1010-1226) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 831.79**



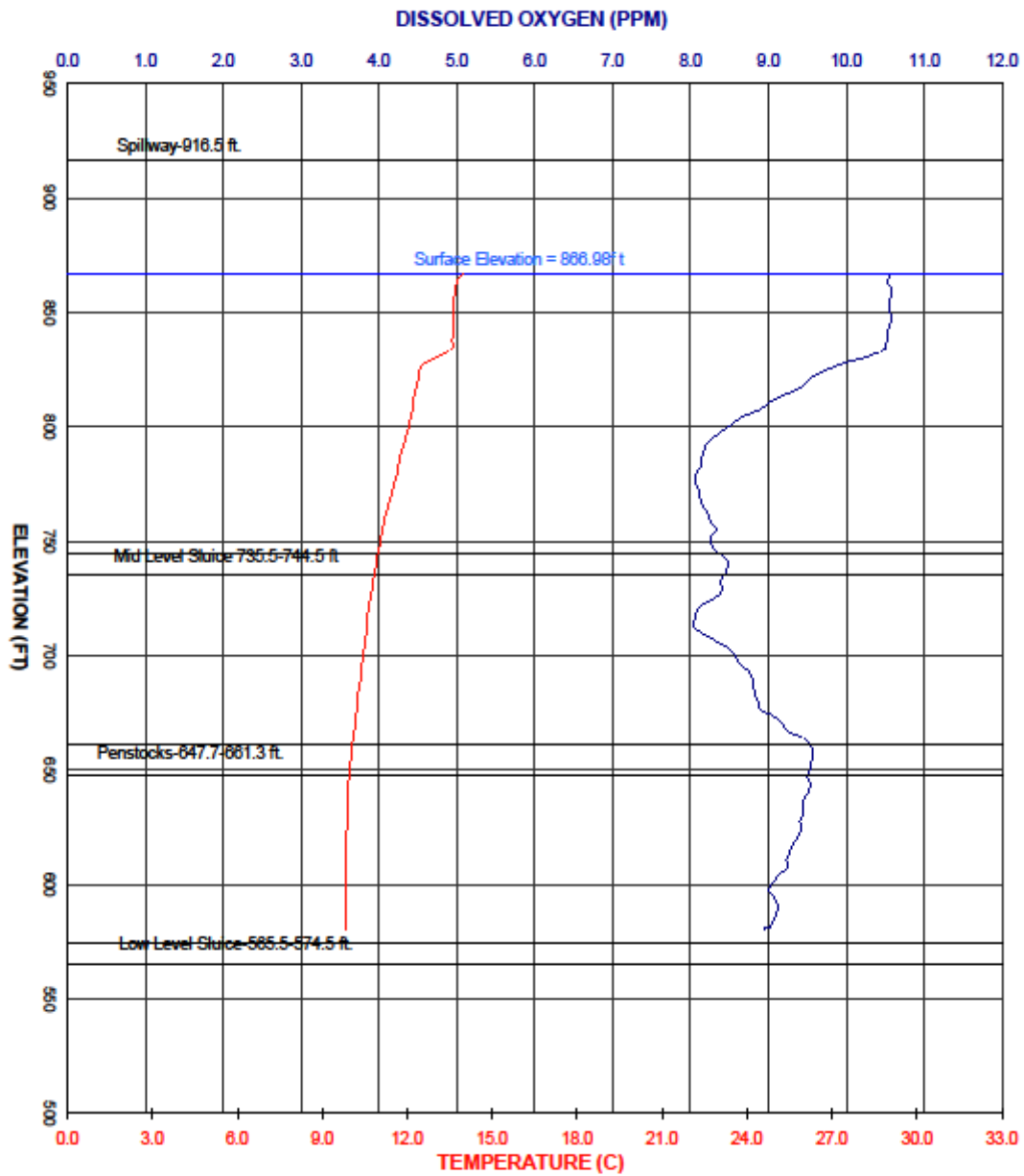
**PINE FLAT RESERVOIR 1/7/2025 (Time: 1005-1204) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 840.22**



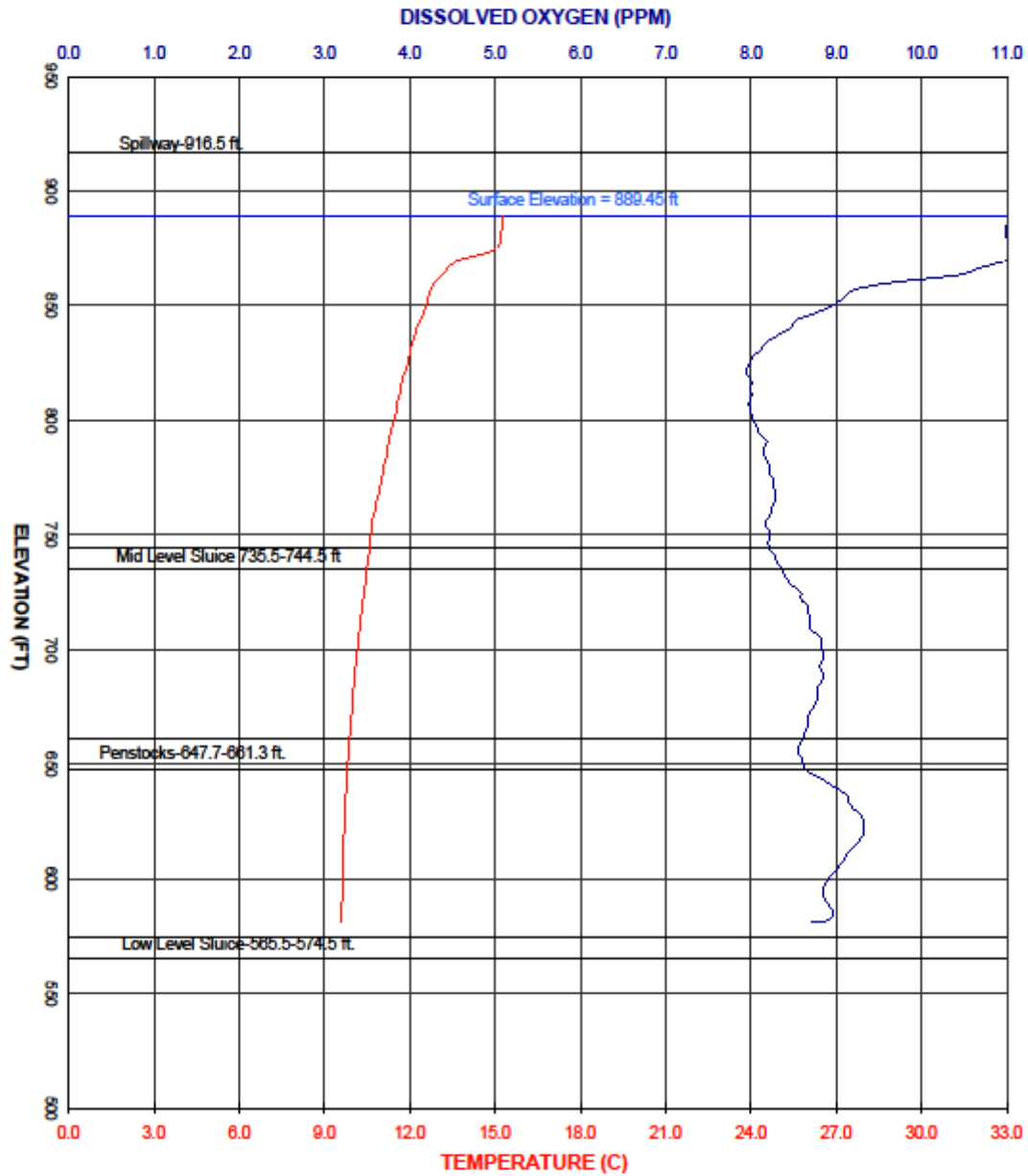
**PINE FLAT RESERVOIR 2/5/2025 (Time: 1127-1321) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 847.33**



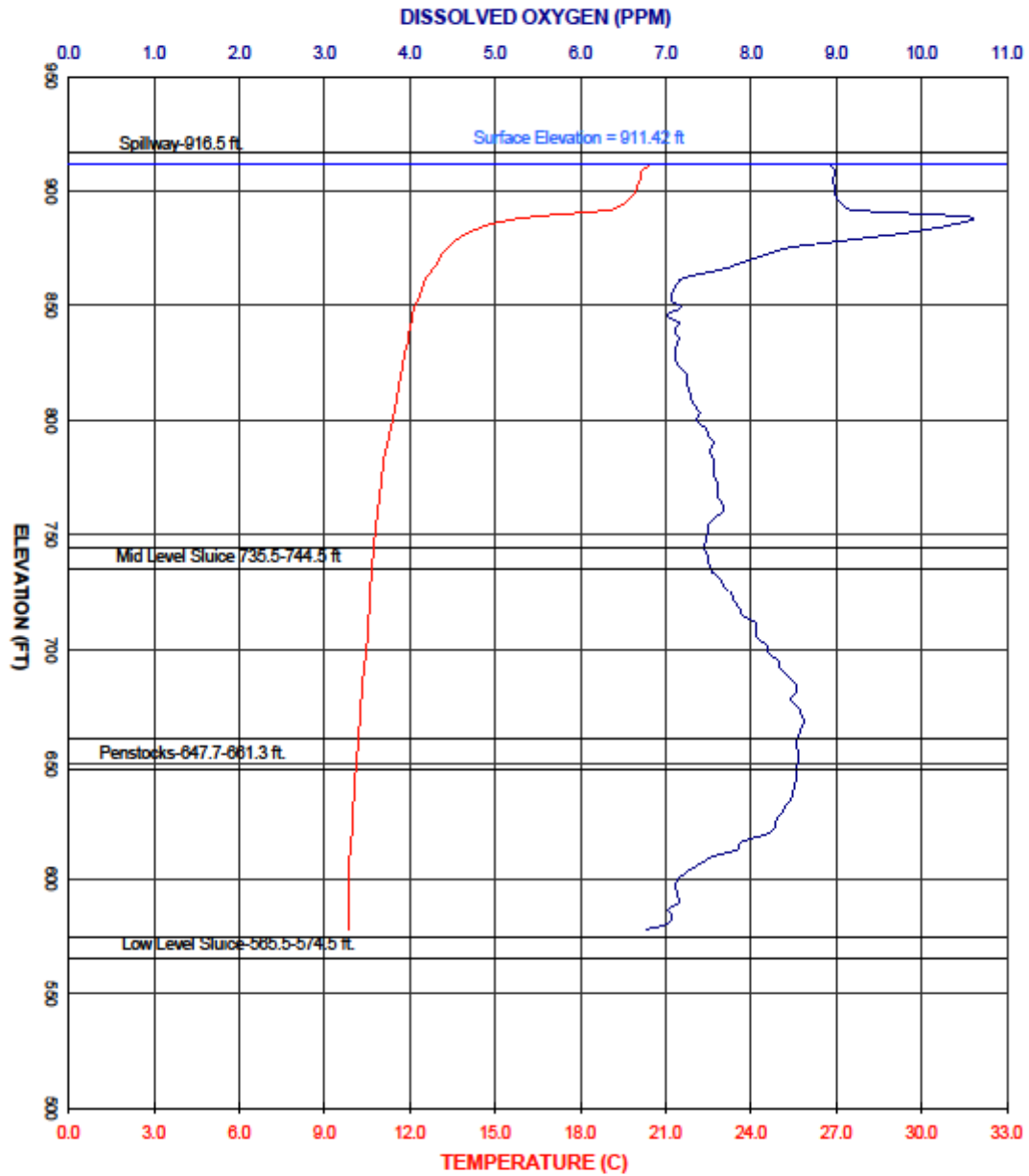
PINE FLAT RESERVOIR 03/04/2025 (Time: 1026-1125) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 866.98



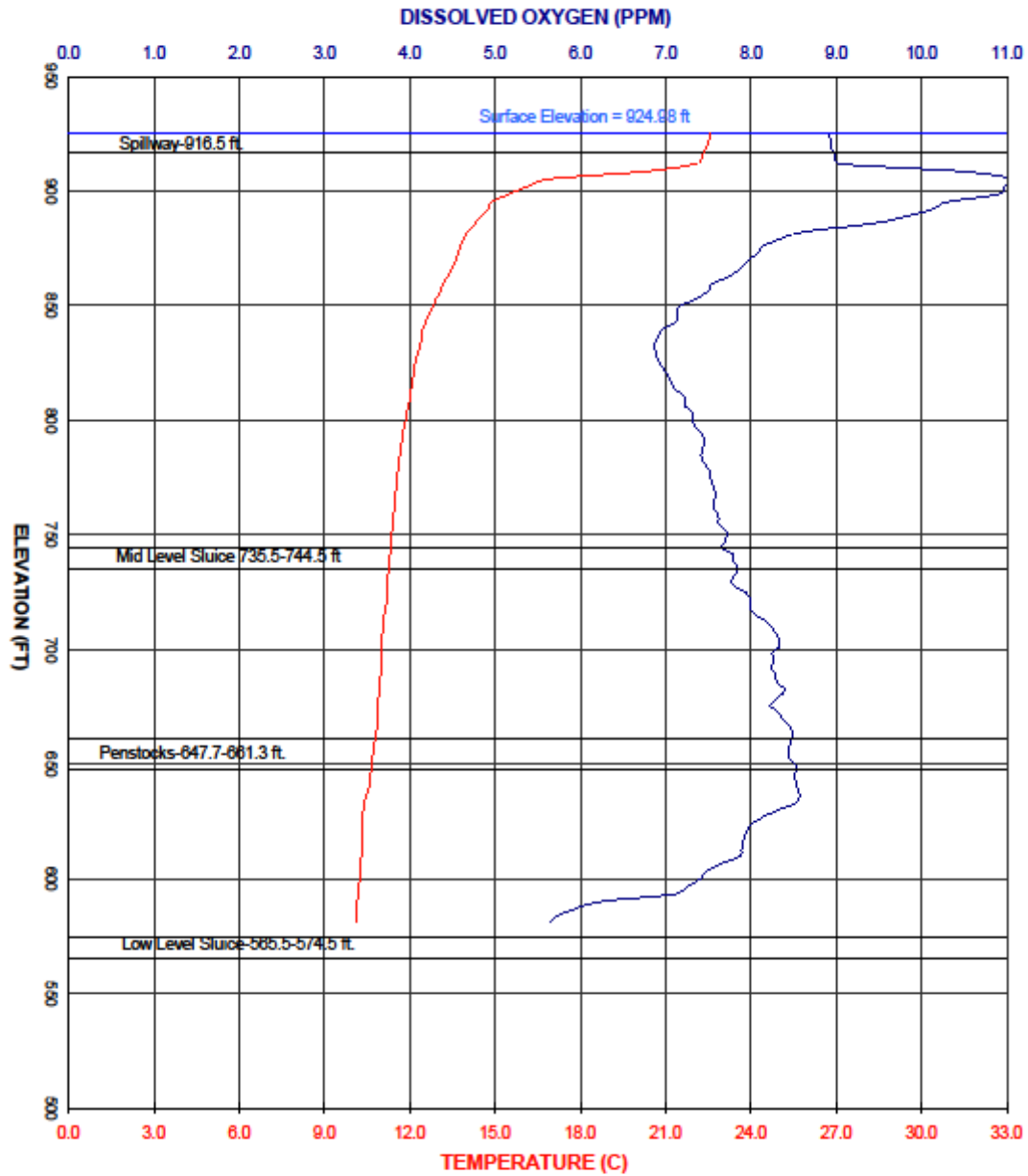
**PINE FLAT RESERVOIR 4/1/2025 (Time: 0933-1050) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 889.45**



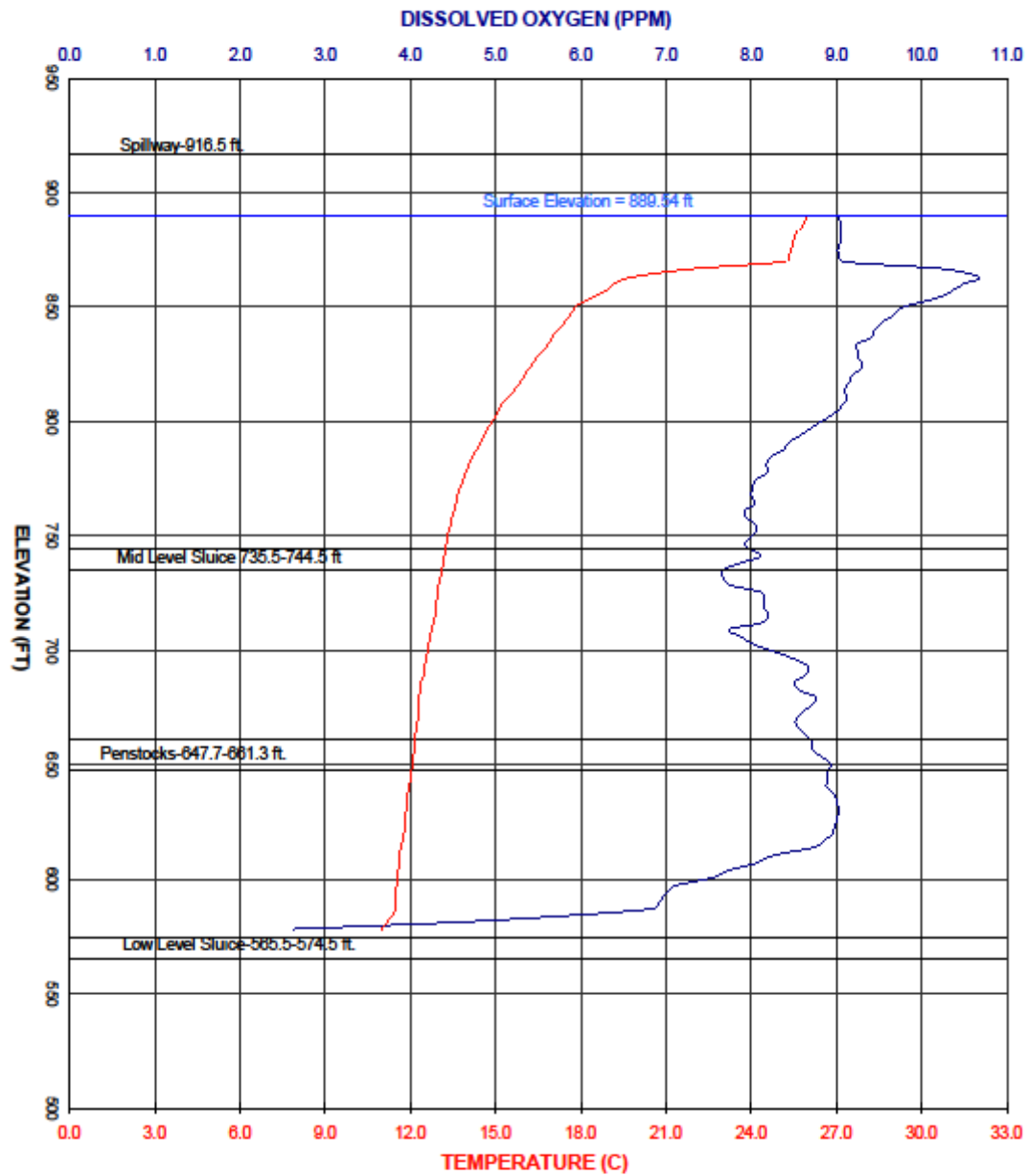
**PINE FLAT RESERVOIR 5/6/2025 (Time: 0918-1025) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 911.42**



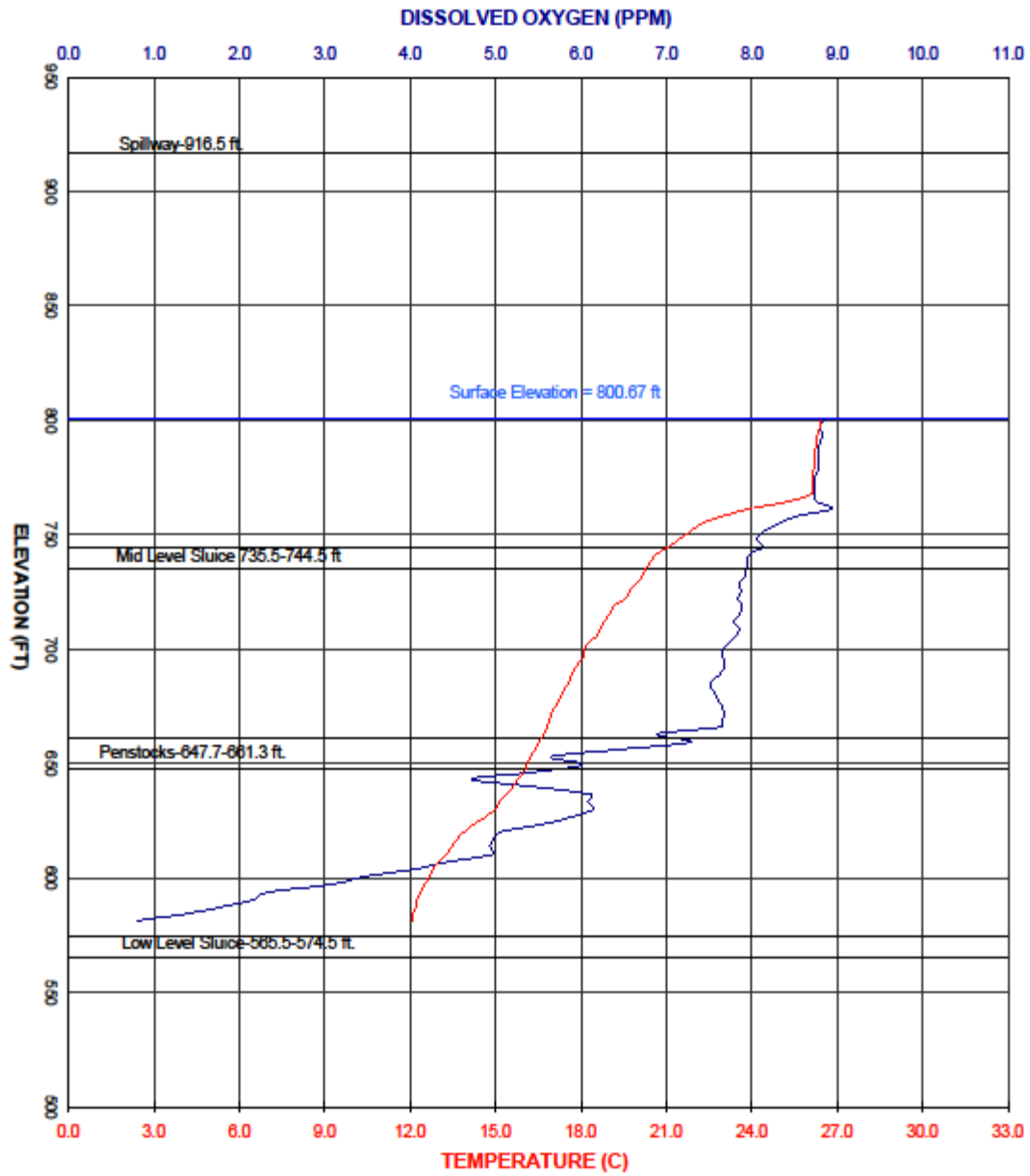
PINE FLAT RESERVOIR 5/29/2025 (Time: 1047-1209) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 924.98



PINE FLAT RESERVOIR 7/1/2025 (Time: 1004-11056) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 889.54



**PINE FLAT RESERVOIR 8/6/2025 (Time: 0945-1027) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 800.67**



PINE FLAT RESERVOIR 9/3/2025 (Time: 0917-1008) New Buoy Line Placement
(0.57 miles upstream of Dam) Reservoir Elevation in Feet = 772.27

