Appendix A-1

Sonoma Water

November 16, 2021

Erik Ekdahl, Deputy Director of Water Rights
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

RE: Petitions for Temporary Urgency Change—Permits 12947A, 12949, 12950 and 16596 (Applications 12919A, 15736, 15737 and 19351)

Dear Mr. Ekdahl:

Enclosed are the Petitions for Temporary Urgency Change to modify the index for determining water supply conditions and minimum instream flow requirements as established by Decision 1610 for Permits 12947A, 12949, 12950 and 16596. Accompanying the petitions are the following:

1) Supplement to the November 2021 Temporary Urgency Change Petitions
2) Environmental Information for Petition
3) Notice of Exemption
4) California Department of Fish and Wildlife Review Fee Payment
5) State Water Resources Control Board Petition Fee Payment

These petitions are submitted due to an exacerbated disconnection between the current index, Lake Pillsbury inflow in the Eel River, and water supply conditions in the Russian River watershed. The index has its basis in the historic contribution of inter-basin transfers of Pacific Gas & Electric's (PG&E) Potter Valley Project (PVP) hydroelectric facility from the Eel River to the East Fork of the Russian River and further downstream to Lake Mendocino. In October 2021, the hydroelectric plant was shuttered due to equipment failure of the transformer bank resulting in a severe reduction in the anticipated inter-basin transfers. Given the likely surrender by PG&E upon the expiration of the project's FERC license in April 2022, the expected fate of the hydroelectric plant is to remain idle due to the multi-year, multi-million-dollar necessary repairs.

Sonoma Water is currently operating under the modified permit conditions of a temporary urgency change order dated June 14, 2021 (and amended October 22, 2021) for Permits 12947A, 12949, 12950 and 16596. This order will expire after December 10, 2021.

On February 1st, the water supply condition for the Russian River was reclassified from 'Normal' to 'Dry' based on the cumulative inflow into Lake Pillsbury for the water year. This designation of 'Dry' water supply conditions would have continued through until the end of the year in the absence of the temporary urgency change petitions filed by Sonoma Water that were approved under the order dated June 14, 2021. Attributable to the hydrologic index implemented under this order and wide-spread water rights curtailments issued throughout the watershed, Lake Mendocino storage levels were prevented from reaching catastrophic levels this summer.

The shutdown of the PVP hydroelectric facility coincides with historically low storage levels in Lake Mendocino and Lake Sonoma due to the historic statewide drought. The Russian River watershed was under the highest category of drought, Exceptional Drought (D4), until the reprieve of the recent storms lowered the watershed into the next category, Extreme Drought (D3) (https://www.drought.gov/current-conditions).

Without the proposed changes in effect, there is an undue risk that water supply conditions as determined by the current hydrologic index will set minimum instream flows in the Russian River watershed that are not sustainable with the limited reservoir storage volumes in Lake Mendocino and Lake Sonoma that have been depleted after two years of drought conditions.

I look forward to working with the Division of Water Rights staff on this important conservation effort.

Sincerely,

[redacted]

Grant Davis
General Manager

c: S. Boland-Brien, J. Ling, S. McFarland – State Water Resources Control Board
R. Coey, J. Fuller – National Marine Fisheries Service
M. Kittle – California Department of Fish & Wildlife
M. St. John, B. McFadin – North Coast Regional Water Quality Control Board
P. Jeane, D. Seymour, T. Schram, J. Martini Lamb, J. Jasperse – Sonoma Water
C. O'Donnell, A. Brand – Sonoma County Counsel
R. Bezerra – Bartkiewicz, Kronick & Shanahan

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Please indicate County where your project is located here:

Sonoma / Mendo.

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PETITION FOR CHANGE

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☐ **Point of Rediversion** Cal. Code Regs., tit. 23, § 791(e)
☐ **Place of Use** Wat. Code, § 1701
☐ **Purpose of Use** Wat. Code, § 1701
☐ **Distribution of Storage** Cal. Code Regs., tit. 23, § 791(e)
☒ **Temporary Urgency** Wat. Code, § 1435
☐ **Instream Flow Dedication** Wat. Code, § 1707
☐ **Waste Water** Wat. Code, § 1211
☐ **Split** Cal. Code Regs., tit. 23, § 836
☐ **Terms or Conditions** Cal. Code Regs., tit. 23, § 791(e)
☐ **Other**

Application 15736 Permit 12949 License Statement

I (we) hereby petition for change(s) noted above and described as follows:

Point of Diversion or Rediversion – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Present:

Proposed:

Place of Use – Identify area using Public Land Survey System descriptions to ¼-¼ level; for irrigation, list number of acres irrigated.

Present:

Proposed:

Purpose of Use

Present:

Proposed:

Split

Provide the names, addresses, and phone numbers for all proposed water right holders.

In addition, provide a separate sheet with a table describing how the water right will be split between the water right holders: for each party list amount by direct diversion and/or storage, season of diversion, maximum annual amount, maximum diversion to offstream storage, point(s) of diversion, place(s) of use, and purpose(s) of use. Maps showing the point(s) of diversion and place of use for each party should be provided.

Distribution of Storage

Present:

Proposed:

Temporary Urgency

This temporary urgency change will be effective from 12/11/2021 to 6/8/2022 .

Include an attachment that describes the urgent need that is the basis of the temporary urgency change and whether the change will result in injury to any lawful user of water or have unreasonable effects on fish, wildlife or instream uses.

Instream Flow Dedication – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Upstream Location:

Downstream Location:

List the quantities dedicated to instream flow in either: ☐ cubic feet per second or ☐ gallons per day:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Will the dedicated flow be diverted for consumptive use at a downstream location? ○ Yes ○ No

If yes, provide the source name, location coordinates, and the quantities of flow that will be diverted from the stream.

Waste Water

If applicable, provide the reduction in amount of treated waste water discharged in cubic feet per second.

Will this change involve water provided by a water service contract which prohibits your exclusive right to this treated waste water? ○ Yes ○ No

Will any legal user of the treated waste water discharged be affected? ○ Yes ○ No

General Information – For all Petitions, provide the following information, if applicable to your proposed change(s).

Will any current Point of Diversion, Point of Storage, or Place of Use be abandoned? ○ Yes ◉ No

I (we) have access to the proposed point of diversion or control the proposed place of use by virtue of:

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If by lease or agreement, state name and address of person(s) from whom access has been obtained.

Give name and address of any person(s) taking water from the stream between the present point of diversion or rediversion and the proposed point of diversion or rediversion, as well as any other person(s) known to you who may be affected by the proposed change.

All Right Holders Must Sign This Form: I (we) declare under penalty of perjury that this change does not involve an increase in the amount of the appropriation or the season of diversion, and that the above is true and correct to the best of my (our) knowledge and belief. Dated 11·16·21 at Santa Rosa, CA .

[redacted]

Right Holder or Authorized Agent Signature

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NOTE: All petitions must be accompanied by:

1. **the form Environmental Information for Petitions, including required attachments, available at: http://www.waterboards.ca.gov/waterrights/publications_forms/forms/docs/pet_info.pdf**
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3. **Department of Fish and Wildlife fee of $850 (Pub. Resources Code, § 10005)**

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☐ **Split** Cal. Code Regs., tit. 23, § 836
☐ **Terms or Conditions** Cal. Code Regs., tit. 23, § 791(e)
☐ **Other**

Application 12919A Permit 12947A License Statement

I (we) hereby petition for change(s) noted above and described as follows:

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Present:

Proposed:

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[redacted]

Right Holder or Authorized Agent Signature

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Application 19351 Permit 16596 License Statement

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Proposed:

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Present:
Proposed:

Purpose of Use
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Application 15737 Permit 12950 License Statement

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Proposed:

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Purpose of Use
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Proposed:

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November 2021

Sonoma County Water Agency

Supplement to the November 2021 Temporary Urgency Change Petitions

The Sonoma County Water Agency (Sonoma Water) seeks temporary urgency changes to its four water-right permits used to provide wholesale water to cities and water districts in Sonoma and Marin counties. These changes are necessary to ensure that the water supply condition and corresponding minimum instream flow requirements in the Russian River watershed are aligned with actual watershed hydrologic conditions. This is essential to maintain sustainable reservoir/river operations to protect municipal water supply and listed salmon species in the Russian River.

Based on Sonoma Water's water right permits established under State Water Resources Control Board (State Water Board) Decision 1610, the water supply condition for the Russian River is determined using cumulative inflow into Lake Pillsbury as the index. Lake Pillsbury is a storage reservoir located in the Eel River watershed for Pacific Gas & Electric Company's (PG&E) Potter Valley Hydroelectric Project (PVP) which transfers water into the East Fork of the Russian River. During a PVP Drought Working Group meeting on October 7, 2021, PG&E informed the group that the transformer bank at the PVP powerhouse had failed and would need to be replaced in order to convey water through the powerhouse for power generation. PG&E estimates it will take up to two years to replace the transformer bank at a cost of five to ten million dollars. It is highly uncertain whether PG&E will make the necessary repairs to continue power generation as its FERC operating license expires in April 2022. In January 2019, PG&E withdrew its Preliminary Application Document and Notice of Intent to relicense the project.

Currently, the PVP is rated at a flow rate up to 240 cubic feet per second (cfs) through the powerhouse for power generation. PG&E can bypass the powerhouse at flow rates up to 135 cfs to meet Federal Energy Regulatory Commission (FERC) license requirements for minimum instream releases into the East Branch Russian

River and water supply contract requirements with the Potter Valley Irrigation District (PVID).

PG&E's transfer obligations to meet FERC license requirements and PVID contract amounts until April 14 is 45 cfs. On April 15 the transfer requirement to the East Branch Russian River will be reassessed based on the water supply condition. PG&E has indicated that without the ability to generate hydropower, it is unlikely PG&E will make discretionary transfers of Eel River water through the PVP above its FERC license and contract obligations. Discretionary transfers to generate hydropower can occur up until early April if hydrologic conditions on the Eel River and at Lake Pillsbury are being met. Without the discretionary transfer of Eel River water to generate hydropower, the total transfer through the PVP will be reduced by up to 400 acre-feet per day.

Under these operating conditions of the PVP, the influence of the Eel River water imports on downstream hydrologic conditions in the Russian River will be greatly diminished. Therefore, there will be little to no correlation between cumulative inflow into Lake Pillsbury and the hydrologic conditions in the Russian River watershed. Consequently, Sonoma Water requests that storage thresholds in Lake Mendocino be used as the hydrologic index to determine the water supply condition in the Russian River watershed. The same storage thresholds were requested by Sonoma Water in prior Temporary Urgency Change Petitions (TUCP) filed in December 2013 and January 2021, which the State Water Board approved in orders issued on December 31, 2013 and February 4, 2021, respectively.

The current drought has led Sonoma Water to file three TUCPs since June 2020. Projected critically low storage levels in Lake Mendocino were the drivers for the TUCPs. These low storage levels were due to dry watershed conditions and reduced transfers of Eel River water through the PVP as a result of variances filed with FERC by PG&E. Lake Mendocino and Lake Sonoma remain at or near their lowest levels for this time of year since filling in 1959 and 1986, respectively. Consequently, it is even more critical that the water supply condition and corresponding minimum instream flows in the Russian River be determined by a hydrologic index representative of the Russian River watershed.

1.0 BACKGROUND

Sonoma Water controls and coordinates water supply releases from Lake Mendocino and Lake Sonoma to implement the minimum instream flow requirements as established in water rights Decision 1610, which the State Water Board adopted on April 17, 1986. Decision 1610 specifies minimum instream flow requirements for the Upper Russian River, Dry Creek and the Lower Russian River.[1] These minimum flow requirements vary based on hydrologic conditions, which are also specified in Decision 1610. The Decision 1610 requirements for the Upper Russian River and Lower Russian River are contained in term 20 of Sonoma Water's water-right Permit 12947A (Application 12919A). The Decision 1610 requirements for the Lower Russian River are contained in term 17 of Sonoma Water's water-right Permit 12949 (Application 15736) and term 17 of Sonoma Water's water-right Permit 12950 (Application 15737). The Decision 1610 requirements for Dry Creek and the Lower Russian River are contained in term 13 of Sonoma Water's water-right Permit 16596 (Application 19351).

Sonoma Water's operations are also subject to the Russian River Biological Opinion issued by the National Marine Fisheries Service on September 24, 2008, and consistency determination issued by the California Department of Fish and Wildlife on November 9, 2009.

1.1 Minimum Flow Requirements

Decision 1610 requires a minimum flow of 25 cubic feet per second (cfs) in the East Fork of the Russian River from Coyote Valley Dam to the confluence with the West Fork of the Russian River under all water supply conditions. From this point to Dry Creek, the Decision 1610 required minimum Russian River flows are: from April through August, 185 cfs, and from September through March, 150 cfs, during *Normal* water supply conditions; 75 cfs during *Dry* conditions; and 25 cfs during *Critical* conditions. Decision 1610 further specifies two variations of the *Normal*

[1] The Upper Russian River is the stream reach from the confluence of the East Fork Russian River and West Fork Russian River to the Russian River's confluence of Dry Creek. The Lower Russian River is the stream reach from the confluence of Dry Creek and the Russian River to the Pacific Ocean.

water supply condition, commonly known as *Dry Spring 1* and *Dry Spring 2*. These conditions provide for lower required minimum flows in the Upper Russian River during times when the combined storage in Lake Pillsbury (located in the Eel River watershed) and Lake Mendocino on May 31 is unusually low. *Dry Spring 1* conditions exist if the combined storage in Lake Pillsbury and Lake Mendocino is less than 150,000 acre-feet on May 31. Under *Dry Spring 1* conditions, the required minimum flow in the Upper Russian River between the confluence of the East Fork and West Fork and Healdsburg is 150 cfs from June through March, with a reduction to 75 cfs during October through December if Lake Mendocino storage is less than 30,000 acre-feet during those months. *Dry Spring 2* conditions exist if the combined storage in Lake Pillsbury and Lake Mendocino is less than 130,000 acre-feet on May 31. Under *Dry Spring 2* conditions, the required minimum flows in the Upper Russian River are 75 cfs from June through December and 150 cfs from January through March.

From Dry Creek to the Pacific Ocean, the required minimum flows in the Lower Russian River are 125 cfs during *Normal* water supply conditions, 85 cfs during *Dry* conditions, and 35 cfs during *Critical* conditions.

In Dry Creek below Warm Springs Dam, the required minimum flows are 75 cfs from January through April, 80 cfs from May through October and 105 cfs in November and December during *Normal* water supply conditions. During *Dry* and *Critical* conditions, these required minimum flows are 25 cfs from April through October and 75 cfs from November through March.

Figure 1 shows all of the required minimum instream flows specified in Decision 1610 by river reach, the gauging stations used to monitor compliance, and the definitions of the various water supply conditions.

1.2 <u>Water Supply Conditions</u>

There are three main water supply conditions that are defined in Decision 1610, which set the minimum instream flow requirements based on the hydrologic conditions for the Russian River system. These water supply conditions are determined based on criteria for the calculated cumulative inflow into Lake Pillsbury from October 1 to the first day of each month from January to June.

Decision 1610 defines cumulative inflow for Lake Pillsbury as the algebraic sum of releases from Lake Pillsbury, change in storage and lake evaporation.

Dry water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 8,000 acre-feet as of January 1;
- 39,200 acre-feet as of February 1;
- 65,700 acre-feet as of March 1;
- 114,500 acre-feet as of April 1;
- 145,600 acre-feet as of May 1; and
- 160,000 acre-feet as of June 1.

Critical water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 4,000 acre-feet as of January 1:
- 20,000 acre-feet as of February 1;
- 45,000 acre-feet as of March 1;
- 50,000 acre-feet as of April 1;
- 70,000 acre-feet as of May 1; and
- 75,000 acre-feet as of June 1.

Normal water supply conditions exist whenever a *Dry* or *Critical* water supply condition is not present. As indicated above, Decision 1610 further specifies three variations of the *Normal* water supply condition based on the combined storage in Lake Pillsbury and Lake Mendocino on May 31. These three variations of the *Normal* water supply condition determine the required minimum instream flows for the Upper Russian River. This provision of Decision 1610 does not provide for any changes in the required minimum instream flows in Dry Creek or the Lower

Russian River. A summary of the required minimum flows in the Upper Russian River for *Normal*, *Normal — Dry Spring 1* and *Normal — Dry Spring 2* water supply conditions is provided here:

1. *Normal*: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year exceeds 150,000 acre-feet or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through August 31	185 cfs
From September 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

2. *Normal-Dry Spring 1*: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year is between 150,000 acre-feet or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less, and 130,000 acre-feet or 80 percent or the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through March 31	150 cfs
From April 1 through May 31	185 cfs
If from October 1 through December 31, storage in Lake Mendocino is less than 30,000 acre-feet	75 cfs

3. *Normal-Dry Spring 2*: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 acre-feet or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through December 31	75 cfs
From January 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

2.0 WATER SUPPLY CONDITIONS

From October 1, 2020 to May 31, 2021, the cumulative inflow into Lake Pillsbury was 82,215 acre-feet. Consequently, the water supply condition is categorized as *Dry* for the remainder of 2021. Sonoma Water is currently managing the Russian River based on a *Critical* water supply condition as authorized by the June 14, 2021 State Water Board order approving Sonoma Water's May 2021 TUCP. These changes were necessary because of the critically dry hydrology and very low storage at Lake Mendocino. The State Water Board's June 14, 2021 order expires after December 10, resulting in the water supply condition changing back to *Dry* for the remainder of the year and the corresponding minimum instream flow requirements increasing from 25 cfs to 75 cfs on the Upper Russian River and from 35 cfs to 85 cfs on the Lower Russian River.

From October 1, 2021 to November 14, 2021, the cumulative in flow into Lake Pillsbury was 41,947 acre-feet. Consequently, the water supply condition will be categorized as *Normal* for at least through February 2022, with a minimum instream flow requirement of 150 cfs on the Upper Russian River and 125 cfs on the Lower Russian River. Without an additional temporary urgency change order approving the requested changes, there is a significant risk that using a hydrologic index based on cumulative inflow into Lake Pillsbury will be misaligned with actual Russian River watershed conditions and storage levels at Lake Mendocino and Lake Sonoma. This could require releases from the two reservoirs to meet minimum instream flow requirements that could deplete the reservoirs to severely low levels.

<u>2.1 Potter Valley Hydroelectric Project</u>

The PVP, owned and operated by PG&E, is located on the East Fork Russian River and the Eel River in Mendocino and Lake Counties. PVP's Lake Pillsbury is impounded by Scott Dam. Eel River natural flows and releases from Scott Dam can be diverted downstream at Cape Horn Dam through PG&E's generation facilities. Those generation facilities then release that water to the East Fork Russian River.

As discussed above, the PVP powerhouse is inoperable for the foreseeable future, which will severely reduce the transfer of Eel River water through the PVP. PG&E

is in the process of assessing the issue, but has indicated that it is unlikely it will repair the facility given the likelihood the FERC license for the PVP may be surrendered.

2.2 Lake Mendocino

As of November 15, 2021 the water supply storage level in Lake Mendocino was 19,995 acre-feet (AF). This storage level is approximately 29 percent of the available water conservation pool for this time of year. This is the second lowest storage level for this time of year since Lake Mendocino filled in 1959. Figure 2 shows observed storage in Lake Mendocino for 2014 through November 14, 2021.

In February 2021, the U.S. Army Corps of Engineers (USACE) approved a Planned Major Deviation (Deviation) of the Coyote Valley Dam/Lake Mendocino Water Control Manual for WY 2021 through WY 2026 at the request of the Lake Mendocino Forecast Informed Reservoir Operations (FIRO) Steering Committee. The Deviation allows USACE flood control managers to store up to an additional 11,050 acre-feet of water in the flood control pool at their discretion. Furthermore, it authorizes USACE flood control managers to leverage a Decision Support Model (DSM) developed by Sonoma Water as part of the tools and protocols USACE uses to manage reservoir operations at Lake Mendocino. Based on an operational hydrologic ensemble of streamflow forecasts provided by the California-Nevada River Forecast Center, current reservoir storage, and current and anticipated downstream conditions, the DSM provides a recommended release to help inform operational decisions. Unfortunately, WY 2021 is the second driest year in the Ukiah Valley during the past 127 years of record, with WY 2020 being the fourth driest. As a result, storage at Lake Mendocino remained well below the flood control pool and the FIRO DSM was not utilized this year.

2.3 Lake Sonoma

As of November 15, 2021, the water supply storage level in Lake Sonoma was 122,322 acre-feet. This storage level is approximately 50 percent of the available water conservation pool. This is the lowest storage level for this time of year since Lake Sonoma filled in 1986. Figure 3 shows observed storage in Lake Sonoma for 2014 through November 14, 2021.

3.0 CRITERIA FOR APPROVING TEMPORARY UNGENCY CHANGE TO PERMITS 12947A, 12949, 12950, AND 16596

As required by Water Code section 1435, subdivision (b), the Board must make the following findings before issuing a temporary change order:

1. The permittee or licensee has an urgent need to make the proposed change;
2. The proposed change may be made without injury to any other lawful user of water;
3. The proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses; and
4. The proposed change is in the public interest.

3.1 <u>Urgency of the Proposed Change</u>

Under Water Code section 1435, subdivision (c), an urgent need to make a proposed change exists when the State Water Board concludes that the proposed temporary change is necessary to further the constitutional policy that the water resources of the State be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented.

For these petitions, an urgent need exists to implement the proposed change due to the drastic reduction of potential Eel River water imports through the PVP resulting from the inoperability of the powerhouse for the foreseeable future. The volume of imported Eel River water that can be transferred with the powerhouse being inoperable results in little or no correlation between cumulative inflow into Lake Pillsbury and the hydrologic condition in the Russian River. Without the proposed changes, the applicable minimum instream flow requirements may require releases of water from Lake Mendocino and Lake Sonoma at levels that would risk significant depletions of storage to severely low levels. Such depletions in storage could cause serious impacts to human health and welfare and reduce water supplies needed for fishery protection.

3.2 No Injury to Any Other Lawful User of Water

If this petition is approved, Sonoma Water still will be required to maintain specific minimum instream flows in the Russian River. Because these minimum flows will be present, all other legal users of water still will be able to divert and use the amounts of water that they may legally divert and use. Accordingly, granting this petition will not result in any injury to any other lawful user of water.

3.3 No Unreasonable Effect upon Fish, Wildlife, or Other Instream Beneficial Uses

If these petitions are approved, monthly storage thresholds in Lake Mendocino would determine the water supply condition that sets the Russian River minimum instream flow requirements. This change would align Sonoma Water's reservoir operations and the applicable minimum streamflows with the Russian River watershed's hydrology. The change therefore could result in lower instream flows in the Russian River. Any effects associated with such flow reductions would not be unreasonable, considering the potential catastrophic impacts to fish, wildlife and other instream beneficial uses that could occur under minimum instream flow requirements that the Russian River watershed and reservoirs cannot sustain.

3.4 The Proposed Change is in the Public Interest

Approval of these petitions would provide alternative criteria for determining minimum instream flow requirements for the Russian River that would be based on a more accurate assessment of water supply conditions in the Russian River watershed. This would result in minimum instream flow requirements that more likely can be sustained with releases from Lake Mendocino and Lake Sonoma without severely depleting storage. It is in the public interest to manage these water supplies based on an index that is more reflective of the hydrologic conditions of the Russian River watershed.

4.0 REQUESTED TEMPORARY URGENCY CHANGE TO PERMITS 12947A, 12949, 12950, AND 16596

To address the inoperability of the PVP powerhouse and corresponding loss of Eel River water imports through the PVP, Sonoma Water is filing these petitions requesting that the State Water Board make the following temporary changes to the Decision 1610 requirements:

Starting December 11, 2021, the minimum instream flow requirements for the Russian River will be established using an index based on water storage in Lake Mendocino, rather than the current index based on cumulative inflow into Lake Pillsbury. This temporary change is requested to ensure that the water supply condition for the Russian River is determined by an index that is reflective of actual watershed conditions. Specifically, Sonoma Water proposes that the monthly storage values listed below be used, in lieu of cumulative Lake Pillsbury inflow, to determine the water supply conditions that determine which minimum instream flow requirements in Term 20 of Permit 12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596 will apply to the Russian River:

a. *Dry* water supply conditions will exist when storage in Lake Mendocino is less than:

40,000 acre-feet as of January 1
59,000 acre-feet as of February 1
68,000 acre-feet as of March 1
69,500 acre-feet as of March 16
71,000 acre-feet as of April 1
70,000 acre-feet as of April 16
69,000 acre-feet as of May 1
67,500 acre-feet as of May 16
65,000 acre-feet as of June 1

b. *Critical* water supply conditions exist when storage in Lake Mendocino is less than:

   31,000 acre-feet as of January 1
   36,000 acre-feet as of February 1
   52,000 acre-feet as of March 1
   53,000 acre-feet as of March 16
   54,000 acre-feet as of April 1
   53,000 acre-feet as of April 16
   52,000 acre-feet as of May 1
   51,000 acre-feet as of May 16
   50,000 acre-feet as of June 1

c. *Normal* water supply conditions exist in the absence of defined *Dry* or *Critical* water supply conditions.

Because the proposed criteria for determining the applicable minimum instream flow requirements would be tied to Lake Mendocino storage, they would more accurately reflect the hydrologic conditions in the Russian River and would adjust through June 1 if the remainder of the winter and spring yields improvements in the hydrologic conditions. The proposed criteria, therefore, mimic the logic underlying the year types and associated streamflow requirements of Decision 1610. It would shift the criteria for establishing hydrologic conditions in the Russian River watershed to local conditions rather than inflows to Lake Pillsbury in the Eel River watershed, which no longer are necessarily representative of Russian River hydrologic conditions.

These storage thresholds in Lake Mendocino were developed by Sonoma Water engineering staff using its Russian River Simulation Model. The modeling scenarios assume: (1) current Russian River system losses; (2) water year (WY) 1911 to WY 2017 unimpaired flow hydrology, and (3) Potter Valley Project operations based on the Reasonable and Prudent Alternatives contained in the 2004 Potter Valley Project Biological Opinion. The thresholds were developed to approximately replicate the frequency of occurrence of the water supply conditions of Decision 1610, with an 86 percent occurrence of *Normal* conditions, a 10 percent occurrence of *Dry* conditions, and a 4 percent occurrence of *Critical* conditions from January to June. A detailed description of the hydrologic analysis is presented in Attachment 1.

5.0 PROPOSED ACTIONS BY SONOMA WATER

To inform State Water Board staff and interested stakeholders in the Russian River watershed regarding reservoir and watershed conditions, Sonoma Water will prepare a weekly hydrologic status report that contains the following information:

- Current reservoir levels and reservoir storage hydrographs for Lake Mendocino and Lake Sonoma;
- The daily rate of change in storage, inflow and reservoir release for Lake Mendocino and Lake Sonoma; and
- Cumulative rainfall plot for current water year versus historical precipitation range for Ukiah. Cumulative rainfall forecasts for 3-day, 7-day and 16-day.

These reports will be made available on Sonoma Water's website during the term of the order approving Sonoma Water's requested temporary changes.

6.0 WATER CONSERVATION ACTIVITIES

The following water conservation activities reflect the efforts of Sonoma Water and the Sonoma-Marin Saving Water Partnership (Partnership). The Partnership represents thirteen North Bay water utilities in Sonoma and Marin counties that have joined together to provide regional solutions for water use efficiency. The utilities (Partners) are: the Cities of Santa Rosa, Rohnert Park, Petaluma, Sonoma, Cloverdale, Cotati, Healdsburg; North Marin Water, Valley of the Moon and Marin Municipal Water Districts; Cal American Water Company-Larkfield; the Town of Windsor and Sonoma Water. The Partnership was formed to identify and recommend water use efficiency projects and to maximize the cost-effectiveness of water use efficiency programs in our region.

On April 21, 2021, Governor Newsom issued a regional drought emergency proclamation for the Russian River watershed in Sonoma and Mendocino counties. The Sonoma County Board of Supervisors took action on April 27, 2021, proclaiming a local emergency due to drought conditions in support of actions needed to mitigate the adverse environmental, economic, health, welfare and social impacts of the drought. The County of Mendocino acted similarly to declare a local drought emergency.

Recognizing the need to reduce diversions from the Russian River, Sonoma Water's contractors adopted a resolution at the May 3, 2021 Water Advisory Committee (WAC) meeting supporting the water saving efforts of the Partnership and urging a 20 percent reduction in customer water use. The WAC also approved temporary allocations of Sonoma Water deliveries for the period July through October necessary to achieve a 20 percent reduction from 2020 levels for the same period. Subsequent to the adoption of the WAC resolution, the contractors took action with their Boards and/or Councils for activation of the Water Shortage Contingency Plans for their respective agencies as needed to meet the reduction goal. Sonoma Water then filed a TUCP on May 13, 2021, including a proposed action for Sonoma Water and its contractors to reduce Russian River diversions by 20 percent from 2020 levels from July 1 through October 31, 2021.

The subsequent State Board Order WR 2021-0056-EXEC approving Sonoma Water's TUCP included Term 11 stating Sonoma Water and its contractors shall ensure a 20 percent reduction in Russian River diversions for the term of the Order as compared to the same period of the previous year (July 1 – December 10, 2021). Separately, on July 8, 2021, Governor Newsom issued Executive Order N-10-21, adding Marin County to a list of 50 counties in California where a state of emergency exists due to drought conditions, and whereby the Governor called for all Californians to voluntarily reduce their water use by 15 percent from their 2020 levels. As a result, all the Partners continue to implement Water Shortage Contingency Plan stages consistent with achieving a 20 percent or greater reduction in water use.

Outreach Campaigns

Prior to the Governor's April drought emergency proclamation, Sonoma Water, its water contractors, and the other member agencies of the Partnership began implementing an aggressive water saving outreach campaign in winter 2021 to raise awareness of the continued dry-year conditions and low water supply levels in the region, asking customers to eliminate water waste and adopt habits to use less. The campaign started as a paid social media effort and expanded in spring to become a broader multi-media marketing campaign. The campaign, called *It's a Dry Year. Save Water With Us*, included broadcast and streaming radio, weekly print ads in the Santa Rosa Press Democrat newspaper, online digital advertisements for both mobile and desktop devices, sponsored media content, and the development of a dedicated webpage that included weekly water supply updates and current activities being undertaken to affect water use reductions.

An outreach subcommittee of the Partnership began meeting twice monthly in early spring to assess the effectiveness of initial outreach efforts and to continue to grow the campaign in step with changing water supply conditions. A decision was made to shift the campaign to drought messaging and adoption of a new tag line, *Drought is Here. Save Water*. Ad placements for the new campaign began in May 2021 and continued throughout summer into fall. In addition to paid advertising, earned media grew markedly in the spring through summer months and brought greater public awareness of the drought conditions locally. This included a series of news articles in the Santa Rosa Press Democrat newspaper in March and April that featured calls to action to save water. Local water supply conditions also received regional televised news coverage featuring Sonoma Water staff interviews that emphasized the urgent need for water savings.

To increase drought awareness and encourage further water savings from efficiency upgrades, the Partnership held three regional giveaway events on June 12, August 21, and October 9. Called the *Drought Drop By*, the events provided free water saving kits including efficient showerheads, faucet aerators, 5-minute shower timers, hose nozzles, water saving tips-cards, incentive program information for lawn removal, irrigation equipment and appliance upgrades, as well as buckets for capture and reuse of warm-up and rinse water from showers and sinks. The June 12 event occurred at 17 locations in Marin, Sonoma, and Mendocino counties, distributing over 5,600 kits to the public. An additional 3,300 kits were handed out across three counties in August, with 1,100 more kits distributed during the October event. Both the June and August events garnered television news coverage that served to amplify the drought message and the need to save water.

In addition to the *Drought Drop By*, the Partnership undertook several other outreach efforts. This included a regional *Saving Water Challenge* event from July through August, inviting participants to save water by implementing daily actions from a water saving tips list, with an opportunity to win water-saving prizes for entry. The Partnership also developed and marketed a *Trusted Messenger* video campaign featuring local businesses sharing the actions they and others are taking to save water. In October 2021, the Partnership sponsored a webinar series on the use of graywater as a drought-proof resource, providing instruction for Do-It-Yourself home installations of laundry systems, as well as permitted branched drain systems. Lastly, in late summer, work was undertaken to update the outreach campaign materials to keep the *Drought is Here, Save Water* message fresh, to add a focus on fall/winter cutbacks to outdoor irrigation, and to introduce a new *Super Water Saver* campaign for continued outreach through the winter months focused on indoor water saving actions. A media toolkit containing all these new materials was assembled and distributed to all the Partners for joint implementation of paid advertising including, print and digital news publications, social media platforms, and broadcast radio. Additional outreach work that has been completed from spring through fall includes the following:

- Printing and distribution of over 5,000 *Drought is Here, Save Water* yard signs
- Launched new Partnership website (https://www.savingwaterpartnership.org/) with easy to access drought information (ongoing)
- Water Supply Levels graphic updated weekly in the Santa Rosa Press Democrat newspaper and on Sonoma Water and Partnership's websites (ongoing)
- Water Saving Tips campaign at Sonoma County Fair's Summer Fun Fest
- Sonoma Water presentations to over two dozen community groups (ongoing)
- Over 150 media interviews conducted (ongoing)

Russian River Diversion Reduction

For the period July 1, 2021 through the issuance of the State Water Board's amended Order on October 22, 2021, (which temporarily suspended the 20 percent diversion reduction required of Term 11), Sonoma Water's contractors have achieved a 22.7 percent reduction in Russian River diversions as compared to the same period in 2020. This significant reduction in water use reflects both the efforts of customers who heeded the call for water savings and also from effective management and conjunctive use of local water supplies. The Partnership will continue implementing the *Drought is Here, Save Water* outreach campaign as water supply conditions warrant and consistent with meeting the Governor's statewide reduction goal.

Figures

Cumulative inflow to Lake Pillsbury (acre-feet) from Oct 1 through

	1/1	2/1	3/1	4/1	5/1	6/1	
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

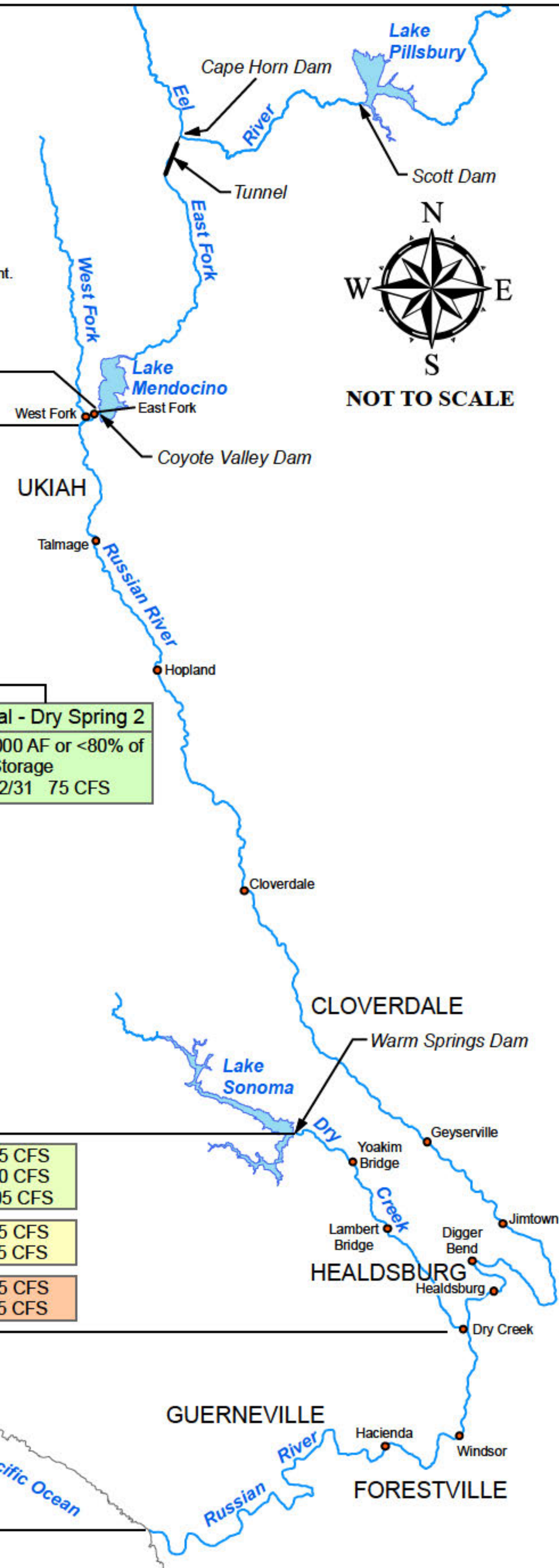
LEGEND

All flows are minimums, expressed in cubic feet per second.

* - Unless Lake Sonoma elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre-Feet

● - USGS Stream Gage Compliance Points



East Fork

Coyote Dam

Mouth of East Fork Russian River

ALWAYS East Fork Russian River Coyote Dam to Russian River 25 CFS

Russian River

NORMAL

1/1 - 3/31 150 CFS
4/1 - 5/31 185 CFS

If Combined Storage in Lake Pillsbury and Lake Mendocino on May 31 is

Normal	Normal - Dry Spring 1	Normal - Dry Spring 2
150,000 AF or >90% of Total Storage 6/1 - 8/31 185 CFS 9/1 - 12/31 150 CFS	130,000 - 150,000 AF or 80-90% of Total Storage whichever is less 6/1 - 12/31 150 CFS	<130,000 AF or <80% of Total Storage 6/1 - 12/31 75 CFS

If Lake Mendocino <30,000 AF Storage
10/1 - 12/31 75 CFS

DRY

75 CFS

CRITICAL

25 CFS

Dry Creek

NORMAL	1/1 - 4/30 75 CFS 5/1 - 10/31 80 CFS 11/1 - 12/31 105 CFS
DRY	4/1 - 10/31 25 CFS 11/1 - 3/31 75 CFS
CRITICAL	4/1 - 10/31 25 CFS 11/1 - 3/31 75 CFS

Mouth of Dry Creek

Russian River

NORMAL	125 CFS*
DRY	85 CFS*
CRITICAL	35 CFS*

Mouth of Russian River

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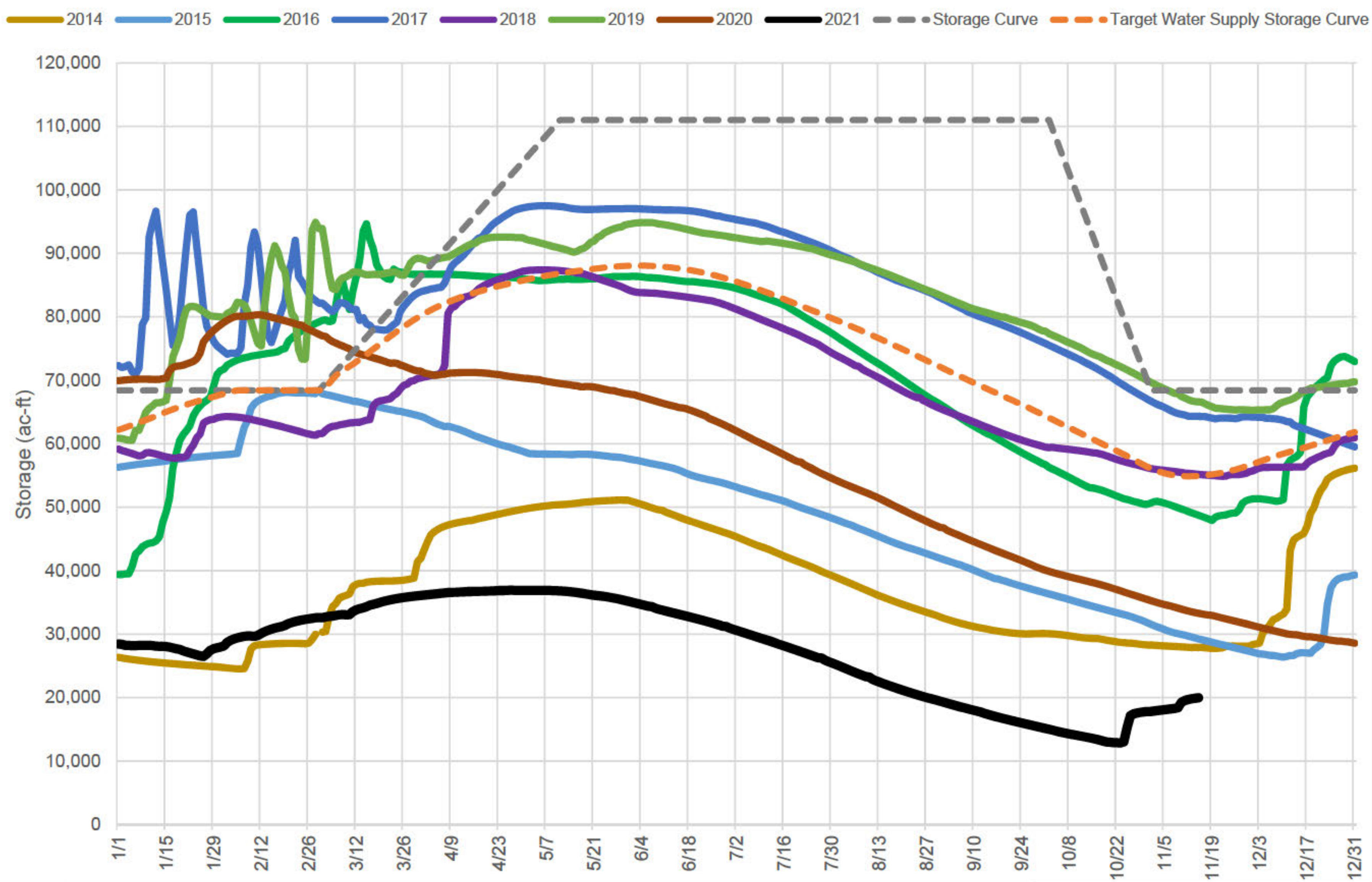
Sonoma Water

Russian River Basin
Streamflow Requirements

Per State Water Resources Control Board Decision 1610, April 1986

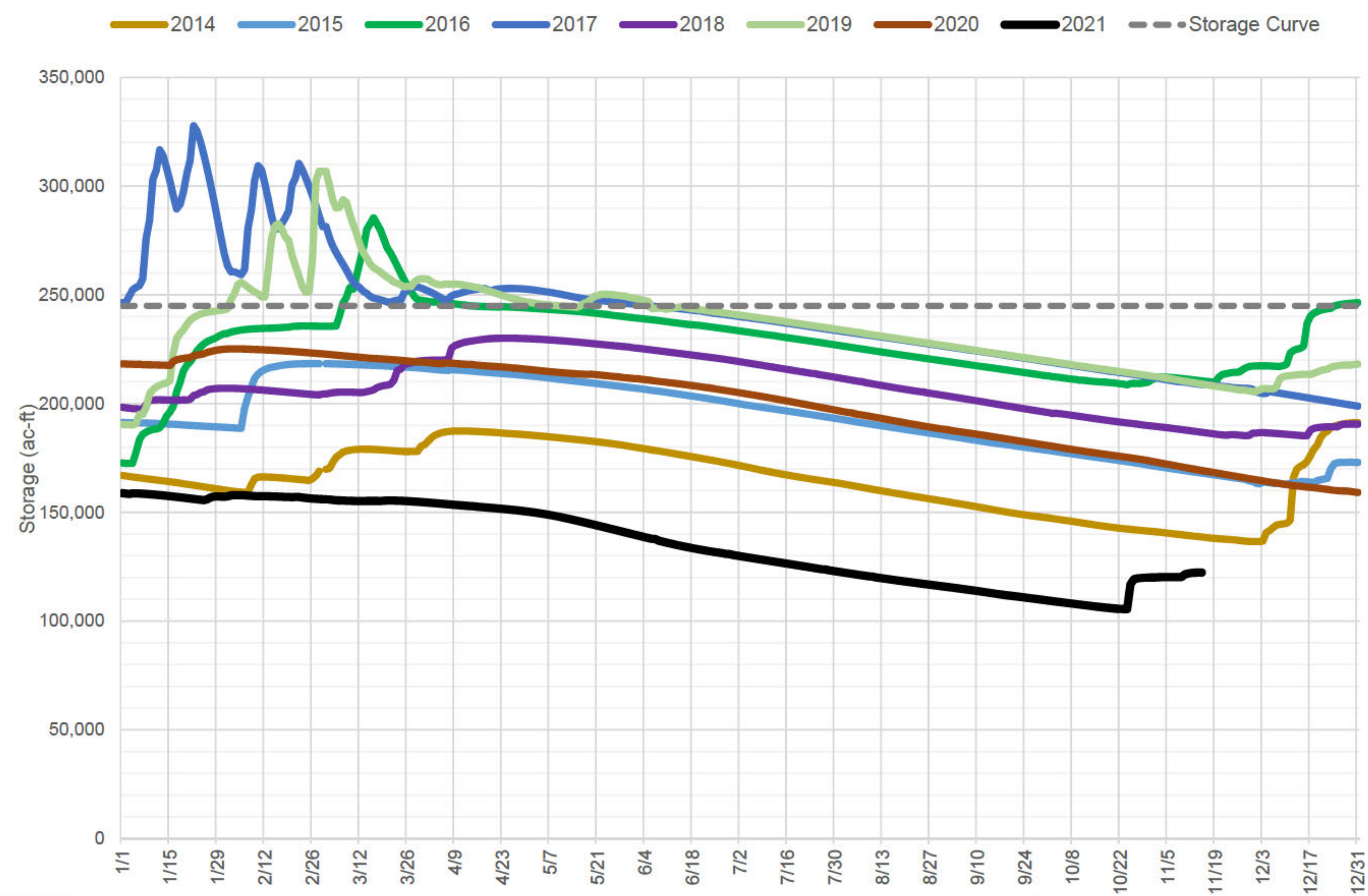
Figure 1



Sonoma Water

Lake Mendocino Storage Hydrograph (2014 - 2021)

Figure 2



Sonoma Water

Lake Sonoma Storage Storage Hydrograph (2014 - 2021)

Figure 3

Lake Mendocino Storage Threshold Analysis

The Lake Mendocino storage thresholds were determined using Sonoma Water's Russian River System Model (RR ResSim). This model was developed using the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center (HEC) ResSim code and is used as a planning tool by Sonoma Water to simulate the effects of various climatic conditions, levels of demand and operational criteria on the water supply available to meet minimum instream flow requirements and demands by downstream users. RR ResSim calculates what releases must be made from Lake Mendocino and Lake Sonoma, taking into account USACE flood control operations criteria, minimum instream flow requirements and/or proposed alternatives to system operations.

The model incorporates 107 water years of hydrologic data (1911 - 2017), represented as daily unimpaired tributary flows into the Russian River and Dry Creek. Unimpaired flows are the "natural" flows, unaffected by man-made influences, such as water demands, or reservoir operations. These unimpaired flows, which form the basis of the hydrology in the model, were synthetically derived by the U.S. Geological Survey using their Basin Characterization Model (BCM) using historical weather, climate and hydrologic data.

The RR ResSim model divides the Russian River and Dry Creek into 13 primary model junctions as presented in Figure 1. Model junctions correspond with important system features such as transfers from the Potter Valley Project (PVP), reservoir releases, major system tributaries and existing stream gage locations. Model reaches are defined as the length of river between each model junction. Within each reach gains associated with unimpaired flows and losses associated with municipal and industrial (M&I) diversions and/or other distributed demands are accounted for.

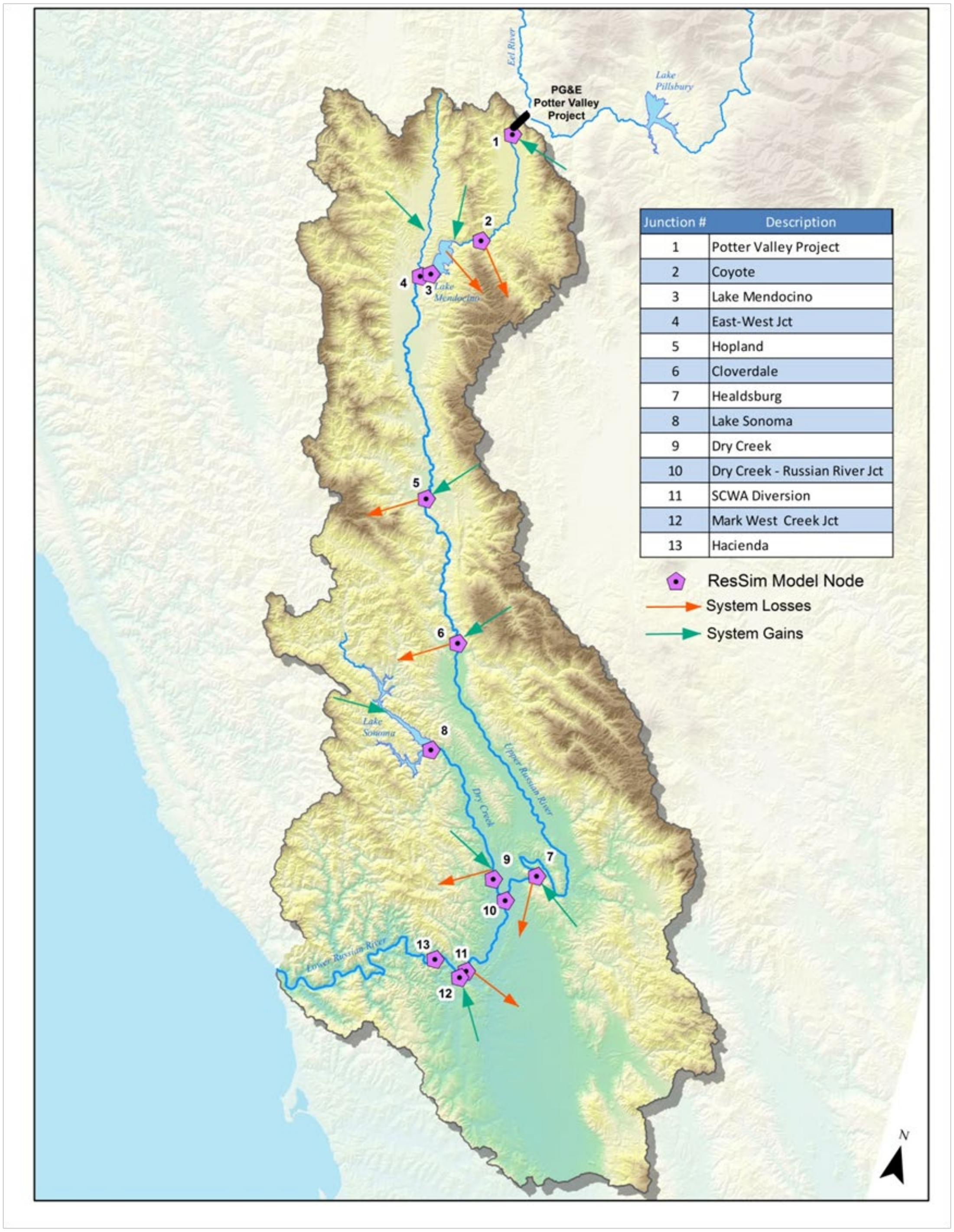


Figure 1: Russian River ResSim Model Schematic

The RR ResSim accounts for losses in the Russian River system that include Sonoma Water's diversions, as well as all other depletions from the watershed including: evapotranspiration by riparian vegetation, aquifer recharge, agricultural diversions and other M&I diversions. The model aggregates system losses by reach between each junction. Sonoma Water's model demands were estimated based on historical river diversions from 2005 to 2012, with an annual diversion of approximately 58,000 acre-feet per year. System losses not associated with the Sonoma Water's diversions were estimated through an analysis of historical M&I data, flow gage data, unimpaired flow data and climate data from 2002 to 2013. Because the model calculates the reservoir releases necessary to meet minimum instream flow requirements, all water uses in the watershed are satisfied by simulated reservoir releases.

PVP diversions were simulated using the PVP ResSim model. The PVP ResSim model was developed by the Water Supply Working Group as part of Congressman Jared Huffman's PVP Ad Hoc group to develop operational alternatives to PVP that met the Ad Hoc's Two Basin objectives. The model encompasses the Lake Pillsbury watershed down to the outlet of Cape Horn Dam (Van Arsdale Reservoir) along the Eel River (Figure 2). The model simulates operations of Scott Dam and Cape Horn Dam, as well as the hydroelectric diversion given a set of physical and operational constraints. Just like the RR ResSim model, it incorporates daily hydrology from water year 1911 through water year 2017. The input hydrology was developed by Western Hydrologics using observed gage records at the reservoir outlets and the change in storage of the reservoirs. Reservoir operations are defined by the 2004 FERC license amendment that implements the Reasonable Prudent Alternative recommended in the 2002 National Marine Fisheries Biological Opinion.

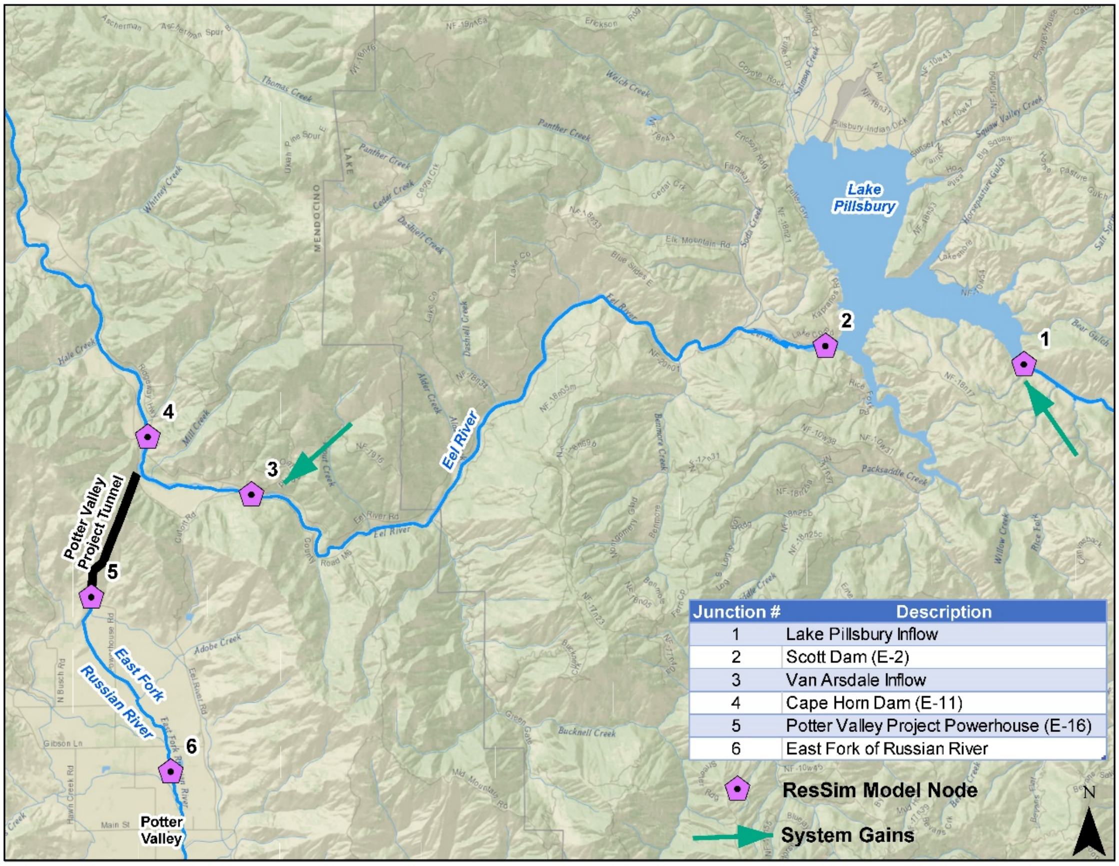


Figure 2: Potter Valley Project ResSim Model Schematic

Lake Mendocino Storage Thresholds

Based on a historical analysis of cumulative inflow into Lake Pillsbury from water year 1911 through water year 2017, the average occurrence frequency of Normal water supply conditions is 86%, of Dry water supply conditions is 11% and of Critical water supply conditions is 4%. Sonoma Water used full period of record simulations (WY1910 – WY2017) with the RR ResSim model to develop storage thresholds for Lake Mendocino to set the water supply condition and associated minimum instream flow requirements for the Russian River that are proposed for use from January through June 2022. These storage thresholds, which were also requested in the Temporary Urgency Change Petition filed by Sonoma Water in December 2013, were designed to approximate the statistical occurrence of *Normal*, *Dry* and *Critical* water supply conditions defined in Decision 1610 from January to June. The percent occurrence of *Normal*, *Dry* and *Critical* water defined by Decision 1610 and the requested storage thresholds are shown in Table 1 below.

Date	D1610 LP[1] Cumulative Inflow			LM[2] Storage Thresholds		
	Normal	Dry	Critical	Normal	Dry	Critical
1-Jan	86.9	9.3	3.7	82.2	6.5	11.2
1-Feb	78.4	13.1	8.4	80.4	14.0	5.7
1-Mar	86.0	9.3	4.7	86.1	7.4	6.5
1-Apr	86.9	10.3	2.8	89.3	7.0	3.7
1-May	86.9	11.2	1.9	90.2	6.0	3.7
1-Jun	87.9	10.3	1.9	93.5	2.8	3.7
Average	**85.5**	**10.6**	**3.9**	**86.9**	**7.3**	**5.8**

Table 1: Percent Occurrence of Water Supply Conditions by Month for D1610 and the Proposed Lake Mendocino Storage Index
[1] Lake Pillsbury [2] Lake Mendocino

Sonoma Water proposes that the monthly storage values listed below be used, in lieu of cumulative Lake Pillsbury inflow, to determine the water supply condition that sets which minimum instream flow requirements in Term 20 of Permit 12947A will apply to the Upper Russian River:

a. Dry water supply conditions will exist when storage in Lake Mendocino is less than:

   40,000 acre-feet as of January 1
   59,000 acre-feet as of February 1
   68,000 acre-feet as of March 1
   69,500 acre-feet as of March 16
   71,000 acre-feet as of April 1
   70,000 acre-feet as of April 16
   69,000 acre-feet as of May 1
   67,500 acre-feet as of May 16
   65,000 acre-feet as of June 1

b. Critical water supply conditions exist when storage in Lake Mendocino is less than:

31,000 acre-feet as of January 1
36,000 acre-feet as of February 1
52,000 acre-feet as of March 1
53,000 acre-feet as of March 16
54,000 acre-feet as of April 1
53,000 acre-feet as of April 16
52,000 acre-feet as of May 1
51,000 acre-feet as of May 16
50,000 acre-feet as of June 1

c. Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

State of California
State Water Resources Control Board
DIVISION OF WATER RIGHTS
P.O. Box 2000, Sacramento, CA 95812-2000
Tel: (916) 341-5300 Fax: (916) 341-5400
http://www.waterboards.ca.gov/waterrights

ENVIRONMENTAL INFORMATION FOR PETITIONS

This form is required for all petitions.

Before the State Water Resources Control Board (State Water Board) can approve a petition, the State Water Board must consider the information contained in an environmental document prepared in compliance with the California Environmental Quality Act (CEQA). This form is not a CEQA document. If a CEQA document has not yet been prepared, a determination must be made of who is responsible for its preparation. As the petitioner, you are responsible for all costs associated with the environmental evaluation and preparation of the required CEQA documents. Please answer the following questions to the best of your ability and submit any studies that have been conducted regarding the environmental evaluation of your project. If you need more space to completely answer the questions, please number and attach additional sheets.

DESCRIPTION OF PROPOSED CHANGES OR WORK REMAINING TO BE COMPLETED

For a petition for change, provide a description of the proposed changes to your project including, but not limited to, type of construction activity, structures existing or to be built, area to be graded or excavated, increase in water diversion and use (up to the amount authorized by the permit), changes in land use, and project operational changes, including changes in how the water will be used. For a petition for extension of time, provide a description of what work has been completed and what remains to be done. Include in your description any of the above elements that will occur during the requested extension period.

See 'Supplement to the November 2021 Temporary Urgency Change Petitions' for a summary of the requested changes.

Insert the attachment number here, if applicable: [ ]

Coordination with Regional Water Quality Control Board

For change petitions only, you must request consultation with the Regional Water Quality Control Board regarding the potential effects of your proposed change on water quality and other instream beneficial uses. (Cal. Code Regs., tit. 23, § 794.) In order to determine the appropriate office for consultation, see: http://www.waterboards.ca.gov/waterboards_map.shtml. Provide the date you submitted your request for consultation here, then provide the following information.

Date of Request: 11/5/2021

Will your project, during construction or operation, (1) generate waste or wastewater containing such things as sewage, industrial chemicals, metals, or agricultural chemicals, or (2) cause erosion, turbidity or sedimentation? ○ Yes ◉ No

Will a waste discharge permit be required for the project? ○ Yes ◉ No

If necessary, provide additional information below:

On November 5, 2021 at the weekly meeting with the fishery agencies and Bryan McFadin of the North Coast Regional Water Quality Control Board (NCRWQCB), this filing was discussed. These meetings are held per term 5 of the June 14, 2021 Temporary Urgency Change Order. This meeting addressed the pending filing of these temporary urgency change petitions and the potential impacts to water quality. An additional consultation meeting is planned for the week of November 15th for further discussions.

Insert the attachment number here, if applicable:

Local Permits

For temporary transfers only, you must contact the board of supervisors for the county(ies) both for where you currently store or use water and where you propose to transfer the water. (Wat. Code § 1726.) Provide the date you submitted your request for consultation here.

Date of Contact:

For change petitions only, you should contact your local planning or public works department and provide the information below.

Person Contacted:

Date of Contact:

Department:

Phone Number:

County Zoning Designation:

Are any county permits required for your project? If yes, indicate type below. ○ Yes ◉ No

☐ Grading Permit ☐ Use Permit ☐ Watercourse ☐ Obstruction Permit

☐ Change of Zoning ☐ General Plan Change ☐ Other (explain below)

If applicable, have you obtained any of the permits listed above? If yes, provide copies. ○ Yes ○ No

If necessary, provide additional information below:

Insert the attachment number here, if applicable:

Federal and State Permits

Check any additional agencies that may require permits or other approvals for your project:

- [ ] Regional Water Quality Control Board
- [ ] Department of Fish and Game
- [ ] Dept of Water Resources, Division of Safety of Dams
- [ ] California Coastal Commission
- [ ] State Reclamation Board
- [ ] U.S. Army Corps of Engineers
- [ ] U.S. Forest Service
- [ ] Bureau of Land Management
- [ ] Federal Energy Regulatory Commission
- [ ] Natural Resources Conservation Service

Have you obtained any of the permits listed above? If yes, provide copies. ○ Yes ◉ No

For each agency from which a permit is required, provide the following information:

Agency	Permit Type	Person(s) Contacted	Contact Date	Phone Number

If necessary, provide additional information below:

Insert the attachment number here, if applicable:

Construction or Grading Activity

Does the project involve any construction or grading-related activity that has significantly altered or would significantly alter the bed, bank or riparian habitat of any stream or lake? ○ Yes ◉ No

If necessary, provide additional information below:

Insert the attachment number here, if applicable:

Archeology

Has an archeological report been prepared for this project? If yes, provide a copy. ◯ Yes ◉ No

Will another public agency be preparing an archeological report? ◯ Yes ◉ No

Do you know of any archeological or historic sites in the area? If yes, explain below. ◯ Yes ◉ No

If necessary, provide additional information below:

Insert the attachment number here, if applicable:

Photographs

For all petitions other than time extensions, attach complete sets of color photographs, clearly dated and labeled, showing the vegetation that exists at the following three locations:

- ☒ Along the stream channel immediately downstream from each point of diversion
- ☒ Along the stream channel immediately upstream from each point of diversion
- ☒ At the place where water subject to this water right will be used

Maps

For all petitions other than time extensions, attach maps labeled in accordance with the regulations showing all applicable features, both present and proposed, including but not limited to: point of diversion, point of rediversion, distribution of storage reservoirs, point of discharge of treated wastewater, place of use, and location of instream flow dedication reach. (Cal. Code Regs., tit. 23, §§ 715 et seq., 794.)

Pursuant to California Code of Regulations, title 23, section 794, petitions for change submitted without maps may not be accepted.

All Water Right Holders Must Sign This Form:

I (we) hereby certify that the statements I (we) have furnished above and in the attachments are complete to the best of my (our) ability and that the facts, statements, and information presented are true and correct to the best of my (our) knowledge. Dated 11.16.21 at Santa Rosa, CA .

[redacted]

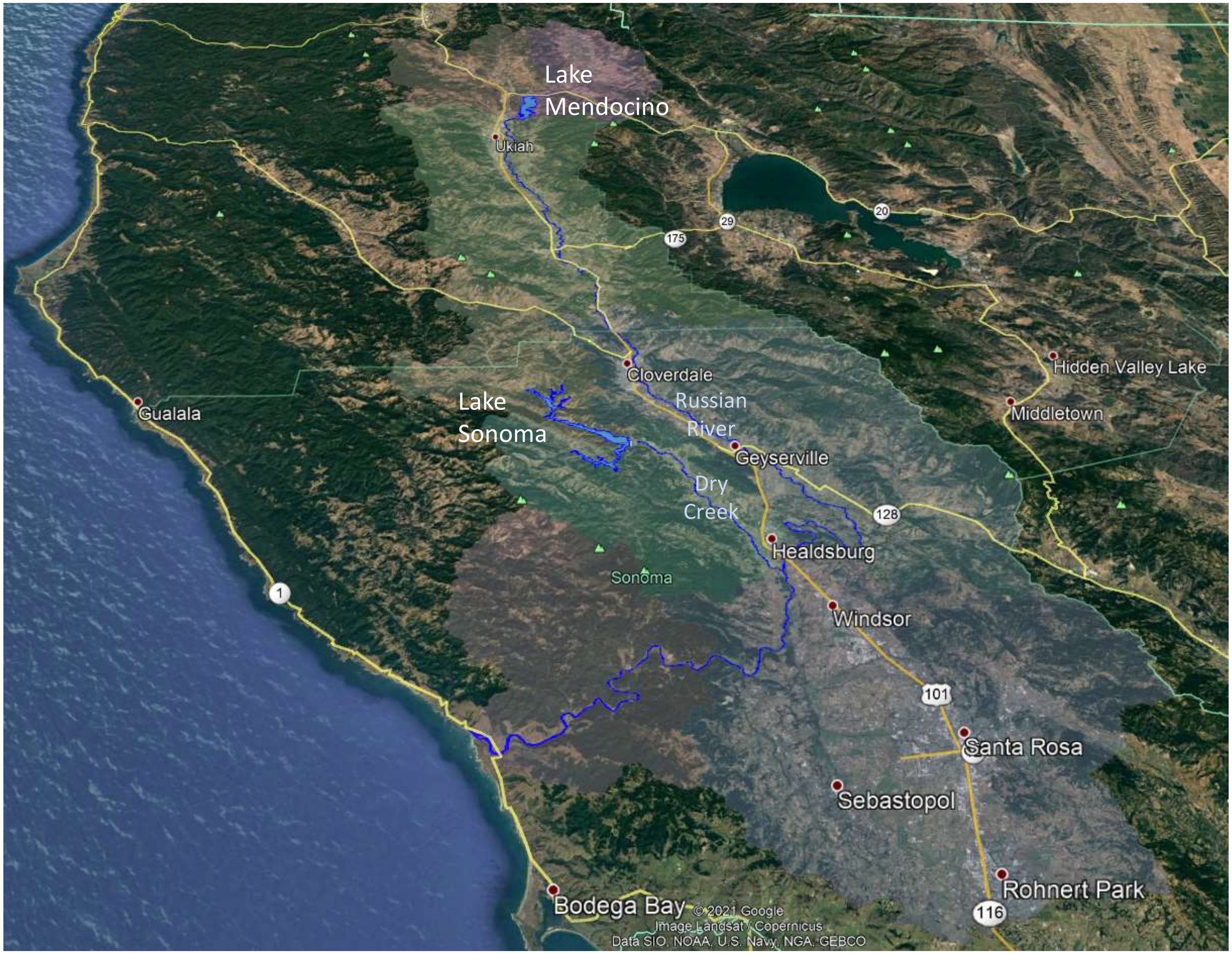
Water Right Holder or Authorized Agent Signature

Water Right Holder or Authorized Agent Signature

NOTE:

- **Petitions for Change may not be accepted unless you include proof that a copy of the petition was served on the Department of Fish and Game. (Cal. Code Regs., tit. 23, § 794.)**
- **Petitions for Temporary Transfer may not be accepted unless you include proof that a copy of the petition was served on the Department of Fish and Game and the board of supervisors for the county(ies) where you currently store or use water and the county(ies) where you propose to transfer the water. (Wat. Code § 1726.)**

Sonoma Water
Russian River Watershed Place of Water Use



SONOMA WATER

Photographs of Russian River Downstream of River Diversion System at Mirabel Park on Oct 14, 2021

Mirabel Inflatable Dam

NOTICE OF EXEMPTION

TO: ☒ Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

☒ County Clerk
County of Sonoma
585 Fiscal Drive, Room 103
Santa Rosa, CA 95403

☒ County Clerk
County of Mendocino
501 Low Gap Road
Ukiah, CA 95482

FROM: Sonoma County Water Agency
404 Aviation Blvd.
Santa Rosa, CA 95403

Project Title: Petitions Requesting Approval of Temporary Urgency Changes in Water Right Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties

Project Location- Specific: The proposed action would occur in Mendocino and Sonoma counties at Lake Mendocino, in the Upper Russian River from Coyote Valley Dam/Lake Mendocino to the confluence with Dry Creek, Dry Creek downstream of Warm Springs Dam/Lake Sonoma, and in the Lower Russian River from the confluence with Dry Creek to the Pacific Ocean. Figure 1 shows the minimum instream flow requirements for the Russian River system. Communities and cities along the Russian River include Ukiah, Hopland, Cloverdale, Geyserville, Healdsburg, Forestville, Mirabel Park, Rio Nido, Guerneville, Monte Rio, Duncans Mills, and Jenner.

Project Location – City: N/A

Project Location – County: Mendocino and Sonoma

Description of Nature, Purpose and Beneficiaries of Project: The Sonoma County Water Agency (Sonoma Water) controls and coordinates water supply releases from the Coyote Valley Dam and Warm Springs Dam projects in accordance with the provisions of water rights Decision 1610, which the State Water Resources Control Board (State Water Board) adopted on April 17, 1986. Decision 1610 specifies the water supply conditions for the Russian River and the minimum instream flow requirements for the Upper Russian River, Dry Creek, and the Lower Russian River, which vary based on hydrological conditions and cumulative inflow into Lake Pillsbury as the hydrologic index (Figure 1).

Sonoma Water is filing temporary urgency change petitions (TUCP) requesting that storage thresholds in Lake Mendocino be used as the hydrologic index to determine the water supply condition in the Russian River watershed.

These changes are necessary to ensure that the water supply condition and corresponding minimum instream flow requirements in the Russian River watershed are aligned with actual watershed hydrologic conditions. This is essential to maintain sustainable reservoir/river operations to protect municipal water supply and listed salmon species in the Russian River.

In Sonoma Water's water right permits established under State Water Board's Decision 1610, the water supply condition for the Russian River is determined using cumulative inflow into Lake Pillsbury as the hydrologic index. Lake Pillsbury is a storage reservoir located in the Eel River watershed for Pacific Gas & Electric Company's (PG&E) Potter Valley Hydroelectric Project (PVP) which transfers water into the East Fork of the Russian River. PG&E has informed Sonoma Water that the transformer bank at the PVP powerhouse failed and will need to be replaced in order to convey water through the powerhouse for power generation. PG&E estimates it will take up to two years to replace the transformer bank at a cost of five to ten million dollars. It is highly uncertain whether PG&E will make the necessary repairs to continue power generation as its Federal Energy Regulatory Commission (FERC) operating license expires in April 2022. In January 2019, PG&E withdrew its Preliminary Application Document and Notice of Intent to relicense the project.

Currently, the PVP is rated at a flow rate up to 240 cubic feet per second (cfs) through the powerhouse for power generation. PG&E can bypass the powerhouse at flow rates up to 135 cfs to meet FERC license requirements for minimum instream releases into the East Branch Russian River and water supply contract requirements with the Potter Valley Irrigation District (PVID).

PG&E's transfer obligations to meet FERC license requirements and PVID contract amounts until April 14 is 45 cfs. PG&E has indicated that, without the ability to generate hydropower, it is unlikely PG&E will make discretionary transfers of Eel River water through the PVP above its license and contract obligations. Discretionary transfers to generate hydropower can occur up until early April if hydrologic conditions on the Eel River and at Lake Pillsbury are being met. Without the discretionary transfer of Eel River water to generate hydropower, the total transfer through the PVP will be reduced by up to 400 acre-feet per day.

Under these operating conditions of the PVP, the influence of the Eel River water imports on downstream hydrologic conditions in the Russian River will be greatly diminished. Therefore, there will be little to no correlation between cumulative inflow into Lake Pillsbury and the hydrologic conditions in the Russian River watershed.

In addition, current drought conditions continue to deplete storage in Lake Mendocino and Lake Sonoma. As of November 15, 2021, the water supply storage level in Lake Mendocino was 19,995 acre-feet (AF). This storage level is approximately 29 percent of the available water conservation pool for this time of year. This is the second lowest storage level for this time of year since Lake Mendocino filled in 1959. As of November 15, 2021 the water supply storage level in Lake Sonoma was 122,322 acre-feet. This storage level is approximately 50 percent of the available water conservation pool. This is the lowest storage level for this time of year since Lake Sonoma filled in 1986.

Consequently, Sonoma Water is requesting the State Water Board approve TUCPs that uses storage thresholds in Lake Mendocino as the hydrologic index to determine the water supply condition in the Russian River watershed.

Name of Public Agency Approving Project: State Water Resources Control Board – Division of Water Rights

Name of Person or Agency Carrying Out Project: Sonoma County Water Agency

Exempt Status (check one):

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☒ Emergency Project (Sec.21080 (b)(4); 15269(b)(c)): Section 21080(b)(4) and State CEQA Guidelines 15269(c): Specific actions necessary to prevent or mitigate an emergency
- ☒ Categorical Exemption. State type and section number: State CEQA Guidelines 15307: Actions by Regulatory Agencies for Protection of Natural Resources; State CEQA Guidelines 15308: Actions by Regulatory Agencies for Protection of the Environment
- ☒ Exemption under Governor's April 21, 2021 emergency proclamation (Sec. 7): Government Code section 8571
- ☐ Statutory Exemptions. State Code number:

Reasons why project is exempt: The proposed action is statutorily exempt under California Environmental Quality Act (CEQA) Statute 21080(b)(4) and categorically exempt from CEQA under the State CEQA Guidelines Sections 15269(c), 15307 and 15308, and under Section 7 of the Governor's April 21 2021, emergency drought proclamation for the Russian River watershed, which remains in effect.

A. Actions to Prevent or Mitigate an Emergency

California Public Resources Code, Division 13, Section 21080(b)(4) provides that specific actions necessary to prevent or mitigate an emergency are exempt from CEQA. The emergency conditions are due to the drastic reduction of potential Eel River water imports through the PVP resulting from the inoperability of the powerhouse for the foreseeable future. The volume of imported Eel River water that can be transferred with the powerhouse being inoperable results in little or no correlation between cumulative inflow into Lake Pillsbury and the hydrologic condition in the Russian River. Without the proposed changes, the applicable minimum instream flow requirements may require releases of water from Lake Mendocino and Lake Sonoma at levels that would risk significant depletions of storage to severely low levels. Such depletions in storage could cause serious impacts to human health and welfare and reduce water supplies needed for fishery protection.

These emergency conditions also are demonstrated by Governor Newsom's April 21, 2021 proclamation of a drought emergency in Sonoma and Mendocino Counties due to drought conditions in the Russian River Watershed (Governor's Drought Proclamation). Section 7 of the Governor's Drought Proclamation suspends the requirements of CEQA for purposes of the State Water Board's consideration of modifying reservoir releases based on a representative hydrologic index, which would be a necessary element of an order granting the TUCP. The Governor has continued that proclamation for Sonoma and Mendocino Counties through further drought proclamations on May 10, July 8 and October 19, 2021.

In addition, the Sonoma County Board of Supervisors on April 27, 2021, proclaimed a local emergency due to drought conditions in the Sonoma County Operational Area (most recently continued on November 2, 2021) and the Mendocino County Board of Supervisors April 20, 2021, adopted a resolution declaring a local emergency and imminent threat of disaster in Mendocino County due to drought conditions.

B. Actions by Regulatory Agencies for Protection of Natural Resources and the Environment
CEQA Guidelines Sections 15307 and 15308 provide that actions taken by regulatory agencies to assure the maintenance, restoration or enhancement of a natural resource and the environment are categorically exempt. Sonoma Water is proposing temporary urgency changes to its water right Permits 12947A, 12949, 12950, and 16596 that the State Water Resources Control Board, as the regulatory agency, will consider and potentially approve. Those changes are necessary in order to maintain viable operations to support municipal use, protect listed salmon species, address water supply conditions at Lake Mendocino and Lake Sonoma, and prevent Lake Mendocino from declining to a storage level at which the reservoir may no longer be functional in light of the extremely dry hydrology the region experienced in water years 2020 and 2021. Approval of the TUCP would provide alternative storage thresholds and criteria for determining minimum instream flow requirements for the Russian River that would be based on a more accurate assessment of water supply conditions in the Russian River watershed. This would result in minimum instream flow requirements that more likely can be sustained with releases from Lake Mendocino and Lake Sonoma without severely depleting storage.

C. Governor's Drought Proclamation
Government Code section 8571 authorizes the Governor to suspend certain regulatory requirements, including CEQA, under emergency conditions. Section 7 of the Governor's April 21 Drought Proclamation suspended CEQA to address "the acutely dry conditions in the Russian River Watershed" through the State Water Board's consideration of modifications of reservoir releases "to ensure adequate, minimal water supplies for critical purposes." The Governor later issued drought proclamations on May 10, July 8 and October 19, 2021, but section 7 of his April 21 proclamation remains in effect. The TUCP's purpose is to modify the storage thresholds from Lake Pillsbury to Lake Mendocino to be used as the hydrologic index to determine the water supply condition in the Russian River watershed and is within the suspension of CEQA under section 7 of the Governor's Drought Proclamation.

Lead Agency Contact Person: Jessica Martini-Lamb **Area Code/Telephone/Extension:** 707-547-1903

[redacted]	General Manager	November 16, 2021
Signature	*Title*	*Date*

☒ Signed by Lead Agency

☐ Signed by Applicant

Date received for filing at OPR:____________________

Russian River Basin
Streamflow Requirements

Per State Water Resources Control Board Decision 1610, April 1986

Cumulative inflow to Lake Pillsbury (acre-feet) from Oct 1 through	1/1	2/1	3/1	4/1	5/1	6/1	
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

LEGEND

All flows are minimums, expressed in cubic feet per second.

* - Unless Lake Sonoma elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre-Feet

● - USGS Stream Gage Compliance Points

East Fork

Coyote Dam

Mouth of East Fork Russian River

ALWAYS East Fork Russian River
Coyote Dam to Russian River 25 CFS

Russian River

NORMAL

1/1 - 3/31 150 CFS
4/1 - 5/31 185 CFS

If Combined Storage in Lake Pillsbury and Lake Mendocino on May 31 is

Normal	Normal - Dry Spring 1	Normal - Dry Spring 2
150,000 AF or >90% of Total Storage 6/1 - 8/31 185 CFS 9/1 - 12/31 150 CFS	130,000 - 150,000 AF or 80-90% of Total Storage whichever is less 6/1 - 12/31 150 CFS	<130,000 AF or <80% of Total Storage 6/1 - 12/31 75 CFS

Normal - Dry Spring 1: If Lake Mendocino <30,000 AF Storage
10/1 - 12/31 75 CFS

DRY

75 CFS

CRITICAL

25 CFS

Dry Creek

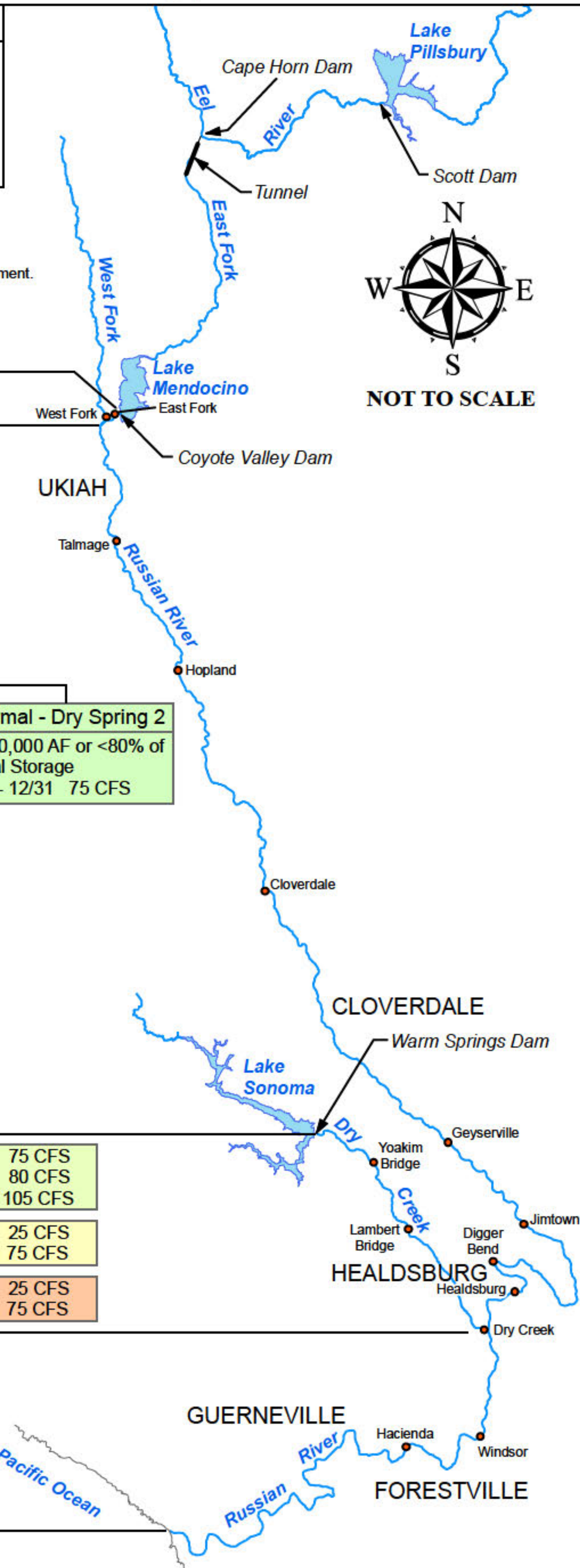
NORMAL	1/1 - 4/30 75 CFS 5/1 - 10/31 80 CFS 11/1 - 12/31 105 CFS
DRY	4/1 - 10/31 25 CFS 11/1 - 3/31 75 CFS
CRITICAL	4/1 - 10/31 25 CFS 11/1 - 3/31 75 CFS

Mouth of Dry Creek

Russian River

NORMAL	125 CFS*
DRY	85 CFS*
CRITICAL	35 CFS*

Mouth of Russian River



Sonoma Water

Figure 1

Appendix A-2

STATE OF CALIFORNIA
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

In the Matter of Permits 12947A, 12949, 12950, and 16596
(Applications 12919A, 15736, 15737, 19351)

Sonoma County Water Agency

ORDER APPROVING TEMPORARY URGENCY CHANGE

SOURCE: Dry Creek, Russian River, and East Fork Russian River

COUNTIES: Sonoma and Mendocino Counties

BY THE DEPUTY DIRECTOR FOR WATER RIGHTS:

1.0 SUBSTANCE OF TEMPORARY URGENCY CHANGE PETITION

On November 17, 2021, Sonoma County Water Agency (Sonoma Water) filed Temporary Urgency Change Petitions (TUCPs) with the State Water Resources Control Board (State Water Board), Division of Water Rights (Division) requesting approval of changes to the subject permits pursuant to California Water Code section 1435. The TUCPs request implementation of an alternative hydrologic index based on Lake Mendocino storage values starting December 11, 2021 (proposed hydrologic index). The proposed hydrologic index is requested in lieu of the hydrologic index contained in the subject permits that is based on cumulative Lake Pillsbury inflow (current hydrologic index). The hydrologic index is used to determine the applicable minimum instream flow requirements in Term 20 of Permit 12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596. Sonoma Water's proposed hydrologic index, for up to 180 days beginning December 11, 2021, is as follows:

a. Dry water supply conditions will exist when storage in Lake Mendocino is less than:

40,000 acre-feet as of January 1
59,000 acre-feet as of February 1
68,000 acre-feet as of March 1
69,500 acre-feet as of March 16

71,000 acre-feet as of April 1
70,000 acre-feet as of April 16
69,000 acre-feet as of May 1
67,500 acre-feet as of May 16
65,000 acre-feet as of June 1

b. Critical water supply conditions exist when storage in Lake Mendocino is less than:

31,000 acre-feet as of January 1
36,000 acre-feet as of February 1
52,000 acre-feet as of March 1
53,000 acre-feet as of March 16
54,000 acre-feet as of April 1
53,000 acre-feet as of April 16
52,000 acre-feet as of May 1
51,000 acre-feet as of May 16
50,000 acre-feet as of June 1

c. Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

This temporary change is requested in response to the current extremely dry conditions, severely low storage levels in Lake Mendocino and Lake Sonoma, and the current hydrologic index not aligning with observed hydrologic conditions in the Russian River Watershed. The proposed change is also requested in response to the reported failure of the transformer bank of the Potter Valley Project (PVP) hydroelectric plant in October 2021 that will likely continue to result in a significant reduction in the inter-basin transfers of Eel River water into the Russian River Watershed.

2.0 BACKGROUND

Sonoma Water controls and coordinates water supply releases from Lake Mendocino and Lake Sonoma to implement the minimum instream flow requirements in accordance with its water rights, including permit terms implemented pursuant to Decision 1610, which the State Water Board adopted on April 17, 1986. Decision 1610 specifies minimum instream flow requirements for the Upper Russian River[1], Dry Creek, and the Lower Russian River[2]. These minimum instream flow requirements vary based on water supply conditions specified in Decision 1610 and are contained in Term 20 of Permit

---

[1] For purposes of this Order, Upper Russian River refers to the mainstem Russian River from its confluence with the East Fork Russian River to its confluence with Dry Creek.
[2] For purposes of this Order, the Lower Russian River refers to the mainstem Russian River from its confluence with Dry Creek to the Pacific Ocean.

12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596. Sonoma Water's operations are also subject to the National Marine Fisheries Service (NMFS) Russian River Biological Opinion issued in 2008.

2.2 Sonoma Water's Water Right Permits

The TUCPs involve the following water right permits held by Sonoma Water:

- Permit 12947A (Application 12919A), which authorizes direct diversion of 92 cubic feet per second (cfs) from the East Fork Russian River and storage of 122,500 acre-feet (AF or af) per year in Lake Mendocino from January 1 through December 31 of each year;

- Permit 12949 (Application 15736), which authorizes direct diversion of 20 cfs from the Russian River from January 1 through December 31 of each year;

- Permit 12950 (Application 15737), which authorizes direct diversion of 60 cfs from the Russian River from April 1 through September 30 of each year; and

- Permit 16596 (Application 19351), which authorizes direct diversion of 180 cfs from the Russian River from January 1 to December 31 of each year and storage of 245,000 AF in Lake Sonoma from October 1 of each year to May 1 of the succeeding year.

Term 20 of Sonoma Water's Permit 12947A states the following:

For the protection of fish and wildlife, and for the maintenance of recreation in the Russian River, permittee shall pass through or release from storage at Lake Mendocino sufficient water to maintain:

A. A continuous streamflow in the [East Fork Russian River] from Coyote Dam to its confluence with the Russian River of 25 cfs at all times.

B. The following minimum flows in the Russian River between the [East Fork Russian River] and Dry Creek:

1. During normal water supply conditions when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year exceeds 150,000 af or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through August 31	*185 cfs*
From September 1 through March 31	*150 cfs*
From April 1 through May 31	*185 cfs*

2. *During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is between 150,000 af or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less, and 130,000 af or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:*

From June 1 through March 31	*150 cfs*
From April 1 through May 31	*185 cfs*
If from October 1 through December 31, storage in Lake Mendocino is less than 30,000 acre-feet	*75 cfs*

3. *During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 af or 80 percent of the estimated water supply storage capacity of [the] reservoirs, whichever is less:*

From June 1 through December 31	*75 cfs*
From January 1 through March 31	*150 cfs*
From April 1 through May 31	*185 cfs*

4. *During dry water supply conditions* — *75 cfs*

5. *During critical water supply conditions* — *25 cfs*

C. *The following minimum flows in the Russian River between its confluence with Dry Creek and the Pacific Ocean to the extent that such flows cannot be met by releases from storage at Lake Sonoma under Permit 16596 issued on Application 19351:*

1. *During normal water supply conditions* — *125 cfs*

2. *During dry water supply conditions* — *85 cfs*

3. *During critical water supply conditions* — *35 cfs*

Term 13 of Permit 16596 states the following:

For the protection of fish and wildlife in Dry Creek and the Russian River and for the maintenance of recreation in the Russian River, permittee shall pass through or release from storage at Lake Sonoma sufficient water to maintain:

A) The following minimum flows in Dry Creek between Warm Springs Dam and its confluence with the Russian River:

1) During normal water supply conditions:

75 cfs from January 1 through April 30
80 cfs from May 1 through October 31
105 cfs from November 1 through December 30

2) During dry or critical water supply conditions:

25 cfs from April 1 through October 31
75 cfs from November 1 through March 31

B) The following minimum flows in the Russian River between its confluence with Dry Creek and the Pacific Ocean, unless the water level in Lake Sonoma is below elevation 292.0 feet with reference to the National Geodetic Vertical Datum of 1929, or unless prohibited by the United States Government:

1) During normal water supply conditions - 125 cfs

2) During dry water supply conditions - 85 cfs

3) During critical water supply conditions - 35 [cfs]

Term 17 of Permit 12949 and Term 17 of Permit 12950 both state the following:

For the protection of fish and wildlife, and the maintenance of recreation in the Russian River, permittee shall allow sufficient water to bypass the points of diversion to maintain the following minimum flows to the Pacific Ocean:

(1) During normal water supply conditions: 125 cfs. . .

(2) During dry water supply conditions: 85 cfs

(3) During critical water supply conditions: 35 cfs

Water supply conditions established for the above flow requirements as required in Decision 1610 are defined in Term 20 of Permit 12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596 as follows:

1. *Dry water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:*

   8,000 acre-feet as of January 1
   39,200 acre-feet as of February 1
   65,700 acre-feet as of March 1
   114,500 acre-feet as of April 1
   145,600 acre-feet as of May 1
   160,000 acre-feet as of June 1

2. *Critical water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:*

   4,000 acre-feet as of January 1
   20,000 acre-feet as of February 1
   45,000 acre-feet as of March 1
   50,000 acre-feet as of April 1
   70,000 acre-feet as of May 1
   75,000 acre-feet as of June 1

3. *Normal water supply conditions exist in the absence of defined dry or critical water supply conditions. . .*

4. *The water supply condition designation for the months of July through December [shall] be the same as the designation for the previous June. Water supply conditions for January through June [shall] be redetermined monthly.*

5. *Cumulative inflow to Lake Pillsbury is the calculated algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury, and evaporation from Lake Pillsbury.*

Term 20 of Permit 12947A includes an additional provision:

6. *Estimated water supply storage space is the calculated reservoir volume below elevation 1,828.3 feet . . . in Lake Pillsbury and below elevation 749.0 [feet] in Lake Mendocino. Both elevations refer to the National Geodetic Vertical Datum . . . of 1929. The calculation shall use the most recent two reservoir volume surveys made by the U.S. Geological Survey (USGS), U.S. Army Corps of Engineers, or other responsible agency to determine the rate of sedimentation to be assumed from the date of the most recent reservoir volume survey.*

2.2 Current Drought Conditions and Response

The Russian River Watershed has experienced extremely dry conditions since 2020, with Water Year 2021 being the second driest year in the Ukiah Valley, and Water Year 2020 being the fourth driest, during the past 127 years of record. Lake Mendocino and Lake Sonoma are at or near their lowest levels since they began storing water in 1959 and 1984, respectively. As of November 15, 2021, the water supply storage level was 19,995 AF in Lake Mendocino, at approximately 29 percent of the available water conservation pool, which is the second lowest storage level for this time of the year since Lake Mendocino was filled in 1959. As of November 15, 2021, the water supply storage level was 122,322 AF in Lake Sonoma, which is the lowest storage level for this time of the year since Lake Sonoma was filled in 1986.

In addition to the extremely dry conditions in the past two years, the Russian River Watershed is expecting significantly less transfer water from the Eel River due to the PVP powerhouse failure. On October 7, 2021, Pacific Gas & Electric (PG&E) informed Sonoma Water that the transformer bank at the PVP powerhouse had failed and would need to be replaced to operate the powerhouse for power generation. Sonoma Water indicates it is highly uncertain that PG&E will make the costly repairs to continue power generation at PVP. PG&E's Federal Energy Regulatory Commission (FERC) license for PVP expires in April 2022, and PG&E withdrew its preliminary application document and notice of intent to relicense the project in January 2019.

In the TUCPs, Sonoma Water indicates the PVP can divert up to 240 cfs through the powerhouse into the East Fork Russian River under normal conditions. Sonoma Water also states that the PVP can separately bypass up to 135 cfs into the East Fork Russian River to meet both FERC license East Fork Russian River instream flow requirements and Potter Valley Irrigation District (PVID) water supply contract requirements. According to Sonoma Water, PG&E is currently bypassing 45 cfs into the East Fork Russian River to meet its stated FERC license obligations and PVID contract amounts until April 14, 2022. The transfer requirement to the East Fork Russian River will reportedly be reassessed based on the water supply conditions after that. PG&E has indicated that without powerhouse operation, it will be unlikely to make discretionary transfers of Eel River water through the PVP above its FERC license and contract obligations. Sonoma Water states that the total transfer through the PVP will be reduced by up to 400 AF per day without the discretionary transfer of Eel River water from hydropower generation, resulting in a significant reduction of a source of inflow to Lake Mendocino.

Sonoma Water states that under these operating conditions of the PVP, the influence of the Eel River water imports on Lake Mendocino water storage and downstream hydrologic conditions in the Russian River will be greatly diminished. Therefore, there will be little to no correlation between cumulative inflow into Lake Pillsbury and the hydrologic conditions in the Russian River Watershed. The TUCPs request that storage thresholds in Lake Mendocino be used directly as the hydrologic index to determine the water supply condition in the Russian River Watershed. The same storage thresholds were requested by Sonoma Water in prior TUCPs approved in December 2013 and February 2021.

The current severe water supply shortage in the Russian River Watershed, particularly the Upper Russian River, resulting from two consecutive extremely dry years, has been recognized by both the state and local governments. On April 21, 2021, Governor Gavin Newsom proclaimed a regional drought emergency for the Russian River Watershed in Mendocino and Sonoma counties. The Governor has continued the drought emergency proclamation for Sonoma and Mendocino counties through further drought proclamations on May 10, July 8, and October 19, 2021. On April 20, 2021, Mendocino County declared a local emergency and imminent threat of disaster in Mendocino County due to drought conditions. On April 27, 2021, Sonoma County also adopted a resolution proclaiming a local drought emergency due to drought conditions in Sonoma County. On June 15, 2021, the State Water Board adopted an emergency regulation for the Curtailment of Diversions to Protect Water Supplies and Threatened and Endangered Fish in the Russian River Watershed (Cal. Code Regs., tit. 23, §§ 877-879.2). Consequently, on August 2, 2021, the State Water Board issued curtailment orders to Upper Russian River Watershed diverters. On August 10, 2021, the State Water Board issued curtailment orders to Lower Russian River Watershed diverters. Due to temporary high flows resulting from atmospheric river conditions, curtailments were temporarily suspended on October 21, 2021, in the Lower Russian River Watershed and on October 23, 2021, in the Upper Russian River Watershed. Temporary curtailment suspensions will likely remain in place through the month of December, based on current forecasts. Curtailments may resume in early January 2022 unless additional precipitation beyond what is currently forecasted occurs.

Sonoma Water has filed three previous sets of TUCPs since June 2020 to address the current drought. On July 28, 2020, in Order WR 2020-0102-EXEC (2020 TUCP order), the State Water Board approved Sonoma Water's TUCPs to temporarily reduce the minimum instream flow requirements in the Russian River. After the 2020 TUCP order expired on December 27, 2020, Sonoma Water filed another TUCP for Permit 12947A in January 2021 to change the hydrologic index that is the subject of this Order. The State Water Board issued an order approving the TUCP on February 4, 2021, and approved clarifying amendments to the order on February 11, 2021. Sonoma Water filed the third set of TUCPs in May 2021 to address the critical drought conditions in the whole Russian River Watershed. The TUCPs were approved on June 14, 2021, in Order WR 2021-0056-EXEC (June 2021 TUCP order), and amended on October 22, 2021, to adjust diversion reductions required under Condition 11 to reflect the temporary but continuing high flow conditions described above.

Decision 1610 established the current hydrologic index, in which water supply conditions are classified as "normal," "dry," or "critical" based on cumulative inflow into Lake Pillsbury (in the adjacent Eel River Watershed) beginning October 1 of each year. From October 1, 2020, to May 31, 2021, the cumulative inflow into Lake Pillsbury was

82,215 AF. Consequently, the water supply condition is categorized as dry for the remainder of 2021. Sonoma Water is currently managing the Russian River instream flows based on a critical water supply condition as authorized by the June 2021 TUCP order. The State Water Board's June 2021 TUCP order expires after December 10, 2021, at which point, under the current hydrologic index, the water supply condition would change back to dry for the remainder of the calendar year. The corresponding minimum instream flow requirements would become 75 cfs in Dry Creek and the Upper Russian River and 85 cfs in the Lower Russian River.

From October 1, 2021, to November 14, 2021, the cumulative in flow into Lake Pillsbury was 41,947 AF. Consequently, pursuant to the current hydrologic index under Decision 1610, the water supply condition would be categorized as normal for at least from January 1 through February 2022, with a minimum instream flow requirement of 150 cfs on the Upper Russian River and 125 cfs on the Lower Russian River. Without an additional temporary urgency change order approving the requested changes, Sonoma Water would be required to be released from Lake Mendocino and Lake Sonoma, actions which could deplete the reservoirs to severely low levels. As stated above, storage conditions at both Lake Mendocino and Lake Sonoma are currently exceptionally low.

The normal water supply conditions designated by the current hydrologic index were premised on the PVP's substantial transfers of water from the Eel River to the East Fork Russian River (see, e.g., Decision 1610, p. 5) and do not accurately reflect the present severe drought conditions in the Upper Russian River despite Lake Pillsbury cumulative inflows. Sonoma Water's proposed temporary urgency change would maintain the reasoning on which Decision 1610's minimum instream flow requirements are based by relying on the same statistical distribution of hydrologic conditions used by Decision 1610. Sonoma Water's proposed temporary urgency change would use Lake Mendocino storage, rather than cumulative inflow into Lake Pillsbury, as the basis for defining the applicable hydrologic condition. This proposed temporary urgency change would implement minimum instream flow requirements under Decision 1610 that would adjust to changes in the Upper Russian River Watershed hydrologic conditions. Streamflow requirements would increase if additional seasonal rainfall results in Lake Mendocino storage increasing or remaining above the volumes specified in the proposed hydrologic index.

3.0 COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT

Ordinarily, the State Water Board must comply with applicable requirements of the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) (CEQA) prior to issuance of any order approving a TUCP. (Cal. Code Regs., tit. 23, § 805.) However, the Governor's April 21, 2021 Drought Emergency Proclamation, ordering paragraph 7 suspended CEQA and regulations adopted pursuant to CEQA in Mendocino and Sonoma Counties, to the extent necessary for the State Water Board to address drought-related impacts through "[m]odifying requirements for reservoir releases or diversion limitations" in the Russian River Watershed "to ensure adequate, minimal water supplies for critical purposes." Sonoma Water's requests to temporarily modify the hydrologic index in its water rights permits—and thereby temporarily modify reservoir release and instream flow requirements in the Russian River—due to historically dry conditions qualify for this suspension under the Governor's April 21, 2021 Drought Emergency Proclamation. In conjunction with approving this Order, the State Water Board will add the activities approved under this Order to its list of suspended projects on its website.

In addition to the Governor's suspension of CEQA covering the activities proposed and approved under this Order, Sonoma Water determined that the requested water right changes are categorically exempt under CEQA's emergency statutory exemption and Class 7 and 8 categorical exemptions. Sonoma Water filed a Notice of Exemption on November 16, 2021. The State Water Board has reviewed the information submitted by Sonoma Water and has made its own independent finding that the requested changes are statutorily and categorically exempt from CEQA. The changes sought by the TUCPs are consistent with the following statutory and categorical CEQA exemptions for the following reasons:

1) As mentioned above, on April 21, 2021, the Governor proclaimed a drought emergency in Mendocino and Sonoma counties due to drought conditions in the Russian River Watershed. The Governor's Drought Emergency Proclamation ordered the State Water Board to consider specific actions to "ensure adequate, minimal water supplies for critical purposes." Information provided by Sonoma Water demonstrates that continued releases of water to maintain minimum instream flows required by Sonoma Water's current water right permit terms could contribute to storage levels in Lake Mendocino and Lake Sonoma declining to unsafe levels. As discussed in this Order, if storage in Lake Mendocino and Lake Sonoma are depleted, there will be serious water supply impacts to human health and safety, and water will not be available to protect aquatic life, including threatened and endangered species in the Russian River. Approval of the TUCPs is therefore necessary to prevent and mitigate loss of, or damage to, the environment, fishery resources, property, public health and safety, and essential public services. Accordingly, the project is statutorily exempt from CEQA because it is necessary to prevent or mitigate an emergency—in this case, a proclaimed drought emergency—that poses a clear and imminent danger. (Pub. Resources Code, §§ 21060.3 & 21080, subd. (b)(4); Cal. Code Regs., tit. 14, § 15269, subd. (c).)

2) A Class 7 categorical exemption "consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment." (Cal. Code Regs., tit. 14, § 15307.) The proposed action is necessary for

maintenance of viable operations to support municipal use and protect listed salmonid species in the Russian River by preventing Lake Mendocino from declining to a storage level at which the reservoir may no longer be operational in light of the extremely dry condition the region has been experiencing. Accordingly, these changes are categorically exempt from CEQA pursuant to a Class 7 exemption.

3) A Class 8 categorical exemption "consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment." (*Id*., § 15308.) The proposed action will assure the maintenance of the environment (i.e., the instream environment of the Russian River) in the same way as stated for the Class 7 categorical exemption, and the proposed temporary changes are also therefore categorically exempt under Class 8.

4.0 PROCEDURAL REQUIREMENTS CONCERNING THE TEMPORARY URGENCY CHANGE PETITION

Pursuant to Water Code section 1438, subdivision (a), the State Water Board may issue a temporary urgency change order in advance of the required notice. The State Water Board will issue and deliver to Sonoma Water, as soon as practicable, a notice of the temporary urgency change order pursuant to Water Code section 1438. Pursuant to Water Code section 1438, subdivision (b)(1), Sonoma Water is required to publish the notice in a newspaper having a general circulation, and that is published within the counties where the points of diversion lie. In addition, the State Water Board will post the notice of the temporary urgency change order on its website and will distribute the notice through an electronic notification system.

Any interested person may file an objection to a temporary urgency change. (*Id.*, subd. (d).) The State Water Board must promptly consider the objection and may hold a hearing on any objection. *(Id.*, subd. (e).) The State Water Board exercises continuing supervision over temporary urgency change orders and may modify or revoke temporary urgency change orders at any time. (Wat. Code, §§ 1439, 1440.) Temporary urgency change orders automatically expire 180 days after issuance, unless they are revoked, an earlier expiration date is specified, or they are renewed. (*Id*., §§ 1440, 1441.)

5.0 CRITERIA FOR APPROVING THE PROPOSED TEMPORARY URGENCY CHANGE

Water Code section 1435 provides that a right holder who has an urgent need to change the point of diversion, place of use, or purpose of use from that specified in the water right may petition for a conditional temporary change order. The State Water Board's regulations set forth the filing and other procedural requirements applicable to TUCPs. (Cal. Code Regs., tit. 23, §§ 805, 806.) The State Water Board's regulations also clarify that requests for changes to permits or licenses other than changes in point of diversion, place of use, or purpose of use may be filed, subject to the same filing and procedural requirements that apply to changes in point of diversion, place of use, or purpose of use. (*Id*., § 791, subd. (e).)

Before approving a TUCP, the State Water Board must make the following findings: (1) the right holder has an urgent need to make the proposed change; (2) the proposed change may be made without injury to any other lawful user of water; (3) the proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses; and (4) the proposed change is in the public interest. (Wat. Code, § 1435, subd. (b)(1-4).)

A temporary change order does not result in the creation of a vested right, even of a temporary nature, but shall be subject at all times to modification or revocation in the discretion of the State Water Board. (Wat. Code, § 1440.)

5.1 Urgency of the Proposed Change

Under Water Code section 1435, subdivision (c), an "urgent need" means "the existence of circumstances from which the [State Water Board] may in its judgment conclude that the proposed temporary change is necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented . . . ."

In this case, an urgent need exists for the proposed change in the hydrologic index for determining minimum instream flow requirements in the Russian River. As described in the TUCPs, cumulative inflow into Lake Pillsbury does not reflect hydrologic or water supply conditions in the Russian River Watershed; storage levels in Lake Mendocino and Lake Sonoma are currently at or near the lowest levels for this time of the year since they were filled, but the current hydrologic index per Decision 1610 indicates conditions are dry for the remainder of this year and normal starting in January 2022. Furthermore, the Russian River Watershed is experiencing significant reductions of Eel River transfers through the PVP due to inoperability of the powerhouse for the foreseeable future. The current hydrologic index under Decision 1610, which is based on cumulative inflow into Lake Pillsbury, is not applicable to water supply conditions in the Russian River due to the changes in PVP operations.

Without the proposed change, Decision 1610's applicable minimum instream flow requirements may require releases of water from Lake Mendocino and Lake Sonoma at levels that would contribute to significant depletions of reservoir storage and potential elimination of water supplies for water users in Mendocino, Sonoma, and Marin Counties if the current drought continues into 2022. Such depletion or possible elimination of stored water supplies would risk serious impacts to human health and safety and fishery protection. Extremely low storage levels may result in loss of the cold-water pool in Lake Mendocino that is needed to support listed Russian River salmonid fishery species in the fall, and may cause increased total dissolved solid or mercury concentrations if lake-bottom sediments become displaced due to reservoir operation at low storage levels.

Water Code section 1435, subdivision (c) also states that the State Water Board shall not find a petitioner's need to be urgent if it concludes that the petitioner has not exercised due diligence either in petitioning for a change pursuant to provisions other than a TUCP or in pursuing that petition for change. As noted in the State Water Board's February 2021 order approving Sonoma Water's TUCP for Permit 12947A, a number of factors have hindered action on Sonoma Water's long-term change petitions to modify Decision 1610 and Permits 12947A, 12949, 12950, and 16596. As required as a condition of that order, Sonoma Water has provided a schedule of milestones and completion dates for further actions necessary to act on its long-term change petitions. In its report dated April 1, 2021, Sonoma Water stated that it planned to submit amended petitions for long-term water right changes in Fall 2021, to recirculate a draft environmental impact report (EIR) for the proposed project in December 2021, and to both certify a final EIR and approve a final project in September 2022. Sonoma Water has been meeting with the State Water Board staff regularly on progress of its long-term petitions while it continues to work on the Fish Habitat Flows and Water Rights Project Draft EIR. However, Sonoma Water has stated that the long-term petitions and draft EIR have been delayed due to the dire drought last summer and changes in the PVP. Sonoma Water plans to provide an update on status of the long-term petitions and draft EIR in January 2022. In light of these circumstances and representations, the State Water Board finds that Sonoma Water has exercised due diligence. Sonoma Water must continue to diligently pursue its stated course of action, as outlined in its report and schedule, but there is also an urgent need now, during the current critical water conditions and ongoing drought emergency, to grant Sonoma Water's TUCPs.

5.2 No Injury to Any Other Lawful User of Water

Under Decision 1610 and the terms and conditions of its associated water rights permits, Sonoma Water is required to maintain specified flows in the Russian River from Lake Mendocino to the Russian River's confluence with the Pacific Ocean. This Order retains these existing minimum instream flow requirements but temporarily changes the circumstances under which "normal," "dry," or "critical" water supply conditions will apply. Minimum instream flows will continue to be maintained under this Order consistent with hydrologic conditions within the Russian River Watershed. It is anticipated that all other lawful users of water will be able to divert and use the amounts of water to which they are legally entitled during the period specified in this Order. Other legal users of water will not be injured by reduction in releases of previously stored water because water released from storage is not available for diversion by downstream users with an independent basis of right. (See, e.g., *North Kern Water*

Storage Dist. v. Kern Delta Water Dist. (2007) 147 Cal.App.4th 555, 570 [when the stored water is released for use, it is not part of the river's natural flow and rediversion of this water does not count toward the appropriator's current allocation of river water]; *State Water Resources Control Bd. Cases* (2006) 136 Cal.App.4th 674, 737-745 [a riparian or appropriator has no legally protected interest in other appropriators' stored water or in the continuation of releases of stored water].)

In conjunction with other actions in response to the current drought state of emergency within the Russian River Watershed, the State Water Board will supervise diversion and use of water under this Order for the protection of all other lawful users of water pursuant to Water Code section 1439.

5.3 No Unreasonable Effect upon Fish, Wildlife, or Other Instream Beneficial Uses

Prior to approval of a TUCP, the State Water Board must find that the proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses. In addition, the State Water Board has an independent obligation to consider the effect of approval of Sonoma Water's petitions on public trust resources and to protect those resources where feasible. (*National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419 [189 Cal.Rptr. 346].) Public trust resources may include, but are not limited to, wildlife, fish, aquatic dependent species, streambeds, riparian areas, tidelands, and recreation in navigable waterways, as well as fisheries located in non-navigable waterways. It is also the policy of this state that all state agencies, boards, and commissions shall seek to conserve endangered species and threatened species and shall use their authority in furtherance of the purposes of the California Endangered Species Act (Fish & G. Code, § 2050 et seq.). State agencies should not approve projects that would jeopardize the continued existence of any endangered species or threatened species if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat that would prevent jeopardy. (Fish & G. Code, §§ 2053 & 2055.)

Although relying on Lake Mendocino storage thresholds to define the water supply conditions may result in lower instream flows in the Russian River than would ordinarily be required under Sonoma Water's permits, maintenance of stored water in Lake Mendocino and Lake Sonoma for subsequent release is crucial for ensuring sufficient water supplies for human health and safety use and maintaining habitat for threatened and endangered fish species during the critical life stages that occur during the fall. With the conditions imposed by this Order, including ongoing efforts to support water conservation and regular monitoring and reporting of conditions by Sonoma Water, the State Water Board finds that granting the proposed temporary changes will not have an unreasonable effect on fish, wildlife, or other instream beneficial uses and protects public trust resources to the extent feasible. The State Water Board will continue to evaluate conditions in the watershed throughout the duration of this Order and consider other actions that may further the protection fish, wildlife, and other instream beneficial uses.

5.3.1 Consultation with Other Agencies

Sonoma Water has consulted with the California Department of Fish and Wildlife (CDFW), NMFS, and North Coast Regional Water Quality Control Board (North Coast Water Board) regarding filing the TUCPs and the effects of the proposed changes.

NMFS submitted a letter on December 3, 2021 in support of Sonoma Water's TUCPs to ensure that the water supply condition and corresponding minimum instream flow requirements in the Russian River Watershed are aligned with actual watershed hydrologic conditions. NMFS's 2008 Biological Opinion addresses the need for modifying minimum instream flow requirements to: 1) protect salmonid species listed under the federal Endangered Species Act, including threatened California Coastal (CC) Chinook salmon (*Onchorynchus [O.] tshawyscha*), endangered Central California Coast (CCC) coho salmon (*O. kisutch*), and threatened CCC steelhead trout (*O. mykiss*), residing in the Russian River; and 2) address water supply conditions at Lake Mendocino and Lake Sonoma to maintain viable operations that support municipal water distribution. The December 3, 2021 letter indicates that the proposed TUCPs meet both objectives towards preventing Lake Mendocino from declining to a storage level at which the reservoir may no longer be operational. NMFS has requested additional terms and conditions be included to any order issued by the State Water Board to provide water needed to protect listed salmonids in the Russian River. NMFS's requested terms and conditions in the December 3, 2021 letter are included in this Order to prevent unreasonable effects on fish and wildlife in the near term while preserving water needed for protecting salmonid species in the Russian River in the longer term.

To allow for adaptive management of releases from Lake Mendocino, this Order requires Sonoma Water to provide weekly updates to the State Water Board, CDFW, NMFS, and the North Coast Water Board regarding the current hydrologic and water quality conditions for the Russian River. This Order also requires Sonoma Water to initiate additional consultation with the North Coast Water Board on additional water quality monitoring activities if any water quality issues of concern are observed. This information will assist the State Water Board in determining whether additional actions or modifications to this Order are necessary.

5.3.2 Conservation

Sonoma Water is actively engaged in water conservation to reduce demands on water stored in Lake Mendocino and Lake Sonoma for municipal supply. Sonoma Water and its water contractors have implemented water use efficiency programs to comply with the California Water Conservation Act since the establishment of the Sonoma-Marin Water Saving Partnership (Partnership) in 2010. The Partnership represents twelve

North Bay water utilities in Sonoma and Marin counties that have joined to provide regional solution for water use efficiency.

As stated in the TUCPs, Sonoma Water, its water contractors, and other members of the Partnership continued implementing an aggressive water saving outreach campaign since winter 2020. The campaign started as a paid social media campaign in winter and expanded in spring to become a broader multi-media effort. To increase drought awareness and encourage further water savings from efficiency upgrades, the Partnership held three regional giveaway events on June 12, August 21, and October 9, in addition to several other outreach efforts. Sonoma Water's contractors also spent additional funds for outreach beyond what is being coordinated by the Partnership and through Sonoma Water.

As part of its Urban Water Management Plan, Sonoma Water has also implemented a Water Shortage Contingency Plan (WSCP) that will, in certain water shortage circumstances, require a 20%, 30%, 40%, or greater percentage reduction in diversions. This plan has reportedly been incorporated into Section 3.5 of the Restructured Agreement for Water Supply with its contractors and similarly applied to its other wholesale customers. In addition to the declared drought emergency within the Russian River Watershed and the water shortage conditions noted by Sonoma Water, the Governor's October 19, 2021 drought emergency proclamation directed local water suppliers to execute their WSCPs and agricultural Drought Plans "at a level appropriate to local conditions that takes into account the possibility of a third consecutive dry year." Sonoma Water states that, as of the time of its filing the TUCPs on November 17, 2021, all members of the Partnership "continue to implement [WSCP] stages consistent with achieving a 20 percent or greater reduction in water use."

To ensure implementation of the Governor's October 19, 2021 proclamation, this Order includes a condition that requires Sonoma Water to report, within 30 days of the Order's issuance, on the status of implementation of its WSCP and the WSCPs of its contractors and other wholesale customers, consistent with the distinct possibility that drought conditions will persist or worsen in 2022. Sonoma Water shall provide monthly summaries to the State Water Board of reduction in total diversions by Sonoma Water and reduction in monthly deliveries to its water contractors and other wholesale customers as compared to the 2013 water use benchmark.

With the conditions imposed by this Order, including ongoing efforts to support water conservation and regular monitoring and reporting by Sonoma Water, the State Water Board finds that granting the proposed temporary changes will not have an unreasonable effect on fish, wildlife, or other instream beneficial uses and protects public trust resources to the extent feasible. The State Water Board will continue to evaluate conditions in the watershed throughout the duration of this Order and consider other actions that may further the protection fish, wildlife, and other instream beneficial uses. The State Water Board will review the monthly conservation efforts of Sonoma Water and will continue to evaluate whether additional conservation measures are necessary to respond to dry conditions in the Russian River Watershed and/or low storage in Lake Mendocino and Lake Sonoma.

5.4 The Proposed Change is in the Public Interest

Approval of the TUCPs to temporarily change the hydrologic index will help conserve stored water in Lake Mendocino and Lake Sonoma to meet human health and safety needs, and to protect endangered and threaten species in the Russian River. Without the proposed changes, the resulting elimination of stored water in Lake Mendocino and the depletion of stored water in Lake Sonoma to unsafe levels will put residents in the counties of Mendocino, Sonoma, and Marin at risk should dry conditions persist into 2022. It is in the public interest to preserve water supplies for these beneficial uses given the extreme hydrologic circumstances and reduced water supplies.

Should the conditions that support the approval of this Order change, whether in alterations to water supply or identification of additional impacts to aquatic habitat, water quality, or other matters within the public interest, the State Water Board has the authority to revoke this Order or modify its terms and conditions as necessary to promote the interests of the public.

6.0 CONCLUSIONS

The State Water Board has adequate information in its files to make the evaluation required by Water Code section 1435. The findings of this Order are based on unique circumstances created by drought, and are independent from any findings to be made in connection with the related change petitions filed by Sonoma Water in 2009 and revised in 2016 pursuant to Chapter 10 of Division 2 of Part 2 of the Water Code.

I conclude that, based on the available evidence:

1. The right holder, Sonoma Water, has an urgent need to make the proposed changes;

2. The proposed changes will not operate to the injury of any other lawful user of water;

3. The proposed changes will not have an unreasonable effect upon fish, wildlife, or other instream beneficial uses; and

4. The proposed changes are in the public interest.

ORDER

NOW, THEREFORE, IT IS ORDERED THAT: the petitions filed by Sonoma Water for a temporary urgency change in Permits 12947A, 12949, 12950, and 16596 are approved and effective from December 11, 2021, through a period of 180 days.

All existing terms and conditions of the subject permits remain in effect, except as temporarily amended by the following terms:

1. The minimum instream flow requirements for the Upper Russian River, the Lower Russian River, and Dry Creek will be established using a hydrologic index based on water storage in Lake Mendocino. For the purposes of the requirements in Term 20 of Permit 12947A, Term 17 of Permit 12949, Term 17 of Permit 12950, and Term 13 of Permit 16596, the following definitions shall apply:

   a. Dry water supply conditions exist when storage in Lake Mendocino is less than:

      40,000 acre-feet as of January 1
      59,000 acre-feet as of February 1
      68,000 acre-feet as of March 1
      69,500 acre-feet as of March 16
      71,000 acre-feet as of April 1
      70,000 acre-feet as of April 16
      69,000 acre-feet as of May 1
      67,500 acre-feet as of May 16
      65,000 acre-feet as of June 1

   b. Critical water supply conditions exist when storage in Lake Mendocino is less than:

      31,000 acre-feet as of January 1
      36,000 acre-feet as of February 1
      52,000 acre-feet as of March 1
      53,000 acre-feet as of March 16
      54,000 acre-feet as of April 1
      53,000 acre-feet as of April 16
      52,000 acre-feet as of May 1
      51,000 acre-feet as of May 16
      50,000 acre-feet as of June 1

   c. Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

2. From December 11, 2021, through April 30, 2021, and as water clarity and safety considerations allow, Sonoma Water shall conduct monitoring to evaluate accessibility to spawning habitat by adult salmonids in the following manner at the following locations:

   a. Upper mainstem Russian River

   If flow at the USGS Hopland gage (station number 11462500) falls below 100 cfs, Sonoma Water shall conduct on a biweekly[3] basis walking surveys of riffles between the confluence of the East Fork Russian River and West Fork Russian River (the Forks) and the confluence of Dry Creek and Russian River in Healdsburg. Proposed reaches include below the Forks, Leaping Lady Rock, Commisky Station Road, downstream of Crocker Road, downstream of Washington School Road, and Alexander Valley. A count of salmonid redds, live adult salmonids, and adult salmonid carcasses shall be documented for each riffle surveyed. In reaches with major tributaries, tributary connectivity to the mainstem shall be assessed with photo documentation and a written description of prevailing conditions as they relate to tributary access by adult salmonids. If tributary stream gage information is available, tributary stage and/or flow at the time of documentation shall also be noted. Proposed tributary confluences include West Fork Russian River, Pieta Creek, Cummiskey Creek, and Big Sulphur Creek.

   b. Lower mainstem Russian River

   If flow at the USGS Hacienda gage (station number 11467000) falls below 125 cfs, Sonoma Water shall conduct on a biweekly basis walking surveys of riffles to evaluate access to spawning habitat by adult salmonids between the confluence of Dry Creek and Russian River in Healdsburg and the upstream end of the Russian River estuary in Duncans Mills. Proposed reaches include Monte Rio, Vacation Beach, Hulbert Creek, and Steelhead Beach. At each site, Sonoma Water staff shall measure riffle length, width, depth, and document the site with photographs. Sonoma Water shall conduct visual surveys of likely holding pools located near riffle sites to document whether adult salmonids are congregating in pools.

   c. Dry Creek

   If flow at the USGS Hopland gage (station number 11462500) falls below 100 cfs, Sonoma Water shall conduct on a biweekly basis walking surveys of riffles in Dry Creek between Warm Springs Dam and Lambert Bridge. Proposed reaches include upstream of Yoakim Bridge and at Board

[3] Biweekly means once every two weeks throughout this Order.

Bridge. A count of salmonid redds, live adult salmonids, and adult salmonid carcasses shall be documented for each riffle surveyed.

3. Ramping

a. To protect against stranding of fish when minimum instream flow requirements are reduced due to dry or critical water supply conditions as defined under this Order, Sonoma Water shall consult with NMFS Santa Rosa Office (North Coast team) and CDFW to determine the appropriate ramping rate and timing for flow reduction. Sonoma Water shall submit to the Deputy Director for Water Rights (Deputy Director) a summary report of consultation details and documentation showing NMFS and CDFW concurrence regarding the ramping rates.

b. To assist hatchery smolt releases from Coyote Valley Fish Facility, Sonoma Water shall consult with CDFW on the timing and level of temporary and periodic flow increases from Lake Mendocino to be made between March 1 and the expiration of this Order, for the purpose of encouraging hatchery smolt outmigration from the East Fork Russian River and Upper Russian River.

4. Sonoma Water shall continue ongoing monitoring in coordination with the USGS at the existing multi-parameter water quality sonde sites on the Russian River. By April 22, 2022, Sonoma Water shall consult with the North Coast Water Board to discuss possible water quality impacts if critical or dry water supply conditions occur and whether additional water quality monitoring activities should be required to document water quality conditions in the Russian River. If any water quality issues of concern are observed from the continuous monitoring or water sampling required by this Order, Sonoma Water shall initiate earlier or additional consultation with the North Coast Water Board. The North Coast Water Board may also initiate additional consultation to discuss concerns based on available water quality information. Sonoma Water shall submit a summary report of consultation details and a description of proposed monitoring activities to the Deputy Director within one week of the consultation. Any necessary revisions to this Condition may be made following consultation with the North Coast Water Board and approval by the Deputy Director.

5. Sonoma Water shall continue to consult with NMFS, CDFW, and the North Coast Water Board on a weekly basis for fishery and water quality monitoring updates and any concerns relative to water quality and hydrologic condition of the Russian River. Sonoma Water shall submit a summary report of consultation details to the Deputy Director upon request.

6. Sonoma Water shall report to the Deputy Director, the North Coast Water Board, CDFW, and NMFS on a weekly basis regarding the current hydrologic condition of the Russian River system, including current reservoir levels and reservoir storage hydrographs for Lake Mendocino and Lake Sonoma, a 16-day cumulative rainfall forecast, current inflow from the PVP, and a summary of the available water quality data. Sonoma Water shall also make each report available on a publicly accessible website.

7. By August 1, 2022, Sonoma Water shall submit to the Deputy Director, CDFW, NMFS, and the North Coast Water Board a summary report of the fishery monitoring activities required by Condition 2 of this Order and water quality monitoring activities required by Condition 4 of this Order. The summary report shall include an evaluation of whether, and to what extent, the change in water supply conditions authorized by the Order caused any impacts to water quality, including any water quality impacts affecting the availability of aquatic habitat for salmonids.

8. Within 30 days of the issuance of this Order, Sonoma Water shall report on the status of implementation of its WSCP and the WSCPs of its contractors and other wholesale customers. The report shall include an explanation of whether the WSCPs' currently implemented water shortage levels and response actions reflect the possibility or likelihood of dry conditions continuing in 2022 and, to the extent they do not, a timeline for when the remaining WSCPs' water shortage levels and response actions will be adjusted and implemented. Sonoma Water shall provide monthly summaries to the State Water Board of reduction in total diversions by Sonoma Water and reduction in monthly deliveries to its water contractors and other customers as compared to the 2013 water use benchmark.

9. This Order does not authorize any act that results in the taking of a candidate, threatened, or endangered species, or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish & G. Code, § 2050 et seq.) or the federal Endangered Species Act (16 U.S.C. § 1531 et seq.). If a "take" will result from any act authorized under this Order, Sonoma Water shall obtain authorization for an incidental take permit prior to operation of the project. Sonoma Water shall be responsible for meeting all requirements of the applicable Endangered Species Act for the temporary urgency changes authorized under this Order.

10. The State Water Board reserves jurisdiction to supervise the temporary urgency changes under this Order, and to coordinate or modify terms and conditions, for the protection of vested rights, fish, wildlife, instream beneficial uses and the public interest as future conditions may warrant.

11. Sonoma Water shall immediately notify the Deputy Director if any significant change in storage conditions in Lake Mendocino or Lake Sonoma occurs that warrants reconsideration of this Order.

12. Based upon the methodology for characterizing Lake Mendocino and Lake Sonoma water inflows, releases, and rediversions specified by Condition 11 of the State Water Board's TUCP order dated February 4, 2021, and Condition 12 of the State Water Board's TUCP order dated June 14, 2021, Sonoma Water shall submit weekly reports of daily average release rates and characterization of those releases. Sonoma Water shall also make each report available on a publicly accessible website. Any amendments to either methodology requested by the Deputy Director shall be implemented within 15 days.

STATE WATER RESOURCES CONTROL BOARD

ORIGINAL SIGNED BY:

Erik Ekdahl, Deputy Director
Division of Water Rights

Date: DEC 10 2021

Appendix A-3

April 13, 2022

Mr. Erik Ekdahl, Deputy Director
Division of Water Rights
State Water Resources Control Board
P.O. Box 2000
Sacramento, CA 95812-2000

PROJECT: State Water Resources Control Board Order Dated December 10, 2021
SUBJECT: **TERM 4 WATER QUALITY MONITORING CONSULTATION**

Dear Mr. Ekdahl:

The Sonoma County Water Agency (Sonoma Water) submitted a temporary urgency change petition on November 17, 2021, for modifications to water right Permits 12947A, 12949, 12950, and 16596 that would implement an alternative hydrologic index based on Lake Mendocino storage values starting December 11, 2021. On December 10, 2021, the State Water Resources Control Board (SWRCB) Order was issued approving Sonoma Water's petition.

Term 4 of the Order states that "...By April 22, 2022, Sonoma Water shall consult with the North Coast Water Board to discuss possible water quality impacts if critical or dry water supply conditions occur and whether additional water quality monitoring activities should be required to document water quality conditions in the Russian River. If any water quality issues of concern are observed from the continuous monitoring or water sampling required by this Order, Sonoma Water shall initiate earlier or additional consultation with the North Coast Water Board. The North Coast Water Board may also initiate additional consultation to discuss concerns based on available water quality information. Sonoma Water shall submit a summary report of consultation details and a description of proposed monitoring activities to the Deputy Director within one week of the consultation. Any necessary revisions to this Condition may be made following consultation with the North Coast Water Board and approval by the Deputy Director."

On Wednesday, April 6, 2022, Sonoma Water and North Coast Regional Water Quality Control Board (North Coast Board) staff met to discuss water quality monitoring. Attendees were Don Seymour, Pam Jeane, Jeff Church, Keenan Foster, Todd Schram, and Jessica Martini-Lamb from Sonoma Water; and Alydda Manglesdorf, Rich Fadness, Mike Thomas, Katherine Carter, and Bryan McFadin from the North Coast Board.

In anticipation of continued dry conditions through the remainder of the Order and into the summer dry season, Sonoma Water staff shared its proposal for water quality monitoring in the Russian River at the meeting. Sonoma Water staff proposed monitoring consistent with that conducted in 2021. Sonoma Water would continue to report water quality conditions recorded at the US Geological Survey (USGS) stream gages (Johnson's Beach, Hacienda, Digger Bend, Jimtown, Cloverdale, Hopland, and East Fork Russian River at Calpella) on the mainstem Russian River. Sonoma Water would deploy datasondes at 5 stations in the Russian River Estuary (Russian River at Patty's Rock, Willow Creek, Russian River at Freezeout Creek, Russian River at Brown's Pool, and Austin Creek) and at 2 stations in the mainstem Russian River (Russian River at Pieta Creek and East Fork Russian River below Coyote Valley Dam).

Sonoma Water staff also proposed to complete weekly grab sampling in the Russian River estuary for nutrients, chlorophyll a, turbidity, and bacteria at the Patterson Point, Monte Rio, and Vacation Beach stations. Mainstem Russian River grab sampling is proposed for the same constituents on a bi-weekly basis at Syar Vineyards, Jimtown, Cloverdale, Hopland, East Fork Russian River, and Calpella.

Bi-weekly algae sampling is proposed to be the same as the 2021 monitoring and occur at the Patterson Point, Syar Vineyard, Jimtown, and Hopland sites. Sonoma Water staff will also share reach-scale observations of cyanobacteria distribution and abundance with Regional Board staff to assist with the Board's coordination efforts.

Sonoma Water staff also proposed continued monitoring in Lake Mendocino. Bi-weekly monitoring would include vertical profiles and grab samples near the reservoir outlet structure, dependent on access to adequate boat launching at low reservoir storage elevations. Monitoring would include vertical profiles for temperature, dissolved oxygen, turbidity, specific conductance, and pH. Grab samples would be collected for nutrients, chlorophyll a, and turbidity in the hypolimnion, metalimnion, and epilimnion.

Water quality monitoring results from datasondes, grab sampling, and vertical profiles would be shared via the weekly hydrologic reports as results become available.

Regional Board staff shared concerns regarding reports of hydrogen sulfide odor in the upper Russian River downstream of Lake Mendocino during monitoring efforts in 2021. The possibility of low reservoir storage levels in Lake Mendocino being the source of the odor was discussed. Regional Board staff expressed their desire to better understand water quality conditions downstream of Lake Mendocino during times of extremely low storage in the reservoir. Sonoma Water field staff will note when hydrogen sulfide odor is observed and the request will also be made to National Marine Fisheries Service and California Department of Fish and Wildlife staff in the weekly TUC coordination meetings. Regional Board staff did not request a change in monitoring approaches, but raised the issue ahead of potential low reservoir storage levels in the later dry season and so that participants in the weekly TUC meetings may anticipate discussing this issue further as needed, with additional monitoring of poor water quality during low reservoir storage levels a possible outcome.

Sonoma Water staff plan to begin water quality monitoring, including installation of datasondes, in the coming weeks. Sonoma Water and Regional Board staff will continue to meet weekly, along with NMFS and CDFW, and have opportunity to discuss water quality monitoring results.

Please contact me should you have any questions or comments.

Sincerely,

[redacted]

Jessica Martini-Lamb
Environmental Resources Manager

c: North Coast Board – Bryan McFadin, Alydda Manglesdorf, Rich Fadness, Mike Thomas, Katherine Carter
Sonoma Water – Don Seymour, Pam Jeane, Jeff Church, Keenan Foster, Todd Schram

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Appendix A-4

Russian River Water Quality Summary for the 2021/2022 Temporary Urgency Change

Sonoma Water

July 2022

American Disabilities Act Compliance

This report for Sonoma Water's Russian River Water Quality Summary for the 2021/2022 Temporary Urgency Change has been prepared to be compliant with requirements under the Americans with Disabilities Act (ADA). The ADA mandates that reasonable accommodations be made to reduce "discrimination on the basis of disability." As such, Sonoma Water is committed to ensuring that documents we make publicly available online are accessible to potential users with disabilities, particularly blind or visually impaired users who make use of screen reading technology.

This disclaimer is provided to advise that portions of the document, including the figures, charts, and graphics included in the document are non-convertible material, and could not reasonably be adjusted to be fully compliant with ADA regulations. For assistance with this data or information, please contact Sonoma Water at (707) 526-5370 and reference the Russian River Water Quality Summary for the 2021/2022 Temporary Urgency Change Project, dated July 2022.

Contents

1.0 Introduction

On 17 November 2021, the Sonoma County Water Agency (Sonoma Water) filed Temporary Urgency Change Petitions (TUCPs) with the State Water Resources Control Board (SWRCB) for modifications to water right Permits 12947A, 12949, 12950, and 16596 that would implement an alternative hydrologic index based on Lake Mendocino storage values starting December 11, 2021. These changes were necessary to ensure that the water supply condition and corresponding minimum instream flow requirements in the Russian River watershed are aligned with actual watershed hydrologic conditions. This is essential to maintain sustainable reservoir/river operations to protect municipal water supply and listed salmon species in the Russian River. On December 10, 2021, the State Water Resources Control Board (SWRCB) Order was issued approving Sonoma Water's petition.

In summary, the SWRCB approved the following temporary changes to the Decision 1610 (D1610) instream flow requirements from 11 December 2021 through 9 June 2022 to the following:

(1) The minimum instream flow requirements for the Upper Russian River, the Lower Russian River, and Dry Creek will be established using a hydrologic index based on water storage in Lake Mendocino. For the purposes of the requirements in Term 20 of Permit 12947A, Term 17 of Permit 12949, Term 17 of Permit 12950, and Term 13 of Permit 16596, the following definitions shall apply:

   a. Dry water supply conditions exist when storage in Lake Mendocino is less than:
      i. 40,000 acre-feet as of January 1
      ii. 59,000 acre-feet as of February 1
      iii. 68,000 acre-feet as of March 1
      iv. 69,500 acre-feet as of March 16
      v. 71,000 acre-feet as of April 1
      vi. 70,000 acre-feet as of April 16
      vii. 69,000 acre-feet as of May 1
      viii. 67,500 acre-feet as of May 16
      ix. 65,000 acre-feet as of June 1
   b. Critical water supply conditions exist when storage in Lake Mendocino is less than:
      i. 31,000 acre-feet as of January 1
      ii. 36,000 acre-feet as of February 1
      iii. 52,000 acre-feet as of March 1
      iv. 53,000 acre-feet as of March 16
      v. 54,000 acre-feet as of April 1
      vi. 53,000 acre-feet as of April 16
      vii. 52,000 acre-feet as of May 1
      viii. 51,000 acre-feet as of May 16
      ix. 50,000 acre-feet as of June 1
   c. Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

This temporary change was requested in response to the current extremely dry conditions, severely low storage levels in Lake Mendocino and Lake Sonoma, and the current hydrologic index not aligning with observed hydrologic conditions in the Russian River Watershed. The proposed change was also requested in response to the reported failure of the transformer bank of the Potter Valley Project (PVP) hydroelectric plant in October 2021 that would likely continue to result in a significant reduction in the inter-basin transfers of Eel River water into the Russian River Watershed.

2.0 2022 Russian River Flow Summary

In early January 2022, following a series of storms in October through December 2020, water storage levels in Lake Mendocino rose above 41,000 acre-feet, which is similar to storage levels experienced in 2016, a normal water year. However, storage declined through the month of February due to less than normal rainfall, and remained below 45,000 acre-feet through the month of March (Figure 2-1). Storage did increase in Lake Mendocino through May due to a late season storm event in April, as well as from higher inflow rates from Potter Valley than outflow rates through the reservoir, and peaked in early June at just over 50,600 acre-feet, where it remained relatively stable through the term of the Order (Figure 2-1).

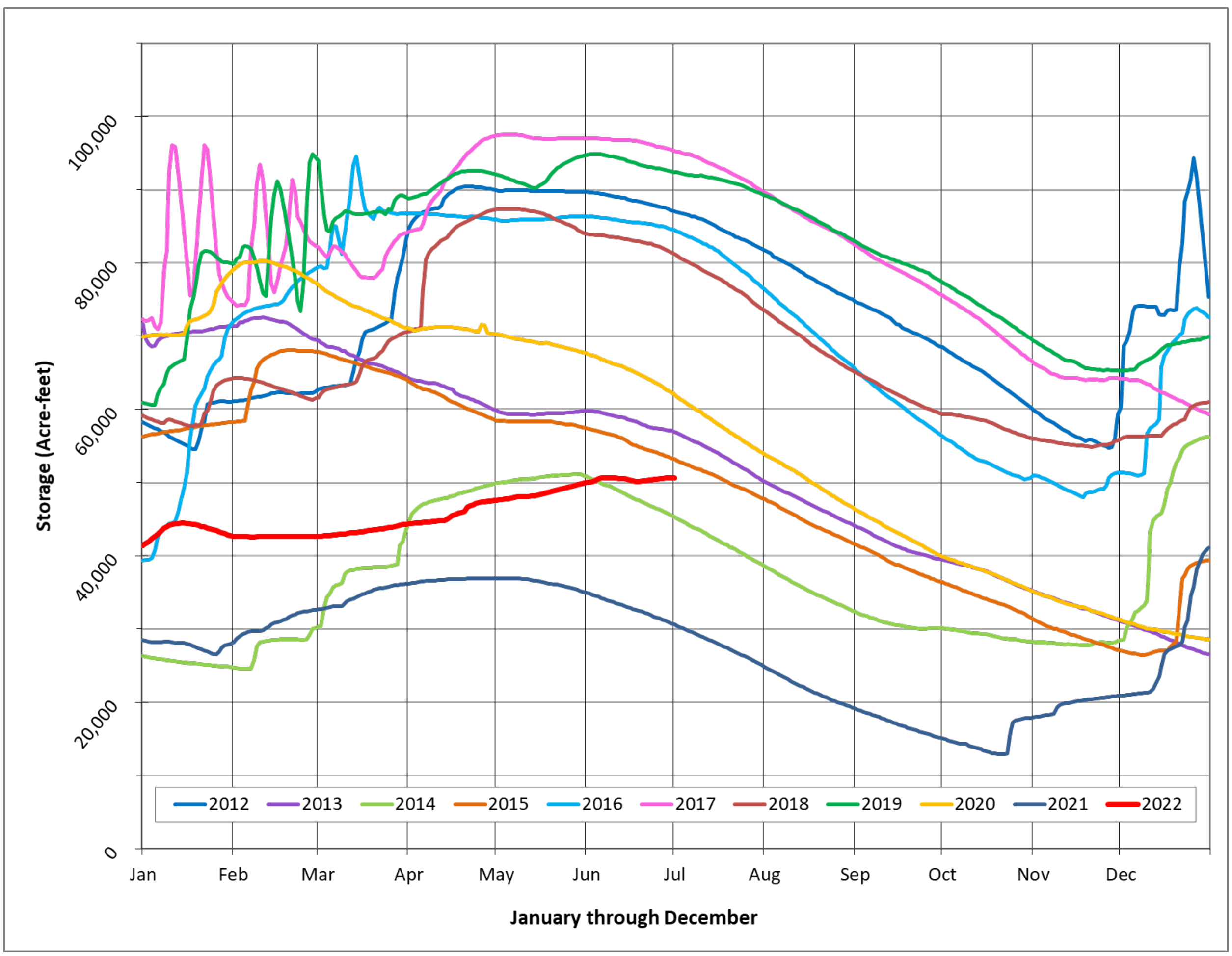

Figure 2-1. Lake Mendocino water storage levels, in acre-feet, from 2012 through 2022.

The 2022 average daily flows at the Talmage, Hopland, Cloverdale, Jimtown, Digger Bend, and Hacienda U.S. Geological Survey (USGS) gaging stations are shown in Figure 2-2.

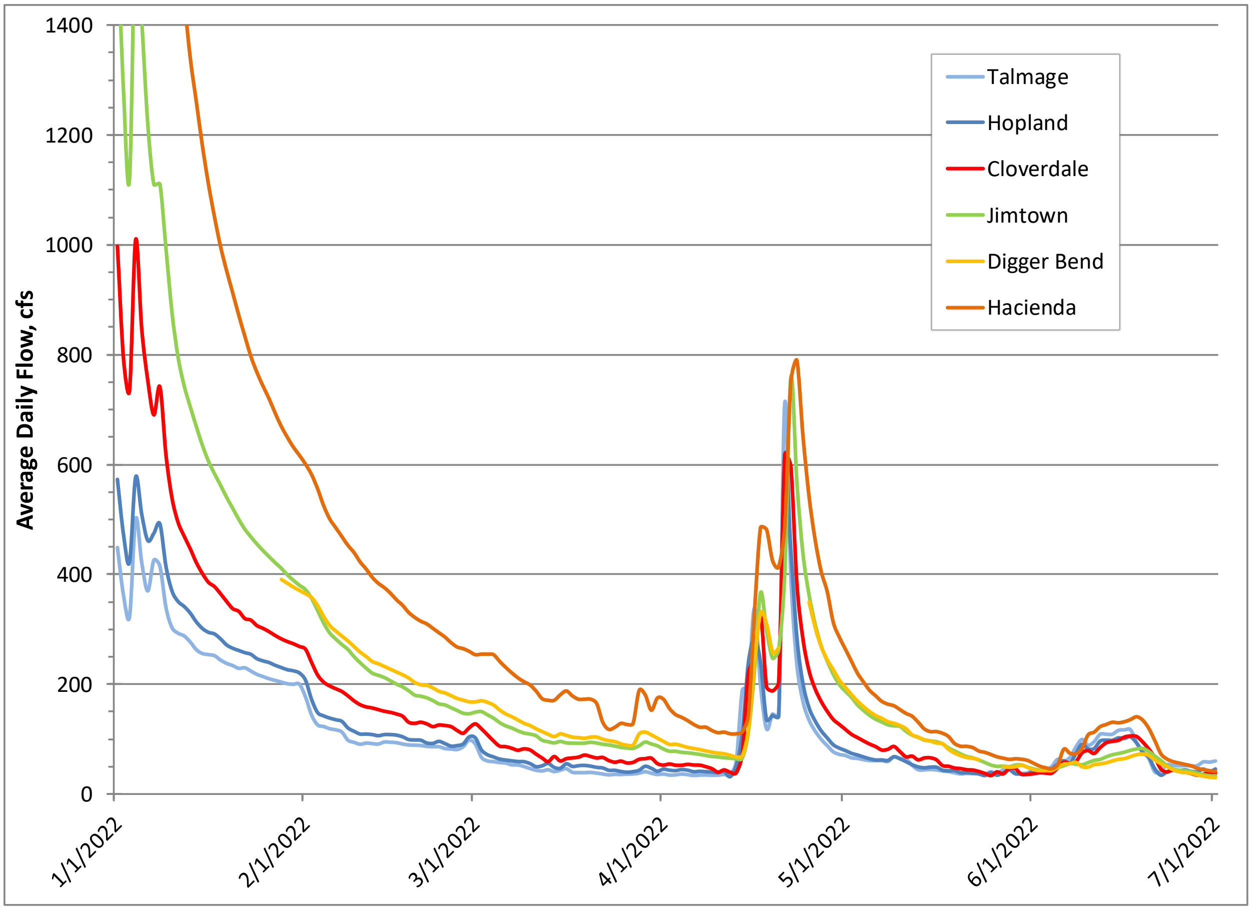

Figure 2-2. 2022 average daily flows in the Russian River as measured at U.S. Geological Survey (USGS) gages in cubic feet per second (cfs). Flow rates are preliminary and subject to final revision by USGS.

The changes in upper Russian River minimum instream flow requirements authorized by the Order generally allowed flows to decline below D1610 minimum instream flows of 150 cfs beginning in February and continuing through June. (Figure 2-3). Flows briefly increased above the D1610 minimum flow in mid-April during late season storm events, but quickly declined to flows below the D1610 minimum, but not below TUC minimum flows. Overall, flows did not decline below the TUC minimum daily average flows in the upper Russian River during the term of the Order (Figure 2-3).

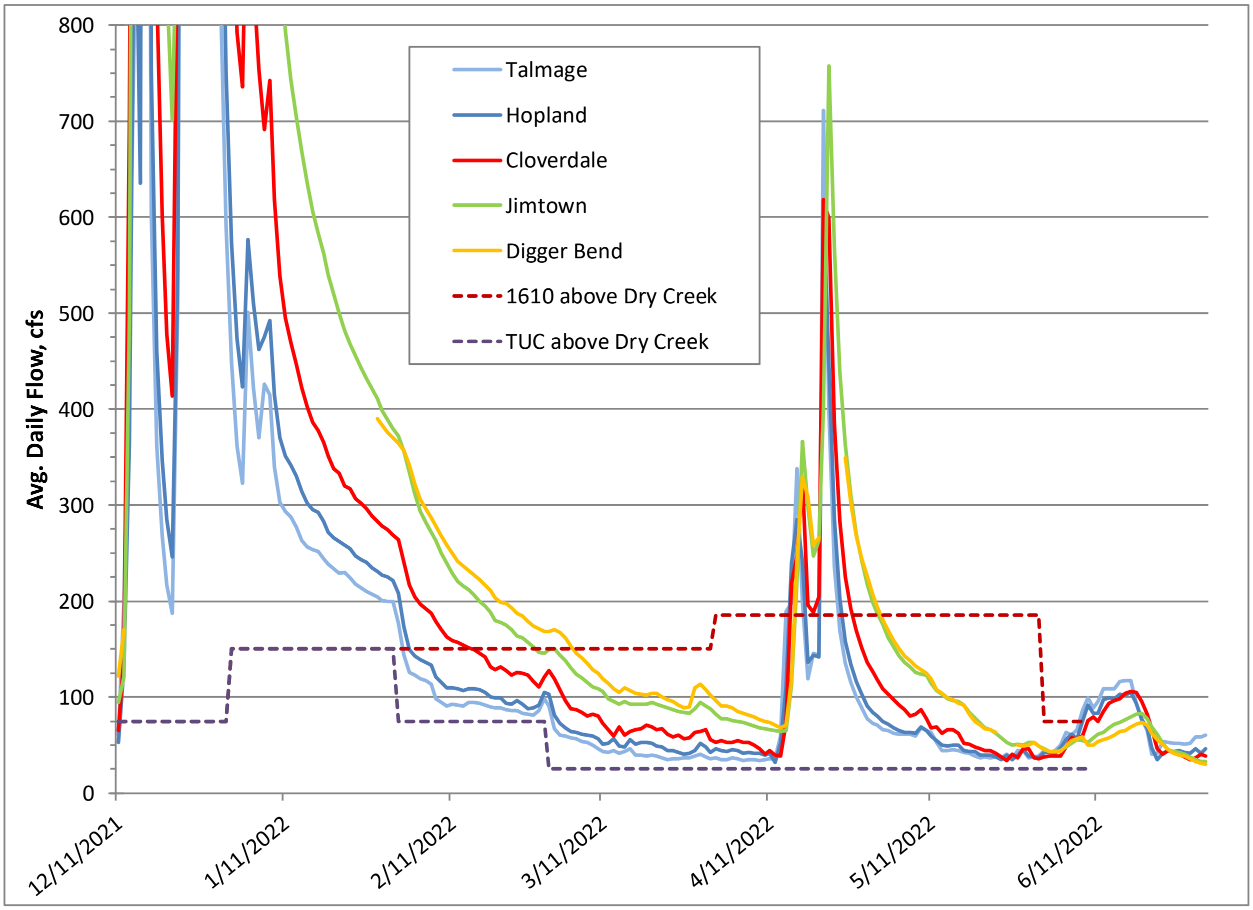

Figure 2-3. December 2021 through June 2022 average daily flows in the upper Russian River as measured at USGS gages above the Dry Creek confluence in cubic feet per second. Flow rates are preliminary and subject to final revision by USGS.

The changes in lower Russian River minimum instream flow requirements authorized by the Order allowed flows at Hacienda to decline below D1610 minimum instream flows of 125 cfs briefly in early April and again in mid-May through the end of the Order (Figure 2-4). However, lower Russian River flows did not decline below the TUC minimum daily average flows authorized by the Order (Figure 2-4).

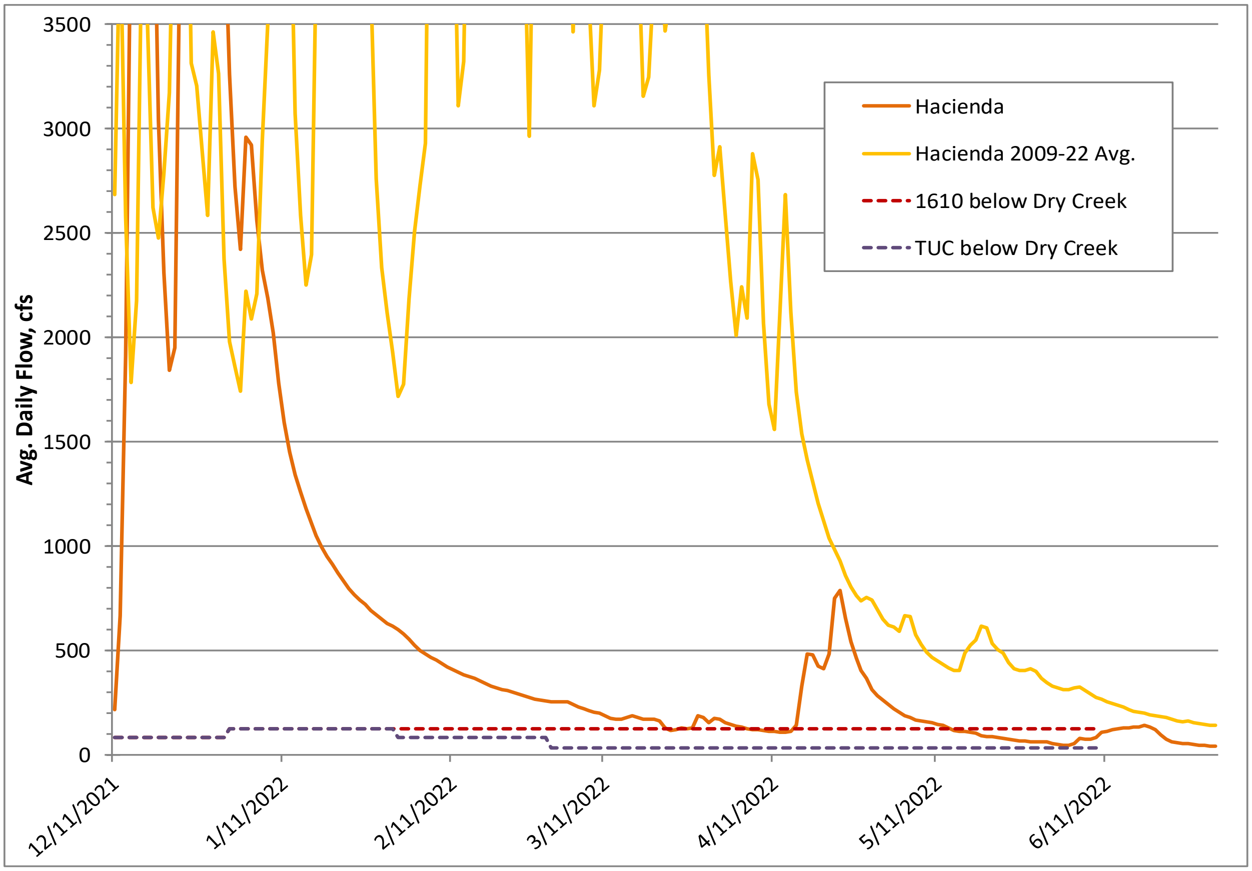

Figure 2-4. December 2021 through June 2022 average daily flows in the lower Russian River as measured at USGS gages below the Dry Creek confluence in cubic feet per second. Flow rates are preliminary and subject to final revision by USGS.

3.0 Water Quality Monitoring

Water quality data was collected at the USGS maintained gages to monitor TUC flows for potential effects to recreation and available aquatic habitat for salmonids. Datasonde data, including temperature and dissolved oxygen measurements, were collected at these and other stations to supplement existing data to provide a more complete basis for analyzing spatial and temporal water quality trends due to Biological Opinion-stipulated changes in river flow and estuary management. Analysis and discussion of the flow data and datasonde data for potential effects to aquatic habitat for salmonids is presented in Section 4.0 below.

4.0 Additional Monitoring

4.1 Sonoma Water and USGS Permanent and Seasonal Datasondes

In coordination with the USGS, Sonoma Water maintains three, multi-parameter water quality sondes on the Russian River located at Russian River near Hopland, Russian River at Digger Bend near Healdsburg, and Russian River near Guerneville (aka Hacienda). These three sondes are referred to as "permanent" because Sonoma Water contracts with the USGS to maintain them as part of Sonoma Water's early warning detection system for use year-round (Figure 4.1). The sondes take real time readings of water temperature, pH, dissolved oxygen content (DO), specific conductivity, turbidity, and depth, every 15 minutes. In addition, Sonoma Water maintains a permanent sonde on the East Fork of the Russian River approximately one-third of a mile (1/3 mi.) downstream of Lake Mendocino. However, this station is not a real-time station or part of the early warning detection system.

In addition to the permanent sondes, Sonoma Water, in cooperation with the USGS, installed four seasonal sondes with real-time telemetry at the USGS river gage stations at East Fork near Calpella (upstream of Lake Mendocino), Russian River near Cloverdale (north of Cloverdale at Comminsky Station Road), Russian River at Jimtown (Alexander Valley Road Bridge), and at Johnson's Beach in Guerneville (Figure 4.1). The three seasonal sondes at Calpella, Cloverdale, and Jimtown are included by the USGS on its "Real-time Data for California" website: https://waterdata.usgs.gov/ca/nwis/rt.

The data collected by the sondes described above are evaluated in Section 4.2 in response to the terms of the SWRCB TUC Order to evaluate whether and to what extent the reduced flows authorized by the Order caused any impacts to water quality or availability of aquatic habitat for salmonids.

Figure 4-1 Sonoma Water and USGS Russian River Permanent and Seasonal Datasonde Monitoring Stations

4.2 Aquatic Habitat for Salmonids

4.2.1 Introduction

In Term 7 of the Temporary Urgency Change Order (Order) the State Water Resource Control Board (SWRCB) tasked Sonoma Water with evaluating impacts associated with reductions in minimum instream flows authorized by the Order to water quality and the availability of aquatic habitat for Russian River salmonids. This section of the report summarizes temperature and dissolved oxygen (DO) conditions in the Russian River during the Order and relates these conditions to fisheries monitoring data collected by Sonoma Water.

4.2.2 Russian River Salmonid Life Stages

Salmonids in the Russian River can be affected by flow, temperature, and dissolved oxygen (DO) changes at multiple life stages. The Russian River supports three species of salmonids, coho salmon, steelhead, and Chinook salmon. These species follow similar life history patterns with adults migrating from the ocean to the river and moving upstream to spawn in the fall and winter. Females dig nests called redds in the stream substrate and deposit eggs simultaneously with fertilization by one or more males. Eggs then remain in the redd for several weeks before hatching. After hatching, the larval fish remain in the gravel for several more weeks before emerging. After emerging from the gravel these young salmonids are identified first as fry and then later as parr once they have undergone freshwater growth. Parr rear for a few months (Chinook) to approximately 2 years (steelhead) in freshwater before undergoing a physiological change identified as smoltification. At this stage, fish are identified as smolts and are physiologically tolerant of saltwater, and therefore ready for ocean entry (Quinn 2005). In the Russian River, smolts move downstream to the ocean in the spring (Chase et al. 2005 and 2007, Obedzinski et al. 2006). Salmonids spend several months to a few years at sea before returning to the river to spawn as adults. Because all three species of Russian River anadromous salmonids spend a period of time in freshwater, individuals must cope with the freshwater conditions they encounter including flow, temperature, and DO. While all three species follow a similar life history, each species tends to spawn and rear in different locations and are present in the Russian River watershed at slightly different times. These subtle but important differences may expose each species to a different set of freshwater conditions.

Coho Timing and Distribution

Wild coho salmon populations in the Russian River are at alarmingly low levels and recovery measures rely mainly on fish released from Don Clausen Warm Springs Hatchery as part of the Russian River Coho Salmon Captive Broodstock Program (RRCSCBP). Data collected at Sonoma Water's Mirabel inflatable dam on an underwater video camera system from 2011 through 2013 indicate that adult coho salmon begin migrating past the dam in late October and continue through at least January and that the bulk of adult coho migrate through that portion of the river from November through February. Spawning and rearing occurs in certain tributaries to the Russian River (NMFS 2008) and data from downstream migrant trapping in some of those tributaries indicate that coho smolt emigration starts before April and continues through mid-June (Obedzinski et al. 2006). Although coho smolts have been captured as late as mid-July in downstream migrant traps operated by Sonoma Water on the mainstem Russian River at the Mirabel dam (Martini-Lamb and Manning 2011), most emigrate from the Russian River from March through May. Only the Russian River coho adult and smolt life stages are present in the mainstem during the Order; therefore, only temperature and DO data relating to these life stages will be analyzed for this report. There is limited coho spawning habitat upstream of Healdsburg therefore only the Hacienda and Digger bend sites will be summarized for coho.

Steelhead Timing and Distribution

Based on video monitoring at Sonoma Water's Mirabel inflatable dam and returns to the Warm Springs Hatchery, adult steelhead return to the Russian River later than Chinook. Deflation of the inflatable dam and removal of the underwater video camera system preclude a precise measure of adult return timing or numbers. However, continuous video monitoring at the inflatable dam during late fall through spring in 2006-2007, timing of returns to the hatchery, and data gathered from steelhead angler report cards (SCWA unpublished data, Jackson 2007) suggests that steelhead return to the Russian River from December through March with the majority returning in January and February.

Many steelhead spawn and rear year round in tributaries of the Russian River and in the upper mainstem Russian River (NMFS 2008, Cook 2003). Cook (2003) found that summer rearing of steelhead in the mainstem Russian River were distributed in the highest concentrations between Hopland and Cloverdale (Canyon Reach). Steelhead were also found in relatively high numbers (when compared to habitats downstream of Cloverdale) in the section of river between the Coyote Valley Dam and Hopland. The Canyon Reach is the highest gradient section of the mainstem Russian River and contains high velocity habitats that include riffles and cascades (Cook 2003). Due to flow releases from Lake Mendocino, both the Canyon and Ukiah reaches generally have cooler water temperatures when compared to other mainstem reaches.

The steelhead smolt migration in the Russian River begins at least as early as March and continues through June, with most steelhead emigrating from March through May (SCWA unpublished data, Martini-Lamb and Manning 2011). Temperature and DO data related to Russian River steelhead adult, juvenile, and smolt life stages are summarized for this report as these life stages are present in the mainstem during the Order.

Chinook Timing and Distribution

Based on video monitoring at Sonoma Water's Mirabel inflatable dam, adult Chinook are typically observed in the Russian River before coho and steelhead. Chinook enter the Russian River as early as September and the migration is complete by early February. Generally the bulk of Chinook pass the Mirabel dam from October through December. Chinook are mainstem spawners and deposit their eggs into the stream bed of the mainstem Russian River and in Dry Creek during the fall (Chase et al. 2005 and 2007, Cook 2003, Martini-Lamb and Manning 2011). Chinook offspring rear for approximately two to four months before emigrating to sea in the spring. The bulk of Chinook smolt emigration occurs from April through mid-July. Russian River Chinook adult, juvenile, and smolt life stages are present in the mainstem during the Order; therefore, temperature and DO data relating to these life stages will be analyzed for this report.

4.2.3 Methods

Sonoma Water uses underwater video, downstream migrant traps, and water quality data collected in the Russian River to depict water quality conditions when salmonids where present. To estimate the number of adult Chinook that return to the Russian River upstream of the Mirabel inflatable dam, Sonoma Water typically operates an underwater video camera in the fish ladder located at the dam. Sonoma Water also operates downstream migrant traps to enumerate salmonid smolts. USGS stream gages and a Sonoma Water operated data sonde were used to provide water quality data in the mainstem Russian River.

Physical and water quality conditions (flow, water temperature, and DO) were collected at multiple sites in the Russian River. USGS stream gages located on the Russian River at Hacienda, Digger Bend, Jimtown, and Hopland provided flow, water temperature, and DO data. A data sonde operated by Sonoma Water collected temperature and DO data in the east fork Russian River 0.5 km downstream of Coyote Valley Dam, near Ukiah, CA. Water quality conditions at these sites were compared to literature-based thresholds then used to construct temperature and DO criteria for Russian River salmonids (Tables 4-1 through Table 4-4).

Table 4-1. Adult salmonid water temperature (°C) thresholds used for migration when describing water quality conditions during the term of the Temporary Urgency Change Order. Criteria are from SCWA (2016).

Description	Chinook	Coho	Steelhead
optimal upper limit	15.6	11.1	11.1
suitable upper limit	17.8	15.0	15.0
stressful upper limit	19.4	21.1	21.1
acutely stressful upper limit	23.8	23.8	23.8
Potentially lethal lower limit	23.9	23.9	23.9

Table 4-2. Juvenile salmonid rearing temperature (°C) thresholds used for describing water quality conditions during the term of the Temporary Urgency Change Order. Criteria are from SCWA (2016).

Description	Chinook	Coho	Steelhead
optimal upper limit	16.9	13.9	16.9
suitable upper limit	17.8	16.9	18.9
stressful upper limit	20.0	17.8	21.9
acutely stressful upper limit	23.8	23.8	23.8
Potentially lethal lower limit	23.9	23.9	23.9

Table 4-3. Salmonid smolting temperature (°C) thresholds used for describing water quality conditions during the term of the Temporary Urgency Change Order. Criteria are from SCWA (2016).

Description	Chinook	Coho	Steelhead
optimal upper limit	16.9	10.0	11.1
suitable upper limit	17.8	13.9	12.8
stressful upper limit	20.0	16.9	15.0
acutely stressful upper limit	23.8	23.8	23.8
Potentially lethal lower limit	23.9	23.9	23.9

Table 4-4. Dissolved oxygen (mg/L) thresholds for all salmonid life stages used for describing water quality conditions during the term of the Temporary Urgency Change Order. Criteria are from SCWA (2016).

Description	Dissolved Oxygen (mg/L)
optimal upper limit	>12
suitable	8.0-11.9
stressful	5.0-7.9
acutely stressful	3.0-4.9
Potentially lethal upper limit	<3

To evaluate temperature- and DO-related impacts from flow changes to the timing and magnitude of adult and smolt salmonid counts from counting stations, we compared count data (when available) to water quality information only where fish would either pass a water quality station before being detected at a particular counting station. For instance, because most steelhead rearing habitat in the mainstem Russian River occurs upstream of Hopland, this report presents the water quality data from the east fork of the Russian River and from the USGS Hopland gaging station when analyzing temperature- and DO-related impacts to juvenile steelhead. Salmonid smolts of all three species moving downstream out of Dry Creek and the upper Russian River pass our downstream migrant trap on the Russian River at Mirabel then pass the Hacienda USGS stream gage before entering the ocean. Therefore, we paired salmonid smolt data from the Russian River downstream migrant trap to Hacienda water quality data to describe the conditions these fish likely experienced as they moved downstream through the lower Russian River.

4.2.4 Results

Flow

The winter 2021 TUCO went into effect on December 11, 2021, and expired 180 days later on June 9, 2022. During that period, average daily flow at Hacienda ranged from a high of 18,820 cfs on December 16, 2021, to a low of 45 cfs on June 4, 2022. Flow during the Order was typically between 141 cfs and 1,375 cfs (25^{th} and 75^{th} percentiles of the daily average flow at Hacienda). During the Order, the Russian River was generally influenced by tributary in-flow early in the winter and in April following rain events.

Temperature

Adult Salmonid Migration

The underwater video camera at the Mirabel dam was installed on September 1, 2021. However, a large storm occurred on October 24, 2021 (Figure 4-1). At approximately 2,000 cfs flow in the river becomes too high to operate the inflatable dam as well as the underwater video equipment used to count returning adult salmonids. Flow at the Hacienda gage approached 20,000 cfs following the rain event in late October and became much too high to operate the video equipment. Because this event occurred during the very early stages of the typical adult migration season, few adults were observed and will therefore not be reported.

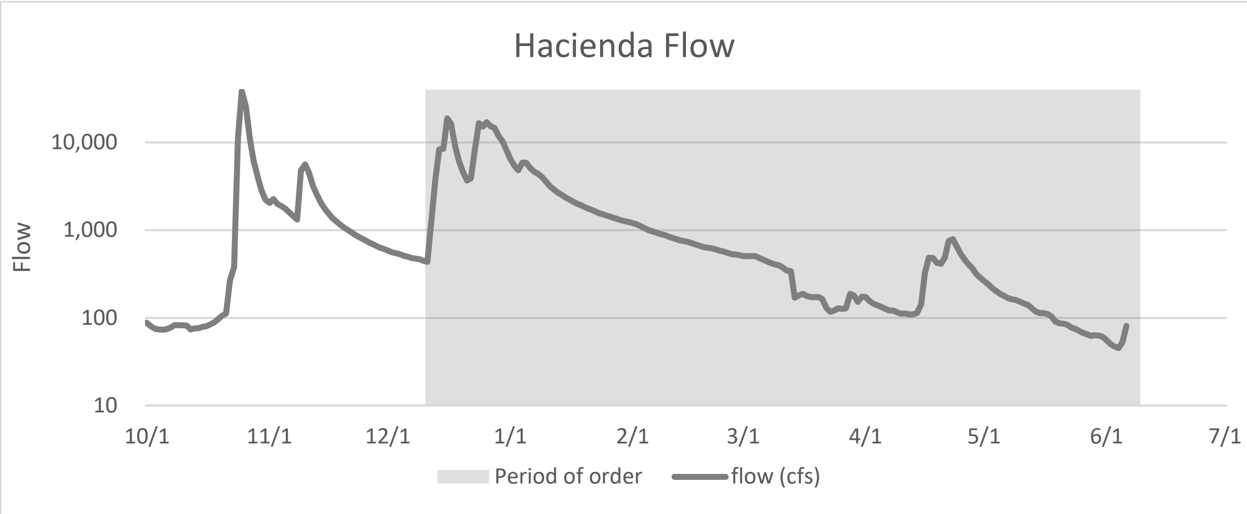

Figure 4-1. Flow in the Russian River at the USGS Hacienda stream gage (11467000).

Chinook

Water temperatures for Chinook salmon were favorable during the period of the order when Chinook are typically observed in the Russian River. Temperature was optimal for adult salmonids (based on the criteria in Table 4-1 and Figures 4-2 through 4-5).

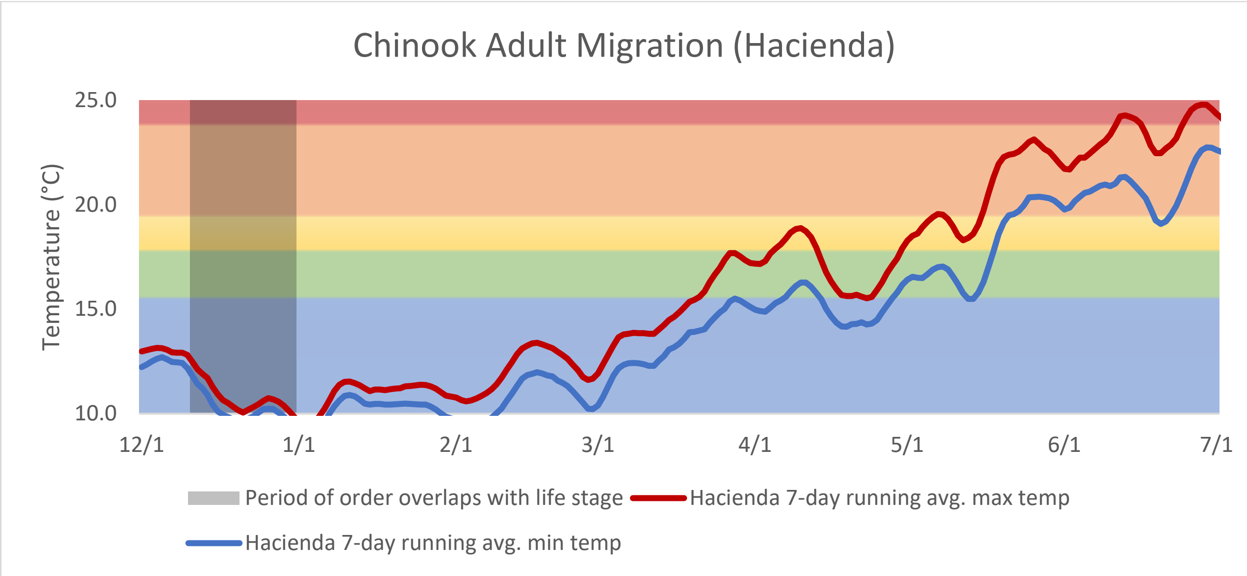

Figure 4-2. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000. Also show are optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for adult Chinook based on Table 4-1.

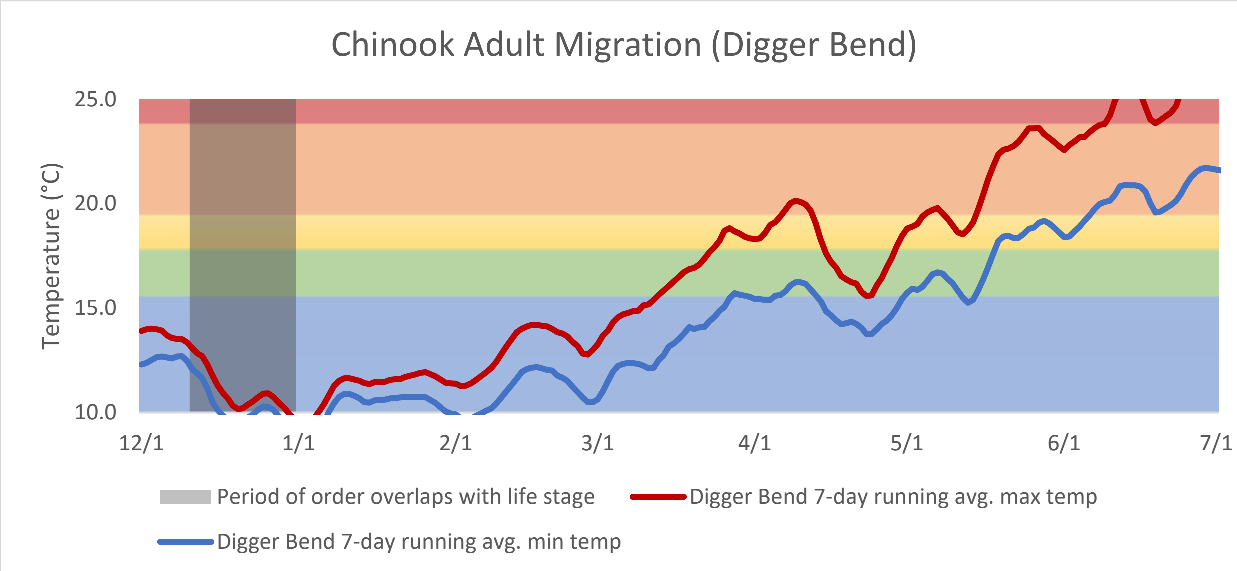

Figure 4-3. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Digger Bend (11463980) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook adult migration based on Table 4-1.

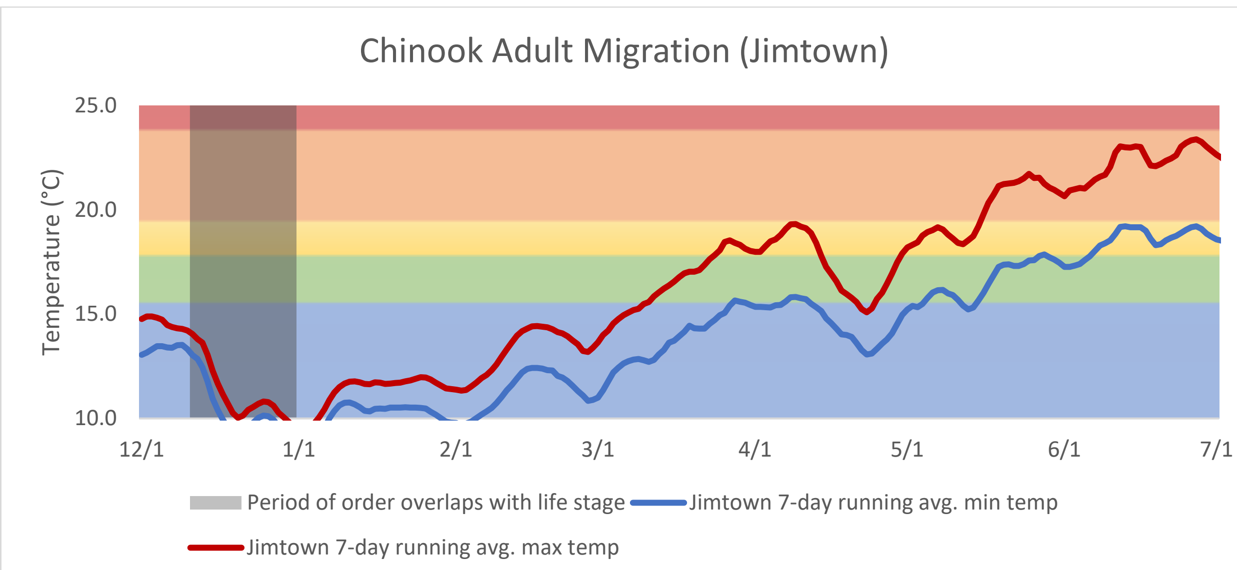

Figure 4-4. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Jimtown (USGS gage number 11463682) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook adult migration based on Table 4-1.

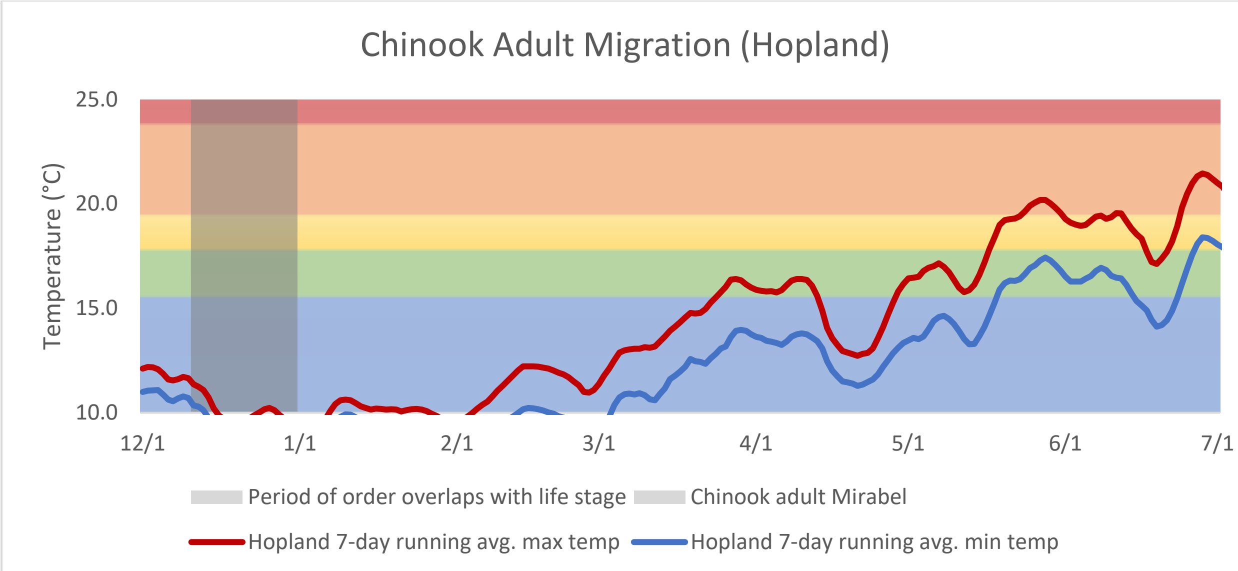

Figure 4-5. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Hopland (11462500) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook adult migration based on Table 4-1.

Coho

Water temperature for coho was generally favorable during the portion of the Order that overlaps with coho adult migration (December through March). At the Hacienda gage and at the Digger Bend gage temperature was mainly in the optimal and suitable range for adult coho (based on the criteria in Table 4-1, and Figure 4-6 and Figure 4-7).

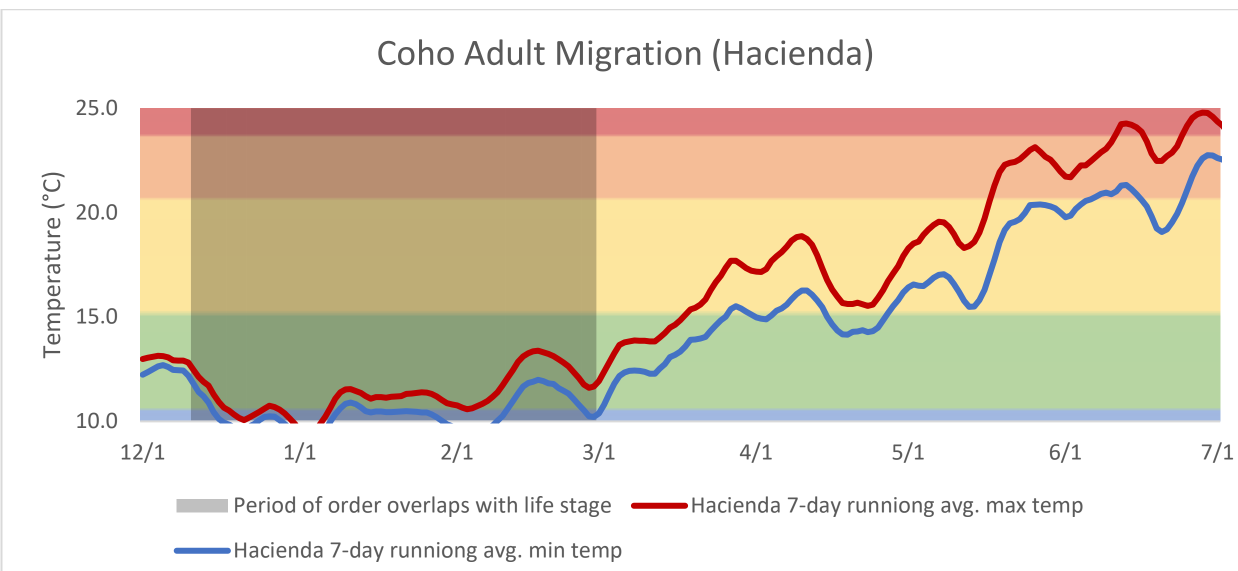

Figure 4-6. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000). Also show are optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for adult coho based on Table 4-1.

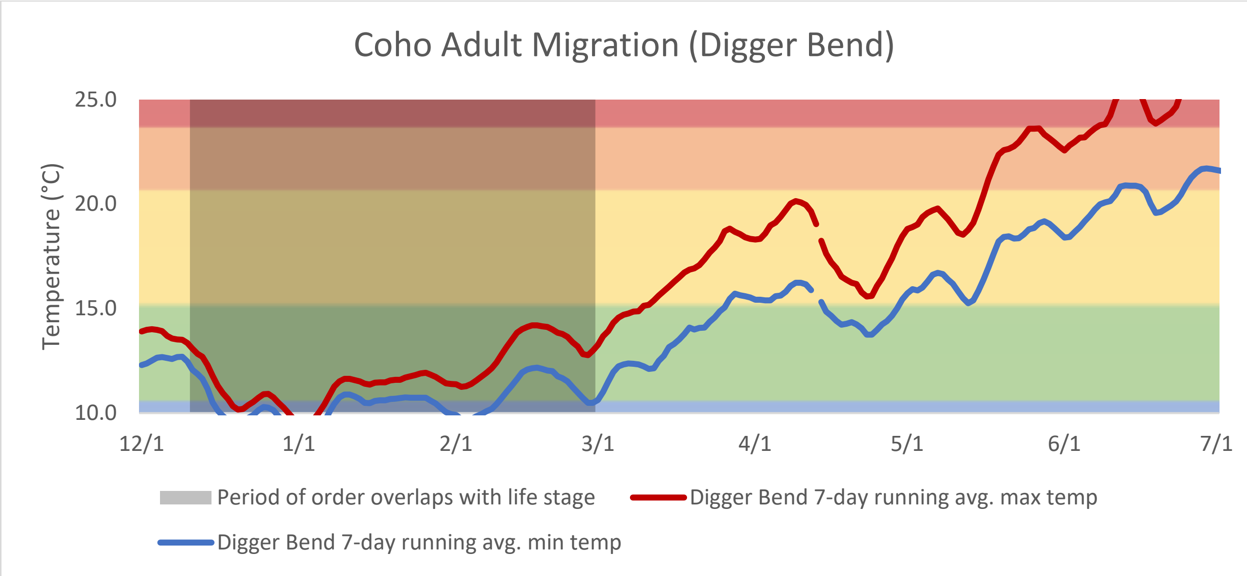

Figure 4-7. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Digger Bend (11463980) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for coho adult migration based on Table 4-1.

Steelhead

Water temperatures for steelhead were favorable during the portion of the Order that overlaps with the steelhead adult migration (December through March). Temperature was optimal to suitable for adult steelhead based on our criteria (Table 4-1 and Figure 4-9 through 4-12).

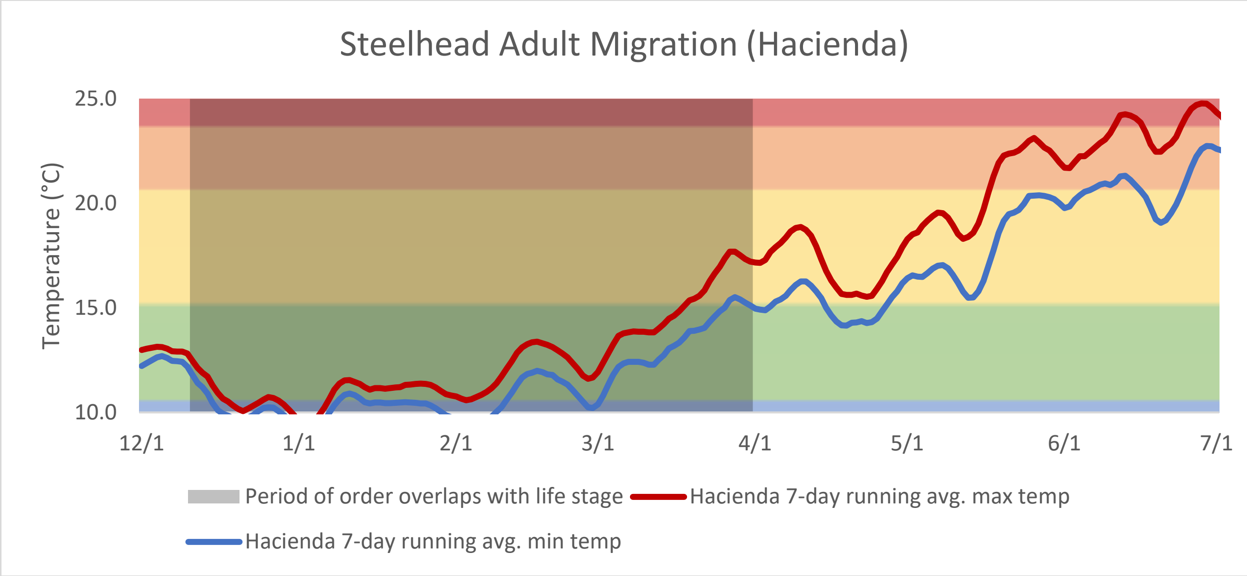

Figure 4-8. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000). Also show are optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for adult steelhead based on Table 4-1.

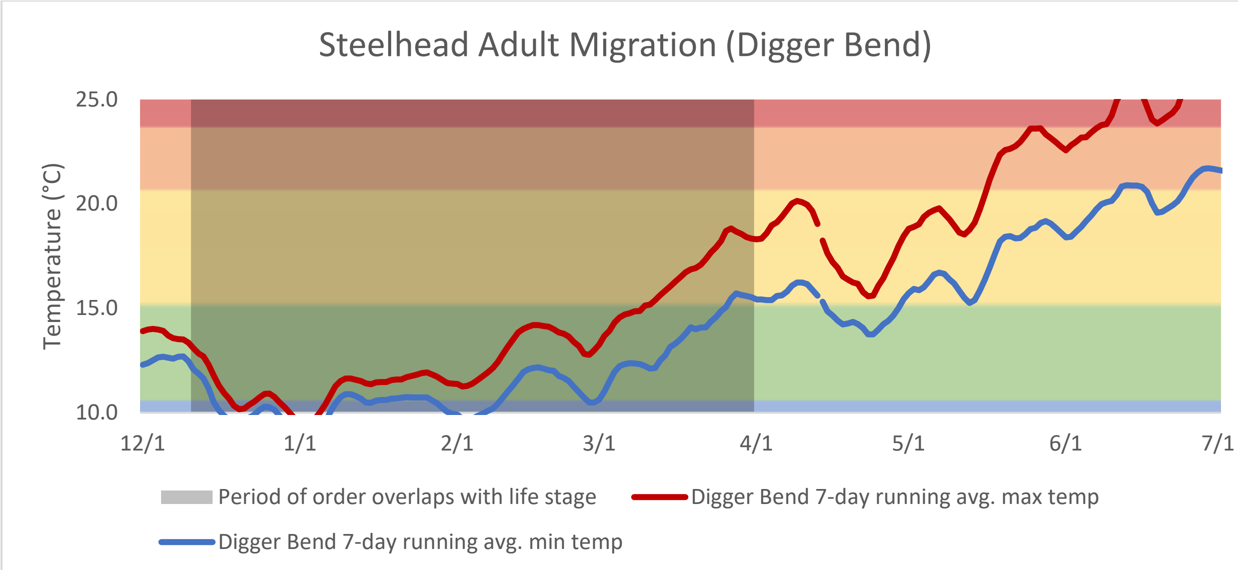

Figure 4-9. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Digger Bend (11463980) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead adult migration based on Table 4-1.

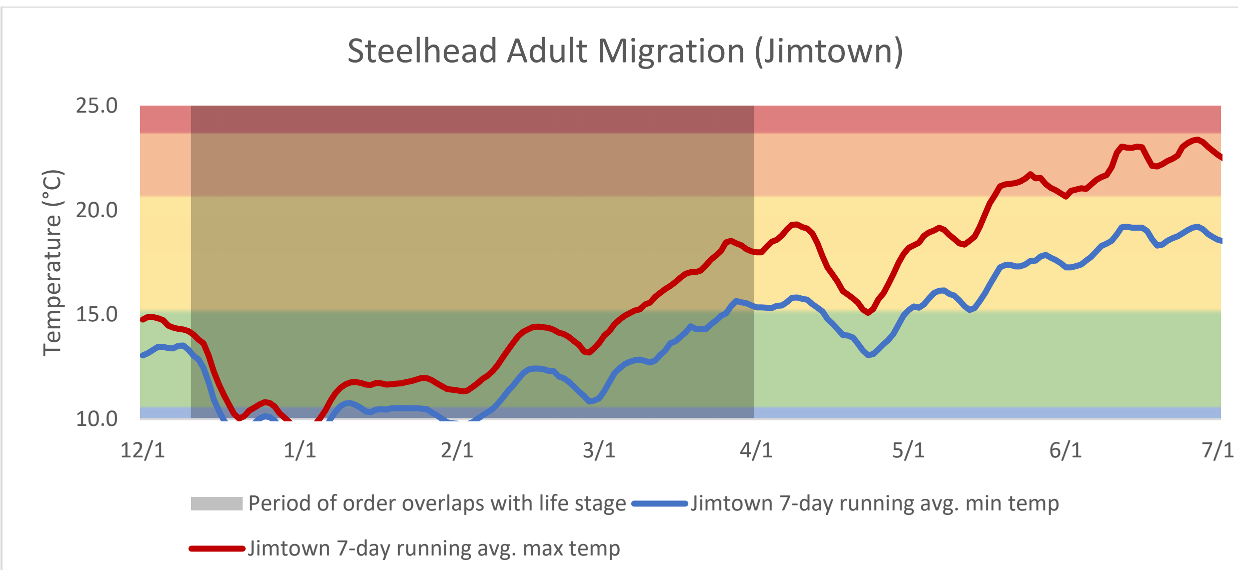

Figure 4-10. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Jimtown (USGS gage number 11463682) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead adult migration based on Table 4-1.

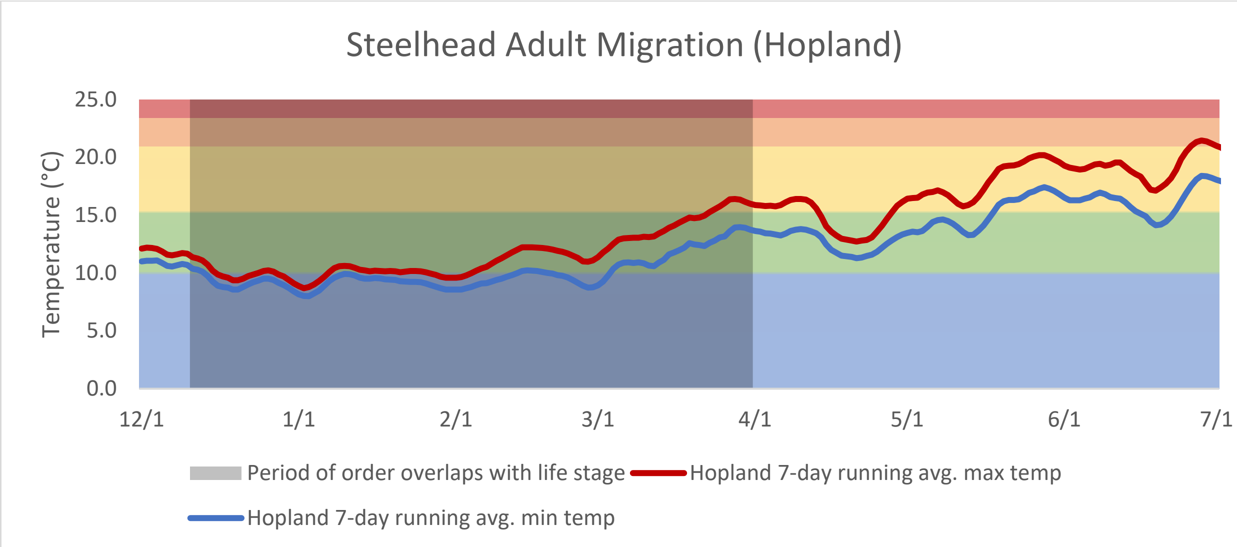

Figure 4-11. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Hopland (11462500) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead adult migration based on Table 4-1.

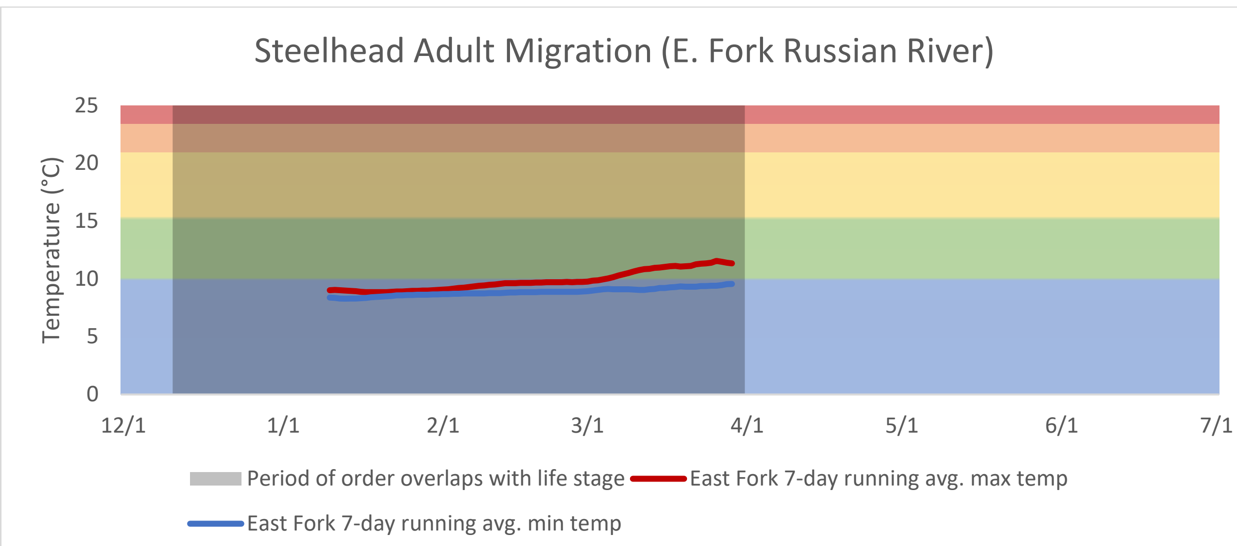

Figure 4-12. The 7-day running average of the minimum and maximum water temperatures collected by Sonoma Water in the east fork Russian River 0.5 km downstream of Coyote Valley Dam shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead adult migration based on Table 4-1.

Salmonid Rearing

Salmonids must cope with water temperatures found at their rearing sites. In the Russian River basin much of the salmonid rearing habitat is in tributaries to the Russian River including Dry Creek, but Chinook and steelhead rear in the mainstem Russian River as well. Chinook emerge from redds constructed in the upper Russian River in the early spring and begin rearing in the shallow portions of the stream margins. In the mainstem Russian River, Chinook finish rearing in the early spring when water temperatures are still relatively cool. As a result, Chinook rear at more locations in the mainstem, but for a shorter time than steelhead. Therefore, we relate water temperature at several mainstem

Russian River sites to Chinook water temperature criteria. Steelhead rear in freshwater for one or more years and are primarily restricted to the tributaries of the Russian River and to the portion of Russian River where water released from the cold-water pool (the bottom portion of the lake) in Lake Mendocino has the greatest cooling effect on mainstem rearing habitat near Coyote Valley Dam. This cooling effect has largely diminished by the time water reaches Cloverdale approximately 50 km downstream. We relate steelhead water temperature criteria to water temperature collected in the east fork of Russian River downstream of Coyote Valley Dam and at Hopland as these sites are within the section of the Russian River that can provide year-round rearing opportunities for juvenile steelhead. Juvenile coho salmon do not rear in the mainstem of the Russian River.

Chinook

During 2021, water temperatures for rearing Chinook ranged from optimal to acutely stressful depending on the site and time period within the Chinook rearing season (Figures 4-13 through 4-19). However, it is important to note that Chinook in the Russian migrate downstream and out to sea in the spring thus avoiding high temperatures and by June the majority of Chinook smolts have emigrated from the Russian River (see Salmonid Smolt Outmigration).

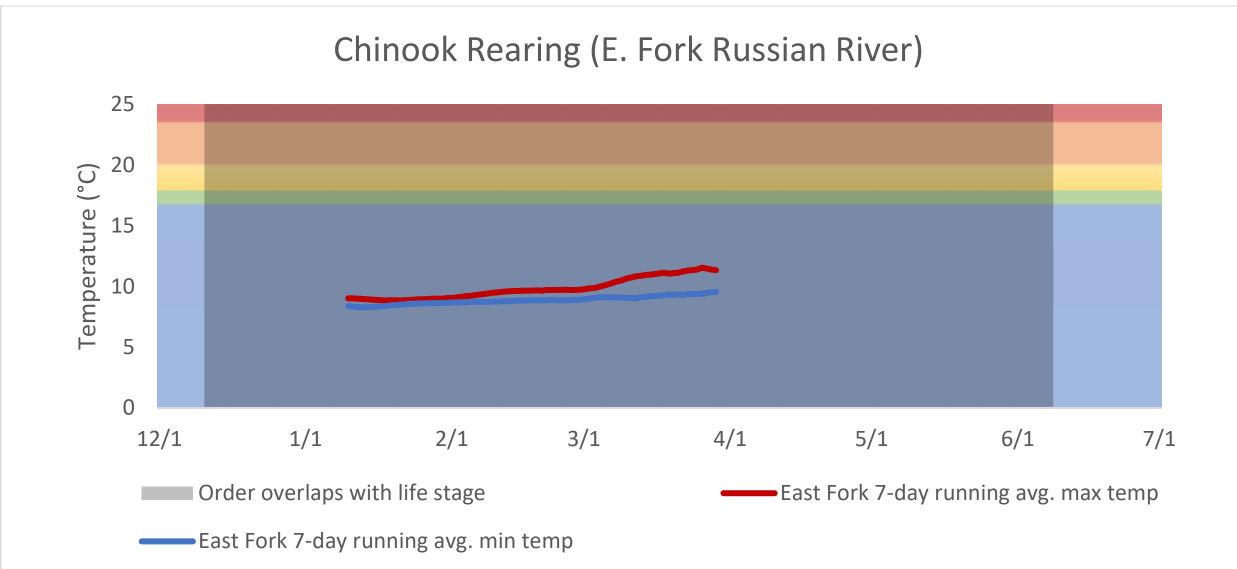

Figure 4-13. The 7-day running average of the minimum and maximum water temperatures collected by Sonoma Water in the east fork Russian River 0.5 km downstream of Coyote Valley Dam shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook rearing based on Table 4-2.

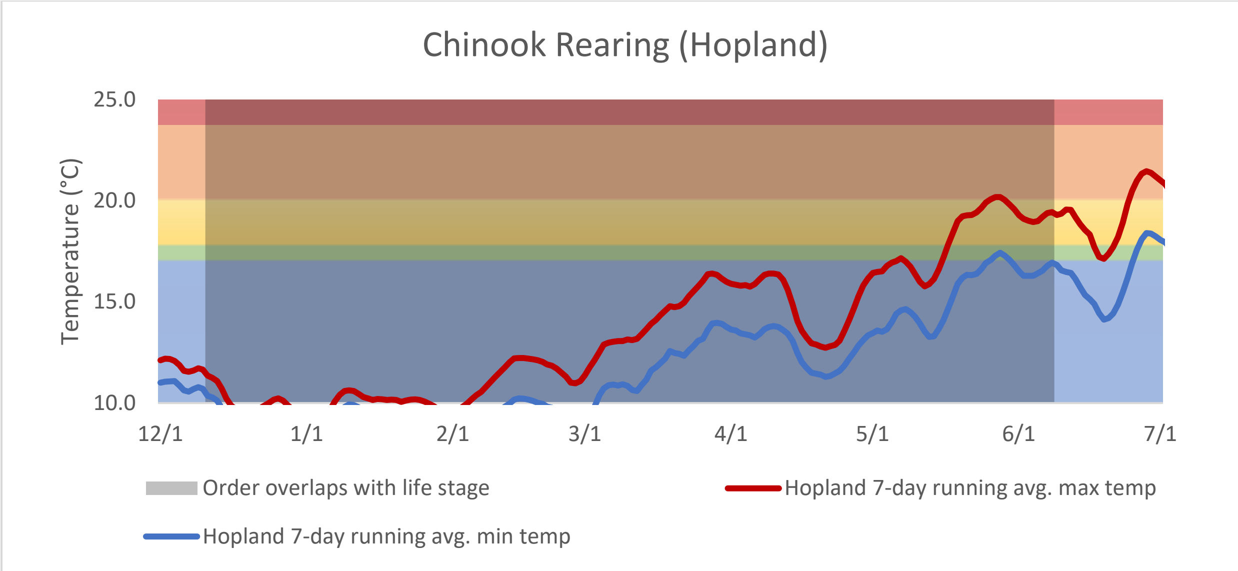

Figure 4-14. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Hopland (11462500) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook rearing based on Table 4-2.

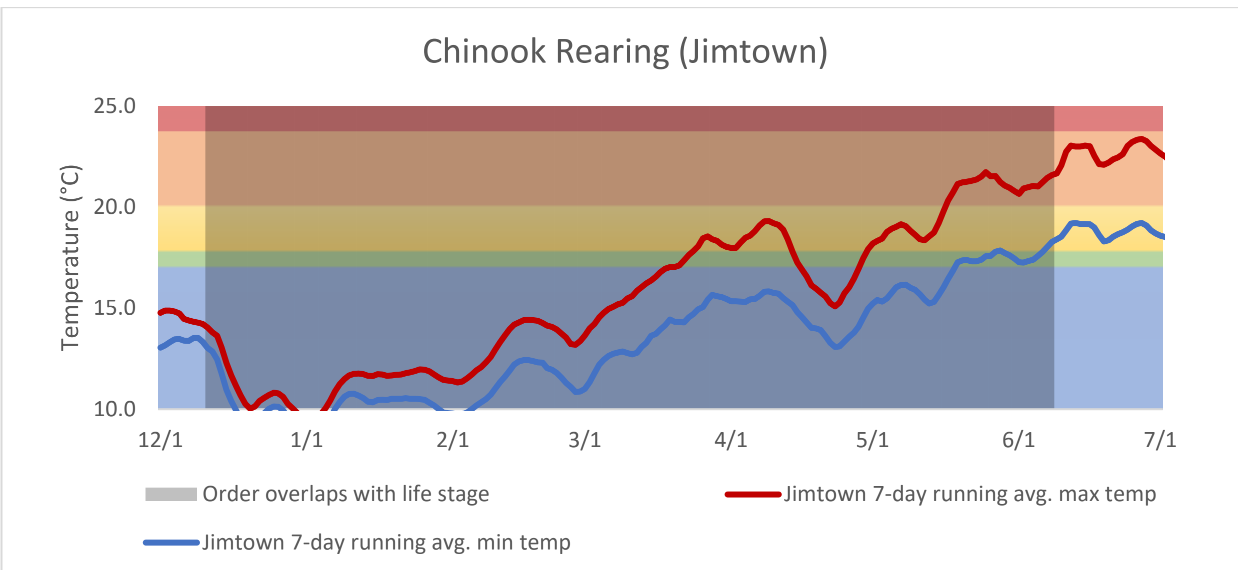

Figure 4-15. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Jimtown (USGS gage number 11463682) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook rearing based on Table 4-2.

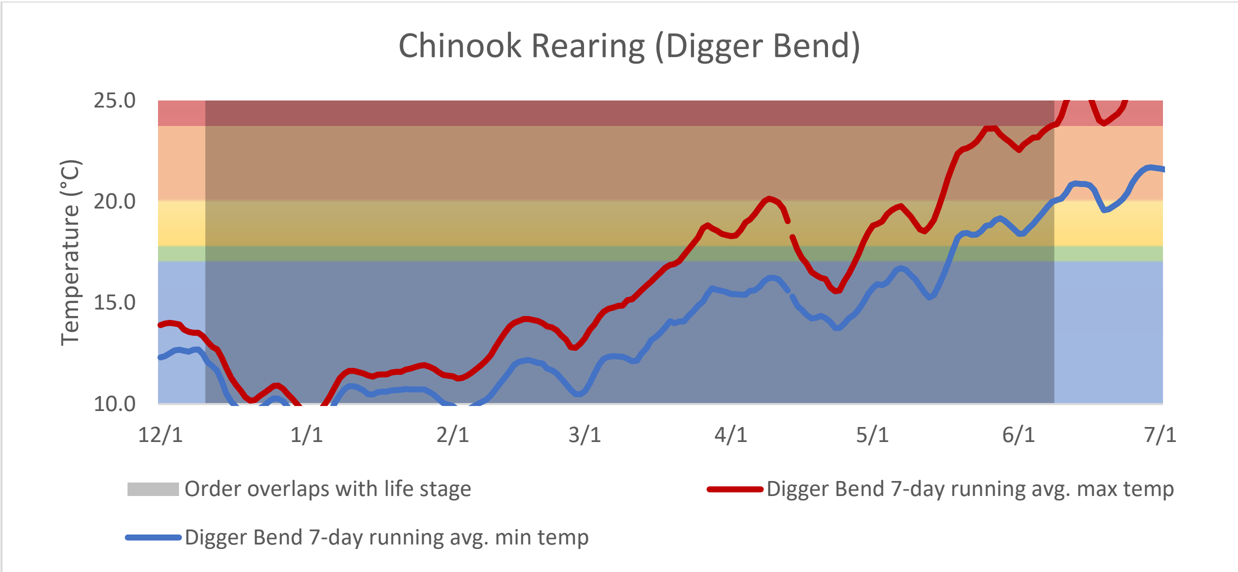

Figure 4-16. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Digger Bend (11463980) shown with the optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook rearing based on Table 4-2.

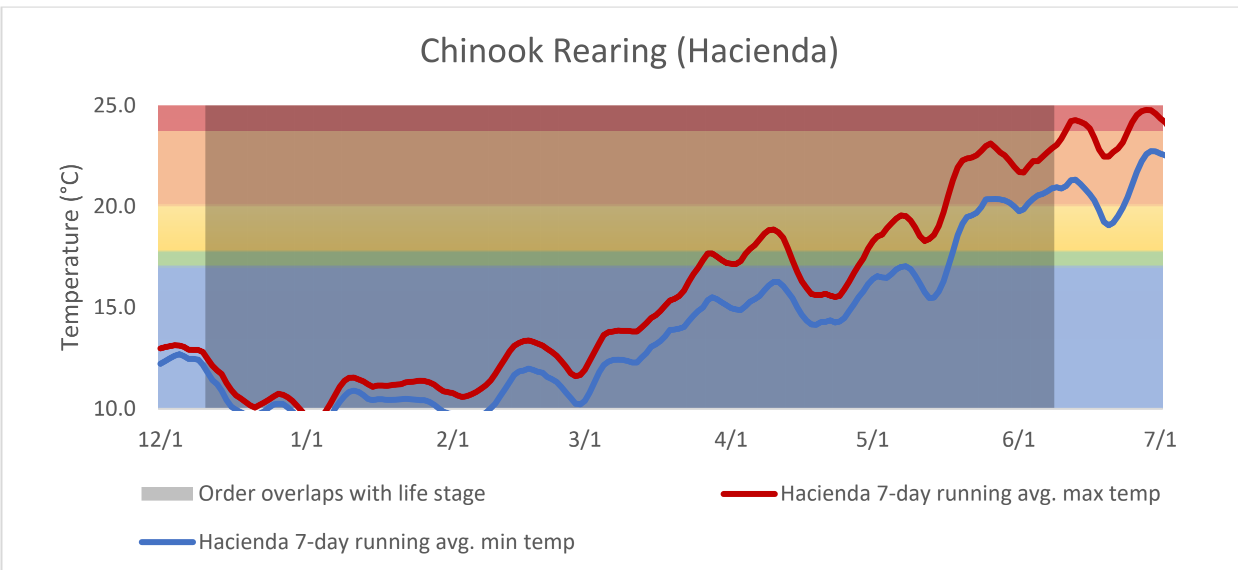

Figure 4-17. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Hacienda (gage number 11467000) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook rearing based on Table 4-2.

Steelhead

Steelhead parr rear year-round in the upper Russian River. During the Order water temperature in the east fork of the Russian River downstream of Coyote Valley Dam was optimal during the period that data was collected at this site (Figure 4-18). At the USGS stream gage at Hopland, water temperature was generally optimal to suitable for steelhead rearing (Figure 4-19).

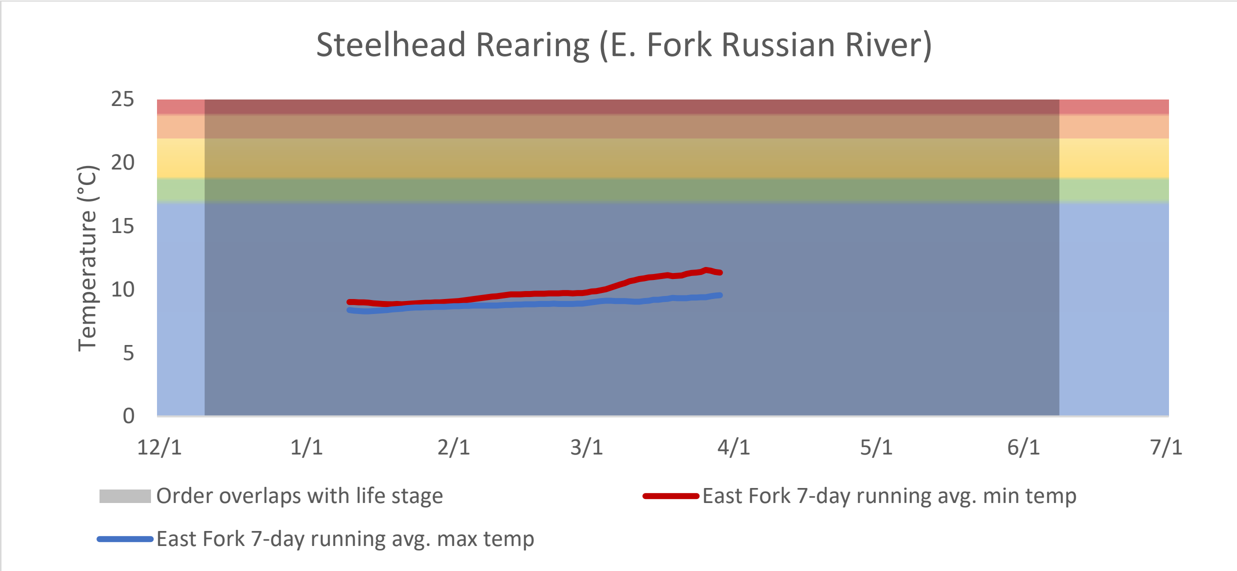

Figure 4-18. The 7-day running average of the minimum and maximum water temperatures collected by Sonoma Water at the east fork Russian River downstream of Coyote Valley Dam shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead parr based on Table 4-2.

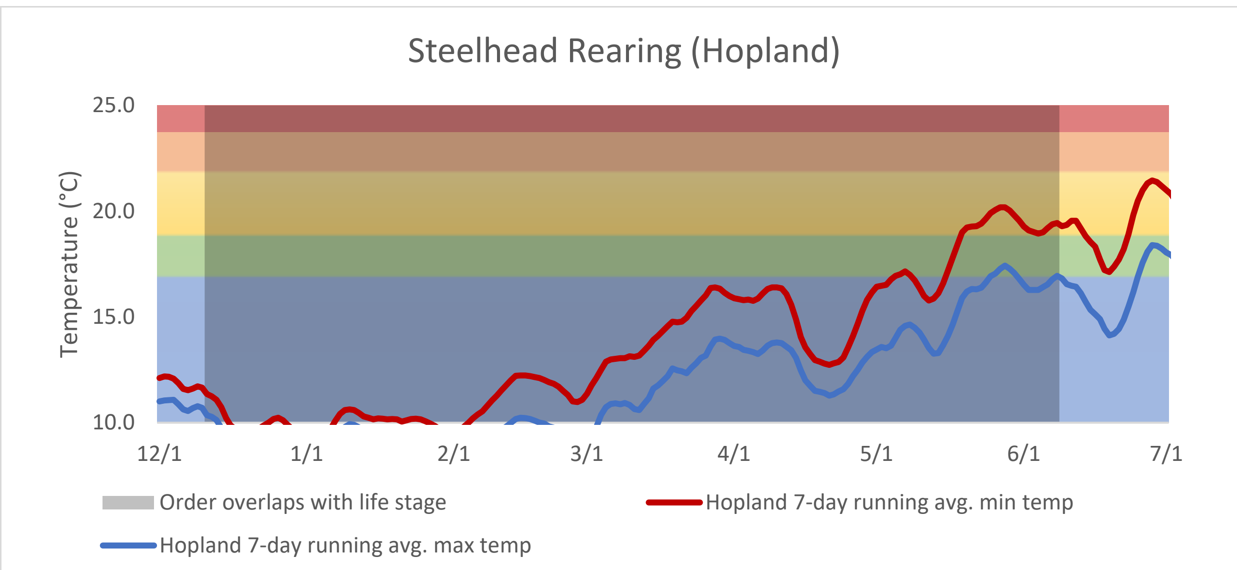

Figure 4-19. The 7-day running average of the minimum and maximum water temperatures collected at Hopland (USGS stream gage number 11462500) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead parr based on Table 4-2.

Salmonid Smolt Outmigration

For smolts produced in the upper portion of the watershed, we summarized Russian River water temperature for the east fork Russian River downstream of Coyote Valley Dam, Hopland, Jimtown, Digger Bend, and Hacienda gages and show these temperatures with water temperature criteria for Chinook and Steelhead smolts. For coho smolts we summarized water temperature for the Digger Bend, and Hacienda gages since there is little coho spawning habitat upstream of Maacama Creek. Catches of Chinook, steelhead, and coho smolts from the Mirabel downstream migrant trap are shown with the Hacienda temperature data since the Hacienda gage is located near the Mirabel downstream migrant trap. The Mirabel downstream migrant trap was installed on April 7, 2022, and fished through July 7, 2022.

Chinook

Water temperature in the upper Russian River near the Coyote Valley Dam was not collected during the smolt outmigration period (April through June). Water temperature was generally favorable at the Hopland gage, however the seven-day running average of the maximum water temperature became stressful near the end of the smolt migration period. Water temperature became stressful to acutely stressful at sites located downstream of Hopland (Figure 4-20 through Figure 4-23). It is important to note that Chinook have evolved to emigrate during the spring before water temperatures become lethal that many Chinook were captured at the Mirabel fish trap emigrated before water temperature became acutely stressful (Figure 4-23).

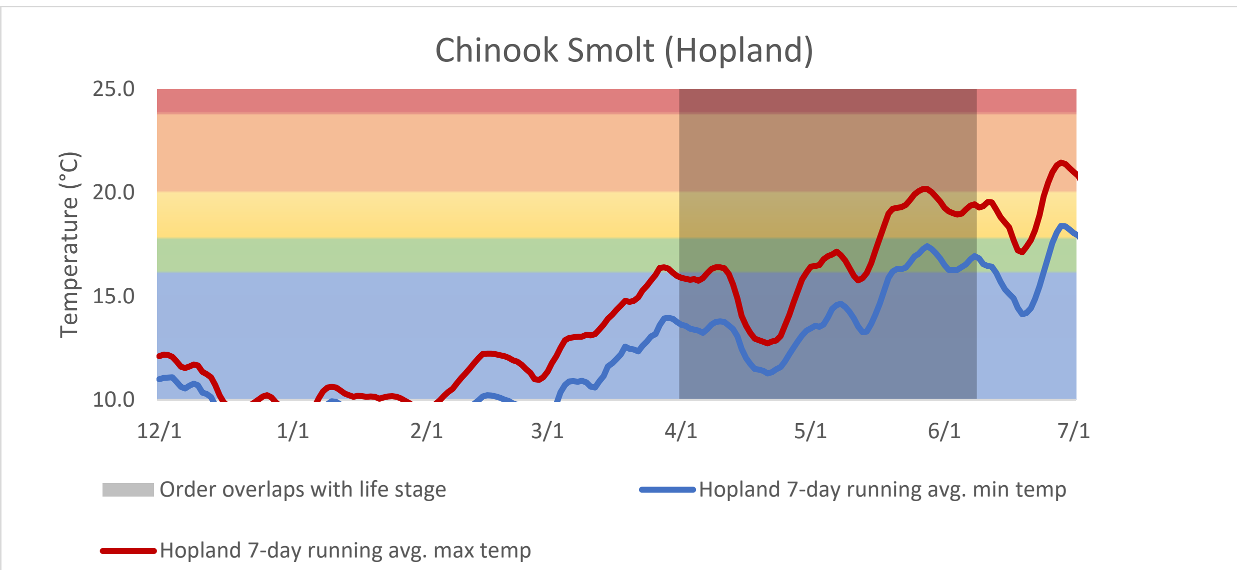

Figure 4-20. The 7-day running average of the minimum and maximum water temperatures collected at Hopland (USGS stream gage number 11462500). Shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook smolts based on Table 4-3.

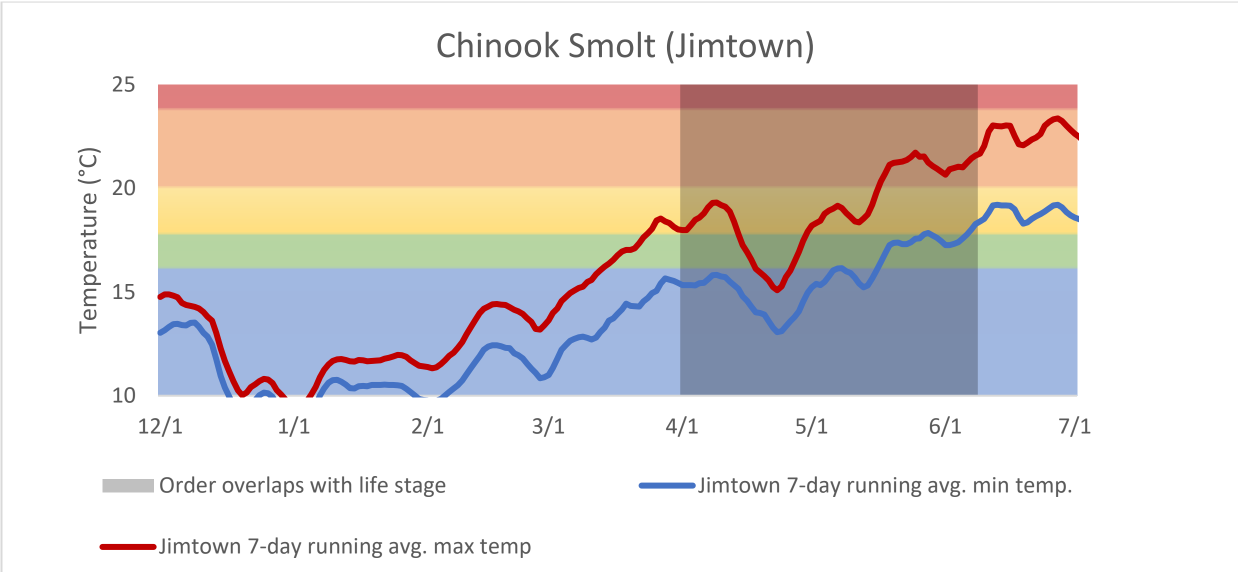

Figure 4-21. The 7-day running average of the minimum and maximum water temperatures collected at the Jimtown USGS stream Gage (1146382) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook smolts based on Table 4-3.

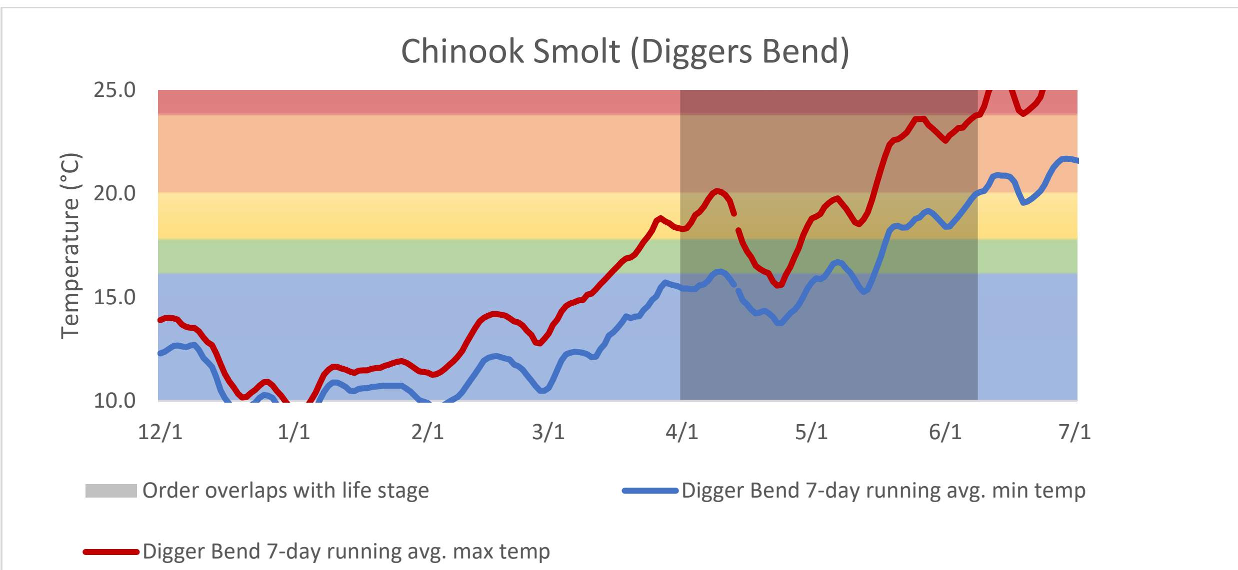

Figure 4-22. The 7-day running average of the minimum and maximum water temperatures collected at the Digger Bend USGS stream gage (11463980) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook smolts based on Table 4-3.

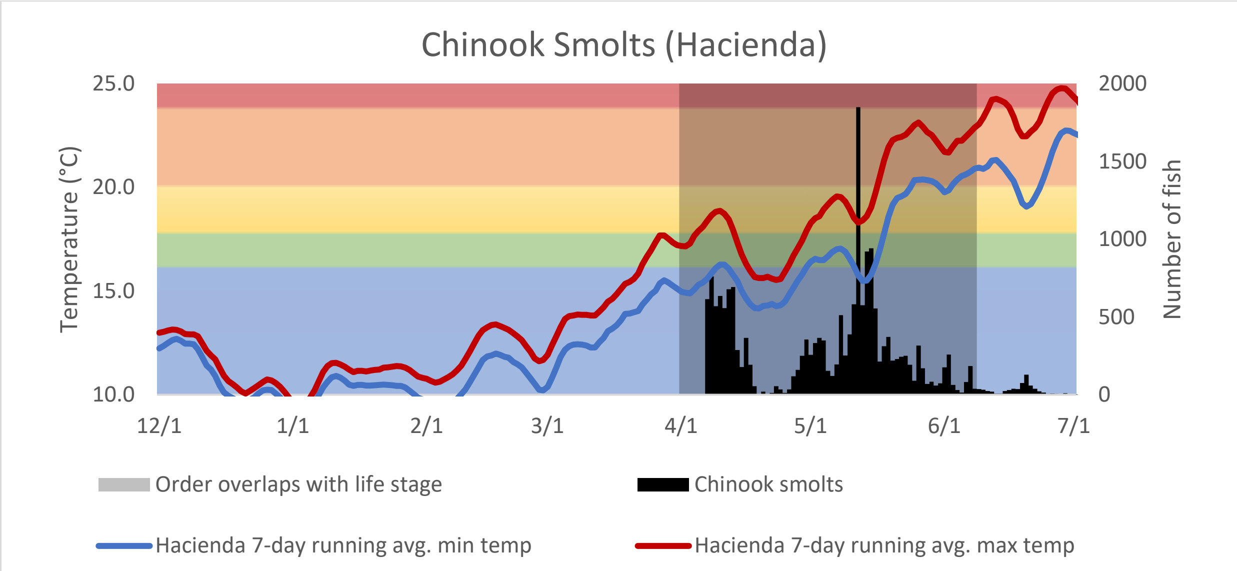

Figure 4-23. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000) shown with the Chinook smolt catch from the Mainstem Russian River near Mirabel and optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook smolts based on Table 4-3.

Coho

Water temperature in the Russian River near Digger Bend and Hacienda ranged from suitable to acutely stressful with early months of the coho smolt emigration period being more favorable (Figure 4-24 and Figure 4-25). It is important to note that coho have evolved to emigrate during the spring before water temperatures become lethal and that many coho were captured at the Mirabel fish trap emigrated before the 7-day running average of the minimum daily water temperature became acutely stressful (Figure 4-25).

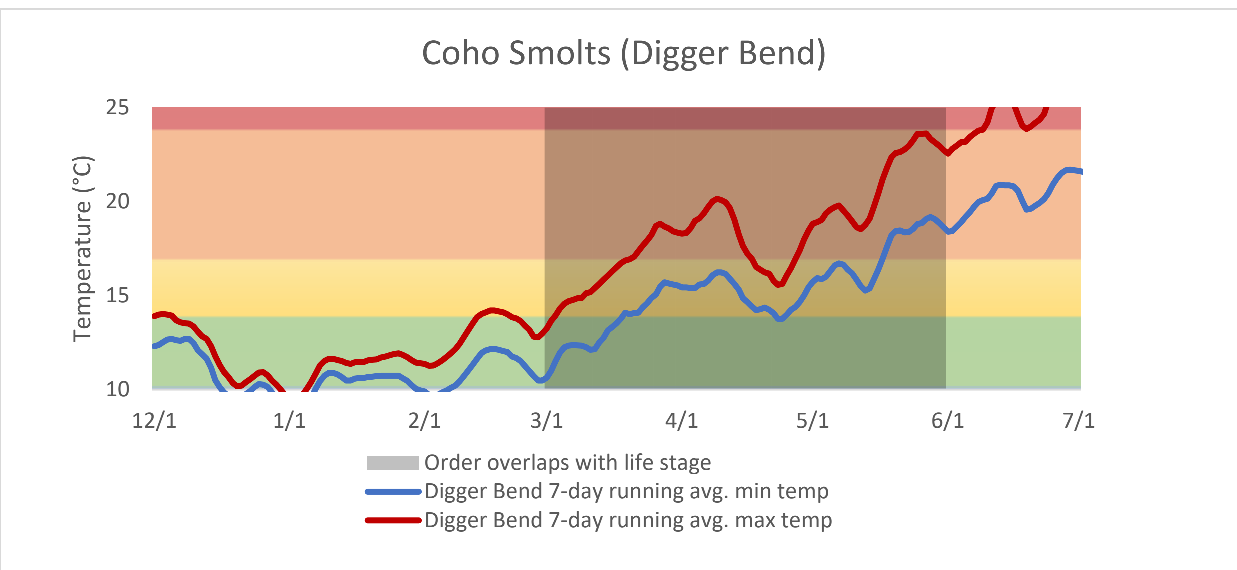

Figure 4-24. The 7-day running average of the minimum and maximum water temperatures collected at the Digger Bend USGS stream gage (11463980) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Coho smolts based on Table 4-3.

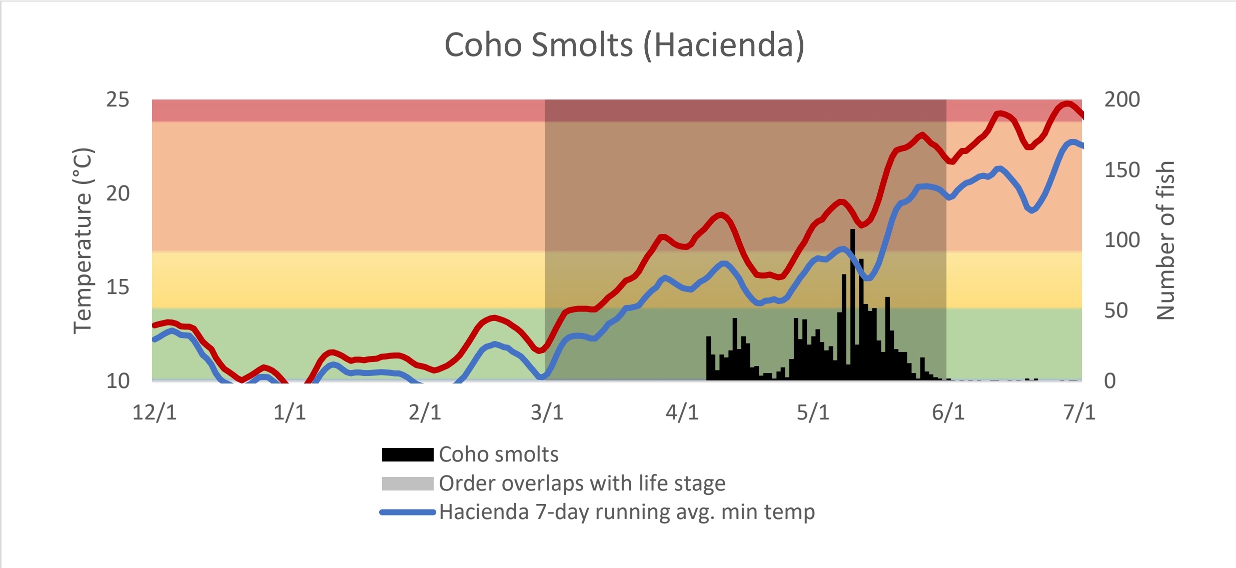

Figure 4-25. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000) shown with the Chinook smolt catch from the Mainstem Russian River near Mirabel and optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Coho smolts based on Table 4-3.

Steelhead

Water temperature in the upper Russian River near the Coyote Valley Dam was generally favorable for steelhead smolts during the period that steelhead smolts are expected to emigrate and when data was available (March through April, Figure 4-26). However, water temperature became stressful to acutely stressful at sites located downstream of Hopland (Figure 4-27 through Figure 4-30). It is important to note that steelhead have evolved to emigrate during the spring before water temperatures become lethal and that many steelhead were captured at the Mirabel fish trap emigrated before water temperature became acutely stressful (Figure 4-30).

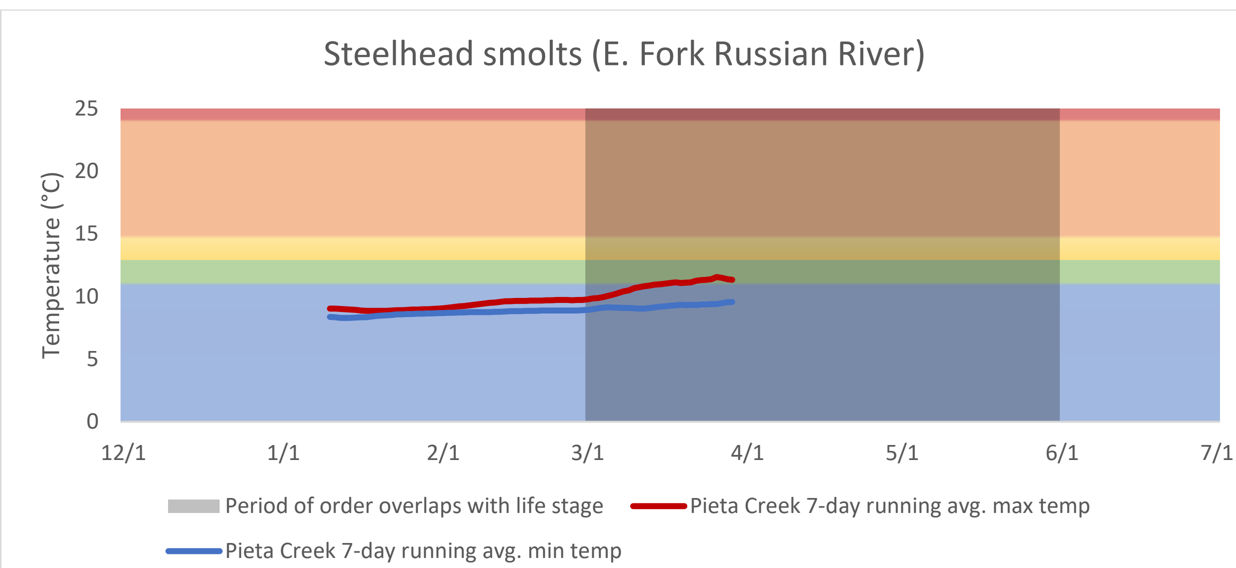

Figure 4-26. The 7-day running average of the minimum and maximum water temperatures collected by Sonoma Water at the east fork of the Russian River downstream of the Coyote Valley Dam. Shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead smolts based on Table 4-3.

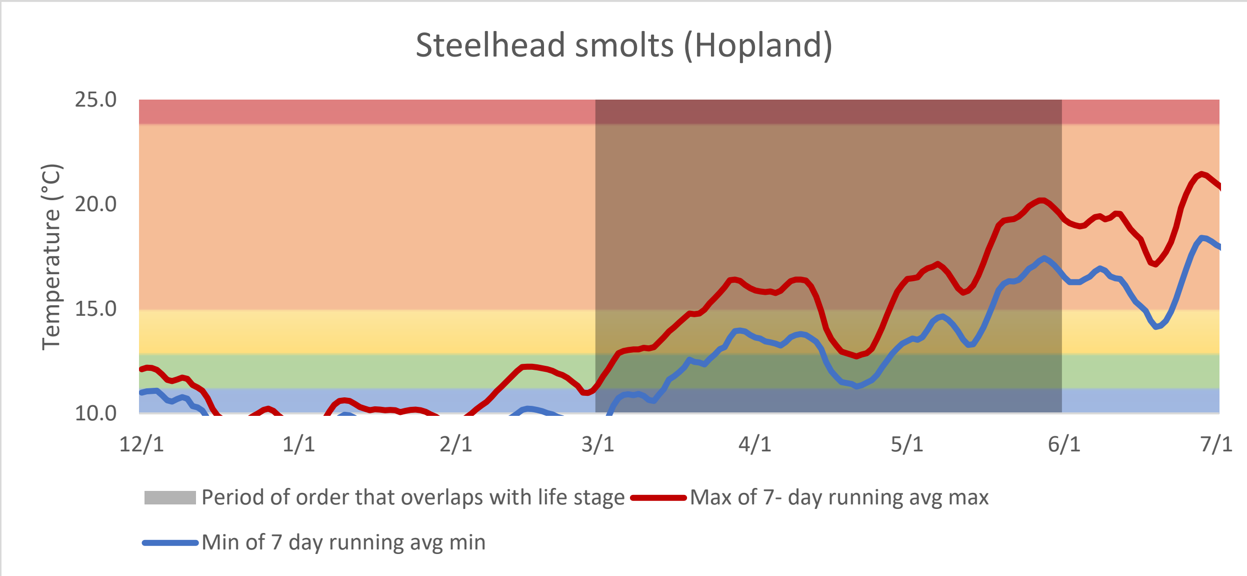

Figure 4-27. The 7-day running average of the minimum and maximum water temperatures collected at Hopland (USGS stream gage number 11462500). Shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead smolts based on Table 4-3.

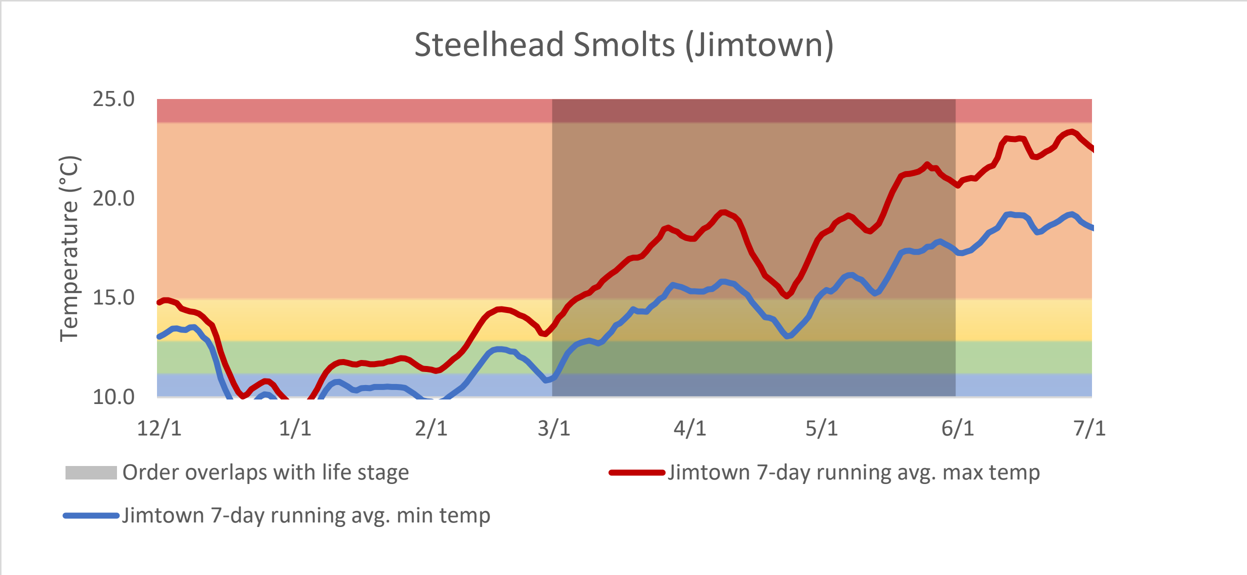

Figure 4-28. The 7-day running average of the minimum and maximum water temperatures collected at the Jimtown USGS stream Gage (1146382) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead smolts based on Table 4-3.

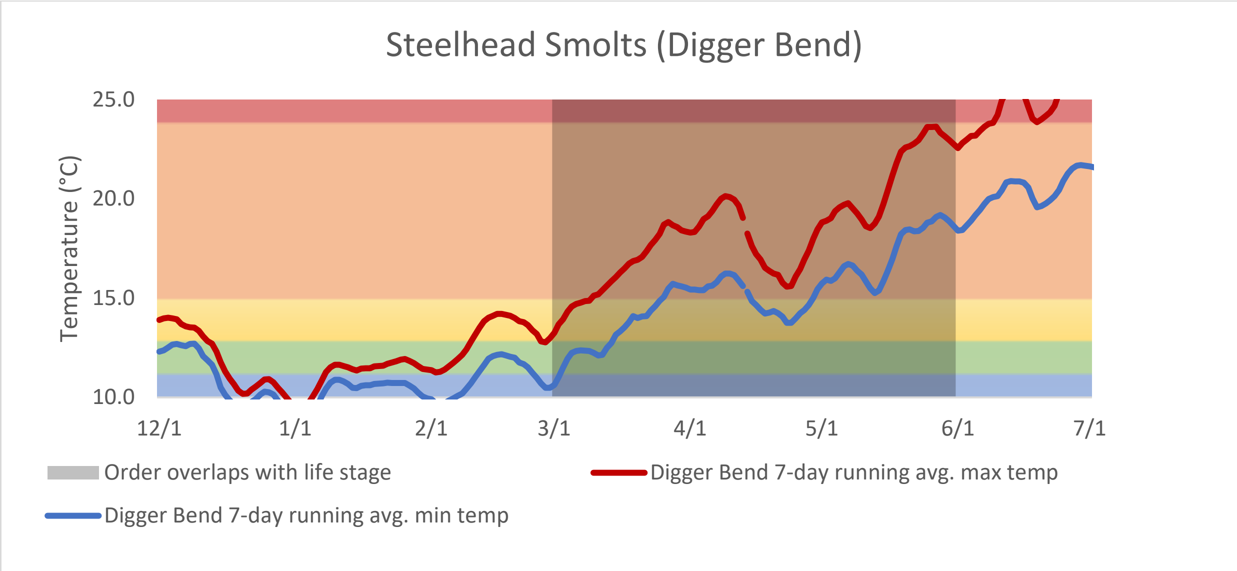

Figure 4-29. The 7-day running average of the minimum and maximum water temperatures collected at the Digger Bend USGS stream gage (11463980) shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead smolts based on Table 4-3.

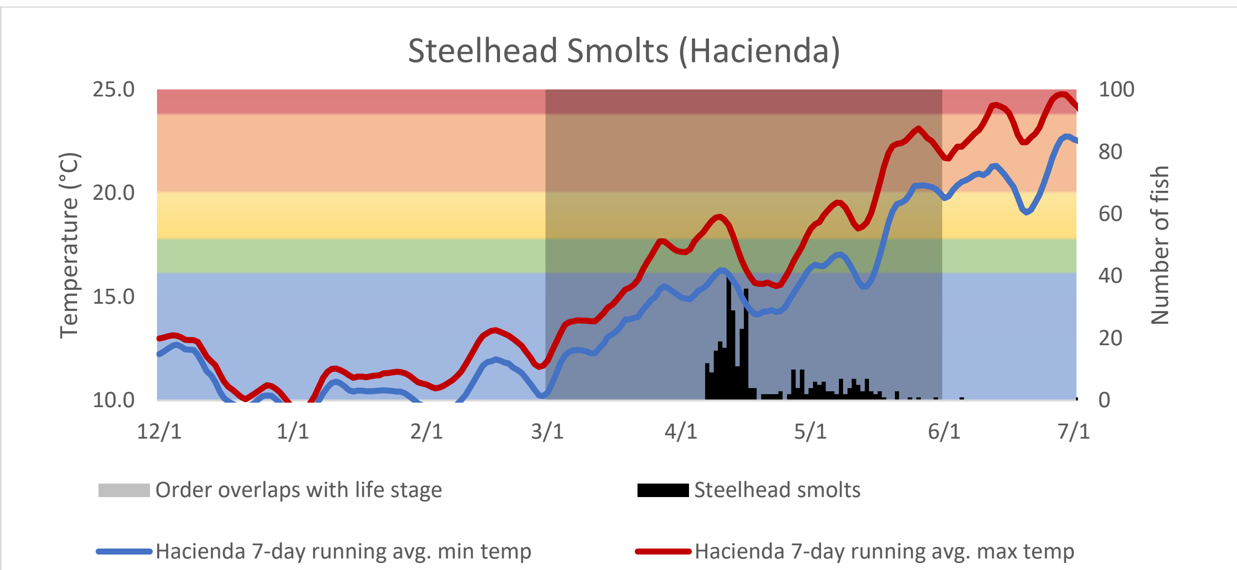

Figure 4-30. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000) shown with the Chinook smolt catch from the Mainstem Russian River near Mirabel and optimal, suitable, stressful, acutely stressful and lethal water temperature zones for steelhead smolts based on Table 4-3.

Dissolved Oxygen

At most sites, dissolved oxygen generally ranged from optimal to suitable for salmonids in the Russian River throughout the Order. In the east fork Russian River dissolved oxygen was favorable based on the limited data that was available for that site (Figure 4-31). At Hopland dissolved oxygen was generally favorable (Figure 4-32). However, dissolved oxygen became stressful at Jimtown, particularly later in the season (Figure 4-33). At Digger Bend and at Hacienda dissolved oxygen was generally favorable during the order (figure 4-34 and Figure 4-35).

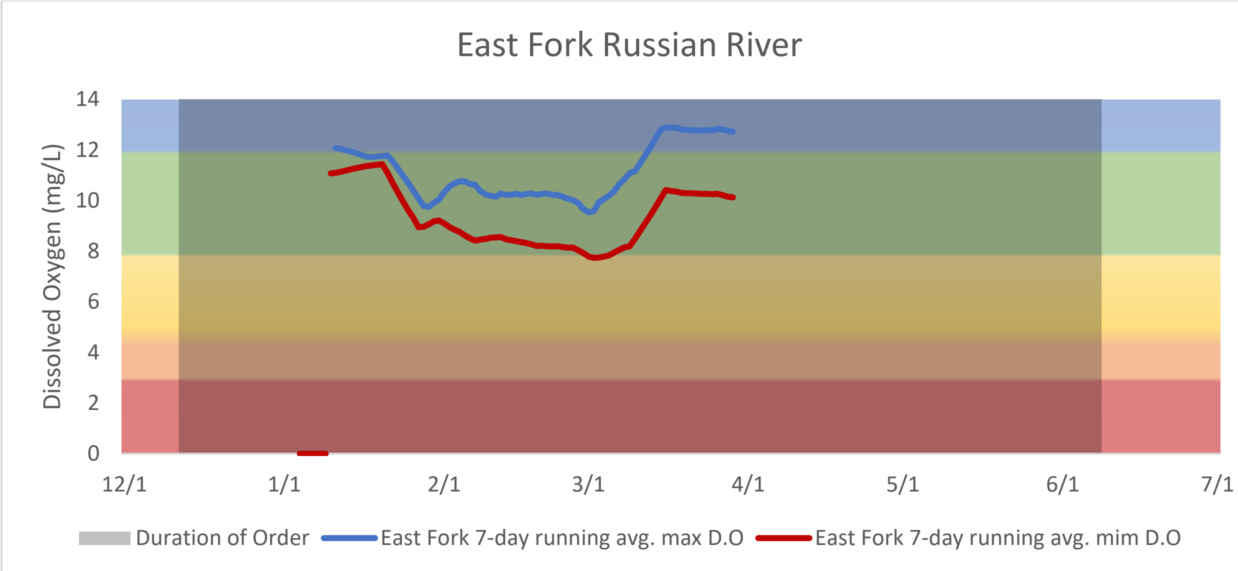

Figure 4-31. The 7-day running average of the minimum and maximum dissolved oxygen collected by Sonoma Water in the east fork of the Russian River downstream of Coyote Valley Dam shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4.

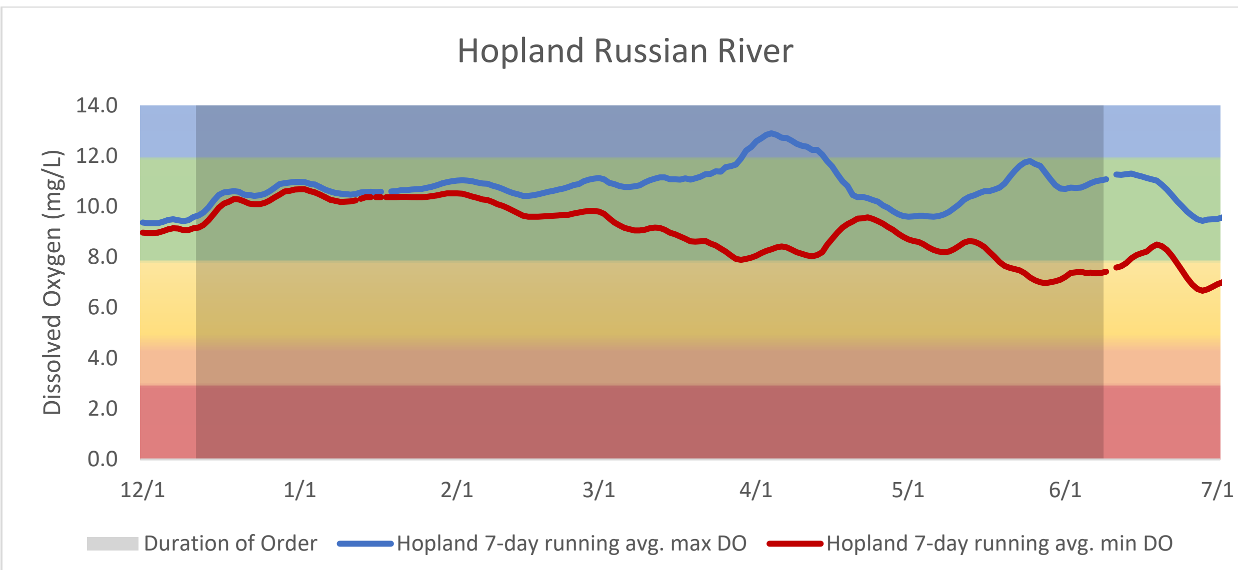

Figure 4-32. The 7-day running average of the minimum and maximum dissolved oxygen collected at Hopland (USGS stream gage number 11462500) shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4.

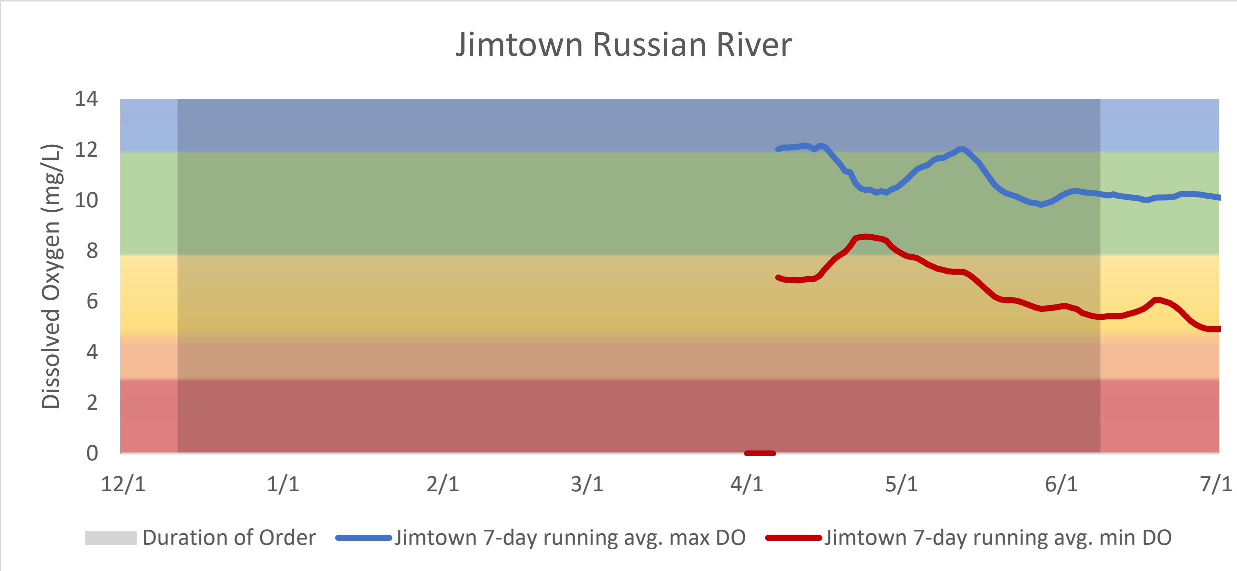

Figure 4-33. The 7-day running average of the minimum and maximum dissolved oxygen collected at the Jimtown USGS stream Gage (1146382) shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4.

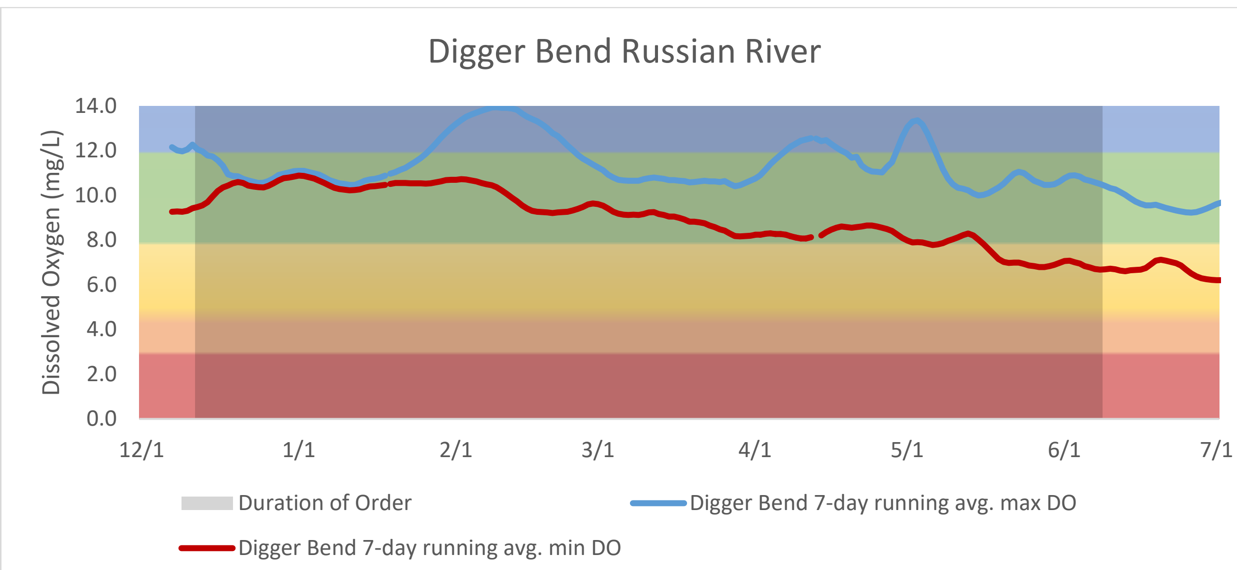

Figure 4-34. The 7-day running average of the minimum and maximum dissolved oxygen collected at the Digger Bend USGS stream gage (11463980) shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4.

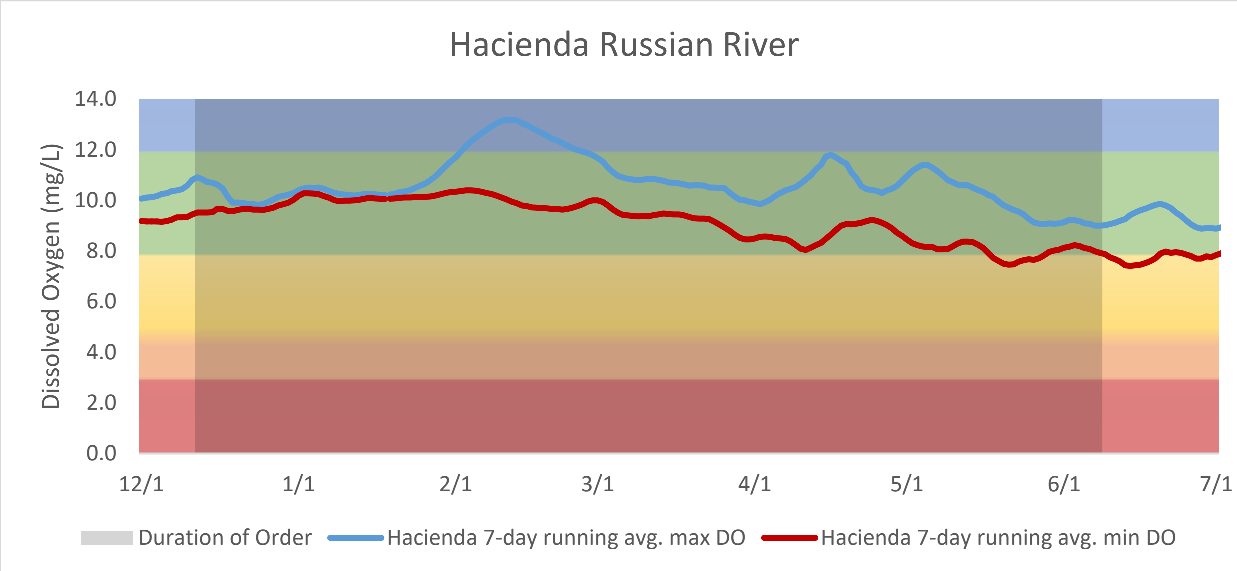

Figure 4-35. The 7-day running average of the minimum and maximum dissolved oxygen collected at the Hacienda USGS stream gage (1146700) shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4.

4.2.5 Summary

Water temperatures were generally favorable for salmonids during the Order since the Order spanned from the winter to late spring. However, some salmonids did experience unfavorable conditions near the end of their migration and rearing periods. Water temperature is mainly dependent on air temperature and varies thought the year with cooler temperature in the winter when air temperature is relatively cool and warmer temperatures in the summer when air temperature is warm. Cold water reservoir releases made from deep in the lakes provide cool water habitat immediately downstream of the Coyote Valley and Warm Springs dams and this habitat can remain cool despite warm air temperatures. Salmonids have adapted to cope with seasonally warm water temperatures by occupying the river at a time of year when water temperatures are favorable or in the case of rearing steelhead by occupying sections of the river that have cooler water temperatures from reservoir releases.

Water temperature was generally favorable for adult salmonids. During the time period that the Order was in effect and that adult Chinook were expected to be migrating upstream water temperature was optimal. For coho adults water temperature was in the optimal to suitable range during the portion of their migration period that overlapped with the Order. Adult steelhead return to the Russian River later in the winter than Chinook or coho. As a result, they must cope with slightly warmer temperatures near the end of their migration period. Water temperature for adult steelhead was generally optimal to suitable with temperatures reaching stressful levels by the end of the migration season. While temperatures were occasionally unfavorable for adult salmonids it is important to note that (1) these fish have evolved to cope with seasonally warm water temperatures by returning to the river during a time of year when water temperatures are cool and (2) most adult salmonids return to the Russian River during a time of year when water temperatures in the river are favorable.

For juvenile Chinook, water temperatures were favorable for rearing in the early spring at most sites but became unfavorable by the end of the rearing season. Fish that remained in the river and emigrated as smolts late in the rearing season encountered unfavorable water temperatures as they moved downstream and out to sea. It is important to note that Chinook have likely adapted to warm temperatures in the Russian River and have adjusted their run timing to further cope with seasonally warmer water temperatures by emigrating earlier in the year.

For steelhead rearing, water temperature in the east fork Russian River was optimal during the time period that data was available. At Hopland, water temperature for steelhead rearing was generally optimal during the Order with a brief period near the end of the Order where the 7-day running average of the average maximum daily temperature was stressful.

Chinook salmon smolts experienced optimal to suitable conditions with stressful water temperatures occurring later in the migration period. However, the bulk of Chinook smolts emigrate from the Russian River when water temperatures are more favorable. In 2022, over 78% (15,205) of the Chinook smolts captured at the Mirabel downstream migrant trap (not adjusted for trap efficiency) were captured before the 7-day average of the maximum daily water temperature reached acutely stressful levels.

Dissolved oxygen was generally suitable for salmonids during the Order. Dissolved oxygen in the east fork of the Russian River was optimal to suitable, although limited data that was available. The 7-day running average of the minimum dissolved oxygen was generally suitable for salmonids at Hopland, Digger Bend, and Hacienda with a period of stressful conditions near the end of the Order. Limited data was available for Jimtown early in the season; however the 7-day running average of the minimum dissolved oxygen was stressful for salmonids from early May to the end of the Order at this site.

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Appendix A-5

May 25, 2022

Erik Ekdahl, Deputy Director of Water Rights
State Water Resources Control Board
Division of Water Rights
P.O. Box 2000
Sacramento, CA 95812-2000

RE: Petitions for Temporary Urgency Change—Permits 12947A, 12949, 12950 and 16596 (Applications 12919A, 15736, 15737 and 19351)

Dear Mr. Ekdahl:

Enclosed are the Petitions for Temporary Urgency Change to modify the minimum instream flow requirements for the Russian River as established by Decision 1610 for Permits 12947A, 12949, 12950 and 16596. Accompanying the petitions are the following:

1) *Supplement to the May 2022 Temporary Urgency Change Petitions*
2) Environmental Information for Petition
3) Notice of Exemption
4) Proposed Draft Fisheries and Water Quality Terms
5) California Department of Fish and Wildlife Review Fee Payment
6) State Water Resources Control Board Petition Fee Payment

These petitions are being submitted due to severe drought conditions, historically low storage levels in Lake Mendocino and Lake Sonoma, and a flawed hydrologic index that establishes minimum instream flow requirements that do not align with the current watershed conditions. Sonoma Water is currently operating under permit conditions for Permits 12947A, 12949, 12950 and 16596 modified by a temporary urgency change order dated December 10, 2021 (Dec 2021 Order), that expires on June 8, 2022. The requested changes in the current submittal would continue river operations under *Critical* minimum instream flow requirements, which have been in place since March 1, 2022.

The hydrologic index in Sonoma Water's permits is based on Lake Pillsbury inflow in the Eel River. On June 1st, the water supply condition for the Russian River will be classified as *Normal*, Dry Spring II and that designation would continue through the end of the year in the absence of the Dec 2021 Order or the proposed changes in these temporary urgency change petitions.

The Russian River watershed is currently under a designation of Severe Drought (D2) as categorized by the U.S. Drought Monitor (https://www.drought.gov/current-conditions).

Without the proposed changes in effect, there is an undue risk that water supply conditions as determined by the permits' current hydrologic index will set minimum instream flows in the Russian River watershed that are not sustainable with the limited reservoir storage volumes in Lake Mendocino and Lake Sonoma that have been depleted after three years of drought conditions.

On May 19th, Sonoma Water staff met with staff from the North Coast Regional Water Quality Control Board, California Department of Fish and Wildlife and National Marine Fisheries Service and developed the enclosed 'Proposed Draft Fisheries and Water Quality Terms'. These draft terms are preliminary and the participating resource agencies may be providing additional comments based on further review of this petition package.

I look forward to working with the Division of Water Rights staff on this important conservation effort.

Sincerely,

[redacted]

Grant Davis
General Manager

c: S. Boland-Brien, K. Emanuel – State Water Resources Control Board
R. Coey, J. Fuller – National Marine Fisheries Service
M. Kittel - California Department of Fish & Wildlife
M. St. John, B. McFadin – North Coast Regional Water Quality Control Board
P. Jeane, D. Seymour, T. Schram, J. Martini Lamb, D. Manning, J. Jasperse – Sonoma Water
C. O'Donnell, A. Brand – Sonoma County Counsel
R. Bezerra – Bartkiewicz, Kronick & Shanahan

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Please indicate County where your project is located here:

Sonoma / Mendo.

MAIL FORM AND ATTACHMENTS TO:
State Water Resources Control Board
DIVISION OF WATER RIGHTS
P.O. Box 2000, Sacramento, CA 95812-2000
Tel: (916) 341-5300 Fax: (916) 341-5400
http://www.waterboards.ca.gov/waterrights

PETITION FOR CHANGE

Separate petitions are required for each water right. Mark all areas that apply to your proposed change(s). Incomplete forms may not be accepted. Location and area information must be provided on maps in accordance with established requirements. (Cal. Code Regs., tit. 23, § 715 et seq.) Provide attachments if necessary.

☐ **Point of Diversion** Wat. Code, § 1701
☐ **Point of Rediversion** Cal. Code Regs., tit. 23, § 791(e)
☐ **Place of Use** Wat. Code, § 1701
☐ **Purpose of Use** Wat. Code, § 1701
☐ **Distribution of Storage** Cal. Code Regs., tit. 23, § 791(e)
☒ **Temporary Urgency** Wat. Code, § 1435
☐ **Instream Flow Dedication** Wat. Code, § 1707
☐ **Waste Water** Wat. Code, § 1211
☐ **Split** Cal. Code Regs., tit. 23, § 836
☐ **Terms or Conditions** Cal. Code Regs., tit. 23, § 791(e)
☐ **Other**

Application 12919A Permit 12947A License Statement

I (we) hereby petition for change(s) noted above and described as follows:

Point of Diversion or Rediversion – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Present:

Proposed:

Place of Use – Identify area using Public Land Survey System descriptions to ¼-¼ level; for irrigation, list number of acres irrigated.

Present:

Proposed:

Purpose of Use

Present:

Proposed:

Split

Provide the names, addresses, and phone numbers for all proposed water right holders.

In addition, provide a separate sheet with a table describing how the water right will be split between the water right holders: for each party list amount by direct diversion and/or storage, season of diversion, maximum annual amount, maximum diversion to offstream storage, point(s) of diversion, place(s) of use, and purpose(s) of use. Maps showing the point(s) of diversion and place of use for each party should be provided.

Distribution of Storage

Present:

Proposed:

Temporary Urgency

This temporary urgency change will be effective from 6/9/2022 to 12/5/2022 .

Include an attachment that describes the urgent need that is the basis of the temporary urgency change and whether the change will result in injury to any lawful user of water or have unreasonable effects on fish, wildlife or instream uses.

Instream Flow Dedication – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Upstream Location:

Downstream Location:

List the quantities dedicated to instream flow in either: ☐ cubic feet per second or ☐ gallons per day:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Will the dedicated flow be diverted for consumptive use at a downstream location? ○ Yes ○ No

If yes, provide the source name, location coordinates, and the quantities of flow that will be diverted from the stream.

Waste Water

If applicable, provide the reduction in amount of treated waste water discharged in cubic feet per second.

Will this change involve water provided by a water service contract which prohibits your exclusive right to this treated waste water? ○ Yes ○ No

Will any legal user of the treated waste water discharged be affected? ○ Yes ○ No

General Information – For all Petitions, provide the following information, if applicable to your proposed change(s).

Will any current Point of Diversion, Point of Storage, or Place of Use be abandoned? ○ Yes ◉ No

I (we) have access to the proposed point of diversion or control the proposed place of use by virtue of:

☐ ownership ☐ lease ☐ verbal agreement ☐ written agreement

If by lease or agreement, state name and address of person(s) from whom access has been obtained.

Give name and address of any person(s) taking water from the stream between the present point of diversion or rediversion and the proposed point of diversion or rediversion, as well as any other person(s) known to you who may be affected by the proposed change.

All Right Holders Must Sign This Form: I (we) declare under penalty of perjury that this change does not involve an increase in the amount of the appropriation or the season of diversion, and that the above is true and correct to the best of my (our) knowledge and belief. Dated 5.25.22 at Santa Rosa, CA .

[redacted]

Right Holder or Authorized Agent Signature

Right Holder or Authorized Agent Signature

NOTE: All petitions must be accompanied by:

(1) the form Environmental Information for Petitions, including required attachments, available at: http://www.waterboards.ca.gov/waterrights/publications_forms/forms/docs/pet_info.pdf

(2) Division of Water Rights fee, per the Water Rights Fee Schedule, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/fees/

(3) Department of Fish and Wildlife fee of $850 (Pub. Resources Code, § 10005)

Please indicate County where your project is located here:

Sonoma / Mendo.

MAIL FORM AND ATTACHMENTS TO:
State Water Resources Control Board
DIVISION OF WATER RIGHTS
P.O. Box 2000, Sacramento, CA 95812-2000
Tel: (916) 341-5300 Fax: (916) 341-5400
http://www.waterboards.ca.gov/waterrights

PETITION FOR CHANGE

Separate petitions are required for each water right. Mark all areas that apply to your proposed change(s). Incomplete forms may not be accepted. Location and area information must be provided on maps in accordance with established requirements. (Cal. Code Regs., tit. 23, § 715 et seq.) Provide attachments if necessary.

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☐ **Place of Use** Wat. Code, § 1701
☐ **Purpose of Use** Wat. Code, § 1701
☐ **Distribution of Storage** Cal. Code Regs., tit. 23, § 791(e)
☒ **Temporary Urgency** Wat. Code, § 1435
☐ **Instream Flow Dedication** Wat. Code, § 1707
☐ **Waste Water** Wat. Code, § 1211
☐ **Split** Cal. Code Regs., tit. 23, § 836
☐ **Terms or Conditions** Cal. Code Regs., tit. 23, § 791(e)
☐ **Other**

Application 15736 Permit 12949 License Statement

I (we) hereby petition for change(s) noted above and described as follows:

Point of Diversion or Rediversion – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Present:

Proposed:

Place of Use – Identify area using Public Land Survey System descriptions to ¼-¼ level; for irrigation, list number of acres irrigated.

Present:

Proposed:

Purpose of Use

Present:

Proposed:

Split

Provide the names, addresses, and phone numbers for all proposed water right holders.

In addition, provide a separate sheet with a table describing how the water right will be split between the water right holders: for each party list amount by direct diversion and/or storage, season of diversion, maximum annual amount, maximum diversion to offstream storage, point(s) of diversion, place(s) of use, and purpose(s) of use. Maps showing the point(s) of diversion and place of use for each party should be provided.

Distribution of Storage

Present:

Proposed:

Temporary Urgency

This temporary urgency change will be effective from 6/9/2022 to 12/5/2022.

Include an attachment that describes the urgent need that is the basis of the temporary urgency change and whether the change will result in injury to any lawful user of water or have unreasonable effects on fish, wildlife or instream uses.

Instream Flow Dedication – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Upstream Location:

Downstream Location:

List the quantities dedicated to instream flow in either: ☐ cubic feet per second or ☐ gallons per day:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Will the dedicated flow be diverted for consumptive use at a downstream location? ○ Yes ○ No

If yes, provide the source name, location coordinates, and the quantities of flow that will be diverted from the stream.

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If applicable, provide the reduction in amount of treated waste water discharged in cubic feet per second.

Will this change involve water provided by a water service contract which prohibits your exclusive right to this treated waste water? ○ Yes ○ No

Will any legal user of the treated waste water discharged be affected? ○ Yes ○ No

General Information – For all Petitions, provide the following information, if applicable to your proposed change(s).

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I (we) have access to the proposed point of diversion or control the proposed place of use by virtue of:

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If by lease or agreement, state name and address of person(s) from whom access has been obtained.

Give name and address of any person(s) taking water from the stream between the present point of diversion or rediversion and the proposed point of diversion or rediversion, as well as any other person(s) known to you who may be affected by the proposed change.

All Right Holders Must Sign This Form: I (we) declare under penalty of perjury that this change does not involve an increase in the amount of the appropriation or the season of diversion, and that the above is true and correct to the best of my (our) knowledge and belief. Dated 5-25-22 at Santa Rosa, CA.

[redacted]

Right Holder or Authorized Agent Signature

Right Holder or Authorized Agent Signature

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PETITION FOR CHANGE

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☐ **Purpose of Use** Wat. Code, § 1701
☐ **Distribution of Storage** Cal. Code Regs., tit. 23, § 791(e)
☒ **Temporary Urgency** Wat. Code, § 1435
☐ **Instream Flow Dedication** Wat. Code, § 1707
☐ **Waste Water** Wat. Code, § 1211
☐ **Split** Cal. Code Regs., tit. 23, § 836
☐ **Terms or Conditions** Cal. Code Regs., tit. 23, § 791(e)
☐ **Other**

Application 15737 Permit 12950 License Statement

I (we) hereby petition for change(s) noted above and described as follows:

Point of Diversion or Rediversion – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Present:

Proposed:

Place of Use – Identify area using Public Land Survey System descriptions to ¼-¼ level; for irrigation, list number of acres irrigated.

Present:

Proposed:

Purpose of Use

Present:

Proposed:

Split

Provide the names, addresses, and phone numbers for all proposed water right holders.

In addition, provide a separate sheet with a table describing how the water right will be split between the water right holders: for each party list amount by direct diversion and/or storage, season of diversion, maximum annual amount, maximum diversion to offstream storage, point(s) of diversion, place(s) of use, and purpose(s) of use. Maps showing the point(s) of diversion and place of use for each party should be provided.

Distribution of Storage

Present:

Proposed:

Temporary Urgency

This temporary urgency change will be effective from 6/9/2022 to 12/5/2022 .

Include an attachment that describes the urgent need that is the basis of the temporary urgency change and whether the change will result in injury to any lawful user of water or have unreasonable effects on fish, wildlife or instream uses.

Instream Flow Dedication – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Upstream Location:

Downstream Location:

List the quantities dedicated to instream flow in either: ☐ cubic feet per second or ☐ gallons per day:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Will the dedicated flow be diverted for consumptive use at a downstream location? ◯ Yes ◯ No

If yes, provide the source name, location coordinates, and the quantities of flow that will be diverted from the stream.

Waste Water

If applicable, provide the reduction in amount of treated waste water discharged in cubic feet per second.

Will this change involve water provided by a water service contract which prohibits your exclusive right to this treated waste water? ◯ Yes ◯ No

Will any legal user of the treated waste water discharged be affected? ◯ Yes ◯ No

General Information – For all Petitions, provide the following information, if applicable to your proposed change(s).

Will any current Point of Diversion, Point of Storage, or Place of Use be abandoned? ◯ Yes ◉ No

I (we) have access to the proposed point of diversion or control the proposed place of use by virtue of:

☐ ownership ☐ lease ☐ verbal agreement ☐ written agreement

If by lease or agreement, state name and address of person(s) from whom access has been obtained.

Give name and address of any person(s) taking water from the stream between the present point of diversion or rediversion and the proposed point of diversion or rediversion, as well as any other person(s) known to you who may be affected by the proposed change.

All Right Holders Must Sign This Form: I (we) declare under penalty of perjury that this change does not involve an increase in the amount of the appropriation or the season of diversion, and that the above is true and correct to the best of my (our) knowledge and belief. Dated 5·25·22 at Santa Rosa, CA .

[redacted]

Right Holder or Authorized Agent Signature

Right Holder or Authorized Agent Signature

NOTE: All petitions must be accompanied by:
(1) the form Environmental Information for Petitions, including required attachments, available at: http://www.waterboards.ca.gov/waterrights/publications_forms/forms/docs/pet_info.pdf
(2) Division of Water Rights fee, per the Water Rights Fee Schedule, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/fees/
(3) Department of Fish and Wildlife fee of $850 (Pub. Resources Code, § 10005)

Please indicate County where your project is located here:

Sonoma / Mendo.

MAIL FORM AND ATTACHMENTS TO:
State Water Resources Control Board
DIVISION OF WATER RIGHTS
P.O. Box 2000, Sacramento, CA 95812-2000
Tel: (916) 341-5300 Fax: (916) 341-5400
http://www.waterboards.ca.gov/waterrights

PETITION FOR CHANGE

Separate petitions are required for each water right. Mark all areas that apply to your proposed change(s). Incomplete forms may not be accepted. Location and area information must be provided on maps in accordance with established requirements. (Cal. Code Regs., tit. 23, § 715 et seq.) Provide attachments if necessary.

☐ **Point of Diversion** Wat. Code, § 1701
☐ **Point of Rediversion** Cal. Code Regs., tit. 23, § 791(e)
☐ **Place of Use** Wat. Code, § 1701
☐ **Purpose of Use** Wat. Code, § 1701
☐ **Distribution of Storage** Cal. Code Regs., tit. 23, § 791(e)
☒ **Temporary Urgency** Wat. Code, § 1435
☐ **Instream Flow Dedication** Wat. Code, § 1707
☐ **Waste Water** Wat. Code, § 1211
☐ **Split** Cal. Code Regs., tit. 23, § 836
☐ **Terms or Conditions** Cal. Code Regs., tit. 23, § 791(e)
☐ **Other**

Application 19351 Permit 16596 License Statement

I (we) hereby petition for change(s) noted above and described as follows:

Point of Diversion or Rediversion – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Present:

Proposed:

Place of Use – Identify area using Public Land Survey System descriptions to ¼-¼ level; for irrigation, list number of acres irrigated.

Present:

Proposed:

Purpose of Use

Present:

Proposed:

Split

Provide the names, addresses, and phone numbers for all proposed water right holders.

In addition, provide a separate sheet with a table describing how the water right will be split between the water right holders: for each party list amount by direct diversion and/or storage, season of diversion, maximum annual amount, maximum diversion to offstream storage, point(s) of diversion, place(s) of use, and purpose(s) of use. Maps showing the point(s) of diversion and place of use for each party should be provided.

Distribution of Storage

Present:

Proposed:

Temporary Urgency

This temporary urgency change will be effective from 6/9/2022 to 12/5/2022 .

Include an attachment that describes the urgent need that is the basis of the temporary urgency change and whether the change will result in injury to any lawful user of water or have unreasonable effects on fish, wildlife or instream uses.

Instream Flow Dedication – Provide source name and identify points using both Public Land Survey System descriptions to ¼-¼ level and California Coordinate System (NAD 83).

Upstream Location:

Downstream Location:

List the quantities dedicated to instream flow in either: ☐ cubic feet per second or ☐ gallons per day:

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

Will the dedicated flow be diverted for consumptive use at a downstream location? ◯ Yes ◯ No

If yes, provide the source name, location coordinates, and the quantities of flow that will be diverted from the stream.

Waste Water

If applicable, provide the reduction in amount of treated waste water discharged in cubic feet per second.

Will this change involve water provided by a water service contract which prohibits your exclusive right to this treated waste water? ◯ Yes ◯ No

Will any legal user of the treated waste water discharged be affected? ◯ Yes ◯ No

General Information – For all Petitions, provide the following information, if applicable to your proposed change(s).

Will any current Point of Diversion, Point of Storage, or Place of Use be abandoned? ◯ Yes ◉ No

I (we) have access to the proposed point of diversion or control the proposed place of use by virtue of:

☐ ownership ☐ lease ☐ verbal agreement ☐ written agreement

If by lease or agreement, state name and address of person(s) from whom access has been obtained.

Give name and address of any person(s) taking water from the stream between the present point of diversion or rediversion and the proposed point of diversion or rediversion, as well as any other person(s) known to you who may be affected by the proposed change.

All Right Holders Must Sign This Form: I (we) declare under penalty of perjury that this change does not involve an increase in the amount of the appropriation or the season of diversion, and that the above is true and correct to the best of my (our) knowledge and belief. Dated 5.25.22 at Santa Rosa, CA .

[redacted]

Right Holder or Authorized Agent Signature

Right Holder or Authorized Agent Signature

NOTE: All petitions must be accompanied by:

(1) the form Environmental Information for Petitions, including required attachments, available at: http://www.waterboards.ca.gov/waterrights/publications_forms/forms/docs/pet_info.pdf

(2) Division of Water Rights fee, per the Water Rights Fee Schedule, available at: http://www.waterboards.ca.gov/waterrights/water_issues/programs/fees/

(3) Department of Fish and Wildlife fee of $850 (Pub. Resources Code, § 10005)

May 2022

Sonoma County Water Agency

Supplement to the May 2022 Temporary Urgency Change Petitions

The Sonoma County Water Agency (Sonoma Water) seeks temporary urgency changes to its four water-right permits used to provide wholesale water to cities and water districts in Sonoma and Marin counties. These changes are necessary to ensure that minimum instream flow requirements in the Russian River watershed are aligned with actual watershed hydrologic conditions. This is essential to maintain sustainable reservoir/river operations to protect municipal water supply and listed salmonid species in the Russian River.

Based on Sonoma Water's water right permits established under State Water Resources Control Board (State Water Board) Decision 1610, the water supply condition for the Russian River is determined using cumulative inflow into Lake Pillsbury as the index. Lake Pillsbury is a storage reservoir located in the Eel River watershed for Pacific Gas & Electric Company's (PG&E) Potter Valley Hydroelectric Project (PVP) which transfers water into the East Fork Russian River. Prior to 2006, transfers of Eel River water through PVP averaged approximately 150,000 acre-feet annually. As a result of an order issued by the Federal Energy Regulatory Commission (FERC) amending PG&E's operating license in the mid-2000s, there has been a 60 percent reduction of the annual transfer of Eel River water into the Russian River watershed. Between 2007 and 2020 the average annual transfer was approximately 60,000 acre-feet. As reported by Sonoma Water in its November 2021 Temporary Urgency Change Petitions (TUCP), the transformer bank at the PVP powerhouse has failed and will need to be replaced in order to convey water through the powerhouse for power generation. PG&E estimates it will take up to two years to replace the transformer bank at a cost of five to ten million dollars. This has resulted in the transfer of Eel River water being further reduced to 30,000 acre-feet or less (based on hydrologic conditions) until PG&E makes the necessary repairs. On May 13, 2022, PG&E submitted a variance request to FERC requesting water year classifications for their East Fork Russian River minimum flows be reduced from *Normal*.

Under these operating conditions of the PVP, the influence of the Eel River water imports on downstream hydrologic conditions in the Russian River is greatly diminished. Therefore, there is little to no correlation between cumulative inflow into Lake Pillsbury and the hydrologic conditions in the Russian River watershed. Due to the continuation of dry conditions in the Russian River watershed, Lake Mendocino and Lake Sonoma are again at or near their lowest levels for this time of year since filling in 1959 and 1986, respectively. Consequently, Sonoma Water requests that the minimum instream flow requirements be reduced to *Critical* water supply condition requirements to preserve stored water in both Lake Mendocino and Lake Sonoma and prevent violating the incidental take statement in the 2008 Russian River Biological Opinion.

1.0 BACKGROUND

Sonoma Water controls and coordinates water supply releases from Lake Mendocino and Lake Sonoma to implement the minimum instream flow requirements in water rights Decision 1610, which the State Water Board adopted on April 17, 1986. Decision 1610 specifies minimum instream flow requirements for the Upper Russian River, Dry Creek and the Lower Russian River.[1] These minimum flow requirements vary based on hydrologic conditions, which are also specified in Decision 1610. The Decision 1610 requirements for the Upper Russian River and Lower Russian River are contained in term 20 of Sonoma Water's water-right Permit 12947A (Application 12919A). The Decision 1610 requirements for the Lower Russian River are contained in term 17 of Sonoma Water's water-right Permit 12949 (Application 15736) and term 17 of Sonoma Water's water-right Permit 12950 (Application 15737). The Decision 1610 requirements for Dry Creek and the Lower Russian River are contained in term 13 of Sonoma Water's water-right Permit 16596 (Application 19351).

Sonoma Water's operations are also subject to the Russian River Biological Opinion issued by the National Marine Fisheries Service (NMFS) on September 24, 2008, and the consistency determination issued by the California Department of Fish and Wildlife (CDFW) on November 9, 2009.

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[1] The Upper Russian River is the stream reach from the confluence of the East Fork Russian River and West Fork Russian River to the Russian River's confluence of Dry Creek. The Lower Russian River is the stream reach from the confluence of Dry Creek and the Russian River to the Pacific Ocean.

1.1 Minimum Flow Requirements

Decision 1610 requires a minimum flow of 25 cubic feet per second (cfs) in the East Fork Russian River from Coyote Valley Dam to the confluence with the West Fork of the Russian River under all water supply conditions. From this point to the confluence with Dry Creek, the Decision 1610 required minimum Russian River flows are: from April through August, 185 cfs; and from September through March, 150 cfs during *Normal* water supply conditions, 75 cfs during *Dry* conditions and 25 cfs during *Critical* conditions. Decision 1610 further specifies two variations of the *Normal* water supply condition, commonly known as *Dry Spring 1* and *Dry Spring 2*. These conditions provide for lower required minimum flows in the Upper Russian River during times when the combined storage in Lake Pillsbury (located in the Eel River watershed) and Lake Mendocino on May 31 is unusually low. *Dry Spring 1* conditions exist if the combined storage in Lake Pillsbury and Lake Mendocino is less than 150,000 acre-feet on May 31. Under *Dry Spring 1* conditions, the required minimum flow in the Upper Russian River between the confluence of the East Fork and West Fork and Healdsburg is 150 cfs from June through March, with a reduction to 75 cfs during October through December if Lake Mendocino storage is less than 30,000 acre-feet during those months. *Dry Spring 2* conditions exist if the combined storage in Lake Pillsbury and Lake Mendocino is less than 130,000 acre-feet on May 31. Under *Dry Spring 2* conditions, the required minimum flows in the Upper Russian River are 75 cfs from June through December and 150 cfs from January through March.

From Dry Creek to the Pacific Ocean, the required minimum flows in the Lower Russian River are 125 cfs during *Normal* water supply conditions, 85 cfs during *Dry* conditions and 35 cfs during *Critical* conditions.

In Dry Creek below Warm Springs Dam, the required minimum flows are 75 cfs from January through April, 80 cfs from May through October and 105 cfs in November and December during *Normal* water supply conditions. During *Dry* and *Critical* conditions, these required minimum flows are 25 cfs from April through October and 75 cfs from November through March.

Figure 1 shows all of the required minimum instream flows specified in Decision 1610 by river reach, the gage stations used to monitor compliance, and the definitions of the various water supply conditions.

1.2 Water Supply Conditions

There are three main water supply conditions defined in Decision 1610 that set the minimum instream flow requirements based on the hydrologic conditions for the Russian River system. These water supply conditions are determined based on criteria for the calculated cumulative inflow into Lake Pillsbury from October 1 to the first day of each month from January to June. Decision 1610 defines cumulative inflow for Lake Pillsbury as the algebraic sum of releases from Lake Pillsbury, change in storage and lake evaporation.

Dry water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 8,000 acre-feet as of January 1;
- 39,200 acre-feet as of February 1;
- 65,700 acre-feet as of March 1;
- 114,500 acre-feet as of April 1;
- 145,600 acre-feet as of May 1; and
- 160,000 acre-feet as of June 1.

Critical water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 4,000 acre-feet as of January 1:
- 20,000 acre-feet as of February 1;
- 45,000 acre-feet as of March 1;
- 50,000 acre-feet as of April 1;
- 70,000 acre-feet as of May 1; and
- 75,000 acre-feet as of June 1.

Normal water supply conditions exist whenever a *Dry* or *Critical* water supply condition is not present.

2.0 PROJECTED WATER SUPPLY CONDITIONS

From October 1, 2021, to May 19, 2022, the cumulative inflow into Lake Pillsbury was

224,000 acre-feet. On May 31st, the combined storage in Lake Pillsbury and Lake Mendocino is projected to be less than 130,000 acre-feet. Consequently, the water supply condition will be categorized as *Normal-Dry Spring 2* for the remainder of the year. Sonoma Water is currently managing the Russian River based on a *Critical* water supply condition as authorized by the December 10, 2021, State Water Board order approving Sonoma Water's November 2021 TUCP (December 2021 Order), which requested that the water supply condition temporarily be determined based on storage thresholds at Lake Mendocino. These changes were necessary because of the critically dry hydrology and very low storage at Lake Mendocino and Lake Sonoma.

The State Water Board's December 2021 Order expires after June 8, 2022, resulting in the water supply condition changing back to that set by the criteria established in Decision 1610 (*Normal-Dry Spring 2*). This designation would apply through the remainder of the year increasing minimum instream flow requirements from 25 cfs to 75 cfs on the Upper Russian River and from 35 cfs to 125 cfs on the Lower Russian River. As discussed in sections 2.2 and 2.3 below, these conditions are projected to draw down both Lake Mendocino and Lake Sonoma to very low levels and require releases from Lake Sonoma that would violate the incidental take statement in the Russian River Biological Opinion.

2.1 Potter Valley Hydroelectric Project

Owned and operated by PG&E, the PVP is located on the East Fork Russian River and Eel River in Mendocino and Lake counties. PVP's Lake Pillsbury is impounded by Scott Dam, which makes releases that combined with the natural flows can be diverted downstream at Cape Horn Dam. Diversions are transferred to PG&E's generation facilities or are bypassed around those facilities. These diversions are then released into the East Fork Russian River to meet minimum instream flow requirements and satisfy Potter Valley Irrigation District (PVID) contract deliveries.

The PVP hydroelectric facility operates under a 2004 amended license from the FERC. The license requires releases for minimum flows in the Eel River and the East Fork Russian River based on water year classification criteria. For the East Fork Russian River, the cumulative inflow into Lake Pillsbury establishes the water year classification setting the seasonal minimum flows. As of May 19th, 2022, the cumulative inflow into Lake Pillsbury is 224,000 acre-feet. This exceeds the threshold of 160,000 acre-feet for June 1st setting the water year classification to *Normal*, which would continue through the end of the calendar year. Under *Normal* conditions, the minimum flow for the East Fork Russian River is 75 cfs from May 15th until September 15th, then reduces to 35 cfs until at least December 31st, when the water year classification is reassessed.

On May 13, 2022, PG&E filed a variance request with FERC due to limited water availability. PG&E requested expedited review and approval to reduce minimum flow requirements on the East Fork Russian River from *Normal* to *Dry/Critical*. The specific request is that the minimum flow requirement be reduced from 75 cfs to the *Critical* level of 5 cfs and be redefined as a target flow, thereby eliminating the 5 cfs buffer. PG&E has proposed that the target flow be reassessed based on additional storage projections over the variance period to determine whether higher target flows are sustainable up to the *Dry* minimum flow requirement of 25 cfs. The proposed term of the drought variance would extend until Lake Pillsbury storage reached 36,000 acre-feet after October 1st.

Sonoma Water has assumed for its analysis that FERC will approve a temporary variance setting a target flow based on a *Critical* water year classification. Sonoma Water has also assumed that PG&E will provide water to the PVID under its contract at requested flowrates up to 50 cfs.

Based on the changes anticipated by the temporary variance and PVID deliveries by request, Sonoma Water staff have projected that PVP transfers from the Eel River to the East Fork Russian River will be reduced by approximately 20,000 acre-feet between June 1, 2022, and October 1, 2022.

2.2 Lake Mendocino

As of May 19, 2022, the water supply storage level in Lake Mendocino was approximately 49,000 acre-feet (AF). This storage level is approximately 44 percent of the available water conservation pool for this time of year. This is the second lowest storage level for this time of year since Lake Mendocino filled in 1959 with the lowest level having occurred last year. Figure 2 shows observed storage in Lake Mendocino for 2014 through May 19, 2022.

In February 2021, the U.S. Army Corps of Engineers (USACE) approved a Planned Major Deviation (Deviation) of the Coyote Valley Dam/Lake Mendocino Water Control Manual for Water Year (WY) 2021 through WY 2026 at the request of the Lake Mendocino Forecast Informed Reservoir Operations (FIRO) Steering Committee. The Deviation allows USACE flood control managers to store up to an additional 11,050 acre-feet of water in the flood control pool at their discretion. Furthermore, it authorizes USACE flood control managers to leverage a Decision Support Model (DSM) developed by Sonoma Water and forecasts provided by the Center for Western Weather and Water Extremes as part of the tools and protocols USACE uses to manage reservoir operations at Lake Mendocino. Based on an operational hydrologic ensemble of streamflow forecasts provided by the California-Nevada River Forecast Center, current reservoir storage, and current and anticipated downstream conditions, the DSM provides a recommended release to help inform operational decisions. Unfortunately, due to the ongoing dry conditions and significantly reduced transfers of Eel River water through PVP, storage at Lake Mendocino remained well below the flood control pool and the FIRO DSM was not utilized this year.

While the December 2021 Order has improved the water supply storage condition at Lake Mendocino, a recent analysis prepared by Sonoma Water engineering staff indicates that unless mitigation measures are taken, such as those requested in the TUCP, the water level in Lake Mendocino is projected to decline to approximately 15,000 acre-feet by October 1 of this year.

Figure 3 shows for Lake Mendocino: (1) the actual storage level that has occurred through May 15, 2022 (solid black line); (2) the projected storage level for the remainder of 2022 if Decision 1610 determined minimum instream flow requirements are in effect (solid orange line); and (3) the projected storage level for the remainder of 2022 with the requested temporary changes (solid green line). Without the requested temporary changes, projected storage levels in Lake Mendocino are expected to reach extremely low levels that could severely impact listed and threatened fish species in the Russian River, create serious water-supply impacts in Mendocino County and the Alexander Valley in Sonoma County, and harm Lake Mendocino and Russian River recreation.

The analysis used to project storage was completed using Sonoma Water's Russian River ResSim simulation model with the following assumptions: (1) *Critical* water supply condition minimum instream flow requirement from May 1st through June 8th (end of December 2021 Order) and *Normal-Dry Spring 2* water supply condition minimum instream flow requirement from June 9th until the end of the year); (2) WY

1976 hydrology; (3) Russian River system losses[2]; and (4) PVP operations based on PG&E's May 13, 2022, variance request to reduce minimum stream flows to a target flow of 5 cfs (*Critical* water year classification) are approved on June 1st and remain unchanged throughout the remainder of the water year.

WY 1976 hydrology was selected based on very similar distribution of West Fork Russian River projected 30-day flow volume (USGS Gage 11461000) from May 15 to June 14 compared to WY 2022.

2.3 Lake Sonoma

As of May 19, 2022, the water supply storage level in Lake Sonoma was 141,000 acre-feet. This storage level is approximately 58 percent of the available water conservation pool. This is the lowest storage level for this time of year since Lake Sonoma filled. Figure 4 shows observed storage in Lake Sonoma for 2014 through May 19, 2022.

Recent analysis prepared by Sonoma Water engineering staff indicates that unless mitigation measures are taken, such as those requested in this TUCP, water levels in Lake Sonoma are projected to decline to approximately 96,000 acre-feet by October 1 of this year. This could threaten the water supply to over 650,000 people in Sonoma and Marin counties who rely on stored water from Lake Sonoma for their water supply needs. Additionally, cold water stored in Lake Sonoma is critical to the operation of the Warm Springs Hatchery, which produces 500,000 steelhead and 200,000 endangered coho salmon annually. High quality water released from the lake also provides valuable spawning and rearing habitat for threatened and endangered salmon and steelhead throughout the 14-mile length of Dry Creek. Sonoma Water and the USACE in concert with NMFS, CDFW, and dozens of private property owners have invested more than $30 million in restoring Dry Creek habitat. With adequate flow, these habitat enhancements serve as crucial refugia

[2] Russian River System reach losses were developed through an analysis of water balance that incorporated observed flows, observed metered diversions, simulated diversions, simulated unimpaired reach gains, and simulated evapotranspiration for the period from 2000 through 2013, to estimate reach water depletion based on current water use practices. These losses were then scaled by 2020 estimated losses to capture the most current observed water losses on the Russian River.

during times of drought and may prevent species extirpation in the Russian River watershed.

Furthermore, the reduced minimum instream flows requested on the Upper Russian River, while necessary to preserve storage in Lake Mendocino, will significantly lower its contribution towards meeting minimum instream flow requirements in the Lower Russian River. Consequently, increased releases from Lake Sonoma into Dry Creek would be necessary to maintain Decision 1610's minimum instream flow requirements for a *Normal Dry Spring 2* water supply condition (125 cfs) in the Lower Russian River. However, such increased releases into Dry Creek would result in Sonoma Water violating the Incidental Take Statement contained in the Russian River Biological Opinion. The Incidental Take Statement restricts releases from Lake Sonoma into Dry Creek because they can result in flows that are too high for optimal habitat for rearing juvenile salmonids. Consistent cool water flow in Dry Creek at velocities that are optimal for rearing juvenile salmonids will provide a critical refuge for endangered salmon and threatened steelhead throughout the current drought.

Figure 5 shows for Lake Sonoma: (1) the actual storage level that has occurred through May 19, 2022 (solid black line); (2) the projected storage level for the remainder of 2022 if Decision 1610 determined minimum flows are in effect (solid orange line); and (3) the projected storage level for the remainder of 2022 with the requested temporary changes (solid blue line).

Without the requested temporary changes, the projected storage level in Lake Sonoma could decline to about 96,000 acre-feet by October 1. With the requested temporary changes described in Section 4 and Sonoma Water's commitment to reduce diversions by 20 percent from 2020 levels between July 1 and October 31 described in Section 5, the storage level in Lake Sonoma is projected to remain above 100,000 acre-feet until October 1 of this year (Figure 6).

The analysis used to project storage was completed using Sonoma Water's Russian River ResSim simulation model with the following assumptions: (1) *Critical* water supply condition minimum instream flow requirements from May 1 through the end of the year; (2) WY 1976 hydrology; (3) Russian River system losses[3]; and (4) PVP

[3] Russian River System reach losses were developed through an analysis of water balance that incorporated observed flows, observed metered diversions, simulated diversions, simulated unimpaired reach gains, and simulated evapotranspiration for the period from 2000 through 2013, to estimate reach water depletion based on current water use practices. These losses were

operations based on PG&E's May 13, 2022 variance request to reduce minimum stream flows to a target flow of 5 cfs (*Critical* water year classification) are approved on June 1st and remain unchanged throughout the remainder of the water year.

WY 1976 hydrology was selected based on very similar distribution of West Fork Russian River projected 30-day flow volume (USGS Gage 11461000) from May 15 to June 14 compared to WY 2022.

3.0 CRITERIA FOR APPROVING TEMPORARY URGENCY CHANGE TO PERMITS 12947A, 12949, 12950, AND 16596

As required by Water Code section 1435, subdivision (b), the State Water Board must make the following findings before issuing a temporary change order:

1. The permittee or licensee has an urgent need to make the proposed change;
2. The proposed change may be made without injury to any other lawful user of water;
3. The proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses; and
4. The proposed change is in the public interest.

3.1 Urgency of the Proposed Change

Under Water Code section 1435, subdivision (c), an urgent need to make a proposed change exists when the State Water Board concludes that the proposed temporary change is necessary to further the constitutional policy that the water resources of the State be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented.

In this case, an urgent need exists for the proposed flow changes on the Upper Russian River because Sonoma Water predicts storage in Lake Mendocino will be critically low by October 1, 2022, unless the requested temporary urgency change is approved. Water supplies sufficient to support survival of listed Russian River salmonid

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then scaled by 2020 estimated losses to capture the most current observed water losses on the Russian River fisheries, agricultural and municipal use, and recreation are at risk. Without the proposed changes, Sonoma Water would need to release additional stored water from Lake Mendocino, which would result in the significant depletion of storage during the summer, and reduction of water supplies needed for fishery protection and stable flows in the Upper Russian River during the fall when spawning state and federally listed fish species are most sensitive to flow and water temperatures. Furthermore, if upcoming WY 2023 is a dry year, carryover storage in Lake Mendocino from 2022 will be crucial for the continued recovery of the Russian River salmonid fishery and water supply reliability during 2023.

An urgent need for the proposed changes on the Lower Russian River exists because Sonoma Water predicts Lake Sonoma could decline to below 100,000 acre-feet by October 1st. Furthermore, in the absence of the requested temporary urgency changes, Sonoma Water would either have to choose between exacerbating the depletion of Lake Mendocino storage levels or increasing Lake Sonoma releases such that they would violate the Incidental Take Statement contained in the Russian River Biological Opinion.

3.2 No Injury to Any Other Lawful User of Water

If these petitions are granted, Sonoma Water still will be required to maintain specific minimum flows in the Russian River. Because Sonoma Water will maintain these minimum flows, all other legal users of water will be able to divert and use the amounts of water that they may legally divert and use to the extent allowed by the State Water Board's applicable curtailment regulations. Moreover, failure to implement the requested temporary changes could result in severe depletion of Lake Mendocino, which in turn could result in serious impacts to entitled users of water downstream of Lake Mendocino later in the year. Accordingly, granting these petitions will not result in any injury to any other lawful user of water.

3.3 No Unreasonable Effect upon Fish, Wildlife, or Other Instream Beneficial Uses

Although flows in the Upper and Lower Russian River will be reduced upon approval of this TUCP, conservation of water in Lake Mendocino will allow enhanced management of flows in early fall for the benefit of salmon migration and spawning. It is possible that reduced flows in the Russian River may impair some instream beneficial uses, principally recreation uses. Although some recreation uses may be affected by these reduced flows, it is not unreasonable considering the potentially grave impacts to fisheries, water supply and recreation in Lake Mendocino and Lake Sonoma, and the loss of juvenile salmonid habitat in Dry Creek that could occur if the petitions were not approved.

3.4 The Proposed Change is in the Public Interest

Approval of these petitions will help conserve stored water in Lake Mendocino so that it can be released later in the year to continue to provide human health and safety needs and maintain continuous flow in the Upper Russian River until the return of natural flows in the forthcoming wet season. In addition, approval of these petitions will help preserve storage in Lake Mendocino and Lake Sonoma as a precaution in the event dry conditions persist into WY 2023. It is in the public interest to preserve water supplies for these beneficial uses when hydrologic circumstances cause severe reductions to water supplies. Furthermore, in the absence of the requested temporary urgency changes, Sonoma Water would need to make releases from Lake Sonoma that would violate the Incidental Take Statement in the Russian River Biological Opinion resulting in loss of juvenile salmonid habitat in Dry Creek.

4.0 REQUESTED TEMPORARY URGENCY CHANGE TO PERMITS 12947A, 12949, 12950, AND 16596

To preserve the limited water supplies in Lake Mendocino and Lake Sonoma and to avoid excessively high releases from Lake Sonoma down Dry Creek that could result in violations of the Incidental Take Statement in the Russian River Biological Opinion, Sonoma Water is filing this TUCP requesting the State Water Board to make the following changes to Sonoma Water's permits for a period of 180 days: (1) reduce the required minimum instream flow in the Russian River from the confluence of the East and West Forks to the river's confluence with Dry Creek from 75 cfs to 25 cfs; and (2) reduce the required minimum instream flow in the Russian River from its confluence with Dry Creek to the Pacific Ocean from 125 cfs to 35 cfs.

Additionally, Sonoma Water requests that compliance with the minimum instream flow requirements be made based on the 5-day running average of average daily stream flow measurements with instantaneous minimum instream flows being no less than 10 cfs below minimum[4].

5.0 PROPOSED ACTIONS BY SONOMA WATER

5.1 Weekly Reports

To inform State Water Board staff and interested stakeholders in the Russian River Watershed, Sonoma Water will prepare the following weekly reports to document reservoir and watershed conditions:

1) Hydrologic Status Report with the following information:

   - Current reservoir levels and reservoir storage hydrographs for Lake Pillsbury, Lake Mendocino and Lake Sonoma;
   - Average daily rate of change in storage, inflow and reservoir release for Lake Mendocino and Lake Sonoma;
   - Average daily transfer flows from the Potter Valley Project for the previous seven days;
   - Streamflow hydrographs for watershed stream gages and daily average flowrates for compliance stream gages;
   - Cumulative rainfall plot for current water year versus historical

[4] These changes will allow Sonoma Water to improve its efforts to optimally manage flows in the Russian River. Sonoma Water does not control and is not able to predict the timing and magnitude of diversions by Russian River water users downstream of the reservoirs. Consequently, the implementation of a 5-day running average will allow for river operations with a reduced frequency of reservoir release changes intended to respond to transitory flow reductions due to large diversions that may occur simultaneously. This implementation of minimum instream flow requirements will allow Sonoma Water to manage stream flows with smaller operational buffers, thereby conserving water supply in Lake Mendocino and Lake Sonoma.

precipitation range for Ukiah; Cumulative rainfall 16-day forecast; and

- A summary of the available water quality data, including bacteria indicators.

2) Russian River Water Accounting Report that will provide daily recorded and estimated flow data for characterizing the types of waters available for the following regions:

   - Upper East Fork Russian River
   - Upper Russian River Downstream of Lake Mendocino
   - Lower Dry Creek Downstream of Lake Sonoma
   - Lower Russian River Downstream of the Dry Creek Confluence

These reports will be published on Sonoma Water's website during the term of the order approving Sonoma Water's requested temporary changes.

5.2 Diversion Reductions

Because the requested change to minimum instream flow requirements on the Lower Russian River to some extent is driven by low storage levels in Lake Sonoma, Sonoma Water and its retail water customers will commit to a 20 percent reduction in total diversions across all downstream points of diversion/re-diversion authorized under Sonoma Water's water rights from July 1 through October 31 compared to the same time period in 2020 or until the flow at the USGS gage at Hacienda Bridge (USGS Gage 11467000) exceeds 125 cfs. Extending the diversion reduction past October 31, when nearly all the demand is indoor use, would have severe water supply consequences for the retail customers who depend on Sonoma Water for all or a portion of their water supply. Extending the diversion reduction past October 31 would result in many retail customers dropping below the human health and safety need.

Sonoma Water will submit a monthly report to the Deputy Director, Division of Water Rights documenting Sonoma Water's reduction in diversions compared to the same period in 2020 and provide an updated projection of Lake Sonoma storage through the end of 2022.

Figure 6 shows for Lake Sonoma: (1) the actual storage level that has occurred through May 15, 2022 (solid black line); (2) the projected storage level for the remainder of 2022 with the requested temporary changes (solid blue line); and (3) the projected storage level for the remainder of 2022 with the requested temporary changes and the 20 percent reduction in Sonoma Water diversions between July 1 and October 31 (solid green line).

As shown in Figure 6, the 20 percent reduction in Sonoma Water's diversions is projected to preserve an additional 4,000 acre-feet of storage in Lake Sonoma by October 31.

6.0 WATER CONSERVATION ACTIVITIES

The following water conservation activities reflect the efforts of Sonoma Water and the Sonoma-Marin Saving Water Partnership (Partnership). The Partnership represents thirteen North Bay water utilities in Sonoma and Marin counties that have joined together to provide regional solutions for water use efficiency. The utilities (Partners) are: the Cities of Santa Rosa, Rohnert Park, Petaluma, Sonoma, Cloverdale, Cotati, Healdsburg; North Marin Water, Valley of the Moon and Marin Municipal Water Districts; Cal American Water Company-Larkfield; the Town of Windsor and Sonoma Water. The Partnership was formed to identify and recommend water use efficiency projects and to maximize the cost-effectiveness of water use efficiency programs in our region.

Sonoma and Mendocino were the first counties placed under a region-specific drought state of emergency on April 21, 2021, by Gov. Gavin Newsom. The Sonoma County Board of Supervisors took action on April 27, 2021, proclaiming a local emergency due to drought conditions in support of actions needed to mitigate the adverse environmental, economic, health, welfare and social impacts of the drought. As required by Government Code section 8630, the Board of Supervisors must review the proclamation of local emergency every 60 days and determine if there is a need for continuing the local emergency. The Sonoma County Board of Supervisors has approved the continuation of the drought emergency conditions every 60 days since April 2021, with the most recent extension occurring May 3, 2022. It is expected that drought emergency conditions will remain in effect through 2022.

Recognizing the need to reduce diversions from the Russian River last year, Sonoma Water's contractors adopted a resolution at the May 3, 2021, Water Advisory

Committee (WAC) meeting supporting the water saving efforts of the Partnership and urging a 20 percent reduction in customer water use. The WAC also approved temporary allocations of Sonoma Water deliveries for the period July through October necessary to achieve a 20 percent reduction from 2020 levels for the same period. Subsequent to the adoption of the WAC resolution, the contractors took action with their Boards and/or Councils for activation of the Water Shortage Contingency Plans for their respective agencies as needed to meet the reduction goal. Sonoma Water then filed a TUCP on May 13, 2021, including a proposed action for Sonoma Water and its contractors to reduce Russian River diversions by 20 percent from 2020 levels from July 1 through October 31, 2021.

The subsequent State Water Board Order WR 2021-0056-EXEC approving Sonoma Water's TUCP included Term 11 stating Sonoma Water and its contractors shall ensure a 20 percent reduction in Russian River diversions for the term of the Order (July 1 – December 10, 2021) as compared to the same period of 2020. Due to a significant October storm and increased natural flows in the Russian River, the State Water Board issued an Amended Order WR 2021-0056-EXEC dated October 22, 2021, that suspended imposed limits on diversions while water right curtailments were not in effect. At the time of the Amended Order, Sonoma Water's cumulative Russian River diversion reduction was 22.7 percent below the same period in 2020.

Since that time and in consideration of a third consecutive dry year and continued low reservoir levels at Lake Sonoma and Lake Mendocino, Sonoma Water and its contractors have continued to implement shortage levels consistent with achieving a 20 percent reduction in water use over 2020 levels. Although Marin Municipal Water District took recent action to rescind their shortage emergency due to their local supply reservoirs being above 90 percent full, they simultaneously implemented new permanent water rules that include two-day per week irrigation limits for sprinklers and three-day per week irrigation limits for drip systems.

On March 28, 2022, Governor Newsom issued Executive Order N-7-22, which included direction to the State Water Board to consider adoption of an emergency regulation that includes, but is not limited to, the following:

- A requirement for urban water providers to submit a preliminary water supply and demand assessment by June 1, 2022.
- A requirement that urban water suppliers that have submitted a water shortage contingency plan to the Department of Water Resources implement,

at a minimum, the shortage response actions adopted for a shortage level of up to twenty percent (Level 2).

Although the emergency regulation is not currently in effect, Sonoma Water, in collaboration with its contractors, is working to finalize its Annual Water Shortage Assessment Report to meet the June 1 preliminary submittal date. Sonoma Water and its contractors are also continuing to implement Level 2 shortage response actions consistent with the Governor's March 28 executive order.

Outreach Campaign

Sonoma Water, its contractors, and the other member agencies of the Partnership continue to run a multi-media drought outreach campaign to maintain customer awareness of low reservoir levels and the need for continued water savings due to a third consecutive dry year. The campaign emphasizes reducing water waste by adhering to statewide water waste prohibitions and local restrictions on irrigation and other non-essential uses of water. As previously mentioned, drought restrictions have been in effect since last summer.

The Partnership outreach campaign includes geo-targeted video ads placed on streaming television platforms (December 2021 and April 2022) showing flyovers of historically low lake levels and calling for conservation. In spring, the campaign focused on leak detection and repair, along with water saving tips for saving water indoors in ad placements on local digital news sites and through social media. A weekly graphic showing current reservoir storage levels is ongoing in The Santa Rosa Press Democrat print and online news publications and on Sonoma Water's and the Partnership's websites. In addition, online sponsored news content was placed in the Press Democrat to provide continuous information about the drought, water saving tips, programs available to help people save water, and reminders of restrictions.

A drought outreach subcommittee of the Partnership continues to meet monthly to coordinate development of new advertising and to finalize outreach plans through the summer and fall. The committee recently completed a refresh of the drought campaign. The campaigns' new taglines emphasize that "Drought is Still Here" and that customers should "Make a Change to Save Water". Similar to previous ads, paid placements on social media and a variety of ads for geo-targeted digital platforms, including local news websites and high traffic online aggregator websites will continue throughout summer into fall.

With a return to in-person events, summer outreach will once again include tabling at local community festivals such as Earth Day celebrations, farmers markets, summer outdoor music venues, fairs, and more. A summer webinar series covering a variety of drought topics is planned, such as a Do-it-Yourself irrigation leak repair event for the Sonoma County Zero Waste Week in late July 2022. Lastly, speakers bureau presentations to a wide range of community service organizations will occur throughout the summer to help build grass roots support for continued water savings. The ongoing drought outreach campaign continues to be effective in meeting the Governor's call for a 15% reduction as compared to 2020 use. For the July 2021 through March 2022 period, the Partnership is maintaining a 22% reduction in water production totals as compared to the same period in 2020.

Figures

Cumulative inflow to Lake Pillsbury (acre-feet) from Oct 1 through	1/1	2/1	3/1	4/1	5/1	6/1	
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

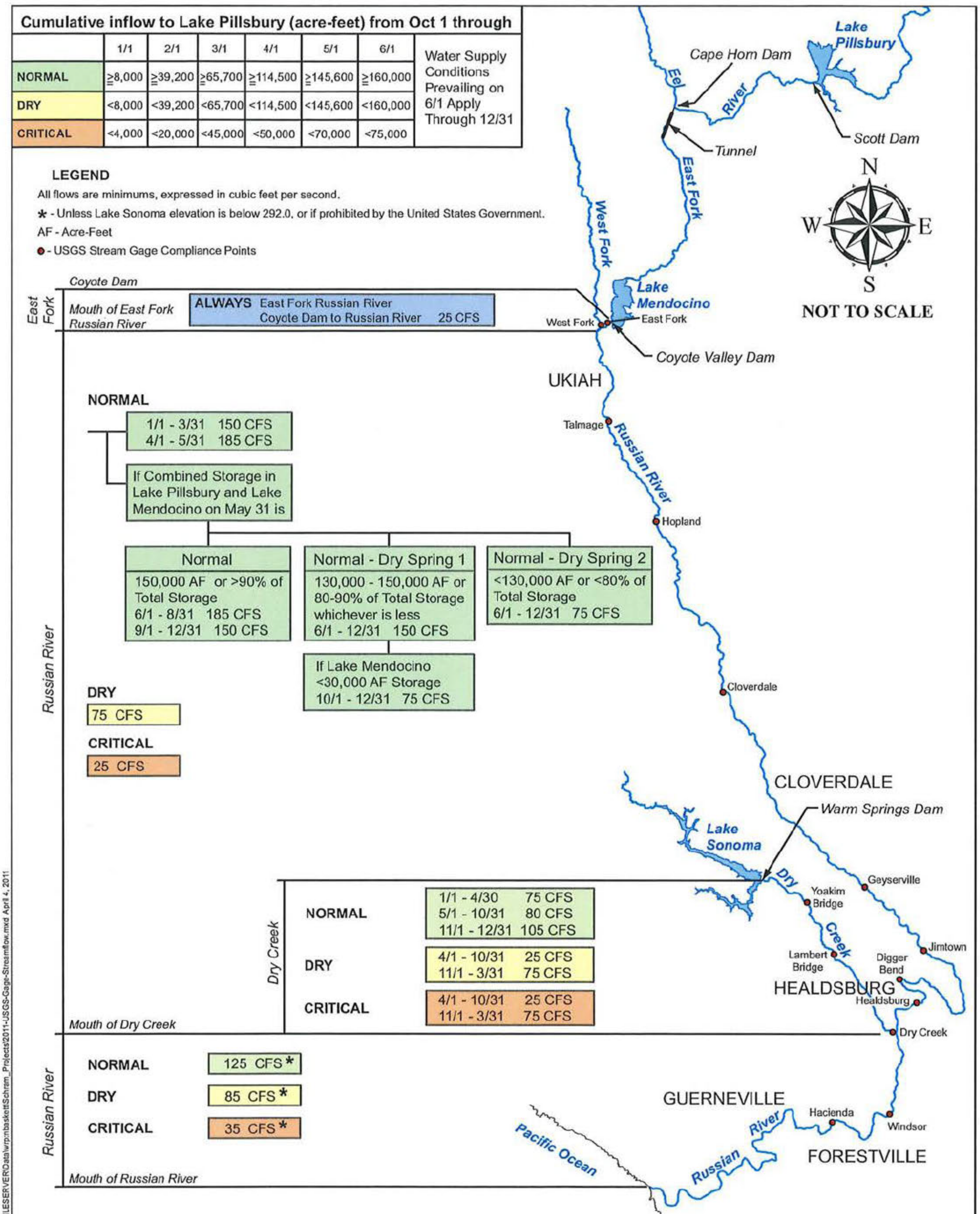
LEGEND

All flows are minimums, expressed in cubic feet per second.

* - Unless Lake Sonoma elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre-Feet

● - USGS Stream Gage Compliance Points

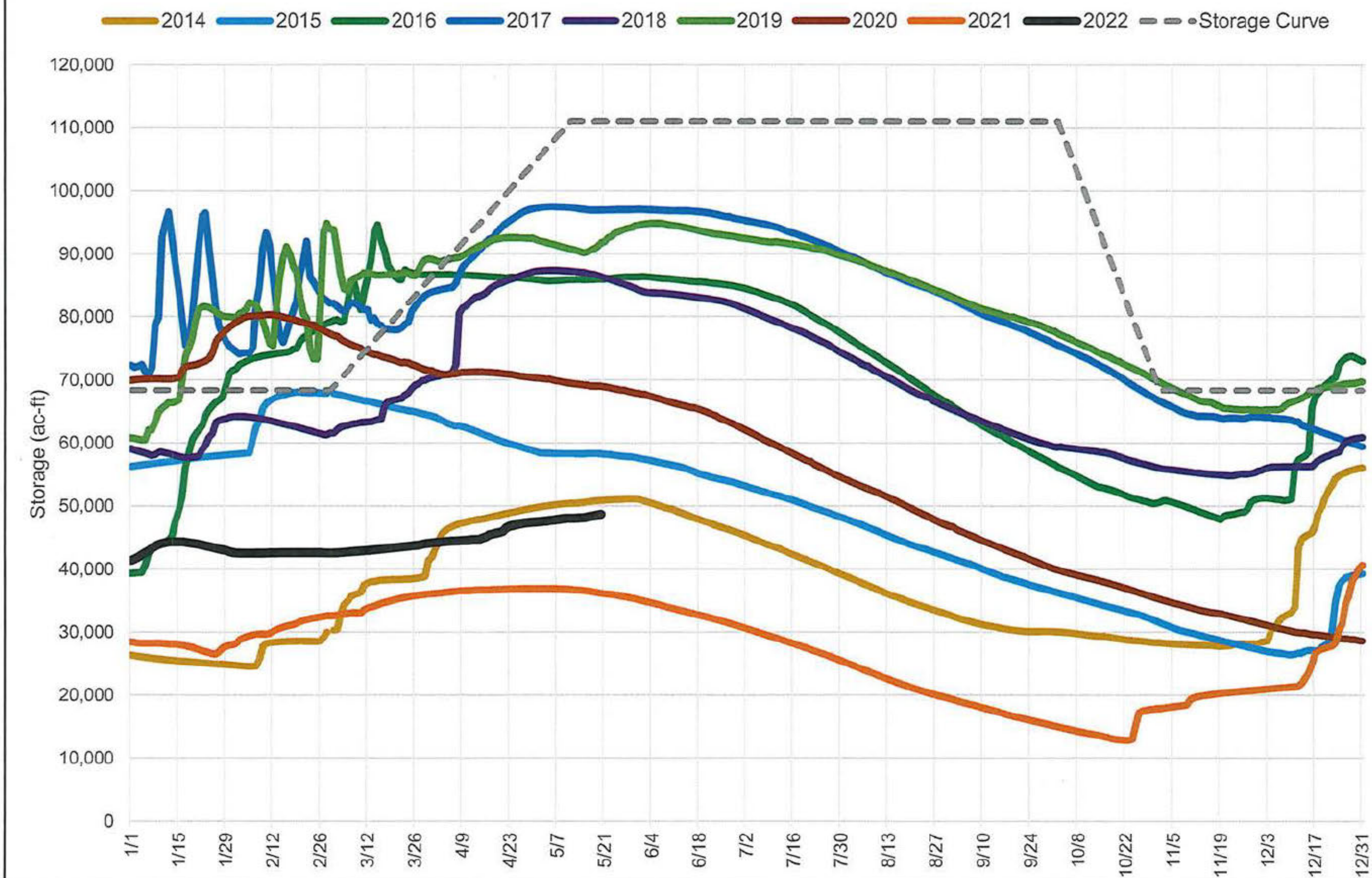


Sonoma Water

Russian River Basin
Streamflow Requirements

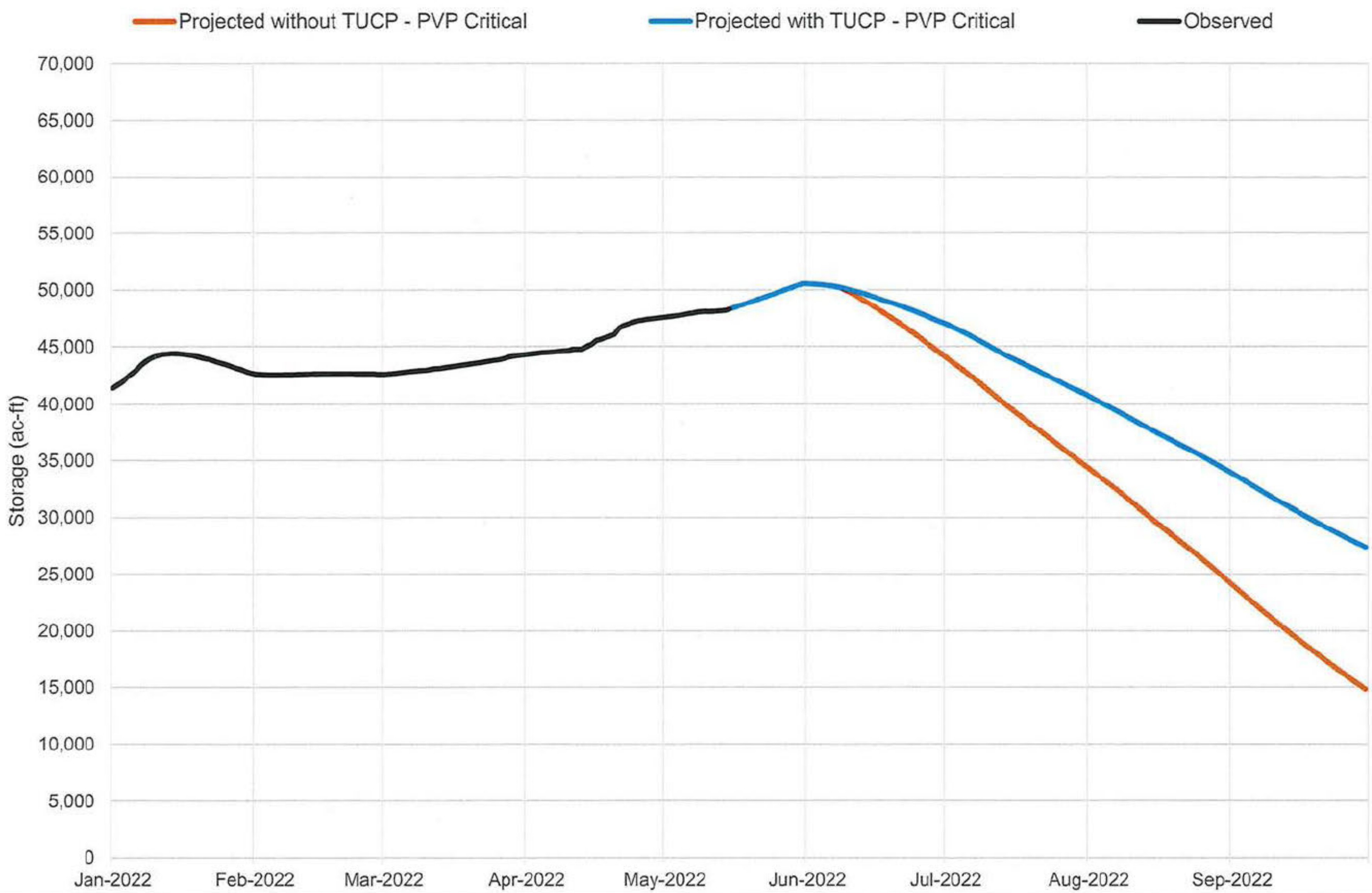
Per State Water Resources Control Board Decision 1610, April 1986

Figure 1



Lake Mendocino Storage Hydrograph (2014 - 2022)

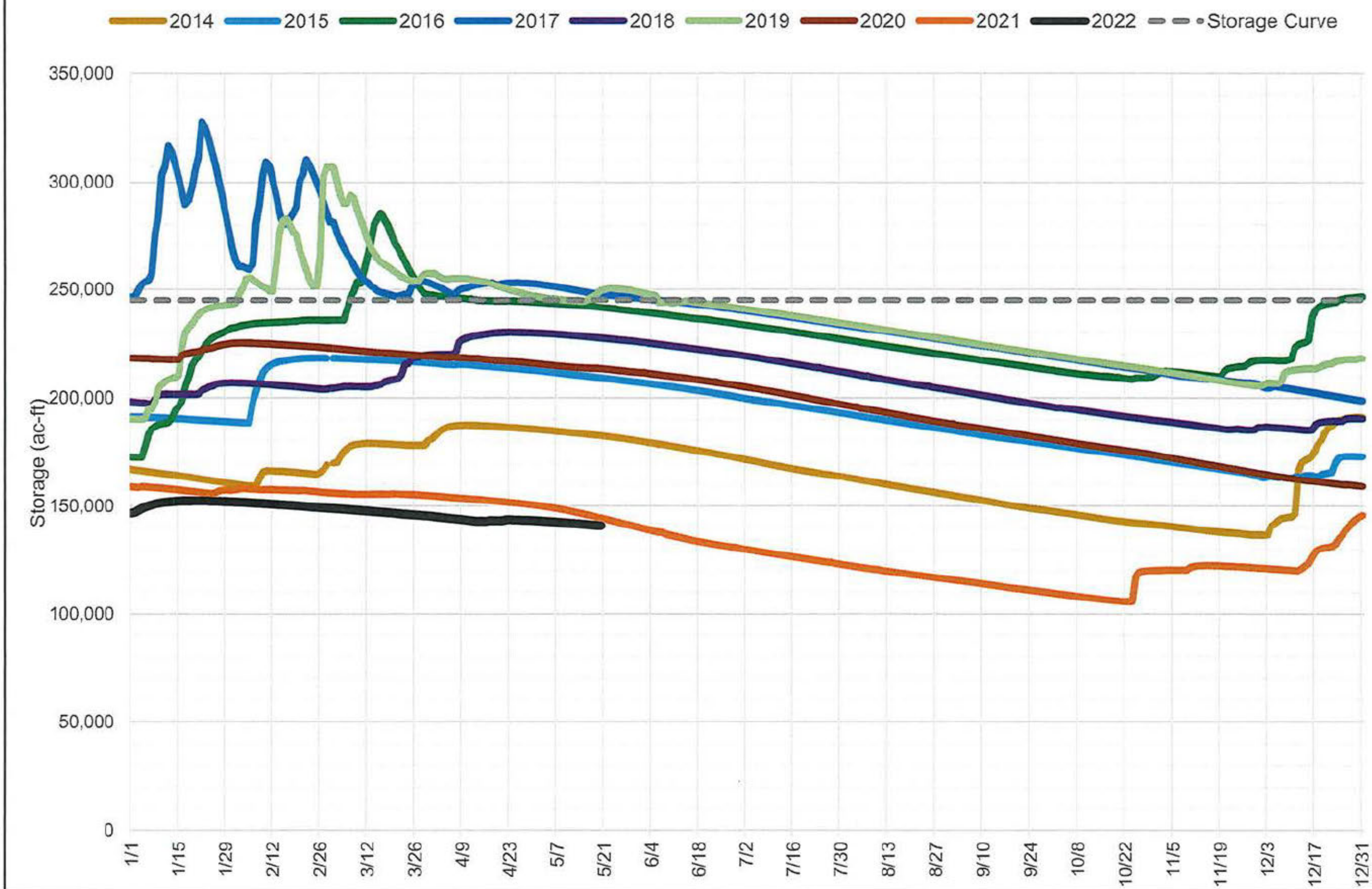
Figure 2



Sonoma Water

Lake Mendocino Storage Projections

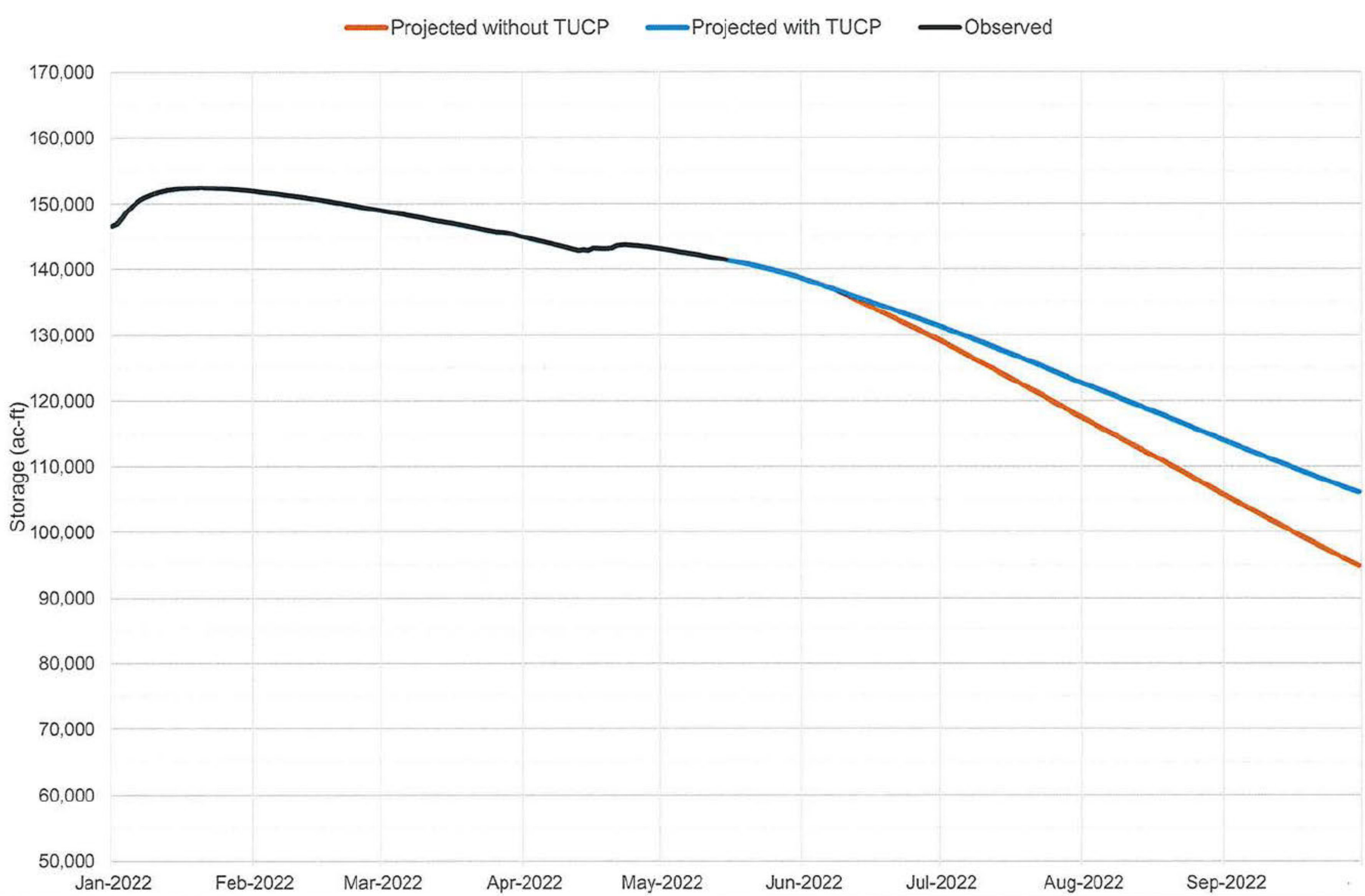
Figure 3



Sonoma Water

Lake Sonoma Storage Storage Hydrograph (2014 - 2022)

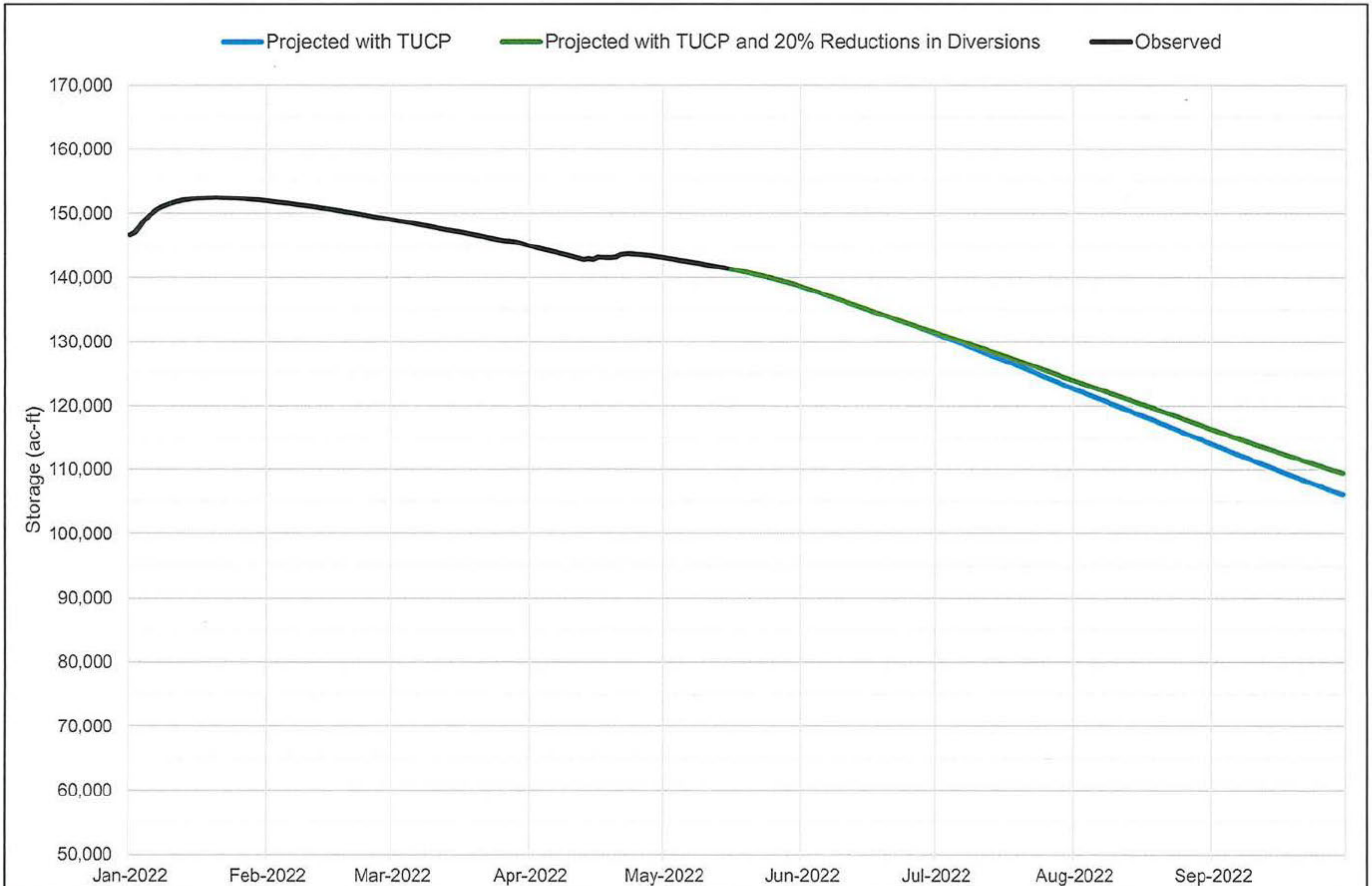
Figure 4



Sonoma Water

Lake Sonoma Storage Projections

Figure 5



Sonoma Water

Lake Sonoma Storage Projections with Proposed Sonoma Water Action

Figure 6

State of California
State Water Resources Control Board
DIVISION OF WATER RIGHTS
P.O. Box 2000, Sacramento, CA 95812-2000
Tel: (916) 341-5300 Fax: (916) 341-5400
http://www.waterboards.ca.gov/waterrights

ENVIRONMENTAL INFORMATION FOR PETITIONS

This form is required for all petitions.

Before the State Water Resources Control Board (State Water Board) can approve a petition, the State Water Board must consider the information contained in an environmental document prepared in compliance with the California Environmental Quality Act (CEQA). This form is not a CEQA document. If a CEQA document has not yet been prepared, a determination must be made of who is responsible for its preparation. As the petitioner, you are responsible for all costs associated with the environmental evaluation and preparation of the required CEQA documents. Please answer the following questions to the best of your ability and submit any studies that have been conducted regarding the environmental evaluation of your project. If you need more space to completely answer the questions, please number and attach additional sheets.

DESCRIPTION OF PROPOSED CHANGES OR WORK REMAINING TO BE COMPLETED

For a petition for change, provide a description of the proposed changes to your project including, but not limited to, type of construction activity, structures existing or to be built, area to be graded or excavated, increase in water diversion and use (up to the amount authorized by the permit), changes in land use, and project operational changes, including changes in how the water will be used. For a petition for extension of time, provide a description of what work has been completed and what remains to be done. Include in your description any of the above elements that will occur during the requested extension period.

See 'Supplement to the May 2022 Temporary Urgency Change Petitions' for a summary of the requested changes.

Insert the attachment number here, if applicable:

Coordination with Regional Water Quality Control Board

For change petitions only, you must request consultation with the Regional Water Quality Control Board regarding the potential effects of your proposed change on water quality and other instream beneficial uses. (Cal. Code Regs., tit. 23, § 794.) In order to determine the appropriate office for consultation, see: http://www.waterboards.ca.gov/waterboards_map.shtml. Provide the date you submitted your request for consultation here, then provide the following information.

Date of Request: 5/19/2022

Will your project, during construction or operation, (1) generate waste or wastewater containing such things as sewage, industrial chemicals, metals, or agricultural chemicals, or (2) cause erosion, turbidity or sedimentation? ○ Yes ◉ No

Will a waste discharge permit be required for the project? ○ Yes ◉ No

If necessary, provide additional information below:

On May 19, 2022 a special meeting was held with the CA DFW, NMFS and Bryan McFadin of the North Coast Regional Water Quality Control Board. This meeting addressed the pending filing of these petitions and the potential impacts to water quality and fisheries. The parties developed preliminary draft terms for consideration in a pending petitions order. These draft terms are still under review and the resource agencies may modify these in forthcoming comment letters.

Insert the attachment number here, if applicable: ☐

Local Permits

For temporary transfers only, you must contact the board of supervisors for the county(ies) both for where you currently store or use water and where you propose to transfer the water. (Wat. Code § 1726.) Provide the date you submitted your request for consultation here.

Date of Contact: ☐

For change petitions only, you should contact your local planning or public works department and provide the information below.

Person Contacted: ☐ Date of Contact: ☐

Department: ☐ Phone Number: ☐

County Zoning Designation: ☐

Are any county permits required for your project? If yes, indicate type below. ○ Yes ◉ No

☐ Grading Permit ☐ Use Permit ☐ Watercourse ☐ Obstruction Permit

☐ Change of Zoning ☐ General Plan Change ☐ Other (explain below)

If applicable, have you obtained any of the permits listed above? If yes, provide copies. ○ Yes ○ No

If necessary, provide additional information below:

Insert the attachment number here, if applicable: ☐

Federal and State Permits

Check any additional agencies that may require permits or other approvals for your project:

☐ Regional Water Quality Control Board ☐ Department of Fish and Game

☐ Dept of Water Resources, Division of Safety of Dams ☐ California Coastal Commission

☐ State Reclamation Board ☐ U.S. Army Corps of Engineers ☐ U.S. Forest Service

☐ Bureau of Land Management ☐ Federal Energy Regulatory Commission

☐ Natural Resources Conservation Service

Have you obtained any of the permits listed above? If yes, provide copies. ○ Yes ◉ No

For each agency from which a permit is required, provide the following information:

Agency	Permit Type	Person(s) Contacted	Contact Date	Phone Number

If necessary, provide additional information below:

Insert the attachment number here, if applicable:

Construction or Grading Activity

Does the project involve any construction or grading-related activity that has significantly altered or would significantly alter the bed, bank or riparian habitat of any stream or lake? ○ Yes ◉ No

If necessary, provide additional information below:

Insert the attachment number here, if applicable:

Archeology

Has an archeological report been prepared for this project? If yes, provide a copy.	◯ Yes	◉ No
Will another public agency be preparing an archeological report?	◯ Yes	◉ No
Do you know of any archeological or historic sites in the area? If yes, explain below.	◯ Yes	◉ No

If necessary, provide additional information below:

Insert the attachment number here, if applicable:

Photographs

For all petitions other than time extensions, attach complete sets of color photographs, clearly dated and labeled, showing the vegetation that exists at the following three locations:

- ☒ Along the stream channel immediately downstream from each point of diversion
- ☒ Along the stream channel immediately upstream from each point of diversion
- ☒ At the place where water subject to this water right will be used

Maps

For all petitions other than time extensions, attach maps labeled in accordance with the regulations showing all applicable features, both present and proposed, including but not limited to: point of diversion, point of rediversion, distribution of storage reservoirs, point of discharge of treated wastewater, place of use, and location of instream flow dedication reach. (Cal. Code Regs., tit. 23, §§ 715 et seq., 794.)

Pursuant to California Code of Regulations, title 23, section 794, petitions for change submitted without maps may not be accepted.

All Water Right Holders Must Sign This Form:

I (we) hereby certify that the statements I (we) have furnished above and in the attachments are complete to the best of my (our) ability and that the facts, statements, and information presented are true and correct to the best of my (our) knowledge. Dated 5.25.22 at Santa Rosa, CA .

[redacted]

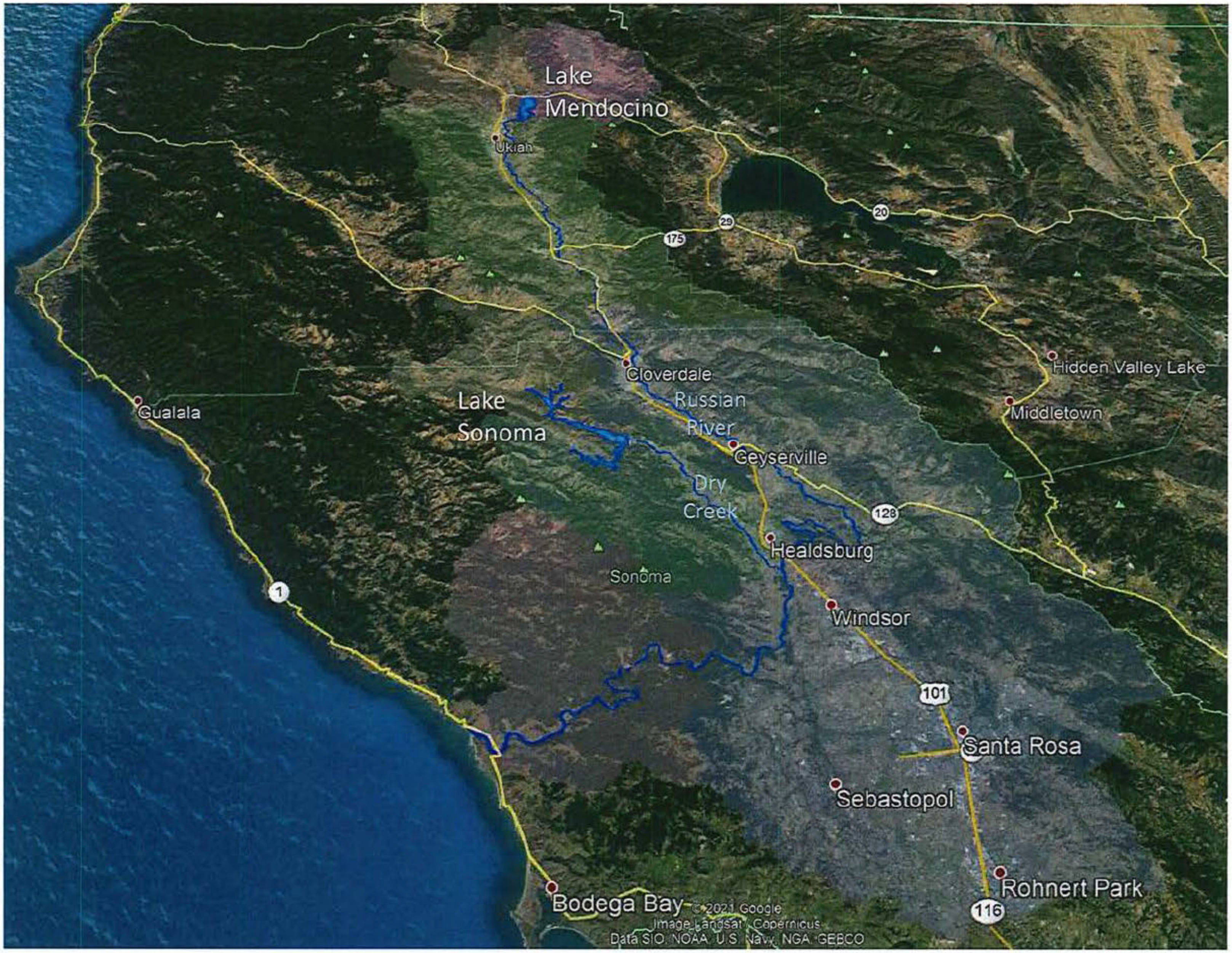
Water Right Holder or Authorized Agent Signature

Water Right Holder or Authorized Agent Signature

NOTE:

- **Petitions for Change may not be accepted unless you include proof that a copy of the petition was served on the Department of Fish and Game. (Cal. Code Regs., tit. 23, § 794.)**
- **Petitions for Temporary Transfer may not be accepted unless you include proof that a copy of the petition was served on the Department of Fish and Game and the board of supervisors for the county(ies) where you currently store or use water and the county(ies) where you propose to transfer the water. (Wat. Code § 1726.)**

SONOMA WATER
Russian River Watershed Place of Water Use



SONOMA WATER

Photographs of Russian River Downstream of River Diversion System at Mirabel Park on May 16, 2022

Mirabel Inflatable Dam

NOTICE OF EXEMPTION

TO: ☒ Office of Planning and Research
State Clearinghouse
1400 Tenth Street
Sacramento, CA 95814

☒ County Clerk
County of Sonoma
585 Fiscal Drive, Room 103
Santa Rosa, CA 95403

☒ County Clerk
County of Mendocino
501 Low Gap Road
Ukiah, CA 95482

FROM: Sonoma County Water Agency
404 Aviation Blvd.
Santa Rosa, CA 95403

Project Title: Petitions Requesting Approval of Temporary Urgency Changes in Water Right Permits 12947A, 12949, 12950, and 16596 in Mendocino and Sonoma Counties

Project Location- Specific: The proposed action would occur in Mendocino and Sonoma counties at Lake Mendocino, in the Upper Russian River from Coyote Valley Dam/Lake Mendocino to the confluence with Dry Creek, and in the Lower Russian River from the confluence with Dry Creek to the Pacific Ocean. Figure 1 shows the minimum instream flow requirements for the Russian River system. Communities and cities along the Russian River include Ukiah, Hopland, Cloverdale, Geyserville, Healdsburg, Forestville, Mirabel Park, Rio Nido, Guerneville, Monte Rio, Duncans Mills, and Jenner.

Project Location – City: N/A

Project Location – County: Mendocino and Sonoma

Description of Nature, Purpose and Beneficiaries of Project: The Sonoma County Water Agency (Sonoma Water) controls and coordinates water supply releases from the Coyote Valley Dam and Warm Springs Dam projects in accordance with the provisions of water rights Decision 1610, which the State Water Resources Control Board (State Water Board) adopted on April 17, 1986. Decision 1610 specifies the minimum instream flow requirements for the Upper Russian River, Dry Creek, and the Lower Russian River, which vary based on water supply conditions (Figure 1).

Sonoma Water is filing temporary urgency change petitions (TUCP) requesting that the State Water Board make the following changes in the minimum instream flow requirements for the Russian River mainstem that are specified in Decision 1610 and Sonoma Water's water right permits: (a) a *Critical* water supply condition minimum instream flow of 25 cubic feet per second (cfs) in the Upper Russian River from its confluence with the East Fork to its confluence with Dry Creek, and (b) a *Critical* water supply condition minimum instream flow of 35 cfs in the Lower Russian River downstream of its confluence with Dry Creek to the Pacific Ocean. The changes are necessary in order to maintain viable operations to support municipal use, protect listed salmonids, preserve stored water in Lake Mendocino and Lake Sonoma, and prevent violating the incidental take statement in the 2008 Russian River Biological Opinion issued under the federal Endangered Species Act.

To allow Sonoma Water to optimally manage instream flows in the Upper Russian River and Lower Russian River, and associated reservoir storage, Sonoma Water is requesting that the TUCP minimum instream flow requirements be specified as a 5-day running average of average daily stream flow measurements with instantaneous minimum instream flows being no less than 10 cfs below the minimum in the Upper and Lower Russian River. This implementation of minimum instream flow requirements will allow Sonoma Water to manage stream flows with a smaller operational buffer, thereby conserving water supply in Lake Mendocino and Lake Sonoma.

Lake Pillsbury and Potter Valley Project

Based on Sonoma Water's water right permits established under Decision 1610, the water supply condition for the Russian River is determined using cumulative inflow into Lake Pillsbury as the index. Lake Pillsbury is a storage reservoir located in the Eel River watershed for Pacific Gas & Electric Company's (PG&E) Potter Valley Hydroelectric Project (PVP), which transfers water into the East Fork Russian River. Prior to 2006, transfers of Eel River water through PVP averaged approximately 150,000 acre-feet annually. As a result of an order issued by the Federal Energy Regulatory Commission (FERC) amending PG&E's operating license in the mid-2000s, there has been a 60 percent reduction of the annual transfer of Eel River water into the Russian River watershed. Between 2007 and 2020, the average annual transfer was approximately 60,000 acre-feet. The transformer bank at the PVP powerhouse has failed and will need to be replaced in order to convey water through the powerhouse for power generation. PG&E estimates it will take up to two years to replace the transformer bank at a cost of five to ten million dollars. This has resulted in the transfer of Eel River water being further reduced to 30,000 acre-feet or less (based on hydrologic conditions) until PG&E makes the necessary repairs. Under these operating conditions of the PVP, the influence of the Eel River water imports on downstream hydrologic conditions in the Russian River is greatly diminished. Therefore, there is little to no correlation between cumulative inflow into Lake Pillsbury and the hydrologic conditions in the Russian River watershed. On May 13, 2022, PG&E filed a variance request with FERC due to limited water availability. PG&E requested expedited review and approval to reduce minimum flow requirements on the East Fork Russian River from *Normal* to *Dry/Critical*. The specific request is that the minimum flow requirement be reduced from 75 cfs to the *Critical* level of 5 cfs and be redefined as a target flow, thereby eliminating the 5 cfs buffer. PG&E has proposed that the target flow be reassessed based on additional storage projections over the variance period to determine whether higher target flows are sustainable up to the *Dry* minimum flow requirement of 25 cfs. The proposed term of the drought variance would extend until Lake Pillsbury storage reached 36,000 acre-feet after October 1st. Additionally, PG&E has stated contract deliveries to the Potter Valley Irrigation District (PVID) will be on a request basis up to the maximum of 50 cfs. Based on the changes anticipated by the temporary variance and PG&E's contract deliveries, Sonoma Water staff have projected that PVP transfers from the Eel River to the East Fork Russian River will be reduced by approximately 20,000 acre-feet between June 1, 2022, and October 1, 2022, compared to operating the PVP under normal water supply condition without the variance request.

Due to the continuation of dry conditions in the Russian River watershed, Lake Mendocino and Lake Sonoma are again at or near their lowest levels for this time of year since filling in 1959 and 1986, respectively. Consequently, Sonoma Water proposes that the minimum instream flow requirements be reduced to *Critical* water supply condition requirements to preserve stored water in both Lake Mendocino and Lake Sonoma and prevent violating the incidental take statement in the 2008 Russian River Biological Opinion.

Lake Mendocino

As of May 19, 2022, the water supply storage level in Lake Mendocino was approximately 49,000 acre-feet. This storage level is approximately 44 percent of the available water conservation pool for this time of year. This is the second lowest storage level for this time of year since Lake Mendocino filled in 1959 with the lowest level having occurred last year. Water supplies sufficient to support continuous flow and health and human safety needs are at risk in the Upper Russian River. Without the proposed changes, Sonoma Water would be required to release additional stored water from Lake Mendocino through most of the summer to meet Decision 1610 *Normal-Dry Spring 2* condition minimum instream flow requirements, which would apply for the remainder of the year and result in the significant depletion and potential elimination of water supplies in Lake Mendocino. Without the requested temporary changes, projected storage levels in Lake Mendocino are expected to reach extremely low levels that could severely impact listed and threatened fish species in the Russian River, create serious water-supply impacts in Mendocino County and the Alexander Valley in Sonoma County, and harm Lake Mendocino and Russian River recreation. Furthermore, if the upcoming Water Year 2023 is another dry year, carryover storage in Lake Mendocino will be crucial for the continued recovery of the Russian River salmonid fishery and for water supply reliability during 2023.

Sonoma Water staff estimate that the Decision 1610 *Normal-Dry Spring 2* condition 75 cfs minimum flow in the Upper Russian River would result in Lake Mendocino water storage declining to approximately 15,000 acre-feet by October 1, 2022.

Lake Sonoma
As of May 19, 2022, the water supply storage level in Lake Sonoma was 141,000 acre-feet. This storage level is approximately 58 percent of the available water conservation pool. This is the lowest storage level for this time of year since Lake Sonoma filled in 1986. A recent analysis prepared by Sonoma Water engineering staff indicates that unless mitigation measures are taken, such as those requested in the TUCP, water levels in Lake Sonoma are projected to decline to approximately 96,000 acre-feet by October 1 of this year. Furthermore, the reduced minimum instream flows requested on the Upper Russian River, while necessary to preserve storage in Lake Mendocino, will significantly lower its contribution towards meeting minimum instream flow requirements in the Lower Russian River. Consequently, increased releases from Lake Sonoma into Dry Creek would be necessary to maintain Decision 1610's minimum instream flow requirements for a *Normal-Dry Spring* water supply condition (125 cfs) in the Lower Russian River. However, such increased releases into Dry Creek would result in Sonoma Water violating the Incidental Take Statement contained in the Russian River Biological Opinion, unless a corresponding reduction is made in the minimum flow requirements for the Lower Russian River. This is because, if there are lower flows in the Upper Russian River and no corresponding reductions in the minimum flow requirements for the Lower Russian River, then higher flows on Dry Creek would be required to meet the Decision 1610 minimum instream flow requirements for the Lower Russian River. To minimize the need for these high Dry Creek flows, Sonoma Water is requesting, as a part of the TUCP, that the required minimum instream flows for the Lower Russian River also be reduced.

Because the requested changes to minimum instream flow requirements on the Lower Russian River to some extent is driven by low storage levels in Lake Sonoma, Sonoma Water and its retail water customers will commit to a 20 percent reduction in total diversions across all downstream points of diversion/re-diversion authorized under Sonoma Water's water rights from July 1 through October 31 compared to the same time period in 2020 or until the flow at the USGS gage at Hacienda Bridge (USGS Gage 11467000) exceeds 125 cfs.

Sonoma Water staff estimate that, without the requested temporary changes, the storage level in Lake Sonoma could decline to approximately 96,000 acre-feet by October 1. With the requested temporary changes and Sonoma Water's commitment to reduce diversions by 20 percent between July 1 and October 31, the storage level in Lake Sonoma is projected to remain above 100,000 acre-feet until October 1 of this year.

Name of Public Agency Approving Project: State Water Resources Control Board – Division of Water Rights

Name of Person or Agency Carrying Out Project: Sonoma County Water Agency

Exempt Status (check one):

- ☐ Ministerial (Sec. 21080(b)(1); 15268);
- ☐ Declared Emergency (Sec. 21080(b)(3); 15269(a));
- ☒ Emergency Project (Sec.21080 (b)(4); 15269(b)(c)): Section 21080(b)(4) and State CEQA Guidelines 15269(c): Specific actions necessary to prevent or mitigate an emergency
- ☒ Categorical Exemption. State type and section number: State CEQA Guidelines 15301(i): Existing Facilities; State CEQA Guidelines 15307: Actions by Regulatory Agencies for Protection of Natural Resources; State CEQA Guidelines 15308: Actions by Regulatory Agencies for Protection of the Environment
- ☒ Exemption under Governor's April 21, 2021 emergency proclamation (Sec. 7): Government Code section 8571
- ☐ Statutory Exemptions. State Code number:

Reasons why project is exempt: The proposed action is statutorily exempt under California Environmental Quality Act (CEQA) Statute 21080(b)(4) and categorically exempt from CEQA under the State CEQA Guidelines Sections 15301(i), 15307, and 15308, and under Section 7 of Governor's April 21, 2021, emergency proclamation for, among other areas, the Russian River watershed.

A. Actions to Prevent or Mitigate an Emergency
California Public Resources Code, Division 13, Section 21080(b)(4) provides that specific actions necessary to prevent or mitigate an emergency are exempt from CEQA. The emergency conditions are demonstrated by current Lake Mendocino and Lake Sonoma storage levels. As of May 19, 2022, the water supply storage level in Lake Mendocino was approximately 49,000 acre-feet. This storage level is 44 percent of the summer water supply pool. As of May 19, 2022, the water supply storage level in Lake Sonoma was approximately 141,000 acre-feet. This storage level is 58 percent of the water supply pool.

These emergency conditions also are demonstrated by Governor Newsom's April 21, 2021, Proclamation of a State of Emergency in Sonoma and Mendocino counties due to drought conditions in the Russian River Watershed (Governor's Drought Proclamation). Section 7 of the Governor's Drought Proclamation suspends the requirements of CEQA for purposes of the State Water Board's consideration of modifying reservoir releases, which would be a necessary element of an order granting the TUCP.

In addition, the Sonoma County Board of Supervisors on April 27, 2021, proclaimed a local emergency due to drought conditions in the Sonoma County Operational Area, which was most recently continued on May 3, 2022, and the Mendocino County Board of Supervisors April 20, 2021, adopted a resolution declaring a local emergency and imminent threat of disaster in Mendocino County due to drought conditions.

Sonoma Water staff estimate that, without the proposed reductions in the minimum instream flow requirement for the Upper Russian River, Lake Mendocino water storage could decline to approximately 15,000 acre-feet by October 1. Reducing the Upper Russian River minimum instream flow requirement from *Normal-Dry Spring 2* condition 75 cfs to *Critical* 25 cfs would improve storage at Lake Mendocino. Without the requested temporary changes, projected storage levels in Lake Mendocino are expected to reach extremely low levels that could severely impact listed and threatened fish species in the Russian River, create serious water-supply impacts in Mendocino County and the Alexander Valley in Sonoma County, and harm Lake Mendocino and Russian River recreation.

Sonoma Water staff estimate water levels in Lake Sonoma are projected to decline to approximately 96,000 acre-feet by October 1 of this year if the *Normal-Dry Spring* water supply condition of 125 cfs on the Lower Russian River is not reduced. With the requested temporary changes and Sonoma Water's commitment to reduce diversions by 20 percent between July 1 and October 31, the projected storage level in Lake Sonoma is projected to remain above 100,000 acre-feet until October 1 of this year. Low water storage levels could affect drinking water supplies, agriculture, commercial and industrial business sectors, and recreation.

B. Actions by Regulatory Agencies for Protection of Natural Resources and the Environment
CEQA Guidelines Sections 15307 and 15308 provide that actions taken by regulatory agencies to assure the maintenance, restoration or enhancement of a natural resource and the environment are categorically exempt. The proposed temporary urgency changes to Sonoma Water's water right Permits 12947A, 12949, 12950, and 16596 are necessary in order to maintain viable operations to support municipal use, protect listed salmonids, address water supply conditions at Lake Mendocino and Lake Sonoma, and prevent Lake Mendocino from declining to extremely low storage levels that could severely impact listed and threatened fish species in the Russian River, create serious water-supply impacts in Mendocino County and the Alexander Valley in Sonoma County, and harm Lake Mendocino and Russian River recreation.

The Russian River Biological Opinion found that high flows in Dry Creek (above 90 cfs) were harmful to listed salmon, and limited the extent to which Sonoma Water could make releases from Lake Sonoma from June through October. Approval of the proposed temporary urgency changes in the Lower Russian River is requested in order to avoid violation of the Incidental Take Statement contained in the Russian River Biological Opinion. Furthermore, if the upcoming Water Year 2023 is another dry year, carryover storage in Lake Sonoma and Lake Mendocino will be crucial for the continued recovery of the Russian River salmonid fishery and for water supply reliability during 2023.

C. Existing Facilities
CEQA Guidelines Section 15301(i) provides, generally, that the operation of existing facilities involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination is categorically exempt from CEQA. The examples in subdivision (i) of Section 15301 specifically provide that the maintenance of

streamflows to protect fish and wildlife resources is exempt. Sonoma Water's request to change minimum instream flows would not expand Sonoma Water's use or increase the water diversions available to Sonoma Water for consumptive purposes. The proposed changes in minimum instream flows would still be within the existing minimum instream flows established by Decision 1610.

D. Governor's Drought Proclamation
Government Code section 8571 authorizes the Governor to suspend certain regulatory requirements, including CEQA, under emergency conditions. Section 7 of the Governor's April 21, 2021, Drought Proclamation suspended CEQA to address "the acutely dry conditions in the Russian River Watershed" through the State Water Board's consideration of modifications of reservoir releases "to ensure adequate, minimal water supplies for critical purposes." The TUCP's purpose is to modify the water-right terms that otherwise would require releases from Lake Mendocino and Lake Sonoma and is within the suspension of CEQA under section 7 of the Governor's Drought Proclamation.

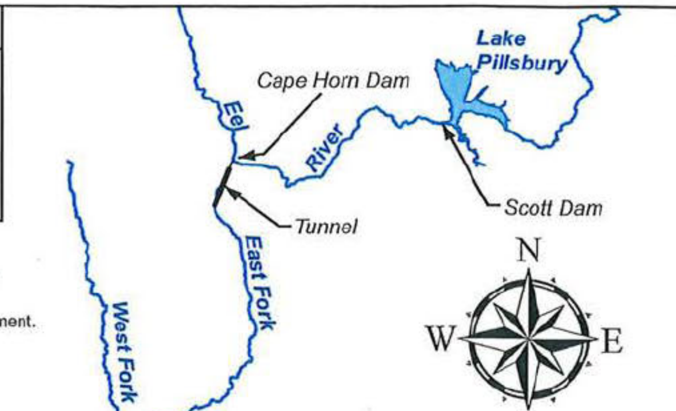
Lead Agency Contact Person: Jessica Martini-Lamb **Area Code/Telephone/Extension:** 707-547-1903

[redacted]	General Manager	May 25, 2022
Signature	*Title*	*Date*

☒ Signed by Lead Agency
☐ Signed by Applicant

Date received for filing at OPR: __________

Cumulative inflow to Lake Pillsbury (acre-feet) from Oct 1 through							
	1/1	2/1	3/1	4/1	5/1	6/1	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	



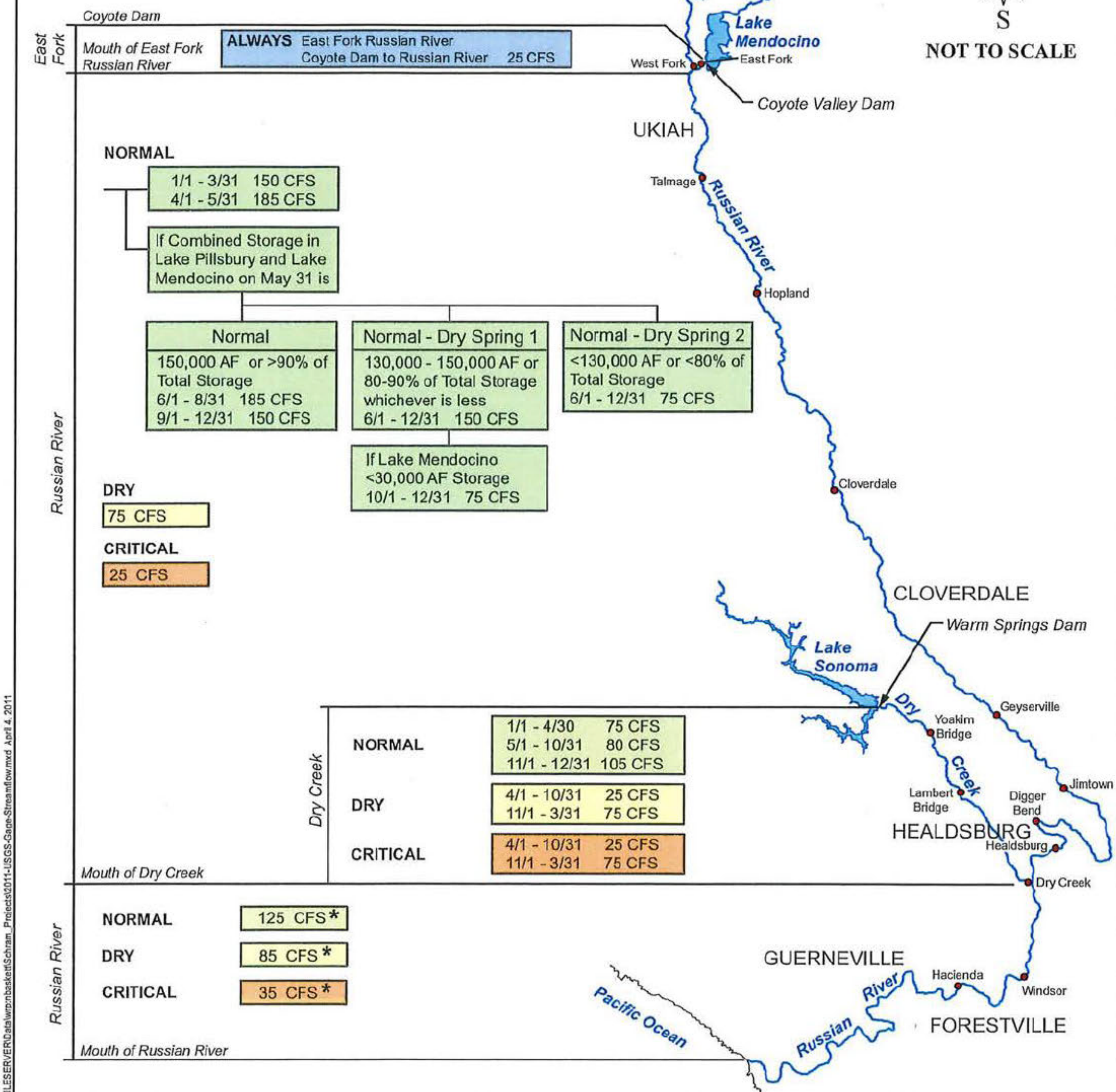
LEGEND

All flows are minimums, expressed in cubic feet per second.

* - Unless Lake Sonoma elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre-Feet

● - USGS Stream Gage Compliance Points



\\FILESERVER\Data\wrp\nbaskett\Schram_Projects\2011-USGS-Gage-Streamflow.mxd April 4, 2011

Sonoma Water

Russian River Basin Streamflow Requirements

Per State Water Resources Control Board Decision 1610, April 1986

Figure 1

Proposed terms were developed in a May 19, 2022 meeting with California Department of Fish and Wildlife, North Coast Regional Water Quality Control Board, and National Marine Fisheries Service based on revised term language from the Temporary Urgency Change Order issued on June 14, 2021

2. Sonoma Water shall conduct the following water quality monitoring tasks to monitor habitat conditions and hydrologic connectivity at the following locations:

    Upper Russian River Habitat:

    Sonoma Water shall supplement data collected at "permanent" water quality monitoring sites (described in Term 3 below) with temperature and dissolved oxygen measurements in up to a total of five reaches in the Upper Russian River between East Fork Russian River and West Fork Russian River confluence and Cloverdale. These sites will consist of pool/riffle complexes and are to be spaced longitudinally to help determine how water quality changes affect fish rearing in the Upper River. These sites will correspond with the Upper River snorkel surveys described in Term 4 below.

    Lower Russian River Habitat:

    From October 1 through the end of this Order, Sonoma Water shall visit at least one, and up to four critical riffle sites based on consultation with NMFS, in the Lower Russian River as conditions allow to assess adult salmonid passage opportunities. At each site, Sonoma Water staff shall measure riffle length, width, depth, and document the site with photographs.

3. Sonoma Water shall conduct monitoring to determine the effects on water quality and availability of aquatic habitat for salmonids. Monitoring in the Russian River shall include continuous monitoring of temperature, dissolved oxygen, pH, and specific conductivity at multiple stations from Calpella to Jenner as follows for the duration of this Order:

    a. Monitoring on the East Fork Russian River shall occur at a seasonal water quality data sonde located approximately 1/3 mile (0.33 mi) downstream from Lake Mendocino and at the Russian River at the confluence with Pieta Creek; Sonoma Water shall record hourly measurements of water temperature, dissolved oxygen, specific conductivity, pH, and turbidity.

    b. Monitoring on the Russian River shall occur at three, multi-parameter "permanent" water quality data sondes at USGS stream gages located at Hopland, Diggers Bend near Healdsburg, and Hacienda Bridge. These three data sondes are referred to as "permanent" as they are maintained as part of Sonoma Water's early warning detection system in coordination with USGS on its "Real-time Data for California" website.

c. Monitoring on the Russian River shall occur at four seasonal data sondes with real-time telemetry in cooperation with USGS at USGS gages at East Fork Russian River at Calpella station, Cloverdale station (north of Cloverdale at Commisky Station Road), Jimtown (at the Alexander Valley Road bridge), and Johnson's Beach (Guerneville). The data sonde at the Cloverdale gage will collect dissolved oxygen and temperature; the data sonde at the Jimtown gage will collect pH, temperature, dissolved oxygen, specific conductivity and turbidity; and the data sonde at Johnson's Beach will collect pH, temperature, dissolved oxygen, specific conductivity and turbidity.

d. Monitoring at Lake Mendocino: Sonoma Water shall work with USACE to monitor the vertical temperature profiles in Lake Mendocino near the outlet structure of the lake on a biweekly basis for the period of this Order. This will inform adjustments to the outlet release at Lake Mendocino to ensure adequate cold water for Coyote Valley Hatchery operations, as well as the need for potential salvage/rescue operations for native fishes in the East Fork Russian River, or other necessary adaptive management. Monitoring at Lake Mendocino will contribute to the assessment of water quality indicators and water column conditions, including vertical profiles for temperature, dissolved oxygen, turbidity, specific conductance, and pH on a biweekly basis. Water grab samples for nutrients, chlorophyll a, and turbidity shall also be collected on a biweekly basis in the hypolimnion, metalimnion, and epilimnion. Monitoring at Lake Mendocino will be dependent on access to adequate safe boat launching sites at low reservoir water surface elevations.

e. Monitoring on the mainstem Russian River shall include collecting water grab samples for nutrients, chlorophyll a, and turbidity at the East Fork Russian River at Calpella, East Fork Russian River approximately 1/3 mile (0.33 mi) downstream from Lake Mendocino, Hopland, Cloverdale, Jimtown, and near Syar Vineyards on a biweekly basis.

f. Monitoring in the Russian River and its estuary shall contribute to assessing water quality indicators and water column conditions. By July 15, 2022, Sonoma Water shall develop a "Water Quality Monitoring Plan for the Russian River Estuary Management Project" (2022 Water Quality Monitoring Plan) in consultation with the North Coast Water Board.

g. Sonoma Water shall conduct the monitoring of the Russian River and its estuary in accordance with the 2022 Water Quality Monitoring Plan to evaluate cyanoHAB conditions and the risk co-factors contributing to nuisance blooms (e.g., flow, temperature, nutrients, etc.). Sonoma Water shall submit a copy of the final plan and any subsequent amendments to the State Water Board's Deputy Director for Water Rights (Deputy Director) and the Executive Officer of the North Coast Water Board within two weeks of their completion.

h. If any water quality issues of concern are observed from the continuous monitoring or water sampling required by this Order, or if extremely low storage conditions in Lake Mendocino (less than 20,000 ac-ft) are forecasted, or if the

Sonoma County Department of Health Services posts health advisories related to cyanotoxins or indicator bacteria, Sonoma Water shall consult with the North Coast Water Board. Sonoma Water shall submit a summary report of consultation details and a description of proposed monitoring activities, if any, to the Deputy Director within one week of the consultation. Any necessary revisions to this Condition may be made following consultation with the North Coast Water Board and approval by the Deputy Director.

4. Sonoma Water shall conduct the following Fisheries Monitoring at the following locations:

Upper Russian River:

Between June and October 2022, Sonoma Water shall conduct two snorkel surveys in a pool/riffle complex at the five reaches between the Forks and Cloverdale described in Condition 2 to document fish presence and species composition. The surveys shall be conducted in the early (June/July) and late (September) portion of the monitoring season.

Lower Russian River:

a. From October 1 through the end of this Order, Sonoma Water shall conduct biweekly snorkel surveys in at least one, and up to six pools based on consultation with NMFS, between Mirabel Dam and the estuary to document the presence of adult salmonids. Snorkel surveys shall start after adult salmonids have access to the river (i.e., when the sandbar at the mouth of the river is open) and shall end after adult salmonids move past the counting station at the Mirabel fish ladder.

b. Beginning no later than September 1, 2022, and continuing through the duration of this Order, Sonoma Water shall monitor and record the daily numbers of adult salmon and steelhead moving upstream past the life cycle monitoring station at the Mirabel Dam fish ladder. Mirabel fish ladder numbers shall be included in the weekly reports required by Condition 6.

c. Beginning no later than October 1, 2022, and after a cumulative season total of 100 adult salmonids have moved past the Mirabel fish ladder, if adult salmon and steelhead can enter the Russian River estuary and suitable water clarity allows, Sonoma Water shall conduct spawning ground surveys in Dry Creek. Based on consultation with NMFS, up to three comprehensive Dry Creek surveys shall be conducted by boat along the 14-mile reach between Warm Springs Dam and the confluence of the Russian River and Dry Creek in Healdsburg.

d. Beginning no later than November 1, 2022, and after a cumulative season total of 100 adult salmonids have moved past the Mirabel fish ladder and flows at the USGS gauge in Healdsburg exceed 100 cfs, Sonoma Water shall monitor numbers of adult salmonids in representation reaches in Alexander Valley and the Upper Russian River. Monitoring shall occur on a monthly basis during the period of this Order.

e. By December 1, 2021, or after a cumulative seasonal total of 100 adult salmonids have moved upstream past the Mirabel fish ladder, whichever is earlier, Sonoma Water shall consult weekly with NMFS and CDFW regarding the possibility of increasing the instream flow at the gage at Hacienda to a level not to exceed 110 cfs.

5. Sonoma Water shall continue to consult with NMFS, CDFW, and the North Coast Water Board on a biweekly basis for fishery and water quality monitoring updates and any concerns relative to water quality and hydrologic condition of the Russian River. Sonoma Water shall submit a summary report of consultation details to the Deputy Director upon request.

Appendix A-6

STATE OF CALIFORNIA
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

In the Matter of Permits 12947A, 12949, 12950, and 16596
(Applications 12919A, 15736, 15737, 19351)

Sonoma County Water Agency

ORDER APPROVING TEMPORARY URGENCY CHANGE

SOURCE: Dry Creek, Russian River, and East Fork Russian River

COUNTIES: Sonoma and Mendocino Counties

BY THE DEPUTY DIRECTOR:

1.0 SUBSTANCE OF TEMPORARY URGENCY CHANGE PETITIONS

On May 26, 2022, Sonoma County Water Agency (Sonoma Water) filed Temporary Urgency Change Petitions (TUCPs) with the State Water Resources Control Board (State Water Board), Division of Water Rights (Division) requesting approval of changes to the subject permits pursuant to California Water Code section 1435. The TUCPs requested temporary reductions to the Russian River instream flow requirements that are conditions of the subject permits to address the current dry conditions in the Russian River Watershed and the extreme low storage conditions in Lake Mendocino and Lake Sonoma. In addition, the changes are proposed to avoid potential violations of the Incidental Take Statement contained in the 2008 National Marine Fisheries Service (NMFS) Biological Opinion on the water supply, flood control, and channel maintenance operations for the Russian River conducted by the U.S. Army Corps of Engineers, Sonoma Water, and the Mendocino County Russian River Flood Control District (hereafter, 2008 Biological Opinion). The TUCPs seek the following changes:

(a) From the date of approval of the TUCPs through a term of 180 days, the minimum instream flow requirements will be set to the *Critical* water supply classification criteria of 25 [cubic feet per second (cfs)] in the Upper Russian River[1] and 35 cfs in the Lower Russian River[2];

b) The minimum instream flow requirement will be implemented as a 5-day running average of average daily stream flow measurements with instantaneous minimum instream flows being no less than 10 cfs below the minimum.

2.0 BACKGROUND

2.1 Sonoma Water's Water Right Permits

The TUCPs involve the following water right permits held by Sonoma Water:

- Permit 12947A (Application 12919A), which authorizes direct diversion of 92 cfs from the East Fork Russian River and storage of 122,500 acre-feet (AF) per year in Lake Mendocino from January 1 through December 31 of each year;
- Permit 12949 (Application 15736), which authorizes direct diversion of 20 cfs from the Russian River from January 1 through December 31 of each year;
- Permit 12950 (Application 15737), which authorizes direct diversion of 60 cfs from the Russian River from April 1 through September 30 of each year; and
- Permit 16596 (Application 19351), which authorizes direct diversion of 180 cfs from the Russian River from January 1 to December 31 of each year and storage of 245,000 AF in Lake Sonoma, located on Dry Creek, from October 1 of each year to May 1 of the succeeding year.

2.2 Requirements of State Water Board Decision 1610

Sonoma Water controls and coordinates water supply releases from Lake Mendocino (Coyote Valley Dam) and Lake Sonoma (Warm Springs Dam) to implement the minimum instream flow requirements in State Water Board Decision 1610 (1986) (hereafter, Decision 1610). Decision 1610 set minimum instream flows in the Russian River to "preserve the fishery and recreation in the river and in Lake Mendocino to the greatest extent possible while serving the needs of the agricultural, municipal, domestic, and industrial uses which are dependent upon the water." (Decision 1610, p. 21.)

Decision 1610 established water year classifications of *Normal*, *Dry*, and *Critical*, which are based on cumulative inflow into Lake Pillsbury (in the adjacent Eel River

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[1] For purposes of this Order, Upper Russian River refers to the mainstem Russian River from its confluence with the East Fork Russian River to its confluence with Dry Creek.
[2] For purposes of this Order, the Lower Russian River refers to the mainstem Russian River from its confluence with Dry Creek to the Pacific Ocean.

Watershed) beginning October 1 of each year.[3] Decision 1610 further identifies two variations of the *Normal* water supply condition, *Dry Spring 1* and *Dry Spring 2*. These conditions provide for lower required minimum flows in the Upper Russian River during times when the combined storage in Lake Pillsbury and Lake Mendocino on May 31 is unusually low.

From October 1, 2021 to June 1, 2022, the cumulative inflow into Lake Pillsbury was 224,000 AF. Pursuant to Decision 1610, the water supply condition would be categorized as *Normal-Dry Spring 2* for the remainder of the year, however up until June 8, 2022, Sonoma Water was managing the Russian River based on a *Critical* water supply condition as authorized by the State Water Board's December 2021 TUCP Order. Subsequent to the expiration of that Order, the following conditions apply, among others:

- Term 20 of Sonoma Water's Permit 12947A requires Sonoma Water to pass through or release from storage at Lake Mendocino sufficient water to maintain instream flows of 75 cfs for the Upper Russian River[4] and 85 cfs for the Lower Russian River.
- Terms 17 of both Permit 12949 and Permit 12950 require Sonoma Water to allow sufficient water to bypass the points of diversion on the Russian River to maintain 85 cfs to the Pacific Ocean.
- Term 13 of Permit 16596 requires Sonoma Water to maintain 85 cfs in the Lower Russian River unless the water level in Lake Sonoma is below elevation 292 feet with reference to the National Geodetic Vertical Datum of 1929, or unless prohibited by the United States Government.

2.3 2008 Biological Opinion

Central California Coast (CCC) steelhead *(Oncorhynchus mykiss)*, CCC coho salmon *(O. kisutch)*, and Central Coast (CC) Chinook salmon *(O. tshawytscha)* in the Russian River Watershed are listed as threatened or endangered species under the federal Endangered Species Act (16 U.S.C § 1531 et seq.). In accordance with the requirements of section 7 of the federal Endangered Species Act (16 U.S.C. § 1536), NMFS, Sonoma Water, and the U.S. Army Corps of Engineers (USACE) participated in a consultation process involving studies to determine whether the water supply, flood control, and channel maintenance operations of the Russian River, including the operations authorized under the subject permits, are likely to harm the survival and recovery of these listed fish species. The 2008 Biological Opinion includes summaries of the studies, analyses of the project impacts, and a determination that summer flows in the Upper Russian River and Dry Creek, as required by Decision 1610, are too high for optimal juvenile salmonid habitat within the Russian River system. According to the

[3] Permits 12947A, 12949, 12950, and 16596 use the same water-year classification definitions. (Decision 1610, pp. 47-48, 53, 57-58, 60.)

2008 Biological Opinion, two types of issues are associated with the summer flows required by Decision 1610[5]: (1) the flows create current velocities that limit the amount of freshwater rearing habitat available to salmonids; and (2) the flow release requirements deplete the cold water pool in Lake Mendocino, contributing to relatively high water temperatures, which reduce the quality of available rearing habitat.

The 2008 Biological Opinion sets limits on releases from Lake Mendocino and Lake Sonoma during the summer months to maintaining suitable habitat for CCC steelhead, CCC coho salmon, and CC Chinook salmon and avoid take under the Endangered Species Act. These limitations are relevant to the TUCPs because the limitations on higher releases from Lake Sonoma restrict Sonoma Water's ability to release additional water from Lake Sonoma to offset reduced releases from Lake Mendocino and maintain instream flows in the Lower Russian River. The Incidental Take Statement from the 2008 Biological Opinion set limits on how many months from June through October Sonoma Water may operate a monthly median daily release above 105 cfs from Lake Sonoma. These criteria are set to avoid jeopardizing listed salmonids and their habitat in Dry Creek. The 2008 Biological Opinion establishes four tiers of Incidental Take Allowance for reservoir releases from Lake Sonoma based on monthly median daily release in June through October in the first 12 years in which the 2008 Biological Opinion is effective.[6]

2.4 Current Drought Conditions and Response

California is experiencing severe to exceptional drought conditions across the state. Water Year 2020-2021 was a second consecutive dry year with record-breaking high temperatures. In response to California's severe drought conditions in 2021, Governor Gavin Newsom proclaimed a regional drought state of emergency on April 21, 2021 for the Russian River Watershed, and on May 10, 2021, he signed a proclamation expanding the drought state of emergency to the Klamath River, Sacramento-San Joaquin Delta, and Tulare Lake Watersheds. On July 8, 2021, Governor Newsom signed a proclamation further expanding the regional drought state of emergency to include nine counties where drought effects are increasingly severe or where state emergency response may be needed. The Governor's drought proclamations brought a total of 50 of the state's 58 counties under the drought state of emergency.

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[5] The 2008 Biological Opinion focused on the flows required by Decision 1610 under *Normal* water year types. No changes to the flows for *Critical* water year types under Decision 1610 were recommended. By letters dated June 3, 2022 and June 7, 2022, respectively, NMFS and CDFW reiterated their support for the need to maintain the flows required in *Critical* water year types.

[6] Sonoma County continues to operate within these Incidental Take Statement "Allowance Tiers" despite the first 12 years of the 2008 Biological Opinion having passed. The Dry Creek Habitat Enhancement projects have not yet been completed as assumed in the 2008 Biological Opinion to support increasing releases and flows in year 13, and Sonoma Water has not yet expended its exceedance allowances.

The Russian River Watershed has experienced extremely dry conditions since 2020, with Water Year 2021 being the second driest year in the Ukiah Valley during the past 127 years of record, and Water Year 2020 being the fourth driest. As the drought continues, Lake Mendocino and Lake Sonoma are at or near their lowest levels for this time of the year since they began storing water in 1959 and 1984, respectively. As of June 9, 2022, the water supply storage level in Lake Mendocino was 50,627 AF, the second-lowest storage level for this time of year since Lake Mendocino first filled in 1959. Similarly, the storage level in Lake Sonoma was 137,661 AF on June 9, 2022, the lowest storage level for this time of year since Lake Sonoma first filled. In addition, on May 16, 2022, Pacific Gas & Electric (PG&E) filed a request with Federal Energy Regulatory Commission (FERC) for a temporary variance to reduce PG&E's minimum instream flow requirements for the East Fork Russian River under the FERC license for the Potter Valley Project (PVP) due to critically low water storage in Lake Pillsbury and the need to maintain minimum flows in the Eel River below Lake Van Arsdale and the Cape Horn Dam, including for threatened Chinook salmon and steelhead trout. If approved, PVP's minimum instream flow requirements for the East Fork Russian River below the Potter Valley Powerhouse would be reduced from 25 cfs to 5 cfs and be redefined as a flow target, thereby eliminating a 5 cfs buffer. Accordingly, Sonoma Water staff have forecasted that transfers from the Eel River to the East Fork Russian River through PVP will be reduced by approximately 20,000 AF between June 1, 2022 and October 1, 2022.

On April 20, 2021, Mendocino County declared a local emergency and imminent threat of disaster in Mendocino County due to drought conditions. On April 27, 2021, Sonoma County also adopted a resolution proclaiming a local drought emergency due to drought conditions in Sonoma County, with the most recent being approved by the Sonoma County Board of Supervisors on May 3, 2022. In response, Sonoma Water has filed four previous sets of TUCPs over the past two years to address dry conditions in the Russian River Watershed and low reservoir storage in Lake Mendocino. On July 28, 2020, the State Water Board approved Sonoma Water's TUCPs to temporarily reduce the minimum instream flow requirements in the Russian River. After the 2020 TUCP order expired on December 27, 2020, Sonoma Water filed another TUCP for Permit 12947A in January 2021 to request an alternative hydrologic index be used for the Upper Russian River. The State Water Board issued an order approving the TUCP on February 4, 2021, and approved clarifying amendments to the order on February 11, 2021. A May 14, 2021 TUCP request was approved on June 14, 2021 to reduce minimum instream flows, followed by a November 2021 TUCP request, approved on December 10, 2021, temporarily changing the hydrologic index. A recent analysis prepared by Sonoma Water engineering staff indicated that the water level in Lake Mendocino is projected to decline to less than 15,000 AF of storage before October 1 unless additional mitigation measures are taken.

Extremely low projected storage levels in Lake Sonoma and the extremely low water storage in Lake Mendocino could cause serious impacts to human health and safety, and harm listed and threatened fish species in the Russian River Watershed. The risks of currently low storage are of particular concern should drought conditions persist into 2023; if the winter of 2022 and early 2023 is similar to 2021, there is significant risk to the quality and availability of stored water for meeting human health and safety and listed and threatened species needs in the summer of 2023. Therefore, Sonoma Water requested changes to the minimum instream flow requirements on both the Upper and Lower Russian River to maintain water in storage in Lake Mendocino and Lake Sonoma at levels necessary to meet water supply demands and maintain instream flows.

In addition to preserving reservoir storage for water supplies to meet human health and safety needs in Sonoma and Marin counties, Sonoma Water proposes to reduce the minimum instream flow requirements for the Lower Russian River to avoid the need for increased release rates from Lake Sonoma in excess of the flows authorized by the 2008 Biological Opinion. Upon approval of the variance filed by PG&E, reduced instream flows on the Upper Russian River will result in significantly less contribution to instream flows in the Lower Russian River. Increased releases from Lake Sonoma into Dry Creek would be necessary for Sonoma Water to maintain Decision 1610 minimum instream flow requirements for the Lower Russian River while meeting water contractor, purchaser, and customer water supply demands. However, releases into Dry Creek in addition to those necessary to meet water supply demands are likely to violate the Incidental Take Statement in the 2008 Biological Opinion, which restricts releases from Lake Sonoma into Dry Creek to prevent flows that are too high to maintain habitat for juvenile salmonids.

3.0 COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT

Ordinarily, the State Water Board must comply with applicable requirements of the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) (CEQA) prior to issuance of any order approving a TUCP. (Cal. Code Regs., tit. 23, § 805.) However, the Governor's April 21, 2021 Drought Emergency Proclamation, ordering paragraph 7 suspended CEQA and regulations adopted pursuant to CEQA in Mendocino and Sonoma Counties, to the extent necessary for the State Water Board to address drought-related impacts through "[m]odifying requirements for reservoir releases or diversion limitations" in the Russian River Watershed "to ensure adequate, minimal water supplies for critical purposes." Sonoma Water's requests to temporarily lower instream flow requirements in the Russian River due to historically dry conditions are eligible for suspension under the Governor's April 21, 2021 Drought Emergency Proclamation. The State Water Board will add this Order to the list of approvals on its website for which CEQA was suspended.

In addition to the Governor's suspension of CEQA covering the activities proposed and approved under this Order, Sonoma Water determined that the requested water right changes are categorically exempt under CEQA's emergency statutory exemption and Class 1, 7, and 8 categorical exemptions. Sonoma Water filed a Notice of Exemption on May 26, 2022. The State Water Board has reviewed the information submitted by Sonoma Water and has made its own independent finding that the requested changes are statutorily and categorically exempt from CEQA. The changes sought by the TUCPs are consistent with the following statutory and categorical CEQA exemptions for the following reasons:

1) As mentioned above, on April 21, 2021, the Governor proclaimed a drought emergency in Mendocino and Sonoma counties due to drought conditions in the Russian River Watershed. The Governor's Drought Emergency Proclamation ordered the State Water Board to consider specific actions to "ensure adequate, minimal water supplies for critical purposes." Information provided by Sonoma Water demonstrates that continued releases of water to maintain minimum instream flows required by Sonoma Water's current water right permit terms could cause storage levels in Lake Mendocino and Lake Sonoma to decline to unsafe levels. As discussed in this Order, if storage in Lake Mendocino is depleted, there will be serious water supply impacts to human health and safety, and water will not be available to protect aquatic life, including threatened and endangered species in the Russian River. Furthermore, increasing Lake Sonoma releases to maintain instream flow requirements under current permit terms could harm critical endangered species habitat in Dry Creek, and the resulting depletion of Lake Sonoma could also affect drinking water supplies and other critical water uses if dry conditions persist into 2023. Approval of the TUCPs is therefore necessary to prevent and mitigate loss of, or damage to, the environment, fishery resources, property, public health and safety, and essential public services. Accordingly, the project is statutorily exempt from CEQA because it is necessary to prevent or mitigate an emergency—in this case, a proclaimed drought emergency—that poses a clear and imminent danger. (Pub. Resources Code, §§ 21060.3 & 21080, subd. (b)(4); Cal. Code Regs., tit. 14, § 15269, subd. (c).)

2) A Class 1 categorical exemption "consists of the operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of existing or former use." (Cal. Code Regs., tit. 14, § 15301.) The proposed action consists of the operation of existing facilities involving negligible or no expansion of use beyond that existing, and accordingly is categorically exempt from CEQA under a Class 1 exemption.

3) A Class 7 categorical exemption "consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the

regulatory process involves procedures for protection of the environment." (Cal. Code Regs., tit. 14, § 15307.) The proposed action will ensure the maintenance of a natural resource (i.e., the instream resources of the Russian River) by increasing availability and improving the quality of salmonid rearing habitat in the Russian River and more closely mimicking natural inflow to the estuary, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that could support increased production of juvenile steelhead. Accordingly, these changes are categorically exempt from CEQA pursuant to a Class 7 exemption.

4) A Class 8 categorical exemption "consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment." (Cal. Code Regs., tit. 14, § 15308.) The proposed action will ensure the maintenance of the environment (i.e., the instream environment of the Russian River) in the same way as stated for the Class 7 categorical exemption, and the proposed temporary changes are also therefore categorically exempt under Class 8.

4.0 PROCEDURAL REQUIREMENTS CONCERNING THE TEMPORARY URGENCY CHANGE PETITION

On June 8, 2022, the State Water Board issued and delivered to Sonoma Water a notice of the temporary urgency change order pursuant to Water Code section 1438, subdivision (a). Pursuant to Water Code section 1438, subdivision (b)(1), Sonoma Water is required to publish the notice in a newspaper having a general circulation, and that is published within the counties where the points of diversion lie within 20 days from the date of issuance of the notice by the State Water Board. Pursuant to Water Code section 1438, subdivision (a), the State Water Board may issue a temporary urgency change order in advance of the required notice. In this case, however, Sonoma Water published the notice in *Ukiah Daily Journal* and *The Press Democrat*. In addition, the State Water Board posted the notice of the temporary urgency change (and accompanying materials) on its website and distributed the notice through its electronic notification system.

Any interested person may file an objection to a temporary urgency change. (Wat. Code, § 1438, subd. (d).) The State Water Board must promptly consider and may hold a hearing on any objection. (*Id*., § 1438, subd. (e).) The State Water Board exercises continuing supervision over temporary urgency change orders and may modify or revoke temporary urgency change orders at any time. (*Id.*, §§ 1439, 1440.)

As of June 16, 2022, the State Water Board had received three letters in support of Sonoma Water's TUCPs from 1) Mendocino County Russian River Flood Control and Water Conservation Improvement District (Mendocino County RRFC), 2) NMFS, and 3) the California Department of Fish and Wildlife (CDFW).

NMFS and CDFW urged the State Water Board to conditionally approve Sonoma Water's TUCPs as early as possible to preserve water stored in Lake Mendocino and Lake Sonoma to meet the needs of federal and state listed salmonids in the Russian River later in the fall, as well as to maintain Dry Creek flows consistent with the requirements and actions under the 2008 Biological Opinion. NMFS and CDFW also proposed terms and conditions that would require Sonoma Water to conduct continuous water quality and fisheries monitoring in the Russian River, ongoing consultation with NMFS, CDFW, and the North Coast Water Board, and ongoing reporting of monitoring measurements to assist NMFS, CDFW, the North Coast Water Board, and the State Water Board in overseeing the effects of the TUCPs on conditions in the Russian River and determining if additional actions are required. The State Water Board has considered and incorporated the terms and conditions from the support letters of NMFS and CDFW into Conditions 2-7 of this Order.

As of June 15, 2022, the State Water Board has received nine comments on Sonoma Water's TUCPs from the Russian River Watershed Protection Committee (RRWPC) and eight residents located near the lower Russian River.

The RRWPC expressed concern over the impacts of reduced river flows on water quality and recreation in the lower river and its associated impacts to the local economy and questioned the reasonableness of the ongoing development of housing in the local area. Additionally, RRWPC asserted the Environmental Impact Report (EIR) related to the long-term petitions to change the hydrologic index and associated instream flows for the Russian River has suffered too many delays. Finally, RRWPC stated that releases into Dry Creek have not been consistent with requirements under the 2008 Biological Opinion. RRWPC supports the inclusion of a term requiring Sonoma Water and its contractors achieve a 20 percent reduction in water diversions.

The eight comment letters received from residents near the lower Russian River expressed concern over the health of the river at lower flows and its impacts to recreation and the economy, as well as the continuing urban development upstream that threatens an already-limited water supply.

5.0 CRITERIA FOR APPROVING THE PROPOSED TEMPORARY URGENCY CHANGE

Water Code section 1435 provides that a right holder who has an urgent need to change the point of diversion, place of use, or purpose of use from that specified in the water right may petition for a conditional temporary change order. The State Water Board's regulations set forth the filing and other procedural requirements applicable to TUCPs. (Cal. Code Regs., tit. 23, §§ 805, 806.) The State Water Board's regulations also clarify that requests for changes to permits or licenses other than changes in point of diversion, place of use, or purpose of use may be filed, subject to the same filing and procedural requirements that apply to changes in point of diversion, place of use, or purpose of use. (*Id*., § 791, subd. (e).)

Before approving a TUCP, the State Water Board must make the following findings: (1) the right holder has an urgent need to make the proposed change; (2) the proposed change may be made without injury to any other lawful user of water; (3) the proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses; and (4) the proposed change is in the public interest. (Wat. Code, § 1435, subd. (b)(1-4).)

A temporary change order does not result in the creation of a vested right, even of a temporary nature, but shall be subject at all times to modification or revocation in the discretion of the Board. (Wat. Code, § 1440.)

5.1 Urgency of the Proposed Change

Under Water Code section 1435, subdivision (c), an "urgent need" means "the existence of circumstances from which the board may in its judgment conclude that the proposed temporary change is necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented . . ."

In this case, an urgent need exists for the proposed change in minimum instream flow requirements on the Upper Russian River. As indicated above in Section 2.4 of this Order, the Russian River Watershed is experiencing a third consecutive year of drought conditions. In April 2021, the state and local governments declared a drought emergency for the Russian River Watershed in Mendocino and Sonoma counties. However, because Decision 1610's hydrologic index is based on cumulative inflow to Lake Pillsbury, the water supply condition is categorized as *Normal-Dry Spring 2* instead of *Critical*. Pursuant to the State Water Board's December 10, 2021 approval of a TUCP, the hydrologic index applicable to the instream flow requirements for the Upper Russian River under Permit 12947A was temporarily changed to be based on Lake Mendocino storage levels, such that applicable minimum instream flows for the Upper Russian River have been 25 cfs, consistent with Decision 1610's requirements for *Critical* water supply conditions. That temporary urgency change expired on June 8, 2022. The Decision 1610 hydrologic index has continued to require Sonoma Water's maintenance of higher instream flows under Sonoma Water's other water rights (Permits 12949, 12950, and 16596), despite the critical dry conditions in the Russian River Watershed.

Sonoma Water stated in the TUCPs that without the proposed changes it would need to release additional stored water from Lake Mendocino to maintain instream flow requirements per Decision 1610, which would lead to critically low water supply during the fall or winter for water users in Mendocino County and the northern part of Sonoma County (above the confluence with Dry Creek) and could severely impact listed and threatened fish species in the Russian River. Sonoma Water has projected that Lake Mendocino would reach a storage level of only 15,000 AF by October 1, 2022, without the proposed temporary changes.

An urgent need also exists for the proposed change in minimum instream flow requirements on the Lower Russian River. Lake Sonoma is at its lowest storage level since it began storing water in 1984. Sonoma Water predicted Lake Sonoma could decline to less than 100,000 AF by October 1, 2022, without changes to instream flow requirements. In addition, reductions in the Upper Russian River flows would require an increase in Lake Sonoma releases into Dry Creek to meet Lower Russian River flow requirements as well as water supply demands. Higher releases from Lake Sonoma could cause Sonoma Water to violate the Incidental Take Statement contained in the 2008 Biological Opinion and reduce the suitability of habitat for threatened and endangered fish species in Dry Creek. Sonoma Water has been releasing over 160 cfs since June 8, 2022 at Lake Sonoma to meet the instream flow requirements per Decision 1610, which puts reservoir operations above the 160 cfs maximum threshold established in the Incidental Take Statement of the 2008 Biological Opinion. Without modification to the current instream flow requirement for the Lower Russian River, Sonoma Water would have to continue releases that would likely result in violation of the Incidental Take Statement contained in the 2008 Biological Opinion.

Therefore, although requests to increase water releases from Lake Sonoma to meet higher minimum instream flow requirements in the Lower Russian River have been received by the Board, the flow limitations in the 2008 Biological Opinion restrict this option. Absent the proposed changes to the minimum instream flow requirements in the Lower Russian River, Sonoma Water would have to choose between either exacerbating the depletion of Lake Mendocino storage levels or increasing Lake Sonoma releases such that they would violate the Incidental Take Statement contained in the 2008 Biological Opinion.

Water Code section 1435, subdivision (c) also states that the State Water Board shall not find a petitioner's need to be urgent if it concludes that the petitioner has not exercised due diligence either in petitioning for a change pursuant to provisions other than a TUCP or in pursuing that petition for change. As noted in the State Water Board's February 2021 order approving Sonoma Water's TUCP for Permit 12947A, a number of factors have hindered action on Sonoma Water's long-term change petitions to modify Decision 1610 and Permits 12947A, 12949, 12950, and 16596. As required as a condition of that order, Sonoma Water has provided a schedule of milestones and completion dates for further actions necessary for action on its long-term change petitions. Since submittal of that schedule, progress has been hindered by two additional significant issues: 1) the severity of the ongoing drought since February 2021 and 2) the ongoing uncertainty regarding the future of transfers of water from the Eel River watershed through the PVP. As described above, drought response has been a significant effort over the past two years and has necessitated the diversion of resources at both Sonoma Water and the Board that otherwise could have been dedicated to making progress on the long-term change petitions. With the expiration of the PVP FERC license on April 14, 2022 and the failure to secure new ownership of the project, the process to abandon the PVP will soon commence. Until the nature and duration of the abandonment process proposed by PG&E and approved by FERC is known, progress on the long-term petitions and the related supporting environmental analyses will be hindered. The Order includes a condition that requires an updated schedule and identification of potential pathways forward given the uncertainty associated with the PVP. In light of these circumstances and representations, the State Water Board finds that Sonoma Water has exercised due diligence. Sonoma Water must continue to diligently pursue the long-term petitions in accordance with its updated report and schedule. In the interim, an urgent need exists now, due to the current critical water conditions and ongoing drought emergency, to grant Sonoma Water's TUCPs.

5.2 No Injury to Any Other Lawful User of Water

Sonoma Water is required to maintain specified flows in the Russian River from its most upstream point of diversion to the Russian River's confluence with the Pacific Ocean. Under this Order, minimum flows are required to be maintained consistent with the critically dry conditions in the Russian River Watershed. Under present conditions, Lake Mendocino storage releases comprise virtually all water flowing in the Upper Russian River. What little natural flow exists, if any, will not be sufficient to support even the most senior water rights. In the Lower Russian River, hydrologic conditions are similarly dry, and it is anticipated that limited flows may only be sufficient to protect senior water right holders and public trust resources. Other legal users of water will not be injured by reduction in releases of previously stored water because water released from storage is not available for diversion by downstream users with an independent basis of right. (See, e.g., *North Kern Water Storage Dist. v. Kern Delta Water Dist.* (2007) 147 Cal.App.4th 555, 570 [when the stored water is released for use, it is not part of the river's natural flow and rediversion of this water does not count toward the appropriator's current allocation of river water]; *State Water Resources Control Bd. Cases* (2006) 136 Cal.App.4th 674, 737-745 [a riparian or appropriator has no legally protected interest in other appropriators' stored water or in the continuation of releases of stored water].)

In conjunction with other actions in response to the current drought state of emergency within the Russian River Watershed, the State Water Board will supervise diversion and use of water under this temporary urgency change order for the protection of all other lawful users of water pursuant to Water Code section 1439.

5.3 No Unreasonable Effect upon Fish, Wildlife, or Other Instream Beneficial Uses

Prior to approval of a TUCP, the Board must find that the proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses. In addition, the State Water Board has an independent obligation to consider the effect of approval of Sonoma Water's petitions on public trust resources and to protect those resources to the extent feasible and in the public interest. (*National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419.) Public trust resources may include, but are not limited to, wildlife, fish, aquatic dependent species, streambeds, riparian areas, tidelands, and recreation in navigable waterways, as well as fisheries located in non-navigable waterways. It is also the policy of this state that all state agencies, boards, and commissions shall seek to conserve endangered species and threatened species and shall use their authority in furtherance of the purposes of the California Endangered Species Act (Fish & G. Code, § 2050 et seq.). State agencies should not approve projects that would jeopardize the continued existence of any endangered species or threatened species if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat that would prevent jeopardy. (Fish & G. Code, §§ 2053 & 2055.)

Although flows in the Russian River will be reduced upon approval of the TUCPs, maintenance of stored water in Lake Mendocino and Lake Sonoma for subsequent release is crucial for ensuring sufficient water supplies for human health and safety use and maintaining habitat for threatened and endangered fish species during the critical life stages that occur during the fall. With the conditions imposed by this Order, including ongoing efforts to support water conservation and regular monitoring and reporting of conditions by Sonoma Water, the State Water Board finds that granting the proposed temporary changes will not have an unreasonable effect on fish, wildlife, or other instream beneficial uses and public trust resources will be protected to the extent feasible and in the public interest. The State Water Board will continue to evaluate conditions in the watershed throughout the effective period of this Order and consider other actions that may further the protection of fish, wildlife, and other instream beneficial uses.

5.3.1 Conservation

Sonoma Water is actively engaged in water conservation to reduce demands on water stored in Lake Mendocino and Lake Sonoma for municipal supply. Sonoma Water and its water contractors have implemented water use efficiency programs to comply with the California Water Conservation Act since the establishment of the Sonoma-Marin Water Saving Partnership (Partnership) in 2010. The Partnership represents thirteen North Bay water utilities in Sonoma and Marin counties that have joined to provide regional solutions for water use efficiency.

To address the current drought and reduce diversions from the Russian River, Sonoma Water's contractors adopted a resolution in its May 3, 2021 Water Advisory Committee (WAC) meeting urging a 20 percent reduction in customer water use in support of the water saving efforts of the Partnership. Sonoma Water's contractors have already taken water conservation actions, and Sonoma Water indicates that they will continue to implement their respective agencies' Water Shortage Contingency Plans to meet the reduction goal. The TUCPs stated that Sonoma Water and its retail water customers will commit to a 20 percent reduction in total diversions across all downstream points of diversion or rediversion authorized under Sonoma Water's water rights from July 1 through October 31 of this year compared to the same period in 2020.

As stated in the TUCPs, Sonoma Water, its water contractors, and other members of the Partnership began implementing an aggressive water saving outreach campaign in winter 2020. Sonoma Water, its contractors, and the other member agencies of the Partnership continue to run a multimedia drought outreach campaign to maintain customer awareness of low reservoir levels and the need for continued water savings due to a third consecutive dry year. The campaign emphasizes reducing water waste by adhering to statewide water waste prohibitions and local restrictions on irrigation and other non-essential uses of water.

In addition, on May 24, 2022, the State Water Board adopted a new emergency regulation for urban water conservation. The regulation requires urban water suppliers to submit preliminary supply and demand assessments to the Department of Water Resources by June 10, 2022. Urban water suppliers also must implement all conservation actions in their locally adopted plans meant to address at least a water shortage level of 10 to 20 percent (Level 2) by June 10, 2022, and owners and managers of commercial, industrial, and institutional properties must not use potable water for irrigating non-functional turf. The regulation remains in effect for one year unless the State Water Board determines that it is no longer necessary due to changed conditions or unless the State Water Board renews the regulation due to continued drought conditions.
To ensure continuation of these conservation activities, this Order includes a condition that requires Sonoma Water and its water contractors to fulfill their commitment to reduce total diversions under Sonoma Water's water rights by 20 percent compared to the same period of 2020 from July 1 through the end of October, unless natural flow conditions in the watershed improve earlier. Sonoma Water is also required to submit to the Deputy Director for Water Rights monthly reports documenting Sonoma Water's reductions in diversions and to provide updated water storage projections of Lake Sonoma and Lake Mendocino during the effective period of this Order.

5.3.2 RECREATION

Reduced flows in the Russian River could impair recreational uses by lowering flows below those necessary for recreational boating and reducing opportunities for other recreational activities such as swimming. Given the extremely low projected storage in

Lake Mendocino and Lake Sonoma and the potential impacts to the environment, fishery resources, and essential human health and safety needs that could occur if the temporary changes are not approved, these impacts to recreation are reasonable under the circumstances. Maintenance of flows in excess of those required by this Order risks elimination of water storage in Lake Mendocino should drought conditions persist into 2023 and reduction of water storage in Lake Sonoma to levels that may not be sufficient to meet human health and safety needs in Mendocino, Sonoma, and Marin counties, or provide minimum flows during the fall that are necessary for threatened and endangered fish species. Additionally, as described in Section 2.3 of this Order, releases from Lake Sonoma are limited by the 2008 Biological Opinion; and maintenance of higher flows in the Lower Russian River could adversely affect rearing habitat for protected salmonids and result in expending additional Incidental Take Allowances. Given the conflicting demands on limited water supplies, the need to maintain minimum storage levels to protect public water supplies and threatened and endangered species, and the implementation of conservation measures by Sonoma Water, this Order protects recreational interests in the Russian River to the extent feasible and in the public interest. Additionally, as described in Section 2.3 of this Order, releases from Lake Sonoma are limited by the 2008 Biological Opinion; maintenance of higher flows in the Lower Russian River may result in expending additional Incidental Take Allowances. Should changes in water supply conditions allow for enhanced flows that would further recreational interests, the Board retains the authority to amend or revoke this Order as appropriate.

5.3.3 Water Quality and Availability of Aquatic Habitat

The Russian River sustains an annual run of adult Chinook salmon that depend on the release of stored water from Lake Mendocino during October, November, and early December. Reduced minimum flows in the Russian River would probably have some immediate adverse impacts to water quality and the availability of aquatic habitat for anadromous fish and other species in the Upper and Lower Russian River. These impacts are, however, expected to be offset by improvements to water quality and aquatic habitat by preventing Lake Mendocino from being drained and allowing continued minimum releases through the fall. As discussed in Section 2.4 of this Order, Sonoma Water predicted that Lake Mendocino would potentially have only 15,000 AF of water remaining by October 1, 2022, without the proposed TUCPs. In addition to impacting flows in the Lower Russian River, elimination of water storage in Lake Mendocino would result in catastrophic impacts to human health and safety and survival of fish and wildlife in the Upper Russian River and the lake itself.

Both NMFS and CDFW support the TUCPs to conserve water storage in Lake Mendocino and Lake Sonoma for the benefit of listed salmonids, conditioned upon ongoing monitoring, reporting, and consultation requirements. These proposed terms and conditions have been included in this Order. To allow for adaptive management of releases from Lake Mendocino and Lake Sonoma, this Order requires Sonoma Water to provide weekly updates to the State Water Board, CDFW, NMFS, and the North Coast Water Board regarding the current hydrologic and water quality conditions on the Russian River and updates on fishery conditions. This information will assist the State Water Board in determining whether additional actions or modifications to this Order are necessary. All monitoring activities will be summarized in annual reports intended to evaluate whether and to what extent the reduced flows may have caused any impacts to water quality and availability of aquatic habitat for salmonids. This information may be used to assist the study and development of future long-term- changes to Decision 1610 instream flow requirements for which separate petitions are pending.

5.3.4 CYANOBACTERIA

Cyanobacteria are present in most freshwater and marine aquatic environments. When conditions are favorable, including abundant light, elevated water temperature, elevated levels of nutrients, and lack of water turbulence and velocity, cyanobacteria can quickly multiply into a bloom. Not every bloom is toxic; however, harmful algal blooms of cyanobacteria (cyanoHABs) are a concern as some species of cyanobacteria produce toxins that have the potential to impact drinking water, recreation, and fish and wildlife. Cyanotoxins were present in the Russian River in 2015, 2016, 2017, and 2018, which led to warning signs being posted by Sonoma County Department of Health Services.

There are currently no federal water quality criteria or regulations for cyanobacteria or cyanotoxins. However, some toxins (microcystins and clyindrospermopsin) have been added to the contaminant candidate list under the Safe Drinking Water Act. In addition, the Clean Water Act sets ambient water quality standards and requires that the Environmental Protection Agency develop management strategies for assessing and managing algal toxins.

Currently, there is no regulation in the State of California specifically regarding cyanobacteria or cyanotoxins in drinking water or recreational waters. However, there has been an increase in cyanoHABs in California. The North Coast Water Board has noted concerns about cyanoHABs and elevated pathogen concentrations that occur when low stream flow conditions coincide with warm weather in the Russian River and its tributaries. The Russian River is listed as impaired on the 303(d) list for pathogen conditions, leading to the North Coast Water Board’s adoption of the Action Plan for the Russian River Watershed Pathogen Total Maximum Daily Load in August 2019. The North Coast Water Board notes that past streamflow monitoring in the Lower Russian River indicates that high rainfall following a dry year is not adequate to restore baseflows in the late summer. Given the extremely dry conditions since 2020, the upcoming critically low late summer baseflows support the rationale for ongoing monitoring and coordination among Sonoma Water, the North Coast Water Board, and the State Water Board.

5.4 The Proposed Change Is in the Public Interest

Approval of the TUCPs to temporarily reduce minimum instream flows will help conserve stored water in Lake Mendocino and Lake Sonoma to meet human health and safety needs, and to protect endangered and threatened species in the Russian River. Without the proposed changes, the resulting elimination of stored water in Lake Mendocino and the depletion of stored water in Lake Sonoma to unsafe levels will put residents in the counties of Mendocino, Sonoma, and Marin at risk should dry conditions persist into 2023. Fisheries and wildlife will be also at risk of running out of water in the Upper Russian River in the fall. In addition, without modification to the current instream flow requirement for the Lower Russian River, Sonoma Water would have to continue releases from Lake Sonoma, which could result in violation of the Incidental Take Statement, and would be detrimental to the fisheries in Dry Creek for the rest of this year. It is in the public interest to preserve water supplies for these beneficial uses given the extreme hydrologic circumstances and reduced water supplies.

Should the conditions that support the approval of this Order change, whether in alterations to water supply or identification of additional impacts to aquatic habitat, water quality, or other matters within the public interest, the State Water Board has the authority to revoke this approval or modify the terms and conditions of this Order as necessary to promote the interests of the public.

6.0 CONCLUSIONS

The State Water Board has adequate information in its files to make the evaluation required by Water Code section 1435. The findings of this Order are based on unique circumstances created by drought and are independent from any findings to be made in connection with the related change petitions filed by Sonoma Water in 2009 and revised in 2016 pursuant to Chapter 10 of Division 2 of Part 2 of the Water Code.

I conclude that, based on the available evidence:

1. The right holder has an urgent need to make the proposed change;

2. The proposed change will not operate to the injury of any other lawful user of water;

3. The proposed change will not have an unreasonable effect upon fish, wildlife, or other instream beneficial uses and public trust resources will be protected to the extent feasible and in the public interest; and

4. The proposed change is in the public interest.

ORDER

NOW, THEREFORE, IT IS ORDERED THAT: the petitions filed by Sonoma Water for a temporary urgency change in Permits 12947A, 12949, 12950, and 16596 are approved effective from the date of this Order for a period of 180 days.

All existing terms and conditions of the subject permits remain in effect, except as temporarily amended by the following terms:

1. The minimum instream flow requirements in the Russian River, as specified in Term 20 of Permit 12947A, Term 17 of Permit 12949, Term 17 of Permit 12950, and Term 13 of Permit 16596, shall be modified as follows:

    a. Minimum instream flow in the Upper Russian River shall remain at or above 25 cfs, as measured on a five-day running average of average daily stream flow.
    b. Minimum instream flow in the Lower Russian River shall remain at or above 35 cfs, as measured on a five-day running average of average daily stream flow.
    c. Sonoma Water shall pass through or release sufficient water to maintain a continuous, instantaneous streamflow of no less than 15 cfs in the Upper Russian River and no less than 25 cfs in the Lower Russian River at all times.

2. Sonoma Water shall conduct the following water quality monitoring tasks to monitor habitat conditions and hydrologic connectivity at the following locations:

    Upper Russian River Habitat:

    a. From June 1 to October 1 of 2021, Sonoma Water shall visit six reach sites on a biweekly basis between the confluence of the East Fork Russian River and West Fork Russian River (the Forks) and the confluence of Dry Creek and Russian River in Healdsburg. Sonoma Water shall visit four reach sites (Ukiah, Hopland, Commisky Station, and Cloverdale) that have been used previously as flow/habitat study sites, and Sonoma Water shall establish two additional reach sites in Alexander Valley and Healdsburg. Each study reach site will be approximately 500 meters long. At each reach site, Sonoma Water shall document habitat conditions and flow connectivity via walking surveys, photo documentation, and measurement of width and depth at established cross-sections. Most reach sites shall be in close proximity to existing U.S. Geological Survey (USGS) stream gauges and Sonoma Water owned water quality data collection sites.

b. Sonoma Water shall supplement data collected at "permanent" water quality monitoring sites with temperature and dissolved oxygen measurements in up to a total of five deep pools in the Upper Russian River. Sonoma Water shall sample these sites opportunistically within and beyond the established habitat monitoring reaches.

Lower Russian River Habitat:

From October 1 through December 14, 2022, Sonoma Water shall visit at least one, and up to four critical riffle sites based on consultation with NMFS, in the Lower Russian River as conditions allow to assess adult salmonid passage opportunities. At each site, Sonoma Water staff shall measure riffle length, width, and depth, and document the site with photographs.

3. Sonoma Water shall conduct monitoring to determine the effects of the changes in instream flows on water quality and availability of aquatic habitat for salmonids. Monitoring in the Russian River shall include continuous monitoring of temperature, dissolved oxygen, pH, and specific conductivity at multiple stations from Calpella to Jenner as follows for the date of this Order to December 14, 2022:
    a. Monitoring on the East Fork Russian River shall occur at a seasonal water quality data sonde located approximately 1/3 mile (0.33 mi) downstream from Lake Mendocino and at the Russian River at the confluence with Pieta Creek; Sonoma Water shall record hourly measurements of water temperature, dissolved oxygen, specific conductivity, pH, and turbidity.
    b. Monitoring on the Russian River shall occur at three, multi-parameter "permanent" water quality data sondes at USGS stream gages located at Hopland, Diggers Bend near Healdsburg, and Hacienda Bridge. These three data sondes are referred to as "permanent" as they are maintained as part of Sonoma Water's early warning detection system in coordination with USGS on its "Real-time Data for California" website.
    c. Monitoring on the Russian River shall occur at four seasonal data sondes with real-time telemetry in cooperation with USGS at USGS gages at East Fork Russian River at Calpella station, Cloverdale station (north of Cloverdale at Commisky Station Road), Jimtown (at the Alexander Valley Road bridge), and Johnson's Beach (Guerneville). The data sonde at the Cloverdale gage shall collect dissolved oxygen and temperature; the data sonde at the Jimtown gage shall collect pH, temperature, dissolved oxygen, specific conductivity, and turbidity; and the data sonde at Johnson's Beach shall collect pH, temperature, dissolved oxygen, specific conductivity, and turbidity.
    d. Monitoring at Lake Sonoma and Lake Mendocino: Sonoma Water shall work with USACE to ensure the monitoring of vertical temperature profiles in Lake Sonoma and Lake Mendocino occurs on a biweekly basis from the date of this Order through December 14, 2022. This will inform

adjustments to the outlet releases at each reservoir to ensure adequate cold water for fish hatchery operations, as well as the need for potential salvage/rescue operations for native fishes in the East Fork Russian River, or other necessary adaptive management. Monitoring at Lake Mendocino should be conducted near the outlet structure of the lake and will contribute to the assessment of water quality indicators and water column conditions, including vertical profiles for temperature, dissolved oxygen, turbidity, specific conductance, and pH on a biweekly basis. Water grab samples for nutrients, chlorophyll a, and turbidity shall also be collected on a biweekly basis in the hypolimnion, metalimnion, and epilimnion. Monitoring at Lake Mendocino will be dependent on access to adequate safe boat launching sites at low reservoir water surface elevations. Monitoring at Lake Sonoma will contribute to the assessment of the volume of the coldwater pool based on vertical profile temperature data. Temperature monitoring at Lake Sonoma should be conducted near the outlet structure of the lake, and at several other locations (minimum of 4 sites/survey). For each survey, depth and temperature should be recorded at 10-foot depth intervals to characterize the change in temperature from the surface to deepest depth at each site within the reservoir. Monitoring on the mainstem Russian River shall include collection of water grab samples for nutrient, chlorophyll a, and turbidity at the East Fork Russian River at Calpella, East Fork Russian River approximately 1/3 mile (0.33 mi) downstream from Lake Mendocino, Hopland, Cloverdale, Jimtown, and near Syar Vineyards on a biweekly basis.

e. Monitoring in the Russian River and its estuary shall contribute to assessing water quality indicators and water column conditions. By July 15, 2022, Sonoma Water shall develop a “Water Quality Monitoring Plan for the Russian River Estuary Management Project” (2022 Water Quality Monitoring Plan) in consultation with the North Coast Water Board.
f. Sonoma Water shall conduct the monitoring of the Russian River and its estuary in accordance with the 2022 Water Quality Monitoring Plan to evaluate cyanoHAB conditions and the risk co-factors contributing to nuisance blooms (e.g., flow, temperature, nutrients, etc.). Sonoma Water shall submit a copy of the final plan and any subsequent amendments to the State Water Board’s Deputy Director for Water Rights (Deputy Director) and the Executive Officer of the North Coast Water Board within two weeks of their completion.
g. Sonoma Water shall consult with the North Coast Water Board if any water quality issues of concern are observed from the continuous monitoring or water sampling required by this Order, if extremely low storage conditions in Lake Mendocino (less than 20,000 af) are forecasted, or if the Sonoma County Department of Health Services posts health advisories related to cyanotoxins or indicator bacteria in the Russian River. Sonoma Water shall submit a summary report of

consultation details and a description of any proposed changes or additions to monitoring activities to the Deputy Director within one week of the consultation. Based on the report, the Deputy Director may revise this Condition to the extent necessary to evaluate the effects of reduced flows on water quality and instream beneficial uses.

4. Sonoma Water shall conduct the following Fisheries Monitoring as follows:

Upper Russian River:
Between June 1 and October 1 of 2022, if suitable water quality allows adequate visibility, Sonoma Water shall conduct two snorkel surveys in a pool/riffle complex at the five reaches between the Forks and Cloverdale described in Condition 2 to document fish presence and species composition. The surveys shall be conducted in the early (July) and late (September) portion of the monitoring season.

Lower Russian River:
a. From October 1 through the end of this Order, Sonoma Water shall conduct biweekly snorkel surveys in at least one, and up to six pools based on consultation with NMFS and CDFW, between Mirabel Dam and the estuary to document the presence of adult salmonids. Snorkel surveys shall start after adult salmonids have access to the river (i.e., when the sandbar at the mouth of the river is open) and shall end when determined by NMFS and CDFW.
b. Beginning no later than September 1, 2022 and continuing through December 14, 2022, Sonoma Water shall monitor and record the daily numbers of adult salmon and steelhead moving upstream past the life cycle monitoring station at the Mirabel Dam fish ladder. Mirabel fish ladder numbers shall be included in the weekly reports required by Condition 6. If no fish are observed at the Mirabel Fish Ladder by October 1, then from October 1 through December 14, 2022, Sonoma Water shall conduct biweekly snorkel surveys in at least one, and up to six pools based on consultation with NMFS and CDFW, between Mirabel Dam and the estuary to document the presence of adult salmonids. Snorkel surveys shall start after adult salmonids have access to the river (i.e., when the sandbar at the mouth of the river is open) and shall end when determined by NMFS and CDFW.
c. Beginning no later than October 1, 2022 and after a cumulative season total of 100 adult salmonids have moved past the Mirabel fish ladder, if adult salmon and steelhead can enter the Russian River estuary and suitable water clarity allows, Sonoma Water shall conduct spawning ground surveys in Dry Creek. Based on consultation with NMFS, Sonoma Water shall conduct up to three comprehensive Dry Creek surveys by boat along the 14-mile reach between Warm Springs Dam and the confluence of the Russian River and Dry Creek in Healdsburg.

d. Beginning no later than November 1, 2022, and after a cumulative season total of 100 adult salmonids have moved past the Mirabel fish ladder and flows at the USGS gauge in Healdsburg exceed 100 cfs, Sonoma Water shall monitor numbers of adult salmonids in representative reaches in Alexander Valley and the Upper Russian River. Monitoring shall occur on a biweekly basis until December 14, 2022.
e. Prior to December 1, at the onset of the Coho Salmon run, Sonoma Water shall consult weekly with NMFS and CDFW to evaluate conditions and discuss the need to implement temporary increases to instream flow (i.e., pulse flows) to attract fish into the respective fish facilities. By December 1, 2022, or after a cumulative seasonal total of 100 adult salmonids have moved upstream past the Mirabel fish ladder, whichever is earlier, Sonoma Water shall consult weekly with NMFS and CDFW regarding the possibility of increasing the instream flow at the gage at Hacienda to a level not to exceed 110 cfs.

5. To protect against stranding of fish when releases from Lake Mendocino are reduced under this Order, flow in the East Fork Russian River immediately below Coyote Dam shall not be reduced by more than 12 cfs per hour, with a minimum of 4 hours between the end of each flow reduction. Flow reduction shall not exceed 24 cfs per day. NMFS Santa Rosa Office (North Coast team) and CDFW shall be notified by email 48 hours in advance of ramping events that will reach 24 cfs per day. Ramping rates specified in this term may be revised upon consultation with NMFS and CDFW and notification to the Deputy Director. Sonoma Water shall submit a summary report of consultation details to the Deputy Director within one week of each consultation meeting. If flow reductions of 12 cfs per hour or 24 cfs per day are made, Sonoma Water shall conduct an in-stream survey on the East Fork Russian River below the fish ladder to the Coyote Valley Fish Facility downstream to the confluence of the Mainstem Russian River and note any regions of the stream that are disconnected or any areas of isolated pools. Sonoma Water shall provide locations of disconnection and isolated pools to CDFW and NMFS on the following business day.

6. Sonoma Water shall continue to consult with NMFS, CDFW, and the North Coast Water Board on a biweekly basis until December 14, 2022 to discuss fishery and water quality monitoring updates and any concerns relative to water quality and the hydrologic condition of the Russian River. Temperature plots for Lake Sonoma should be taken in the week prior to the biweekly meeting and processed and released within 3 days of collection so that the agencies may utilize this information in adaptive management of the water supply to maintain in-stream and in-hatchery conditions. Sonoma Water shall provide materials to be discussed during these meeting to the resource agencies by 1:00 p.m. of the day prior to the meeting. Sonoma Water shall send notes of those meetings to the resource agencies and State Board within one week after their occurrence.

Sonoma Water shall submit a summary report of consultation details to the Deputy Director upon request.

7. Sonoma Water shall report to the Deputy Director, the North Coast Water Board, CDFW, and NMFS on a biweekly basis regarding the current hydrologic condition of the Russian River system, including current reservoir levels in Lake Mendocino and Lake Sonoma, the rates of decline for Lake Mendocino and to Lake Sonoma, a 16-day cumulative rainfall forecast, current inflow from the Potter Valley Project, available data for Mirabel fish ladder numbers, and a summary of the available water quality data. Sonoma Water shall also make each report available on a publicly accessible website.

8. By December 1, 2022, Sonoma Water shall submit to the Deputy Director, CDFW, NMFS, and the North Coast Water Board a summary report of water quality monitoring activities required by Condition 3 of this Order and the fishery monitoring activities required by Condition 4 of this Order. The summary report shall include an evaluation of whether, and to what extent, the reduced flows authorized by the Order caused any impacts to water quality, including any water quality impacts affecting recreation or the availability of aquatic habitat for salmonids. The summary report shall also include a discussion of the conditions that contribute to cyanoHAB toxicity events and address the potential for minimizing cyanoHAB outbreaks during the current and future water years under similar environmental conditions to those experienced during the period of this Order.

9. This Order does not authorize any act that results in the taking of a candidate, threatened, or endangered species, or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish & G. Code, § 2050 et seq.) or the federal Endangered Species Act (16 U.S.C. § 1531 et seq.). If a “take” will result from any act authorized under this Order, Sonoma Water shall obtain authorization for an incidental take permit prior to operation of the project. Sonoma Water shall be responsible for meeting all requirements of the applicable Endangered Species Act for the temporary urgency changes authorized under this Order.

10. The State Water Board reserves jurisdiction to supervise the temporary urgency changes under this Order, and to coordinate or modify terms and conditions, for the protection of vested rights, fish, wildlife, instream beneficial uses and the public interest as future conditions may warrant.

11. Sonoma Water shall immediately notify the Deputy Director if any significant change in storage conditions in Lake Mendocino or Lake Sonoma occurs that warrants reconsideration of this Order.

12. Sonoma Water and its water contractors shall ensure a 20 percent reduction, as compared to the same period of 2020, in total diversions across all downstream points of diversion or rediversion authorized under Sonoma Water's water rights from July 1, 2022 through October 31, 2022, or until natural flows at the Hacienda gage are greater than 125 cfs.

    Sonoma Water shall submit a monthly report to the Deputy Director documenting Sonoma Water's reduction in diversions compared to the same period of 2020.

13. By September 15, 2022, Sonoma Water shall submit a report detailing an updated schedule of proposed milestones and completion dates for additional activities related to the State Water Board's consideration of, and potential action on, Sonoma Water's pending petitions to permanently change Permit 12947A, and other interrelated water rights. Sonoma Water shall propose alternate options, if available, for expediting components of the proposed permanent changes or the related environmental analyses. The report shall also describe potential impediments to completion of the schedule, sources of uncertainty related to the schedule, and how Sonoma Water plans to address these impediments and uncertainties.

14. Based upon the methodology for characterizing Lake Mendocino and Lake Sonoma water inflows, releases, and rediversions developed pursuant to Condition 11 of the State Water Board's TUCP order dated February 4, 2021, and Condition 12 of the State Water Board's TUCP order dated June 14, 2021, Sonoma Water shall submit weekly reports of daily average release rates and characterization of those releases. Sonoma Water shall also make each report available on a publicly accessible website. Any amendments to either methodology requested by the Deputy Director shall be implemented within 15 days.

STATE WATER RESOURCES CONTROL BOARD

ORIGINAL SIGNED BY:

Erik Ekdahl, Deputy Director
Division of Water Rights

Dated: JUN 17 2022

Appendix A-7

State Water Resources Control Board
Order 6/17/2022 Amended 10/11/2022

Term 2 and Term 4– Fisheries Monitoring Tasks

December 1, 2022

Prepared by

Sonoma County Water Agency

404 Aviation Blvd

Santa Rosa, CA 95403

Introduction

On May 26, 2022, the Sonoma County Water Agency (Sonoma Water) filed a Temporary Urgency Change Petition (TUCP) with the State Water Resources Control Board (SWRCB) to temporarily reduce minimum instream flows in the Russian River and in Dry Creek to address low storage in Lake Mendocino and Lake Sonoma (SWRCB 2022a). The SWRCB issued an Order (Order) approving the Water Agency's TUCP on June 17, 2022 (SWRCB 2022a). The Order was later amended on October 11, 2022 (SWRCB 2022b). The SWRCB's Order included fisheries monitoring and reporting tasks that are summarized in terms 2 and 4 of the Order and presented in the Methods section of this report.

The fisheries monitoring terms in the Order are tailored to document how minimum instream flows prescribed by the Order may affect adult, juvenile, and smolt life stages of salmonids and their habitat. The federally and state listed salmonids found in the Russian River are Chinook salmon, Coho salmon, and steelhead. Because of differences in species biology, habitat preference and migration timing, the effect of flow in the mainstem Russian River varies by species and life stage. These differences are incorporated into the Summary and Discussion section of this report.

In the June 17, 2022, TUCO there are monitoring terms to document the number of adult salmonids that return to the Russian River, the stream conditions adults may encounter during their upstream migration, and the distribution and timing of redds that adult salmonids construct. There are also terms to document the distribution of juvenile steelhead and the water quality conditions experienced by these fish.

Methods

In the sections that follow, we outline the monitoring methods required under Terms 2 and 4 (Fisheries Monitoring) of the Order (SWRCB 2022a). The location of sample sites and their respective river Km can be found in Figure 1 and Table 1.

Figure 1. Sample sites for the fisheries monitoring terms in the State Water Resources Control Board 2022 Order.

Table 1. River kilometers (RKm) for sample sites in the mainstem Russian River and in the East Fork Russian River.

Tributary	RKm	Site
East Fork Russian River	1.35	Downstream of Coyote Valley Dam
Russian River	152.59	Gobbi Street
	136.62	Parsons Creek confluence
	136.49	USGS 11462500 Russian River near Hopland
	120.02	Pieta Creek confluence
	118.16	Downstream of Leaping Lady Rock
	114.27	USGS 11463000 Russian River near Cloverdale
	109.88	Hwy 101 bridge at Geyser Rd
	39.67	Mirabel Dam
	37.01	Steelhead Beach
	34.77	USGS 11467000 Russian River at Hacienda Bridge
	23.47	Hulbert Creek
	21.36	Vacation Beach
	16.23	Monte Rio
	11.17	Browns Riffle

Habitat measurements

Lower Russian River

Transects

Sonoma Water was required to visit at least one but up to four critical riffles in the lower Russian River to assess adult salmonid passage opportunities. These surveys were to begin October 1 and continue through December 14, 2022. Critical riffle sites were selected based on consultation with NMFS. Sites included Brown's Riffle near the confluence of the Russian River and Austin Creek, Monte Rio, Vacation Beach, the Russian River near the confluence with Hulbert Creek, and Steelhead Beach. Length, width, and depth measurements were to be collected, and sites documented with photographs. Sonoma Water was also tasked with conducting visual surveys of likely holding pools located near riffle sites to document whether adult salmonids were congregating in pools.

Spawning Surveys

Dry Creek

Beginning no later than October 1, 2022, and after 100 adult salmonids have been counted at the Mirabel fish ladder, Sonoma Water was to begin boat-based salmon spawning surveys in Dry Creek. A total of three surveys from Warms Springs Dam to the confluence with the Russian River were to be conducted.

Alexander Valley and Upper Russian River

If flow at Healdsburg exceeds 100 cfs and at least 100 adult Chinook salmon moved past the Mirabel fish ladder, then Sonoma Water was to monitor the number of adult salmonids in representative reaches in Alexander Valley and in the upper Russian River.

Snorkel Surveys

Upper Russian River

Two snorkel surveys were to be conducted between June 1 and October 1. These surveys were intended to be conducted in the early (July) and late (September) portions of the monitoring season. The survey sites chosen were located on the mainstem Russian River at the following locations: at the end of Gobbi Street in Ukiah; near the mouth of Parsons Creek; downstream of Leaping Lady Rock; downstream of the confluence of Pieta Creek; and at the Highway 101 bridge near Geysers Road.

Lower Russian River

Starting in October Sonoma Water was to conduct biweekly snorkel surveys in at least one and up to six pools based on consultation with NMFS and CDFW. These surveys were to occur between the Mirabel Dam and the estuary and to document the presence of adult salmonids.

Video Monitoring

Sonoma Water was tasked with operating an underwater video camera in the fish ladder that provides fish passage around the Mirabel Dam, which is located on the mainstem Russian River near the town of Forestville. The video camera was to be operated from September 1, 2022, to December 14, 2022.

Water Quality

To supplement water quality data collected at permanent USGS gage stations Sonoma Water collected temperature and dissolved oxygen (D.O.) in 5 deep pools in the upper Russian River. These sites were at the same locations as the upper Russian River snorkel survey sites.

Results

This report is due before the Order expires (due on December 1, 2022) and presents data that has been collected through October 31, 2022. From June 17, 2022, when the Order went into effect, to October 31, 2022, flow at the Russian River USGS gage at Hacienda (USGS gage number 11467000) was typically under 100 cfs (Figure 1).

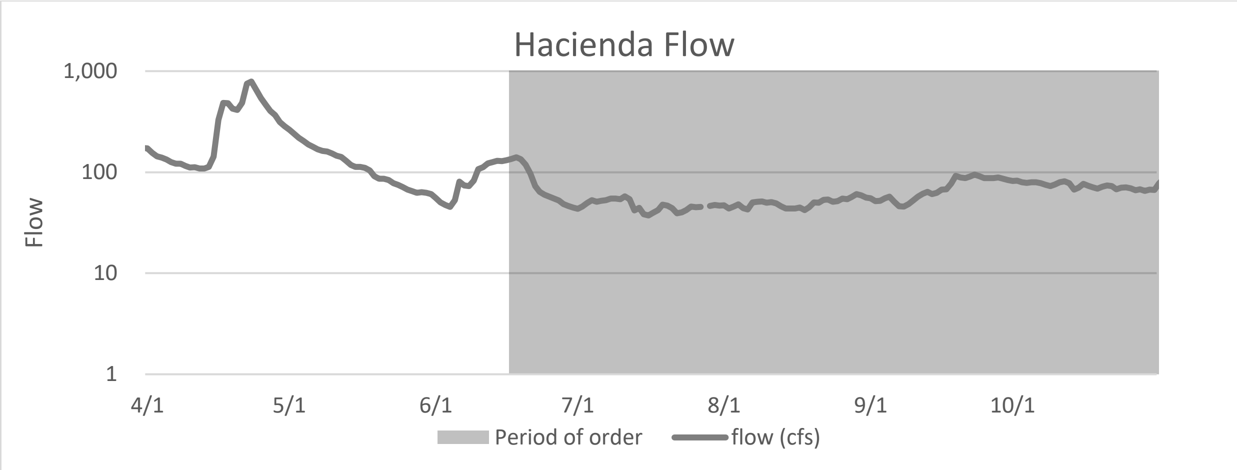

Figure 1. Flow in cubic feet per second (cfs) in the Russian River at the U.S. Geological Survey Hacienda stream gage (USGS gage number 11467000) from June 17, 2022, to October 31, 2022. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022.

Habitat measurements

Lower Russian River

Transects

From October 1 through December 14, 2022, Sonoma Water was to measure one and up to four riffles in the lower river to assess fish passage. As of October 31, 2022, those surveys had not yet been implemented but the sites that will be surveyed include the mainstem Russian River at Monte Rio, Vacation Beach, at the confluence with Hulbert Creek, and at Steelhead Beach.

Spawning surveys

Dry Creek, Alexander Valley, and Upper Russian River

As of October 31, 2022, spawner surveys in Dry Creek and the mainstem Russian River had not yet been implemented.

Snorkel Surveys

Upper Russian River

Two dive surveys were conducted in the upper Russian River. These surveys were intended to be conducted in the early (July) and late (September) portions of the monitoring season. The early survey was conducted on June 21, 2022, however, due to staffing constraints it was necessary to conduct the late survey on August 31, 2022 (Table 2.**Error! Reference source not found.**). Visibility was variable between sites, but was suitable during the August 31, 2022, survey at most sites. The Russian River near Parsons Creek was not surveyed on August 31, 2022, due to lack of landowner access. In total 65 juvenile steelhead were observed during the June 21, survey (Table 1). Most (49) of these fish were observed at one site, Hwy 101 crossing near Geysers Road, upstream of Cloverdale. A total of 10 juvenile steelhead were observed during the August 31, 2022, survey. No juvenile steelhead were observed at the Hwy 101 crossing near Geysers Road during the August 31, 2022, survey. The lack of juvenile steelhead at this site during the August survey is likely due to unsuitable water temperatures.

Table 2. The number of fish observed at dive survey sites in the upper Russian River on June 21 and August 31, 2022. Also shown is water visibility in meters. All steelhead observed were juveniles. No survey was conducted at Parsons Creek on August 31, 2022, due to lack of landowner access.

Date	Site	Visibility (meters)	Steel-head	Hard-head	Pike-minnow	Roach	Sacramento Sucker	Smallmouth Bass	Russian River Tule Perch
6/21	Gobbi Street	3	8				3		
	Parsons Creek	4	1						10
	D.S. of Leaping Lady Rock	1							
	D.S. of Pieta Creek	4	7	20		75	60		30
	Hwy 101 bridge near Geysers Rd	5	49				1		
8/31	Gobbi Street	3	1						
	Parsons Creek	no survey							
	D.S. of Leaping Lady Rock	10		20				4	30
	D.S. of Pieta Creek	10	9	1035	8	1	50	1	50
	Hwy 101 bridge at Geyser Rd	10		52	2		10	13	5

Lower Russian River

On October 13, 2022, Sonoma Water conducted a dive survey in the lower Russian River (Table 33Table 33). Sites sampled included downstream of the Mirabel Dam in Forestville, the pool at the Hacienda Bridge crossing, and the mainstem Russian River at the confluence with Hulbert Creek. Visibility ranged from 1 m at Hulbert Creek to 4 m at Mirabel Dam and Hacienda. No adult salmonids were observed. One juvenile steelhead was observed downstream of the Mirabel Dam.

Table 33. The number of fish by species, observed during a dive survey in the mainstem Russian River at the Mirabel Dam, at Hacienda Bridge, and at the confluence with Hulbert Creek on October 13, 2022.

Site	Water Visibility (meters)	Species	Number of Fish
Mirabel Dam	4	Steelhead	1
		Hardhead	20
		Tule perch	5
Hacienda Bridge	4	Carp	4
		Hardhead	10
		Largemouth bass	15
		Pikeminnow	20
		Sacramento sucker	100
		Smallmouth bass	10
RR at Hulbert Creek	1	Sacramento Sucker	1

Video Monitoring

Sonoma Water installed a video camera in the fish ladder at the Mirabel Dam on September 1, 2022, to monitor adult salmonids as they returned to the Russian River. By October 31, 2022, a total of 104 adult Chinook salmon, and 6 adult Coho had passed the Mirabel Dam (Figure 2 and Table 4).

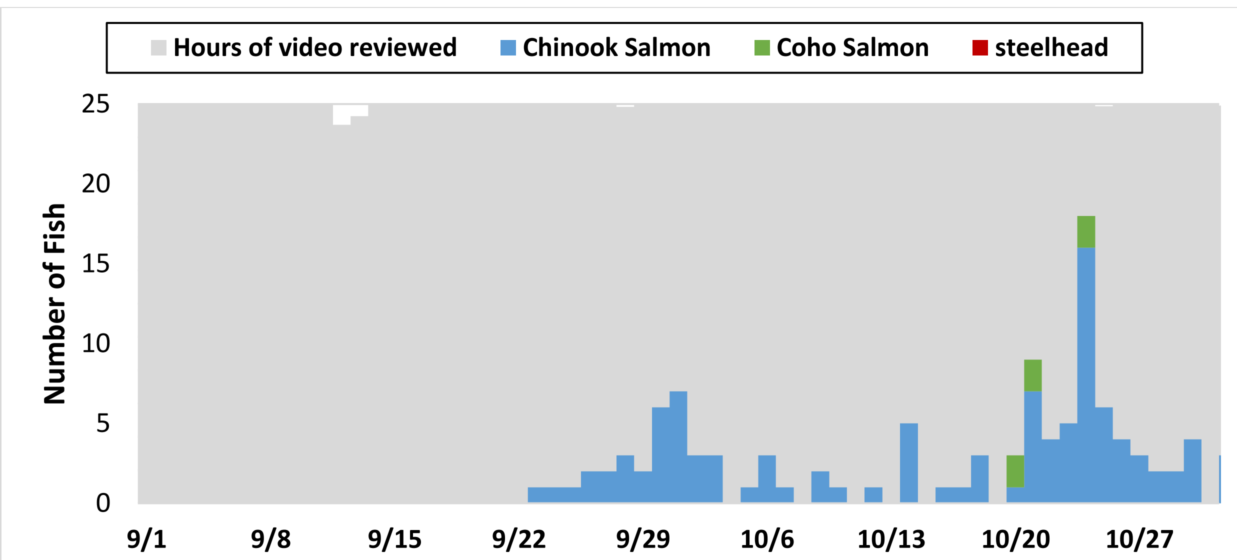

Figure 2. Number of adult salmonids and proportion of each day reviewed for video monitoring data collected at the Mirabel Dam, (9/1/2022-10/31/22).

Table 4. Weekly totals of adult salmonids observed on the Mirabel Dam video camera (9/1/2022-10/31/2022) and historic run timing.

	Chinook Salmon		***Coho Salmon***		***Steelhead***	
Week	**2022**	**2000-2019 Avg**	**2022**	**2000-2019 Avg**	**2022**	**2000-2019 Avg**
09/01	0	0.05%	0	0.00%	0	0.65%
09/08	0	0.14%	0	0.00%	0	0.65%
09/15	0	0.24%	0	0.10%	0	0.71%
09/22	10	0.59%	0	0.00%	0	0.93%
09/29	22	6.10%	0	0.30%	0	1.30%
10/06	8	3.57%	0	0.61%	0	1.30%
10/13	10	13.30%	0	1.73%	0	2.35%
10/20	43	13.66%	6	3.05%	0	1.42%
10/27	11	17.31%	0	1.12%	0	1.27%

Water Quality

Temperature and dissolved oxygen loggers were recovered on October 25, 2022; however, the loggers located at the Highway 101 crossing near Geysers Road was stolen before data could be downloaded. Temperature at Gobbi Street ranged from 11.9 °C to 18.5 °C, temperature at the confluence with Parsons Creek ranged from 12.9 °C to 22.5 °C, temperature at the confluence with Pieta Creek ranged from 13.4 °C to 23.4 °C, temperature at Leaping Lady Rock ranged from 13.5 °C to 22.6 °C (Figure 3 to Figure 6). Dissolved oxygen at Gobbi Street was poor after mid-August, dissolved oxygen at Parsons Creek and at Pieta Creek was fair (Figure 3 to Figure 6). The dissolved oxygen sensor for Leaping Lady Rock was being serviced and could not be installed until late July. It was installed on the stream bottomed at the bottom of a deep pool. After the D.O. logger was installed at Leaping Lady Rock D.O. declined sharply (Figure 6).

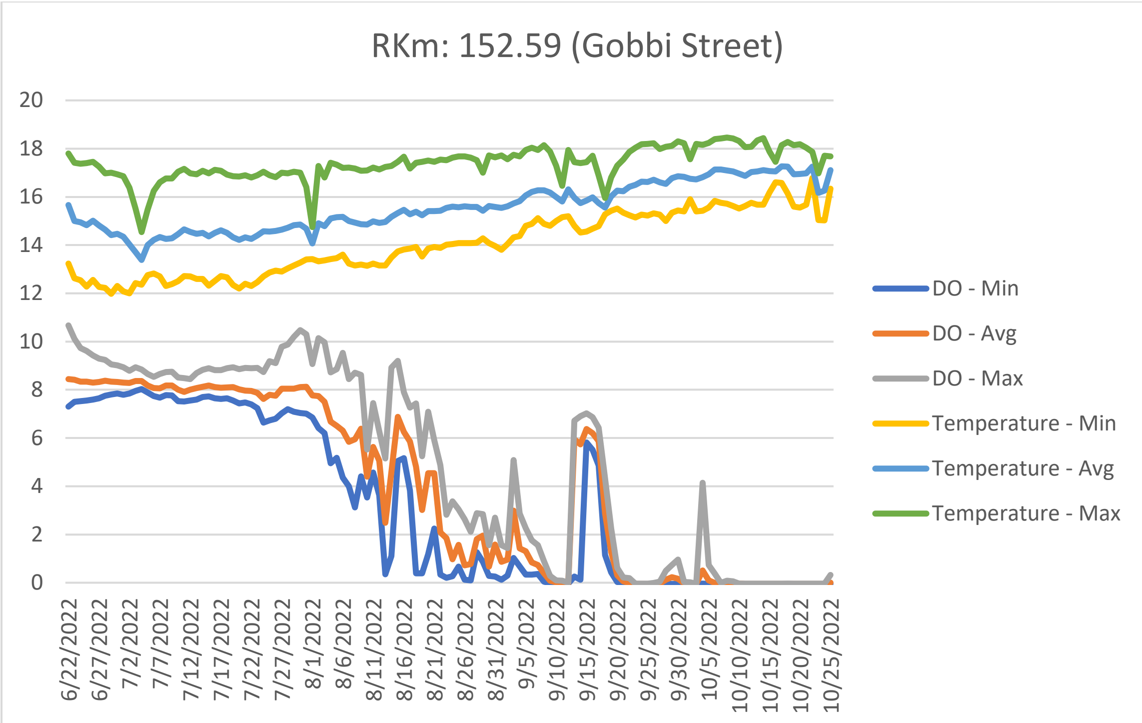

Figure 3. Temperature and dissolved oxygen collected in the mainstem Russian River near the end of Gobbi Street in Ukiah at river km 152.59 from June 22, 2022, to October 25, 2022.

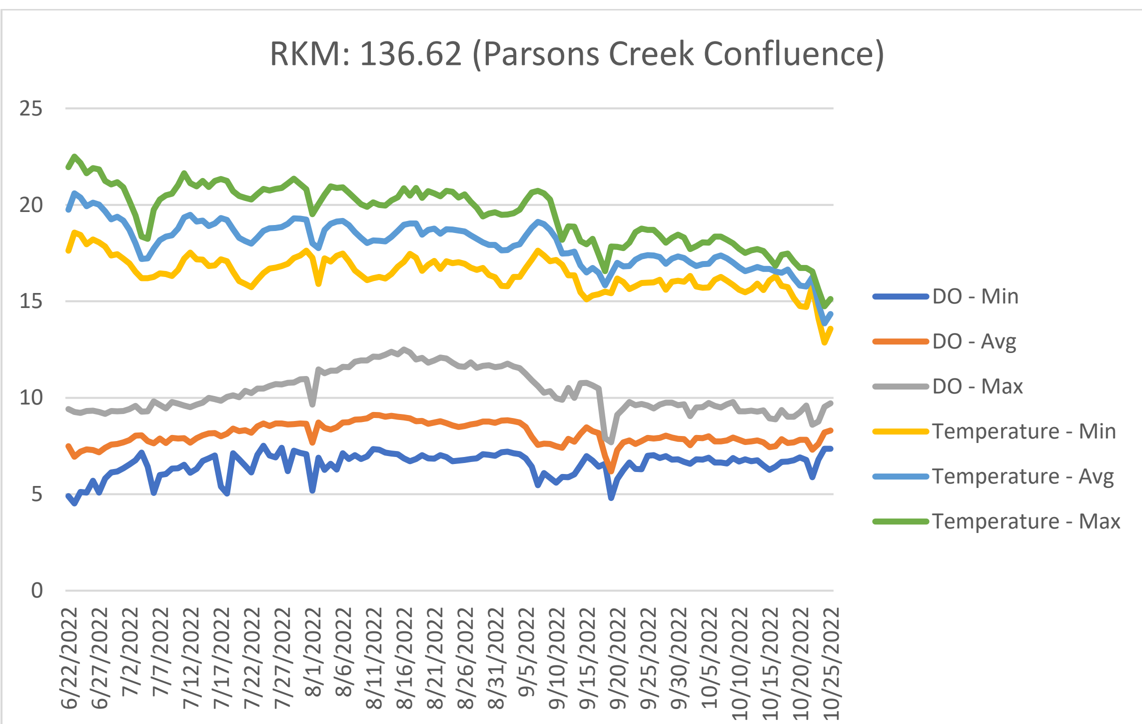

Figure 4. Temperature and dissolved oxygen collected in the mainstem Russian River near the confluence with Parsons Creek near Hopland at river km 136.62 from June 22, 2022, to October 25, 2022.

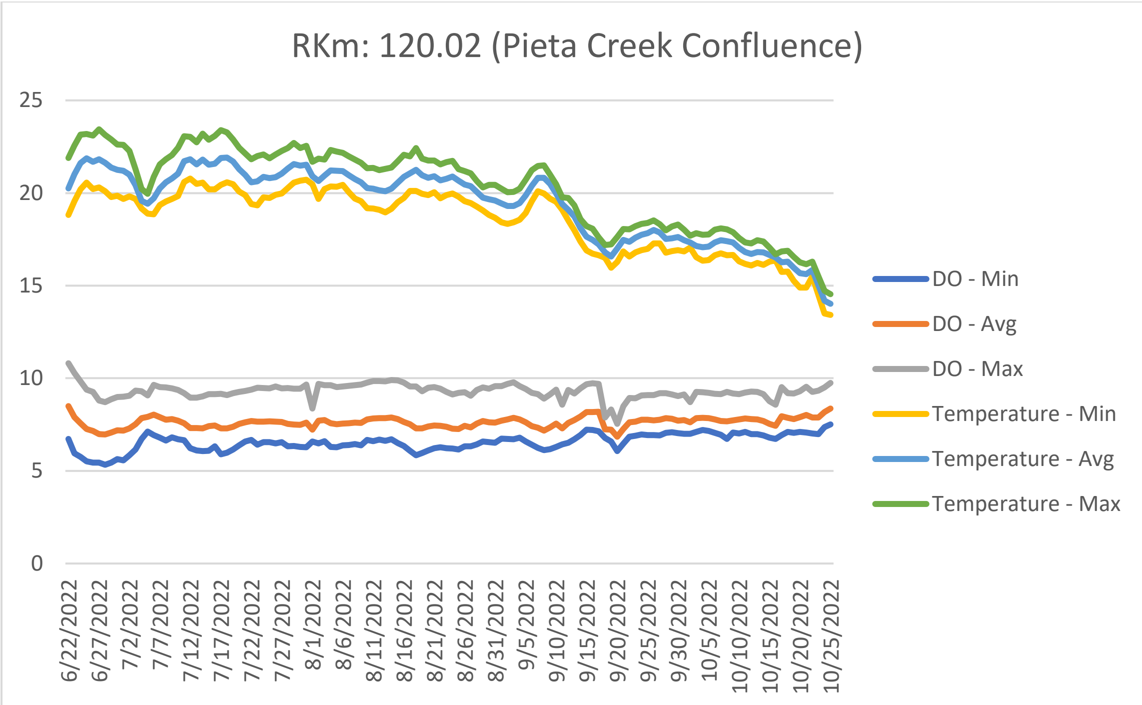

Figure 5. Temperature and dissolved oxygen collected in the mainstem Russian River near the confluence with Pieta Creek near Hopland at river km 120.02 from June 22, 2022, to October 25, 2022.

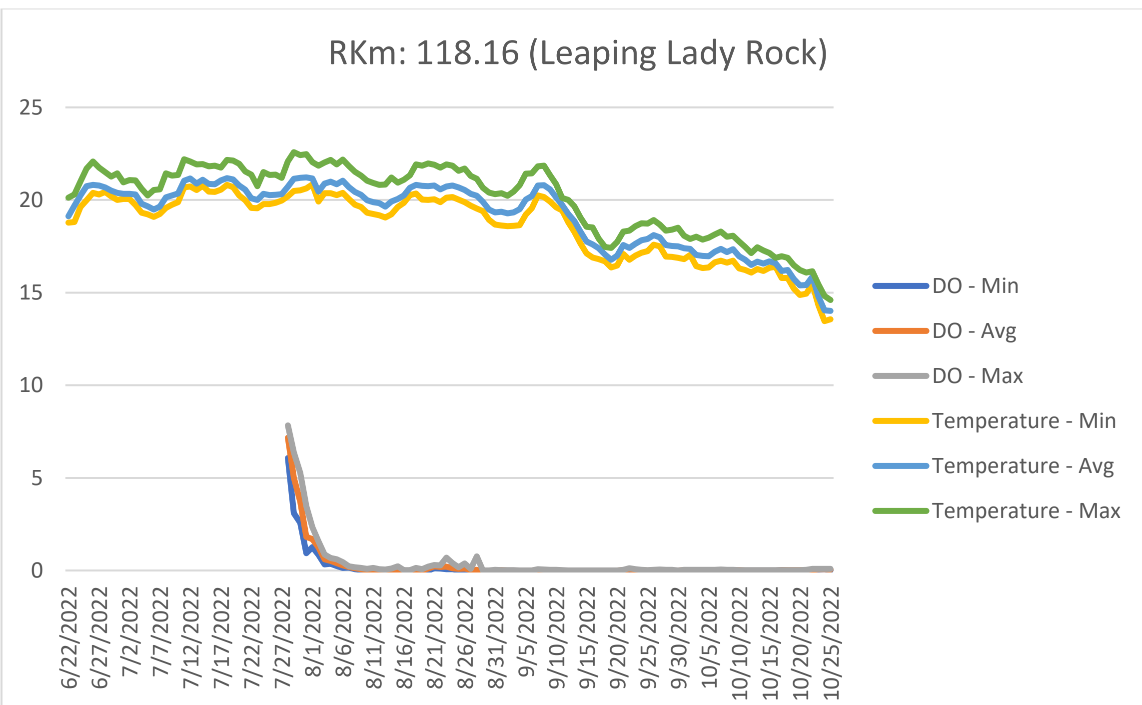

Figure 6. Temperature and dissolved oxygen (D.O.) collected in the mainstem Russian River near Leaping Lady Rock near Hopland at river km 118.16. Temperature data was collected from June 22, 2022, to October 24, 2022. The D.O. was collected from July 29, 2022, to October 25, 2022.

Summary and Discussion

Snorkel Surveys

The fish species assemblage observed in 2022 during snorkel surveys is similar to the species assemblage observed during snorkel surveys conducted for the Sonoma Water's Fisheries Enhancement Program and for surveys conducted for previous Orders where juvenile steelhead are relatively uncommon and non-salmonids dominate the fish assemblage. Sonoma Water conducted snorkel surveys in 2002 as part of the Fisheries Enchantment Program. Selected sections of the river from the confluence of the east and west fork of the Russian River to the confluence of the mainstem Russian River and with Dry Creek were sampled. During the 2002 survey 1,436 juvenile steelhead were detected. Steelhead were found in the upper portions of the Ukiah reach, throughout most of the canyon reach, and infrequently in the Alexander Valley and Healdsburg reaches. The effort of the 2002 snorkel surveys was much higher than snorkel surveys conducted in future years. However, juvenile steelhead only comprised 1% to 5 % of the fish counted depending on the reach surveyed in the 2002 study (Cook 2003). Snorkel surveys conducted for Temporary Urgency Change Orders in recent years have resulted in fewer observations of juvenile steelhead. For example, 16,384 fish comprised of 13 species were observed during snorkel surveys conducted in the upper Russian River in 2009, but only 18 of those fish were juvenile steelhead (SCWA 2010). In 2010, 9,655 fish comprised of 11 species were observed during the 2010 TUCO snorkel surveys, but only 11 of these individuals were juvenile steelhead (SCWA 2011). In 2011, a total of 5,226 fish comprised of 11 species were observed in upper Russian River snorkel surveys, but only 19 juvenile steelhead were observed (SCWA 2012). In 2012, a total of 7,321 fish were detected during summer dive surveys consisting of 11 species, but only 15 juvenile steelhead were detected (SCWA 2013). In 2013, a total of 5,928 fish were detected during summer dive surveys consisting of 8 fish species, with 311 being juvenile steelhead (SCWA 2014). In August 2021, 759 fish were observed consisting of 7 species, but only 5 were juvenile steelhead (Sonoma Water 2022). Because the number of sample sites, the location of sites, and water visibility differed between years, direct comparisons between years should not be made.

Video Monitoring

In total 104 Chinook salmon were observed on the Mirabel camera from when the camera was installed on September 1, 2022, to October 31, 2022. Video monitoring of the adult Chinook run has been conducted annually from 2000 to 2022, with the exception of 2014 and 2015 when the fish ladder was being replaced. Compared to the long-term data set (2000-present), a large portion of the run typically returns to the Russian River by October 31 (Table 4). However, in other drought years there has been a late start to the adult Chinook salmon run (SCWA unpublished data) so it is likely that the 2022 adult Chinook run will be delayed.

Water Quality

Water temperature likely influenced the distribution of juvenile steelhead in the upper Russian River. More juvenile steelhead were observed in the upper Russian River during the June dive surveys than the August dive survey. The lack of steelhead at the Cloverdale dive site (Hwy 101 crossing) in August is likely due to warm water temperatures. Releases from Coyote Valley Dam provide cool water for steelhead rearing in the upper Russian River. In most years the downstream end of this thermal refuge is in the section of river between Hopland and Cloverdale. In 2022 water temperatures at the USGS Cloverdale gage (USGS gage number 11463000) reached unfavorable temperatures for steelhead rearing (Figure 7). However, it is worth noting that water temperatures are often acutely stressful at the Cloverdale site (Figure 7). For a detailed discussion of water temperature see Sonoma Water's report that summarizes data collected for Term 3 (water quality) in the 2022 TUCO.

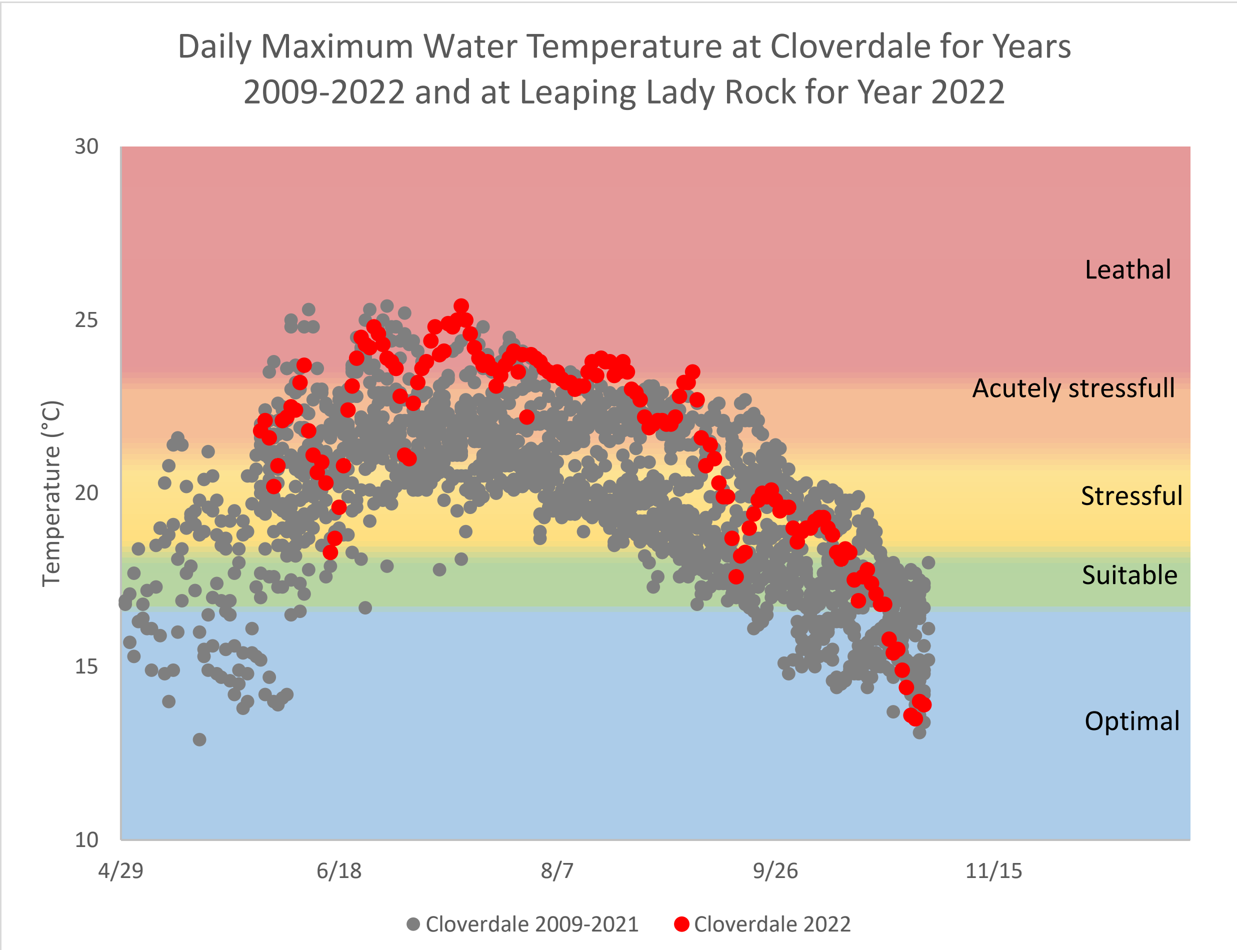

Figure 7. The daily maximum water temperatures for years 2009 through 2022 from the USGS Russian River gage at Cloverdale (USGS gage number 11463000) shown with optimal (< 16.9 °C), suitable (16.9 °C to 18.9 °C), stressful (18.9 °C to 21.9 °C), acutely stressful (21.9 °C to 23.8 °C) and lethal (> 23.9 °C) water temperature zones for steelhead rearing based on SCWA 2016.

D.O. at Leaping Lady Rock was lower than D.O. at the confluence of the mainstem Russian River with Pieta Creek and the confluence of the mainstem Russian River with Parson Creek. This is likely due to thermal stratification occurring in the pool at Leaping Lady Rock resulting in limited oxygen exchange with the hypolimnion. In 2021 the pool at Leaping Lady Rock was thermally stratified whereas the pools at the confluence of the mainstem Russian River with Pieta Creek and the confluence of the mainstem Russian River with Parson Creek were not thermally stratified. Thermal stratification in pools was not an environmental condition that was monitored in 2022. However, because flows in summer 2022 were similar to those in 2021, it is likely that stratification occurred at Leaping Lady Rock in 2022.

Unfortunately, the cooler water at the bottom of Leaping Lady Rock pool may not have been valuable rearing habitat as dissolved oxygen at the bottom of the pool was low (Figure 6).

Low dissolved oxygen levels at Gobbi Street may be related to conditions in Lake Mendocino but there is a possibility that the placement of the D.O. logger near the stream bottom affected the accuracy of its readings. Cool water releases made from the bottom of Lake Mendocino provide summer steelhead rearing habitat in the upper Russian River in most years. Dissolved oxygen is typically low in the east fork Russian River and generally recovers a short distance downstream (SCWA unpublished data). In 2022 dissolved oxygen in the east fork of the Russian River (6.8 rKm upstream of Gobbi Street) was also low (Figure 8). However, D.O. became low in the east fork Russian River approximately 2 months before D.O. became low at Gobbi Street. This suggests that the D.O. readings at Gobbi Street may not be related to low D.O. water released from Lake Mendocino. The pool at Gobbi Street that the logger was placed in was not stratified, but the logger was located near detritus on the stream bottom so it is possible that this decomposing material affected the D.O. measurements.

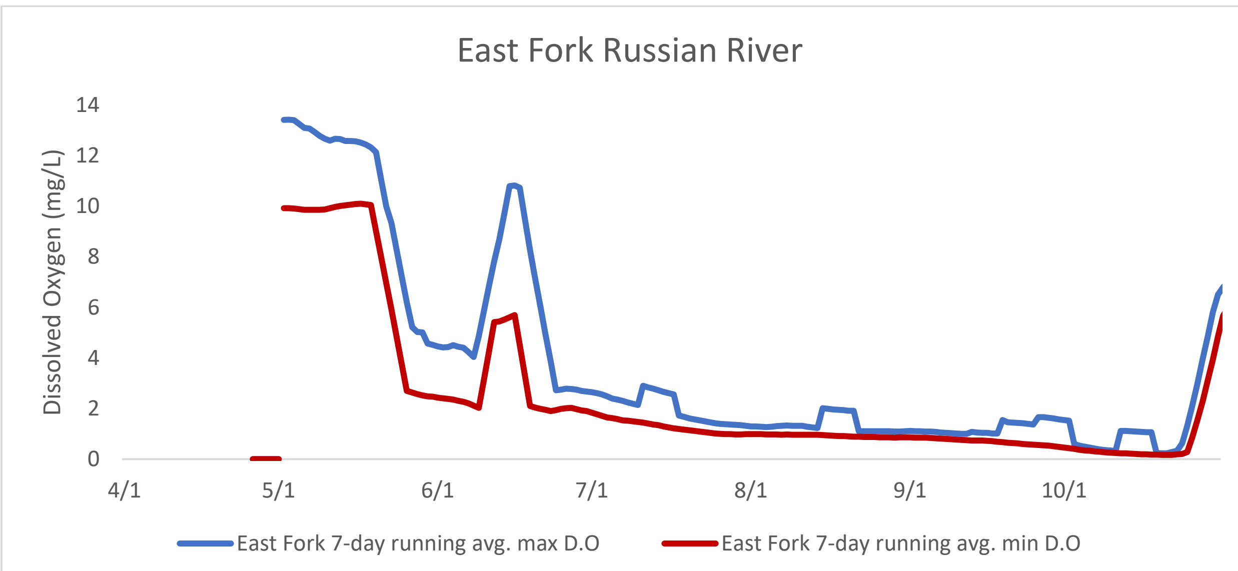

Figure 8. Dissolved oxygen in the east fork Russian River near the outlet of the Coyote Valley Dam.

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Appendix A-8

Russian River Water Quality Summary for the 2022 Temporary Urgency Change

Sonoma Water

December 2022

American Disabilities Act Compliance

This report for Sonoma Water's Russian River Water Quality Summary for the 2022 Temporary Urgency Change has been prepared to be compliant with requirements under the Americans with Disabilities Act (ADA). The ADA mandates that reasonable accommodations be made to reduce "discrimination on the basis of disability." As such, Sonoma Water is committed to ensuring that documents we make publicly available online are accessible to potential users with disabilities, particularly blind or visually impaired users who make use of screen reading technology.

This disclaimer is provided to advise that portions of the document, including the figures, charts, and graphics included in the document are non-convertible material, and could not reasonably be adjusted to be fully compliant with ADA regulations. For assistance with this data or information, please contact Sonoma Water at (707) 526-5370 and reference the Russian River Water Quality Summary for the 2022 Temporary Urgency Change Project, dated December 2022.

Contents

1.0 Introduction

On 26 May 2022, the Sonoma County Water Agency (Sonoma Water) filed Temporary Urgency Change Petitions (TUCPs) with the State Water Resources Control Board (SWRCB) due to severe drought conditions, historically low storage levels in Lake Mendocino and Lake Sonoma, and a flawed hydrologic index that establishes minimum instream flow requirements that do not align with the current watershed conditions.

In summary, the terms of the SWRCB Order approved the following temporary changes to the Decision 1610 (D1610) instream flow requirements from 17 June 2022 through 14 December 2022 to the following:

(1) Minimum instream flow in the Upper Russian River (from its confluence of the East and West Forks of the Russian River to its confluence with Dry Creek) shall remain at or above 25 cubic feet per second (cfs), as measured on a five-day running average of average daily stream flow.

(2) Minimum instream flow in the Lower Russian River (from its confluence with Dry Creek to the Pacific Ocean) shall remain at or above 35 cfs, as measured on a five-day running average of average daily stream flow.

(3) Sonoma Water shall pass through or release sufficient water to maintain a continuous, instantaneous streamflow of no less than 15 cfs in the Upper Russian River and no less than 25 cfs in the Lower Russian River at all times.

Approval of the TUCP will preserve reservoir storage levels in Lake Mendocino in the fall, which will preserve storage for water supplies to meet human health and safety needs, will be used for releases of stored water to benefit returning adult Chinook salmon, and improve the likelihood of carryover storage for use in 2023 in the event 2023 is also a dry year. The SWRCB issued the Order (Order) approving Sonoma Water's TUCP on 17 June 2022.

2.0 2022 Russian River Flow Summary

In early January 2022, following a relatively dry winter in 2021 and water storage levels as low as 13,000 acre-feet in October 2021, water storage levels in Lake Mendocino were just above 41,000 acre-feet, which is similar to storage levels experienced in 2016, a normal water year. Overall storage in 2022 was lower than most years in the last eleven years of monitoring. In addition, storage only increased by about 1,000 acre-feet through January before remaining relatively flat through February and March due to less than normal rainfall, and by April 2022 storage levels were below drought levels observed in 2014 and remained that way through May (Figure 2-1). However, storage levels continued to increase through May and into early June due to higher inflows from Potter Valley, as measured at the U.S. Geological Survey (USGS) near Calpella gaging station, compared to outflows through the lake. Storage in Lake Mendocino peaked in June and July at approximately 50,500 acre-feet, remained above 50,000 acre-feet through July, and above 40,000 acre-feet by 1 October. However, with no significant rainfall in October, storage levels continued to decline and were just below 38,000 acre-feet by 1 November (Figure 2-1).

The 2022 average daily flows at the Talmage, Hopland, Cloverdale, Jimtown, Digger Bend, and Hacienda USGS gaging stations are shown in Figure 2-2.

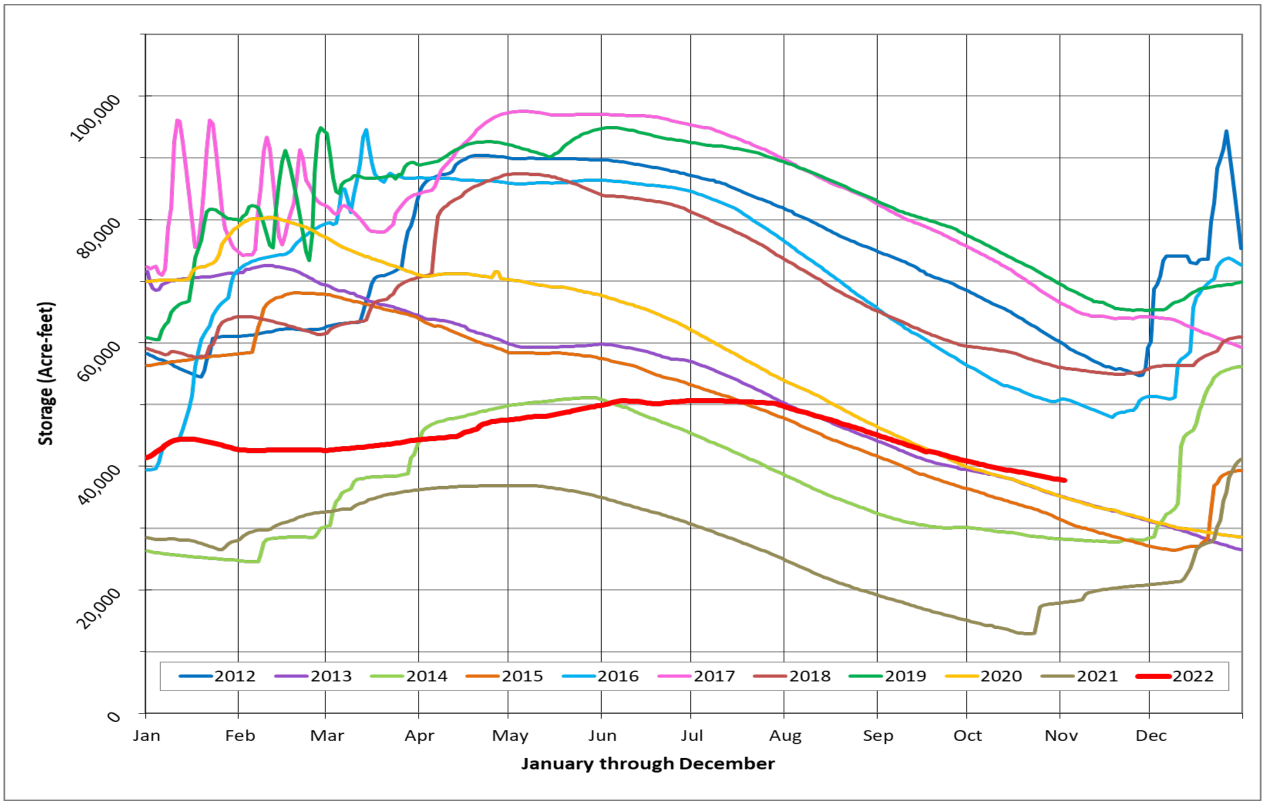

Figure 2-1. Lake Mendocino water storage levels, in acre-feet, from 2012 through 2022.

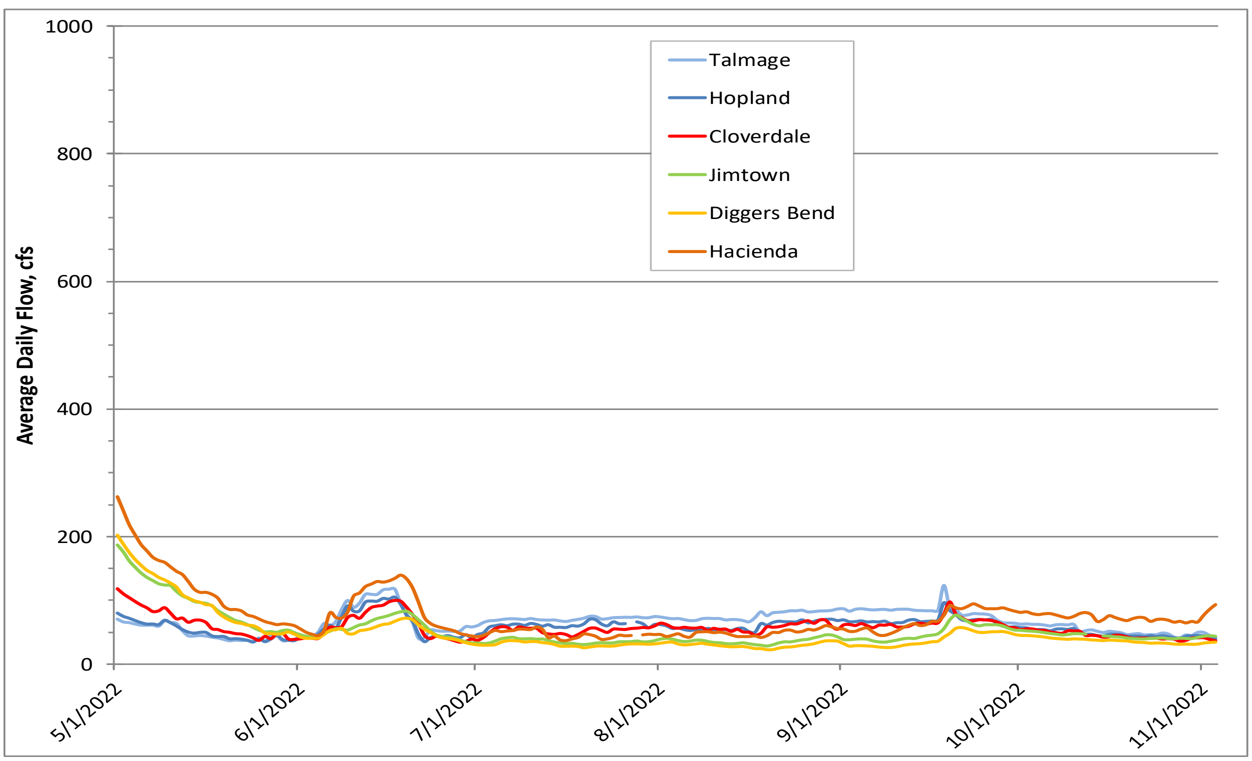

Figure 2-2. 2022 average daily flows in the Russian River as measured at U.S. Geological Survey (USGS) gages in cubic feet per second (cfs). Flow rates are preliminary and subject to final revision by USGS.

The changes in upper Russian River minimum instream flow requirements authorized by the Order allowed flows to decline below D1610 minimum instream flows of 75 cfs for most of the monitoring season (Figure 2-3). Additionally, upper Russian River flows did briefly decline below the TUC minimum daily average flows of 25 cfs at the Diggers Bend station, but did not drop below the instantaneous minimum flow of 15 cfs authorized by the Order (Figure 2-3).

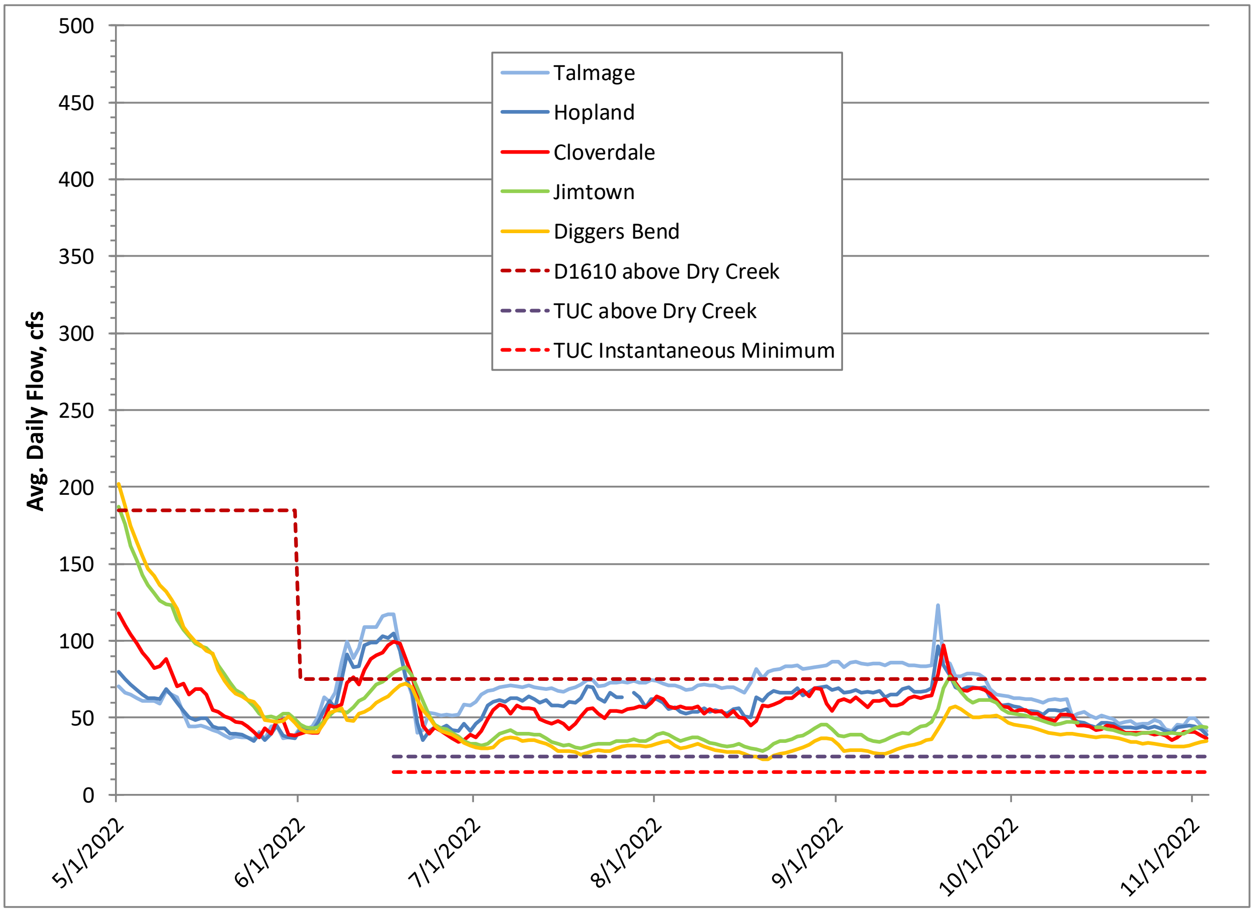

Figure 2-3. 2022 average daily flows in the upper Russian River as measured at USGS gages above the Dry Creek confluence in cubic feet per second. Flow rates are preliminary and subject to final revision by USGS.

The changes in lower Russian River minimum instream flow requirements authorized by the Order allowed flows at Hacienda to decline below D1610 minimum instream flows of 85 cfs for most of the monitoring season (Figure 2-4). However, lower Russian River flows did not decline below the TUC minimum daily average flows of 35 cfs or the instantaneous minimum flow of 25 cfs at Hacienda authorized by the Order (Figure 2-4).

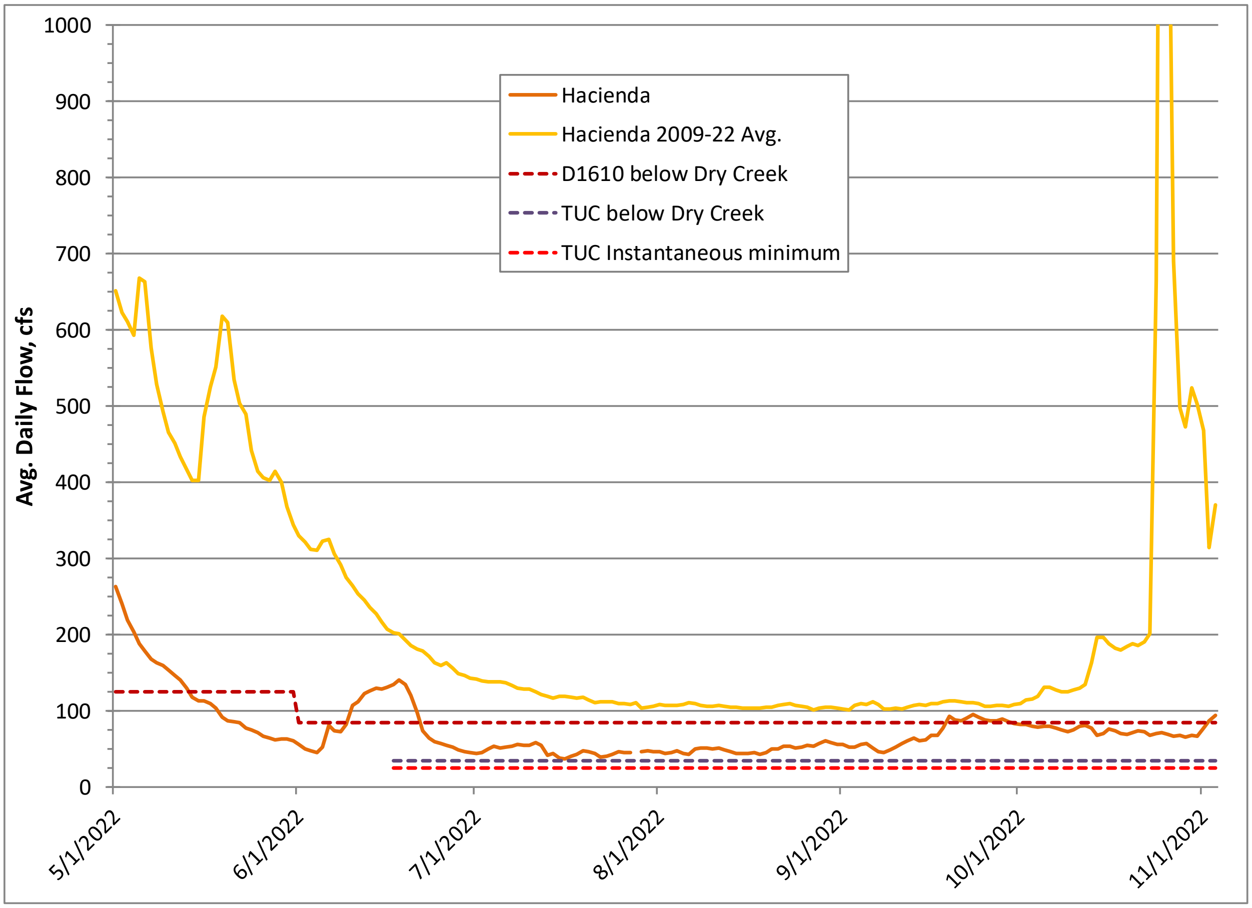

Figure 2-4. 2022 average daily flows in the lower Russian River as measured at USGS gages below the Dry Creek confluence in cubic feet per second. Flow rates are preliminary and subject to final revision by USGS.

3.0 Water Quality Monitoring

Water quality data was collected to monitor TUC flows for potential effects to recreation and available aquatic habitat for salmonids. The data was used to supplement existing data to provide a more complete basis for analyzing spatial and temporal water quality trends due to Biological Opinion-stipulated changes in river flow and estuary management. Given that 2022 was a dry year beginning in January, monitoring was conducted prior to the terms of the TUC Order taking effect in June. This was done to provide additional context on conditions in the watershed leading up to the period in which the Order was active. The results discussed below include the data collected from that period prior to the Order taking effect. In addition, the Order requires submittal of this report by December 1, 2022, before the expiration of the Order; therefore, results included here do not reflect all data collected through the December 14, 2022, Order expiration.

3.1 Mainstem Russian River Water Quality Monitoring

The North Coast Regional Water Quality Control Board (NCRWQCB), Sonoma County Department of Health Services (DHS), Sonoma Water, and Sonoma County Department of Parks and Recreation (Regional Parks) formed a workgroup to coordinate a monitoring approach for assessing cyanobacteria in the Russian River during the summer of 2016. Sonoma Water staff continue to consult and coordinate with NCRWQCB staff regarding monitoring activities related to the workgroup. As a result of ongoing consultation, Sonoma Water has made modifications to their existing Water Quality Monitoring Plan for the Russian River Estuary Management Project to include mainstem freshwater monitoring for the purpose of assisting in the evaluation of cyanobacteria harmful algal bloom (cyanoHAB) conditions and the risk of co-factors contributing to biostimulatory conditions and nuisance blooms (e.g., flow, temperature, nutrient, etc.).

In 2022, Sonoma Water staff continued monitoring the East Fork Russian River above and below Lake Mendocino, as well as in Lake Mendocino itself, as part of their overall TUCP monitoring effort to provide a better understanding of lake limnology and potential effects on water quality in the upper Russian River mainstem.

In 2022, the Sonoma County DHS conducted weekly bacteriological sampling at ten (10) beaches with recreational activities involving the greatest body contact on the Russian River between Cloverdale and Patterson Point. Sonoma Water staff conducted vertical profiling and nutrient grab sampling at three (depths) in Lake Mendocino and conducted nutrient grab sampling at two (2) stations in the East Fork Russian River located above and below the lake. Sonoma Water also conducted mainstem sampling for nutrients at five (5) sites, and algae and cyanobacteria at four (4) sites, along the Russian River between Hopland and Patterson Point to support NCRWQCB analysis and evaluation of water quality data relating to biostimulatory conditions and cyanotoxins. In addition, Sonoma Water continued to conduct long-term water quality monitoring and weekly grab sampling for nutrients, bacteria, and algae in the middle and upper reaches of the Russian River Estuary and the upper extent of inundation and backwatering during lagoon formation, between Patty's Rock in Jenner and Vacation Beach in Guerneville, including in two tributaries.

3.1.1 Sonoma County DHS Seasonal Mainstem Bacterial Sampling (Beach Sampling)

The Sonoma County DHS conducts seasonal bacteriological sampling to monitor levels of pathogens at ten (10) Russian River beaches with recreational activities involving the greatest body contact. Results are used by the Sonoma County DHS to determine whether or not bacteria levels fall within State guidelines. The 2022 Sonoma County DHS seasonal beach sampling locations consisted of: Cloverdale River Park; Del Rio Woods Beach; Camp Rose Beach; Healdsburg Veterans Memorial Beach; Steelhead Beach; Forestville Access Beach; Sunset Beach; Johnson's Beach; Monte Rio Beach; and Patterson Point. Bacteriological samples were generally collected weekly beginning 31 May and continued until 29 August. The samples were analyzed using the Colilert quantitray MPN method for Total Coliform and *E. coli*.

The California Department of Public Health (CDPH) developed the "Draft Guidance for Fresh Water Beaches," which describes bacteria levels that, if exceeded, may require posted warning signs in order to protect public health (CDPH, 2011). The CDPH draft guideline for single sample maximum (SSM) concentrations is: 10,000 most probable numbers (MPN) per 100 milliliters (mL) for Total Coliform; 235 MPN per 100 mL for *E. coli*; and 61 MPN per 100 mL for *Enterococcus*. In 2012, the United States Environmental Protection Agency (EPA) issued Clean Water Act (CWA) §304(a) Recreational Water Quality Criteria (RWQC) for States (EPA, 2012). The RWQC recommends using two criteria for assessing water quality relating to *E. coli* and *Enterococcus*: the geometric mean (GM) of the dataset, and changing the single sample maximum (SSM) to a Statistical Threshold Value (STV) representing the 75th percentile of an acceptable water-quality distribution. The EPA recommends using STV values for potential recreational beach posting. However, EPA also suggests that states may use a (Beach Action Value) BAV as a more conservative, precautionary tool for making beach notification decisions. The BAV for *E. coli*, which is consistent with the CDPH SSM value, is not a component of EPA's recommended criteria, but a tool that states may choose to use as a "do not exceed" value for beach notification purposes (such as advisories). Exceedances of the CDPH SSM value for Total Coliform and the EPA BAV value for *E. coli* are highlighted in Table 3-1. It must be emphasized that these are draft guidelines and criteria, not adopted standards, and are therefore both subject to change (if it is determined that the guidelines and/or criteria are not accurate indicators) and are not currently enforceable.

There were three exceedances of the SSM for Total Coliform during the season at the Cloverdale River Park station. There were also two (2) exceedances each of the Total Coliform SSM at the Sunset Beach and Johnson's Beach stations, and one (1) exceedance at the Monte Rio Beach station. There was one (1) exceedance each of the BAV for *E. coli* that occurred at Cloverdale River Park and Healdsburg Veterans Memorial Beach stations. Finally, there were two (2) exceedances each of the BAV for *E. coli* that occurred at Steelhead Beach, Johnson's Beach, and Monte Rio Beach. Results from the sampling program were reported by the Sonoma County DHS at their website and on the Sonoma County DHS Beach Sampling Hotline (Sonoma County DHS, 2022a). The 2022 seasonal results are shown in Table 3-1 and in Figures 3-1 and 3-2.

Table 3-1. Sonoma County DHS 2022 Seasonal Mainstem Bacteria Sampling Results (Sonoma County DHS, 2022a).

Date Sampled	Cloverdale River Park		Del Rio Woods Beach		Camp Rose Beach		Healdsburg Veterans		Steelhead Beach		Forestville Access Beach		Sunset Beach		Johnson's Beach		Monte Rio Beach		Patterson Point	
	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC	TC	EC
5/31/2022	5,127	20	529	10	631	20	776	63	908	243*	1,439	<10	1,259	10	2,282	160	2,755	31	4,352	20
6/1/2022									530	10										
6/6/2022	9,208	74	1,935	63	2,098	135	1,529	266*	3,654	441*	2,382	86	1,467	106	2,014	41	7,270	63	839	31
6/7/2022							1,119	10	1,314	121										
6/13/2022	4,611	20	2,481	10	1,515	<10	1,664	10	1,162	10	3,076	63	11,199*	52	4,106	173	12,997*	345*	2,143	52
6/14/2022													860	10			1,720	259		
6/20/2022	3,488	146	4,611	10	2,987	63	3,130	20	988	20	813	20	860	20	5,172	292*	4,611	31	1,674	20
6/21/2022															24,196	75				
6/27/2022	8,864	20	2,359	41	3,255	10	2,489	<10	1,145	20	6,867	31	>24196	52	10,462	41	4,884	512*	1,281	31
6/28/2022													2,489	<10			1,793	86		
7/5/2022	11,199*	259*	1,956	<10	2,014	20	1,250	10	1,250	10	1,153	10	1,162	20	3,873	175	1,529	86	1,187	31
7/6/2022	5,475	31																		
7/11/2022	>24196	31	1,989	<10	2,613	31	1,674	10	1,106	<10	1,607	<10	1,664	10	2,909	63	2,909	63	1,658	20
7/12/2022	5,475	10																		
7/18/2022	8,664	20	3,873	52	2,909	31	1,616	<10	1,314	52	2,603	75	1,664	<10	4,106	<10	2,613	<10	1,500	20
7/25/2022	6,488	20	272	<10	4,611	52	3,255	31	1,354	<10	1,860	20	1,455	20	2,909	31	884	31	1,092	10
8/1/2022	8,664	41	2,489	41	2,247	31	2,613	31	1,112	<10	2,851	31	1,989	<10	3,654	31	1,314	20	1,162	10
8/8/2022	9,208	10	1,664	41	2,481	10	1,789	<10	888	10	3,448	10	2,098	10	1,850	31	127	10	1,333	30
8/15/2022	7,701	31	1,500	31	2,755	<10	1,467	<10	1,314	<10	2,755	<10	1,935	<10	2,359	241*	985	<10	988	10
8/16/2022															1,935	10				
8/22/2022	11199*	31	2,046	31	2,909	<10	1,236	<10	1,081	<10	2,359	10	3,255	31	1,439	63	1,421	20	1,153	10
8/23/2022	8,164	<10																		
8/29/2022	7,270	20	1,918	<10	1,872	20	1,607	20	789	10	2,187	10	1,904	10	1,259	31	1,439	41	689	10

* Resample conducted for confirmatory test.

** Resample conducted for lab accident.

GREEN indicates the beach is open - bacterial level results are within State guidelines.
YELLOW indicates the beach is open, but swimming is not advised - bacterial level results exceed State guidelines.
RED indicates the beach is closed - bacterial level results exceed State guidelines and are associated with a known or suspected human sewage release.

Recommended California Department of Public Health (CDPH) Draft Guidance - Single Sample Maximum (SSM):
Total Coliform (SSM): 10,000 per 100ml
Environmental Protection Agency (EPA) Recreational Water Quality Criteria - Beach Action Value (BAV):
E. coli (BAV): 235 per 100 ml
(Beach notification is recommended when indicator organisms exceed the SSM for Total Coliform or the BAV for *E. coli*) - Indicated by yellow or red text

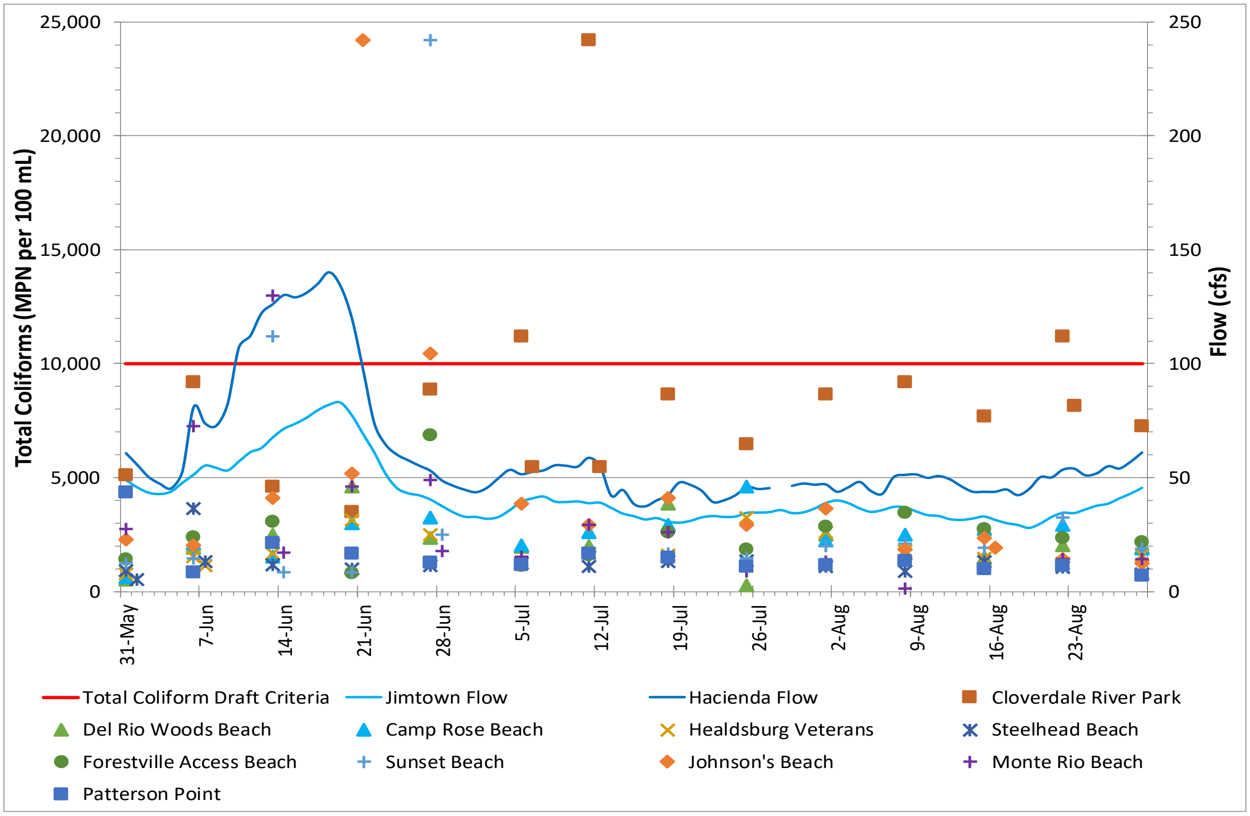

Figure 3-1. Sonoma County DHS 2022 Seasonal Mainstem Russian River Bacteria Sample Results for Total Coliform. Flow rates are preliminary and subject to final revision by USGS.

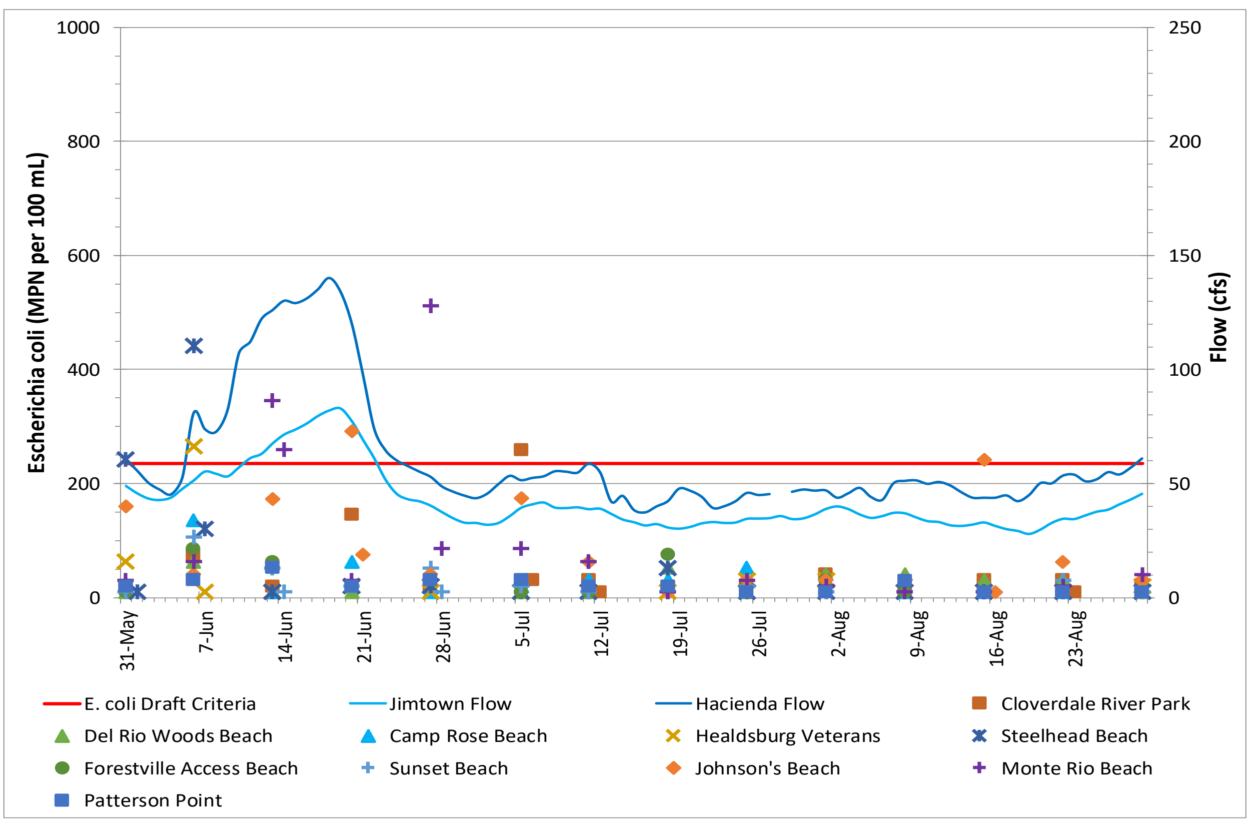

Figure 3-2. Sonoma County DHS 2022 Seasonal Mainstem Russian River Bacteria Sample Results for *E. coli*. Flow rates are preliminary and subject to final revision by USGS.

3.1.2 Sonoma County DHS Seasonal Mainstem Cyanotoxin Sampling (Beach Sampling)

The Sonoma County DHS did not conduct seasonal cyanotoxin sampling in 2022 (Sonoma County DHS, 2022b).

3.1.3 Sonoma Water Seasonal Lake Mendocino and East Fork Russian River Monitoring

Lake Mendocino Vertical Profiles

In 2022, Sonoma Water staff collected vertical profiles at Lake Mendocino near the dam using a datasonde. Vertical profiles were collected for temperature, dissolved oxygen, and turbidity from February to November as weather and access allowed, including biweekly monitoring from April through October (Figure 3-3). Vertical profiling was conducted in large part to track the timing and strength of stratification of the lake into a three-layered profile including: a colder, generally anoxic bottom layer known as the hypolimnion; a transitional middle layer known as the metalimnion where temperatures and dissolved oxygen rapidly increase; and a warm oxygenated layer on the surface known as the epilimnion (Figures 3-3 and 3-4). Water temperature and density differences typically form between the bottom and top layers in the spring as surface temperatures begin to rise with increasing air temperatures, creating a stratified lake profile. Stratification of the lake typically begins to break down in the fall as surface temperatures decrease, diminishing the density gradient between layers, and wind driven events contribute to the mixing of the lake. Stratification of the lake was observed to begin in March and did not break down into a mixed system until the end of October. Turbidity values were generally observed to be higher in the hypolimnion than in the epilimnion (Figure 3-5).

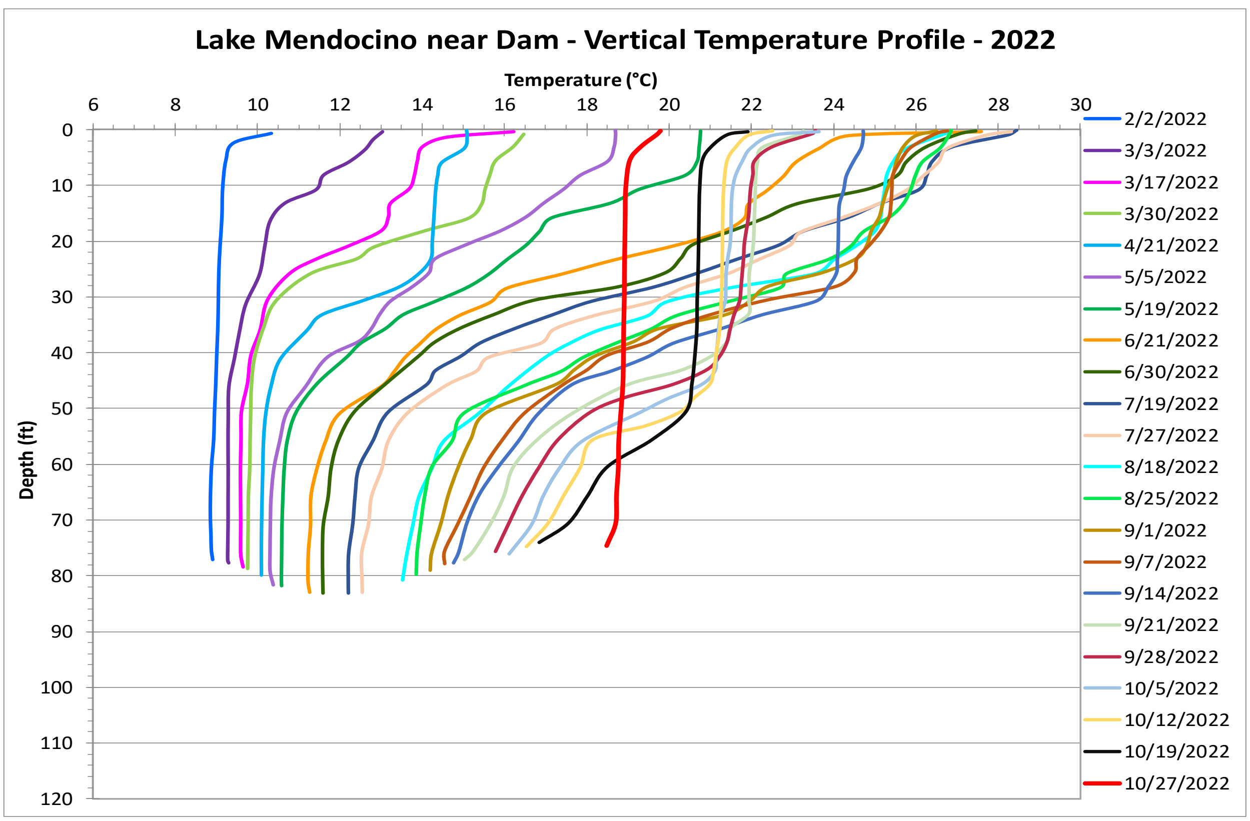

Figure 3-3. Sonoma Water 2022 Vertical Temperature Profiles in Lake Mendocino near Coyote Valley Dam.

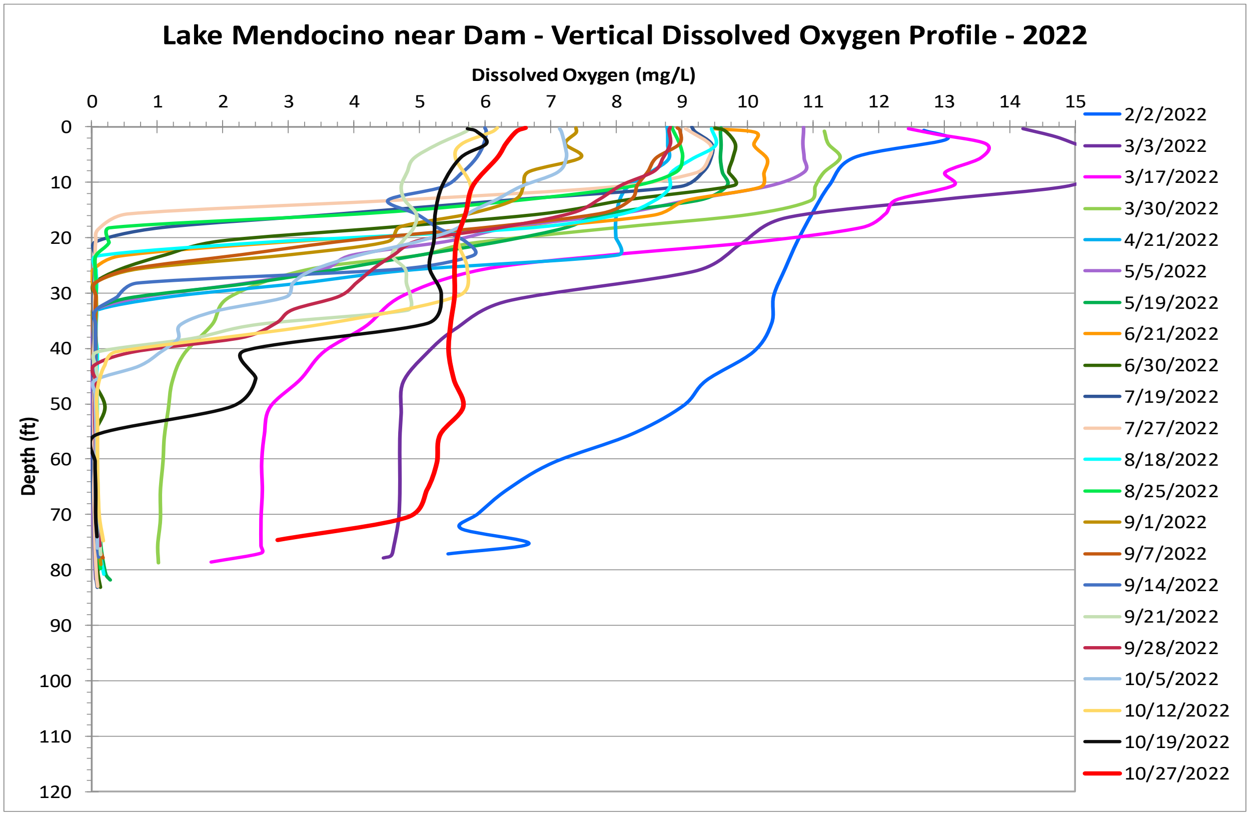

Figure 3-4. Sonoma Water 2022 Vertical Dissolved Oxygen Profiles in Lake Mendocino near Coyote Valley Dam.

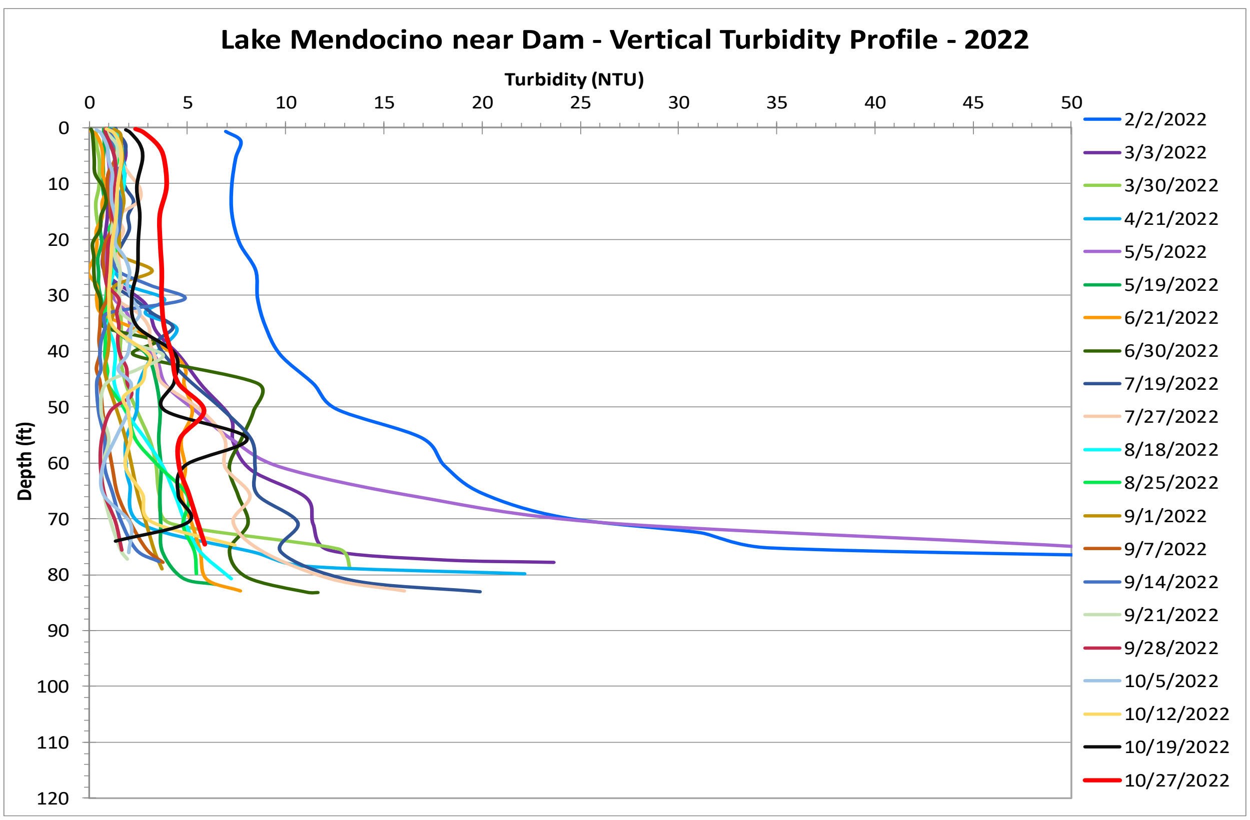

Figure 3-5. Water Vertical 2022 Turbidity Profiles in Lake Mendocino near Coyote Valley Dam.

Lake Mendocino and East Fork Russian River Grab Sampling

Sonoma Water staff generally conducted nutrient grab sampling on a bi-weekly basis during the terms of the Order at three depths in Lake Mendocino including the bottom (hypolimnion) layer, the middle transitional (metalimnion) layer, and the surface (Epilimnion) layer. Nutrient grab samples were also generally collected bi-weekly at the USGS East Fork near Calpella station (East Fork Calpella) located upstream of Lake Mendocino, and the East Fork Russian River below Dam station (East Fork below Dam) located approximately 1/3 mile downstream of Lake Mendocino. Sampling results are only included up to 5 October due to the timing of this report and delay associated with receiving sample results.

All grab samples were analyzed for nutrients including: total organic nitrogen, ammonia, unionized ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total nitrogen, total phosphorus, and total orthophosphate. Samples were also analyzed for total dissolved solids, total and dissolved organic carbon, turbidity, and *chlorophyll a* (a measurable parameter of algal growth). Grab samples were submitted to Alpha Analytical Labs in Ukiah for analysis.

The sampling results for total nitrogen, total phosphorus, turbidity, and *chlorophyll a* are discussed below and summarized in Tables 3-2 through 3-4 and Figures 3-6 through 3-9.

The United States Environmental Protection Agency (EPA) has established section 304(a) nutrient criteria across 14 major ecoregions of the United States. The Russian River is located in Aggregate Nutrient Ecoregion III (EPA, 2022).

Highlighted values for stations located on the East Fork of the Russian River indicate those values exceeding EPA recommended ambient water quality criteria for “Rivers and Streams in Nutrient Ecoregion III” (EPA, 2000). Lab analysis constraints in 2022 resulted in a method detection limit (MDL) for *chlorophyll a*, which is the level of accuracy for a given lab analysis to provide a valid concentration of a given constituent, that was higher than the EPA criteria for exceedances for *chlorophyll a* in rivers and streams. Put simply, the EPA exceedance criteria for *chlorophyll a* in rivers and streams is approximately 0.0018 mg/L, whereas the lab analysis MDL for *chlorophyll a* was 0.0030 mg/L. Therefore, some lab results for *chlorophyll a* that are listed as non-detect (ND) could potentially have concentrations above the criteria and below the MDL, which in turn could result in an under representation of the actual number of exceedances observed. However, for reporting purposes, only those exceedances that are quantified are included in the summation.

Highlighted values for the vertical stations located in Lake Mendocino indicate those values exceeding EPA recommended ambient water quality criteria for “Lakes and Reservoirs in Nutrient Ecoregion III” (EPA, 2001). The EPA criteria for *chlorophyll a* in lakes and reservoirs is 0.0034 mg/L, which is above the lab MDL for *chlorophyll a*, therefore, exceedance values are accurately represented for Lake Mendocino results.

Finally, it must be emphasized that the EPA criteria are not adopted standards and are therefore both subject to change (if it is determined that the guidelines or criteria are not accurate indicators) and are not currently enforceable. Sampling results for other nutrient components, dissolved and total organic carbon, and total dissolved solids are included in the tables; however, a discussion of these constituents is not included in this report.

Total Nitrogen

The EPA desired goal for total nitrogen in Aggregate Ecoregion III is 0.38 mg/L for rivers and streams (EPA, 2000). The EPA desired goal for total nitrogen in Aggregate Ecoregion III is 0.40 mg/L for lakes or reservoirs (EPA, 2001).

Calculating total nitrogen values requires the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (referred to as Total Kjeldahl Nitrogen or TKN), and nitrate/nitrite nitrogen. The EPA criteria for total nitrogen for rivers and streams was exceeded twenty-three (23) times prior to and during the terms of the Order, representing 63.9% of the total samples collected (23 out of 36) at the upper and lower East Fork Russian River stations (Tables 3-2 and 3-6, and Figure 3-6). The EPA criteria for lakes and reservoirs was exceeded twenty-six (26) times prior to and during the terms of the Order, representing 51% of the total samples collected (26 out of 51) in Lake Mendocino during the monitoring effort (Tables 3-3 through 3-5).

The East Fork Calpella station had seven (7) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of 18 samples collected (38.9%), under flows that ranged from 13.5 cfs to 299 cfs (Table 3-2 and Figure 3-6). The maximum concentration measured 0.99 mg/L on 21 April with a flow of 299 cfs (Table 3-2). The maximum concentration measured during the terms of the Order was 0.67 mg/L on 1 September with a flow of 25.2 cfs (Table 3-2). The minimum concentration was 0.052 mg/L, which occurred on 27 July with a flow of 86.5 cfs. Nitrogen values were observed to fluctuate at Calpella prior to and during the terms of the Order.

Table 3-2. Sonoma Water 2022 Seasonal Grab Sampling Results at East Fork Russian River near Calpella.

East Fork Russian River near Calpella	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	USGS 11461500 RR Near Calpella***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	Flow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
2/2/2022	15:00	7.9	8.1	ND	ND	ND	0.29	ND	ND	0.29	**0.024**	0.035	1.41	1.82	130	2.2	ND	66.6
3/17/2022	11:40	11.7	7.6	ND	ND	ND	0.14	ND	ND	0.14	**0.023**	ND	1.44	1.67	130	1.5	ND	54.5
3/30/2022	14:50	14.0	8.1	ND	ND	ND	0.10	ND	ND	0.10	0.020	0.052	1.76	2.10	120	1.6	ND	68.1
4/21/2022	10:50	10.9	7.4	0.64	ND	ND	0.35	ND	0.64	**0.99**	**0.22**	0.16	5.32	7.72	180	**83**	**0.0067**	299
5/5/2022	10:50	15.7	7.9	0.24	ND	ND	0.14	ND	0.24	**0.38**	**0.033**	0.049	1.58	1.97	130	**2.4**	ND	63.7
5/19/2022	10:40	17.0	7.9	0.30	ND	ND	0.12	ND	0.30	**0.42**	**0.032**	0.051	1.79	2.25	140	**2.5**	ND	87.8
6/21/2022	14:20	19.8	8.0	0.26	ND	ND	0.055	ND	0.26	0.32	**0.039**	0.061	1.85	2.19	130	2.1	**0.0032**	91.5
6/30/2022	11:20	19.6	8.0	ND	ND	ND	0.079	ND	ND	0.079	**0.056**	0.076	1.91	2.37	120	**3.3**	**0.0059**	92.8
7/19/2022	10:50	20.3	7.9	0.20	0.13	0.0040	0.094	ND	0.33	**0.42**	**0.067**	0.11	2.72	3.30	120	**5.1**	**0.0085**	87.9
7/27/2022	14:20	22.5	8.1	ND	ND	0.00045	0.052	ND	ND	0.052	**0.068**	0.12	2.52	3.01	110	**4.8**	**0.0059**	86.5
8/18/2022	14:00	22.7	8.1	ND	ND	ND	0.13	ND	ND	0.13	**0.086**	0.18	3.38	3.83	140	1.2	ND	21.6
8/25/2022	14:20	22.6	8.0	ND	ND	0.0019	0.13	ND	ND	0.132	**0.090**	0.21	4.17	5.22	150	1.4	ND	18.7
9/1/2022	13:30	20.5	8.0	0.55	ND	0.0024	0.12	ND	0.55	**0.67**	**0.11**	0.24	2.94	3.32	130	1.7	ND	25.2
9/7/2022	12:50	21.8	7.9	ND	ND	ND	0.098	ND	ND	0.098	**0.097**	0.22	3.09	3.63	130	1.1	ND	16.8
9/14/2022	14:20	18.8	8.1	ND	ND	0.0027	0.11	ND	ND	0.113	**0.10**	0.24	2.73	2.82	160	1.9	**0.0040**	21.7
9/21/2022	14:30	17.7	7.9	0.29	ND	0.0011	0.16	ND	0.29	**0.45**	**0.11**	0.25	4.11	4.61	150	1.6	ND	16.4
9/28/2022	14:50	17.8	8.0	0.52	ND	0.0029	0.11	ND	0.52	**0.63**	**0.075**	0.17	2.12	2.55	160	1.5	ND	13.5
10/5/2022	14:40	17.5	8.0	ND	ND	0.00057	0.15	ND	ND	0.151	**0.067**	0.17	2.11	2.44	140	1.3	ND	14.2

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

*** United States Geological Survey (USGS) Continuous-Record Gaging Station.

**** Flow rates are preliminary and subject to final revision by USGS.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.02188 mg/L (21.88 ug/L) ≈ 0.022 mg/L

Chlorophyll a: 0.00178 mg/L (1.78 ug/L) ≈ 0.0018 mg/L

Total Nitrogen: 0.38 mg/L

Turbidity: 2.34 FTU/NTU

The Lake Mendocino epilimnion had seven (7) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of seventeen (17) samples collected (41.2%) at a depth of 5 feet (Table 3-3 and Figure 3-6). The maximum concentration measured 0.69 mg/L, which occurred on 2 February (Table 3-3). The maximum concentration measured during the terms of the Order was 0.49 mg/L, which occurred on 19 July (Table 3-3). The minimum concentration was ND, which occurred on 7 September at a depth of 5 feet.

The Lake Mendocino metalimnion had five (5) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of seventeen (17) samples collected (29.4%) at depths ranging from 20 to 50 feet (Table 3-4 and Figure 3-6). The maximum seasonal value measured 0.53 mg/L, which occurred on 2 February at a depth of 25 feet (Table 3-4). The maximum seasonal value measured during the terms of the Order was 0.46 mg/L, which occurred on 21 June at a depth of 20 feet (Table 3-4). The minimum concentration was ND, which occurred twice, on 19 May at a depth of 25 feet, and on 7 September at a depth of 30 feet.

The Lake Mendocino hypolimnion had fourteen (14) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of 17 samples collected (82.4%) at a depth of 70 feet (Table 3-5 and Figure 3-6). The maximum seasonal value occurred during the terms of the Order and measured 0.75 mg/L on 21 September at a depth of 70 feet (Table 3-5). The minimum concentration was 0.22 mg/L, which occurred on 21 April at a depth of 70 feet (Table 3-5). The minimum concentration during the terms of the Order was 0.32 mg/L, which occurred on 27 July at a depth of 70 feet.

Table 3-3. Sonoma Water 2022 Seasonal Grab Sampling Results in Lake Mendocino Epilimnion.

Lake Mendocino Epilimnion	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	Depth of Sample
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	feet
2/2/2022	14:40	9.2	8.0	0.50	ND	ND	0.19	ND	0.50	**0.69**	**0.054**	ND	4.17	4.50	140	7.9	**0.034**	5
3/17/2022	13:50	13.9	8.8	0.45	ND	ND	0.062	ND	0.45	**0.51**	**0.029**	ND	3.89	4.00	120	2.2	**0.029**	5
4/21/2022	13:30	14.5	8.1	0.26	ND	ND	ND	ND	0.26	0.26	**0.032**	ND	3.60	4.15	120	1.8	**0.0077**	5
5/5/2022	13:20	18.5	8.6	0.54	ND	ND	ND	ND	0.54	**0.54**	**0.030**	ND	3.67	4.09	120	1.9	**0.0093**	5
5/19/2022	12:20	20.7	8.6	0.51	ND	ND	ND	ND	0.51	**0.51**	**0.029**	ND	3.85	4.28	130	2.2	**0.0051**	5
6/21/2022	13:20	23.6	8.8	0.38	ND	ND	ND	ND	0.38	**0.41**	**0.027**	ND	3.87	4.27	140	2.1	**0.0085**	5
6/30/2022	13:30	25.8	8.9	0.33	ND	ND	0.054	ND	0.33	0.38	**0.032**	ND	3.95	4.51	160	1.6	**0.0051**	5
7/19/2022	13:00	26.4	8.9	0.28	0.15	0.049	0.063	ND	0.43	**0.49**	**0.026**	ND	4.35	5.10	130	3.0	**0.0045**	5
7/27/2022	13:00	26.5	8.9	0.20	ND	0.032	ND	ND	0.30	0.30	**0.023**	ND	4.39	5.00	130	3.0	**0.0077**	5
8/18/2022	12:30	25.4	8.8	0.32	ND	ND	0.071	ND	0.32	0.39	**0.036**	ND	4.07	4.61	130	2.9	**0.0096**	5
8/25/2022	12:50	26.2	8.8	0.20	ND	0.010	ND	ND	0.20	0.20	**0.021**	ND	4.26	4.74	140	2.6	**0.0067**	5
9/1/2022	12:10	25.5	8.6	0.32	0.10	0.020	ND	ND	0.42	**0.42**	**0.030**	ND	3.45	3.92	130	2.4	**0.0069**	5
9/7/2022	11:30	25.6	8.7	ND	ND	ND	ND	ND	ND	ND	**0.030**	ND	3.46	4.14	130	2.0	**0.0080**	5
9/14/2022	12:40	24.5	8.3	0.27	ND	0.0094	ND	ND	0.27	0.27	**0.029**	ND	3.16	3.89	150	2.2	**0.0056**	5
9/21/2022	13:00	22.1	7.7	0.35	ND	0.0013	ND	ND	0.35	0.35	**0.027**	ND	2.95	3.74	150	2.4	**0.0096**	5
9/28/2022	13:20	22.1	8.4	0.33	ND	0.0090	ND	ND	0.33	0.33	**0.024**	ND	3.17	3.61	150	1.6	**0.0077**	5
10/5/2022	13:20	21.8	8.1	ND	ND	0.0045	0.062	ND	ND	0.067	**0.024**	ND	3.08	3.57	120	2.1	**0.013**	5

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.017 mg/L (17.00 ug/L) Chlorophyll a: 0.0034 mg/L (3.40 ug/L)

Total Nitrogen: 0.40 mg/L

Table 3-4. Sonoma Water 2022 Seasonal Grab Sampling Results in Lake Mendocino Metalimnion.

Lake Mendocino Metalimnion	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	Depth of Sample
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	feet
2/2/2022	14:30	9.1	7.6	0.32	ND	ND	0.21	ND	0.32	**0.53**	**0.042**	ND	4.24	4.62	120	7.6	**0.014**	25
3/17/2022	13:40	12.2	8.1	0.40	ND	ND	0.067	ND	0.40	**0.47**	**0.024**	ND	4.06	3.94	120	1.7	**0.018**	20
4/21/2022	13:20	12.5	7.1	ND	ND	ND	0.069	ND	ND	0.069	**0.023**	ND	3.40	4.05	130	2.2	ND	30
5/5/2022	13:10	15.1	7.5	0.46	ND	ND	ND	ND	0.46	**0.46**	**0.025**	ND	3.39	3.92	130	2.7	**0.0093**	20
5/19/2022	12:30	15.6	7.3	ND	ND	ND	ND	ND	ND	ND	**0.022**	ND	3.27	3.95	130	1.3	ND	25
6/21/2022	13:30	20.1	7.3	0.43	ND	ND	ND	ND	0.43	**0.46**	**0.022**	ND	3.09	3.89	130	2.0	**0.014**	20
6/30/2022	13:40	20.6	7.3	0.36	ND	ND	ND	ND	0.36	0.36	**0.033**	ND	3.06	3.56	130	1.5	**0.0091**	20
7/19/2022	13:10	22.7	7.2	0.36	ND	0.00063	0.064	ND	0.36	**0.42**	**0.028**	0.21	3.20	4.23	130	2.6	**0.011**	20
7/27/2022	13:10	21.4	7.1	ND	ND	0.00037	ND	ND	ND	0.0004	**0.023**	ND	3.03	3.74	130	2.7	**0.0059**	25
8/18/2022	12:40	20.0	7.0	ND	ND	ND	0.068	ND	ND	0.068	**0.032**	ND	3.15	3.87	130	1.9	**0.0056**	30
8/25/2022	13:00	22.9	7.1	ND	ND	0.00012	ND	ND	ND	0.0001	**0.025**	ND	3.70	4.72	140	2.7	**0.0056**	25
9/1/2022	12:20	22.0	7.0	0.37	ND	0.0003	ND	ND	0.37	0.37	**0.031**	ND	2.88	3.46	130	2.6	**0.0040**	30
9/7/2022	11:40	22.4	7.1	ND	ND	ND	ND	ND	ND	ND	**0.029**	ND	2.93	3.56	130	2.3	**0.011**	30
9/14/2022	12:50	21.3	7.0	0.22	ND	0.00040	ND	ND	0.22	0.22	**0.040**	ND	2.97	3.56	170	3.5	**0.0061**	35
9/21/2022	13:10	19.0	7.0	0.31	ND	0.00026	0.063	ND	0.31	0.37	**0.077**	0.076	2.80	3.45	130	7.5	ND	45
9/28/2022	13:30	20.1	7.1	0.26	ND	0.00045	ND	ND	0.26	0.26	**0.045**	0.040	2.80	3.32	130	2.9	**0.0067**	45
10/5/2022	13:30	19.3	7.0	ND	0.15	0.00056	ND	ND	ND	0.151	**0.070**	0.12	2.90	3.42	140	5.0	**0.0037**	50

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.017 mg/L (17.00 ug/L)

Chlorophyll a: 0.0034 mg/L (3.40 ug/L)

Total Nitrogen: 0.40 mg/L

Table 3-5. Sonoma Water 2022 Seasonal Grab Sampling Results in Lake Mendocino Hypolimnion.

Lake Mendocino Hypolimnion	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	Depth of Sample
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	feet
2/2/2022	14:20	8.9	7.0	0.21	ND	ND	0.39	ND	0.21	**0.60**	**0.066**	0.031	4.16	4.91	120	21	ND	70
3/17/2022	13:30	9.6	7.1	ND	ND	ND	0.30	ND	ND	0.30	**0.025**	ND	3.65	4.19	130	3.7	**0.0037**	70
4/21/2022	13:10	10.1	6.8	ND	ND	ND	0.22	ND	ND	0.22	**0.054**	0.11	3.68	4.31	130	2.3	ND	70
5/5/2022	13:00	10.3	6.7	0.40	ND	ND	0.15	ND	0.40	**0.55**	**0.063**	0.093	3.57	4.15	130	4.1	ND	70
5/19/2022	12:40	10.6	6.9	0.53	ND	ND	0.11	ND	0.53	**0.64**	**0.081**	0.13	3.58	4.24	140	4.4	ND	70
6/21/2022	13:40	11.3	7.0	0.55	ND	ND	ND	ND	0.55	**0.55**	**0.14**	0.23	3.52	4.26	140	8.6	ND	70
6/30/2022	13:50	11.6	7.0	0.28	0.32	ND	0.053	ND	0.60	**0.65**	**0.13**	0.19	3.42	4.15	77	9.5	ND	70
7/19/2022	13:20	12.3	7.0	0.30	0.34	0.00076	0.063	ND	0.64	**0.70**	**0.16**	0.21	3.57	4.79	130	14	**0.0075**	70
7/27/2022	13:20	12.7	6.8	ND	0.33	0.00048	ND	ND	0.32	0.32	**0.15**	0.20	3.53	4.53	120	13	ND	70
8/18/2022	12:50	13.8	7.0	ND	0.28	0.00069	0.071	ND	0.44	**0.51**	**0.17**	0.20	3.47	4.45	130	12	0.0032	70
8/25/2022	13:10	14.0	7.0	ND	0.38	0.00098	ND	ND	0.50	**0.50**	**0.20**	0.28	3.62	5.03	130	17	**0.0045**	70
9/1/2022	12:30	14.5	6.9	0.24	0.30	0.0006	ND	ND	0.54	**0.54**	**0.14**	0.24	3.15	3.89	120	8.9	0.0032	70
9/7/2022	11:50	14.9	6.9	0.24	0.22	0.014	ND	ND	0.46	**0.46**	**0.15**	0.24	3.17	3.97	120	8.3	ND	70
9/14/2022	13:00	15.1	6.9	ND	0.45	0.001	ND	ND	0.64	**0.64**	**0.18**	0.37	3.14	3.95	150	14	**0.0037**	70
9/21/2022	13:20	15.7	6.9	0.27	0.48	0.0011	ND	ND	0.75	**0.75**	**0.20**	0.39	3.06	3.97	130	13	**0.0048**	70
9/28/2022	13:40	16.1	6.9	ND	0.55	0.0013	ND	ND	0.73	**0.73**	**0.20**	0.35	3.08	3.86	140	12	ND	70
10/5/2022	13:40	16.7	6.8	ND	0.49	0.00096	0.064	ND	0.52	**0.58**	**0.19**	0.52	3.00	3.80	120	14	ND	70

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.017 mg/L (17.00 ug/L)

Chlorophyll a: 0.0034 mg/L (3.40 ug/L)

Total Nitrogen: 0.40 mg/L

The East Fork below Dam station had sixteen (16) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of 18 samples collected (88.9%), under flows that ranged from 28 cfs to 219 cfs (Table 3-6 and Figure 3-6). The maximum concentration occurred during the terms of the Order and measured 0.99 mg/L on 28 September with a flow of 66 cfs (Table 3-6). The minimum concentration was 0.22 mg/L, which occurred on 21 April with a flow of 28 cfs (Table 3-6). The minimum concentration during the terms of the Order was 0.26 mg/L, which occurred on 7 September with a flow of 89 cfs (Table 3-6). Nitrogen values were observed to generally remain elevated throughout the monitoring season.

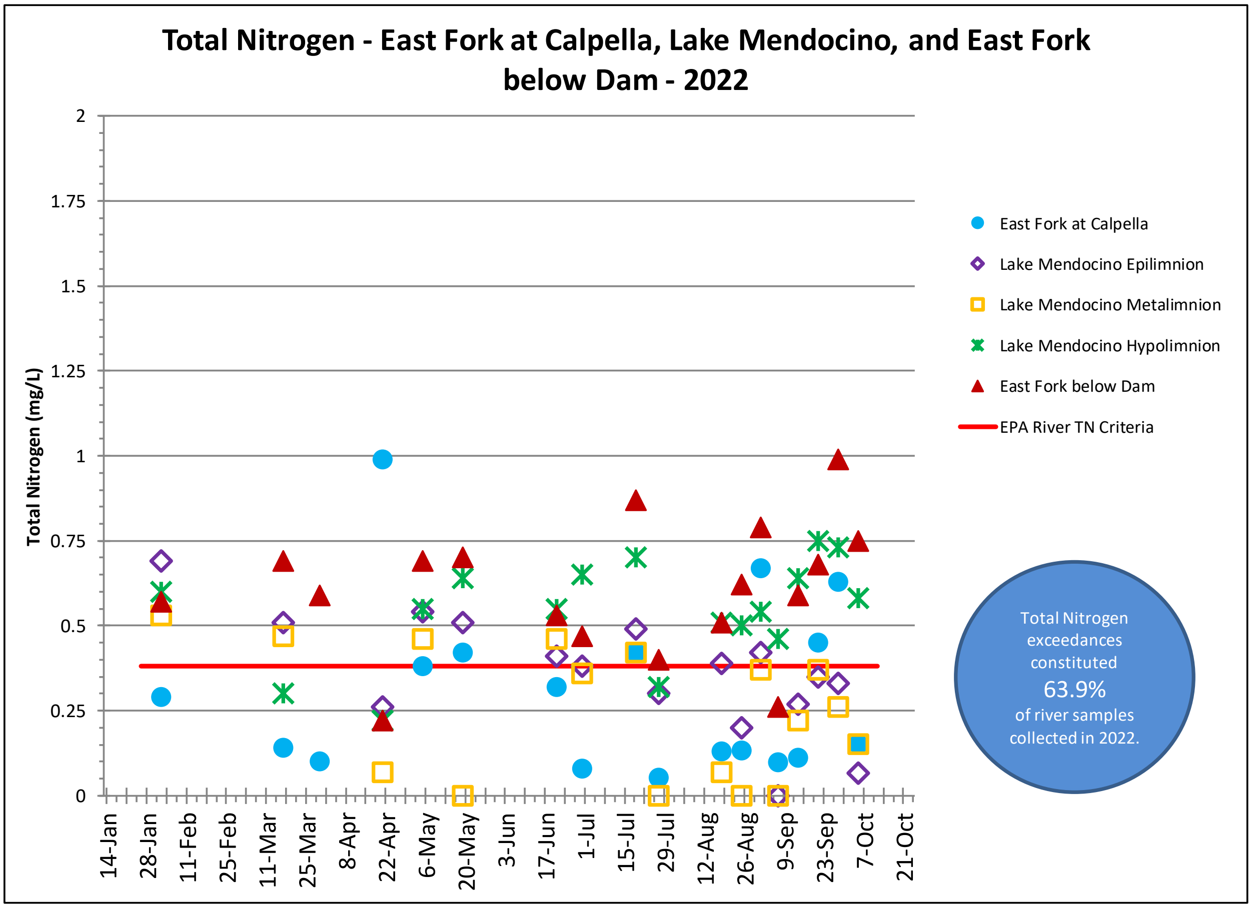

Figure 3-6. Sonoma Water Total Nitrogen results for the East Fork Russian River at Calpella, Lake Mendocino, and East Fork Russian River below Coyote Valley Dam in 2022. Percent exceedances only apply to samples collected at East Fork river stations.

Total Phosphorus

The EPA's desired goal for total phosphates as phosphorus for rivers and streams in Aggregate Ecoregion III has been established as 21.88 micrograms per liter (µg/L), or approximately 0.022 mg/L (EPA, 2000). The EPA's desired goal for total phosphates as phosphorus for lakes and reservoirs in Aggregate Ecoregion III has been established as 17.00 micrograms per liter (µg/L), or approximately 0.017 mg/L (EPA, 2001).

The total phosphorus criteria for rivers and streams was exceeded thirty (34) times prior to and during the terms of the Order, representing 94.4% of the total samples collected (34 out of 36) at the East Fork Russian River stations located above and below Lake Mendocino (Tables 3-2 and 3-6, and Figure 3-7).

The total phosphorus criteria for lakes and reservoirs was exceeded fifty-one (51) times prior to and during the terms of the Order, representing 100% of the total samples collected (51 out of 51) in Lake Mendocino during the monitoring effort (Tables 3-3 through 3-5).

Calpella exceeded the EPA criteria for a majority of the season prior to and during the terms of the Order, including 17 of 18 samples (94.4%), under flows that ranged from13.5 cfs to 299 cfs (Table 3-2 and Figure 3-7). The maximum concentration measured 0.22 mg/L on 21 April with a flow of approximately 299 cfs (Table 3-2 and Figure 3-7). The maximum concentration during the terms of the Order measured 0.11 mg/L, which occurred twice on 1 September and 21 September with flows of 25.2 cfs and 16.4 cfs, respectively (Table 3-2 and Figure 3-7). The minimum concentration was 0.020 mg/L, which occurred on 30 March with a flow of approximately 68.1 cfs (Table 3-2). The minimum concentration during the terms of the Order was 0.039 mg/L, which occurred on 21 June with a flow of approximately 91.5 cfs. Other than the spike in concentration during the April storm event, total phosphorus values were observed to generally increase from spring into summer at Calpella then decrease through the fall.

Table 3-6. Sonoma Water 2022 Seasonal Grab Sampling Results at East Fork Russian River below Dam.

East Fork Russian River below Dam	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	USACE COY (Lake Mendocino)***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	Outflow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
2/2/2022	12:20	9.2	7.5	0.26	ND	ND	0.31	ND	0.26	**0.57**	**0.044**	ND	4.12	4.77	120	**16**	**0.0059**	80
3/17/2022	12:20	10.3	7.3	0.38	ND	ND	0.31	ND	0.38	**0.69**	**0.025**	ND	3.72	4.17	110	**3.5**	**0.0053**	29
3/30/2022	12:50	10.5	7.4	0.30	ND	ND	0.29	ND	0.30	**0.59**	0.0091	ND	3.70	3.99	130	**2.6**	**0.0040**	29
4/21/2022	11:30	10.7	7.4	ND	ND	ND	0.22	ND	ND	0.22	**0.046**	0.084	3.73	4.45	130	**3.7**	**0.0032**	28
5/5/2022	14:10	11.0	7.5	0.54	ND	ND	0.15	ND	0.54	**0.69**	**0.064**	0.10	3.62	4.50	130	**3.2**	**0.0048**	29
5/19/2022	13:30	12.6	7.8	0.58	ND	ND	0.12	ND	0.58	**0.70**	**0.076**	0.13	3.70	4.22	120	**4.0**	ND	28
6/21/2022	11:10	12.1	7.1	0.49	ND	ND	0.040	ND	0.49	**0.53**	**0.11**	0.19	3.83	4.14	120	**5.6**	ND	48
6/30/2022	14:30	12.7	7.1	ND	0.23	0.00067	0.060	ND	0.41	**0.47**	**0.12**	0.17	3.34	4.12	130	**8.3**	ND	70
7/19/2022	14:00	13.2	7.1	0.53	0.34	0.0010	ND	ND	0.87	**0.87**	**0.15**	0.19	3.72	4.73	120	**11**	ND	219
7/27/2022	13:50	13.5	7.1	ND	0.37	0.0011	ND	ND	0.40	**0.40**	**0.16**	0.19	3.59	4.92	130	**11**	ND	82
8/18/2022	13:30	14.5	7.1	0.23	0.21	0.00070	0.069	ND	0.44	**0.51**	**0.17**	0.22	3.56	4.44	130	**8.1**	ND	90
8/25/2022	14:00	14.7	7.1	ND	0.38	0.0013	0.084	ND	0.54	**0.62**	**0.20**	0.20	3.58	6.21	140	**9.7**	**0.0032**	89
9/1/2022	13:00	15.1	7.0	0.38	0.35	0.00060	0.063	ND	0.73	**0.79**	**0.18**	0.20	3.18	4.00	130	**4.8**	ND	89
9/7/2022	12:20	15.5	7.1	ND	0.27	0.0048	ND	ND	0.26	0.26	**0.18**	0.22	3.15	3.96	120	**4.1**	ND	89
9/14/2022	13:40	15.8	7.1	ND	0.44	0.0016	ND	ND	0.59	**0.59**	**0.20**	0.31	3.11	4.02	160	**5.5**	**0.0037**	92
9/21/2022	14:00	16.3	7.0	0.23	0.39	0.0012	0.064	ND	0.62	**0.68**	**0.22**	0.33	3.11	3.90	110	**5.1**	**0.0035**	74
9/28/2022	14:20	17.0	7.1	0.39	0.60	0.0024	ND	ND	0.99	**0.99**	**0.23**	0.34	3.10	3.86	160	**3.9**	ND	66
10/5/2022	14:10	17.4	7.1	ND	0.60	0.0011	0.069	ND	0.68	**0.75**	**0.23**	0.530	3.16	3.81	120	**7.2**	ND	61

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

*** United States Army Corps of Engineers (USACE) Continuous-Record Gaging Station.

**** Flow rates are preliminary and subject to final revision by USACE.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.02188 mg/L (21.88 ug/L) ≈ 0.022 mg/L

Chlorophyll a: 0.00178 mg/L (1.78 ug/L) ≈ 0.0018 mg/L

Total Nitrogen: 0.38 mg/L

Turbidity: 2.34 FTU/NTU

The Lake Mendocino epilimnion exceeded the total phosphorus EPA criteria throughout the season prior to and during the terms of the Order (17 of 17 samples or 100%) at a sampling depth of 5 feet (Table 3-3 and Figure 3-7). The maximum concentration measured 0.054 mg/L on 2 February (Table 3-3). The maximum concentration during the terms of the Order measured 0.036 mg/L on 18 August (Table 3-3). The minimum concentration at the Lake Mendocino epilimnion occurred during the terms of the Order and was 0.021 mg/L, which occurred on 25 August (Table 3-3).

The Lake Mendocino metalimnion also exceeded the total phosphorus EPA criteria throughout the season prior to and during the terms of the Order (17of 17 samples or 100%) at a sampling depth that ranged from 25 to 50 feet (Table 3-4 and Figure 3-7). The maximum concentration occurred during the terms of the Order and measured 0.077 mg/L on 21 September at a depth of 45 feet (Table 3-4). The minimum concentration at the Lake Mendocino epilimnion was 0.022 mg/L, which occurred twice, on 19 May at a depth of 25 feet and on 21 June at a depth of 20 feet.

The Lake Mendocino hypolimnion also exceeded the total phosphorus EPA criteria throughout the season prior to and during the terms of the Order (17of 17 samples or 100%) at a sampling depth of 70 feet (Table 3-5 and Figure 3-7). The maximum concentration occurred during the terms of the Order and measured 0.20 mg/L, which occurred three times, on 25 August, 21 September, and 28 September (Table 3-5). The minimum concentration at the Lake Mendocino epilimnion was 0.025 mg/L, which occurred on 17 March (Table 3-5). The minimum concentration at the Lake Mendocino epilimnion during the terms of the Order was 0.14 mg/L, which occurred on 1 September (Table 3-5). Total phosphorus values at the hypolimnion were observed to generally increase from spring into fall.

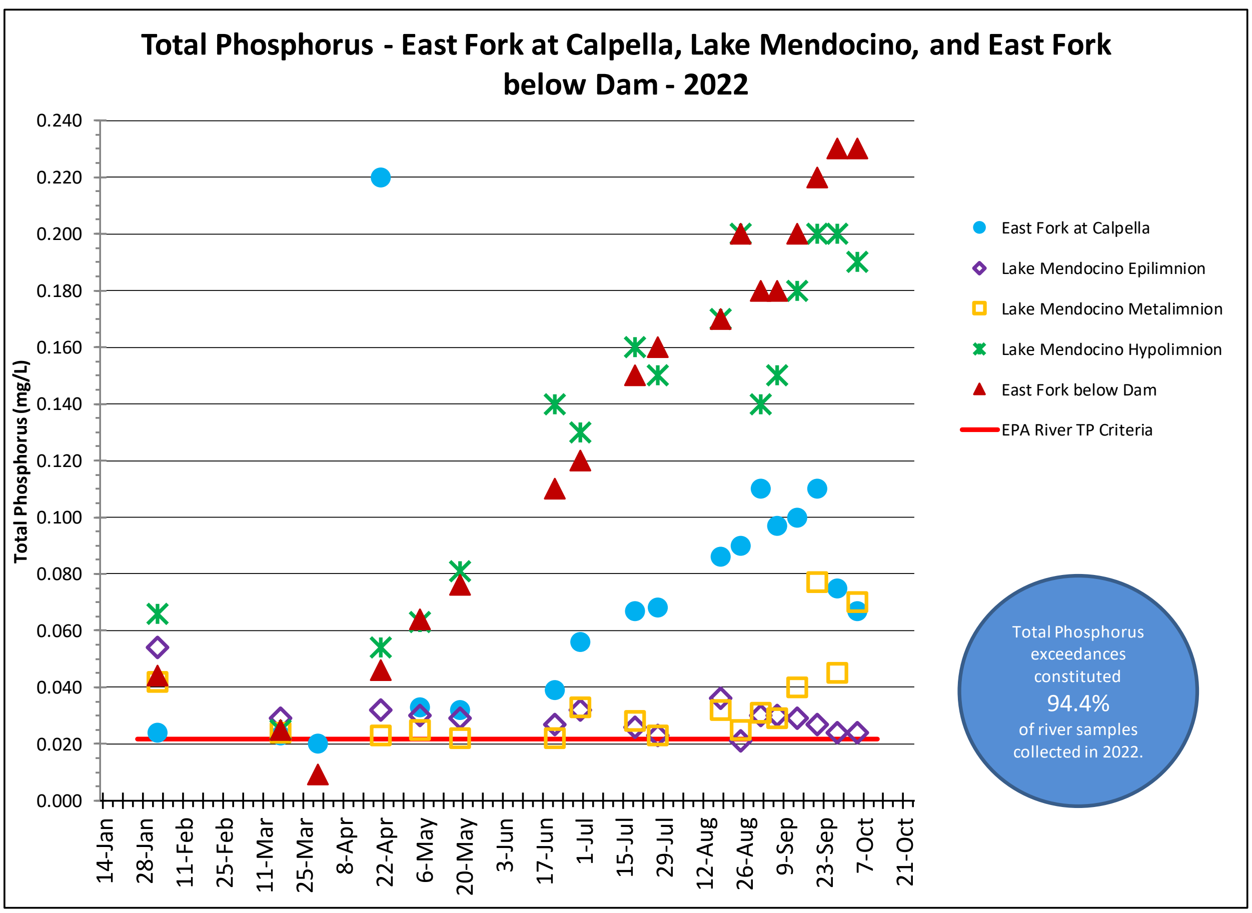

Figure 3-7. Sonoma Water Total Phosphorus results for the East Fork Russian River at Calpella, Lake Mendocino, and East Fork Russian River below Dam in 2022. Percent exceedances only apply to samples collected at East Fork river stations.

The East Fork below Coyote Valley Dam exceeded the total phosphorus EPA criteria for a majority of the season prior to and during the terms of the Order, including 17 of 18 samples (94.4%) at flows that ranged from 28 to 219 cfs (Table 3-6). The East Fork below Coyote Valley Dam was observed to have the highest overall concentration with a maximum value of 0.23 mg/L which occurred twice during the terms of the Order, on 28 September with a flow of 66 cfs, and on 5 October with a flow of 61 cfs (Table 3-6). Total phosphorus values were observed to generally increase from spring into fall (Table 3-6 and Figure 3-7).

Turbidity

The EPA recommended criteria for turbidity in rivers and streams is 2.34 Nephelometric Turbidity Units (NTU) (EPA, 2000). The EPA recommended criteria for turbidity in lakes and reservoirs is based on a secchi depth of 2.7 meters (EPA, 2001). Measuring the depth of visibility of a secchi disk to assess water clarity was not conducted in Lake Mendocino as part of a vertical profiling effort because two of the stations sampled occur well below visible depth. Turbidity was measured using NTU in the lake to provide additional context and a comparison to values observed in water being released from the lake as measured at the East Fork below Dam station. The EPA criteria for turbidity for rivers and streams was exceeded twenty-four (24) times prior to and during the terms of the Order, representing 66.7% of the total samples collected (24 out of 36) at the upper and lower East Fork Russian River stations (Tables 3-2 and 3-6, and Figure 3-8).

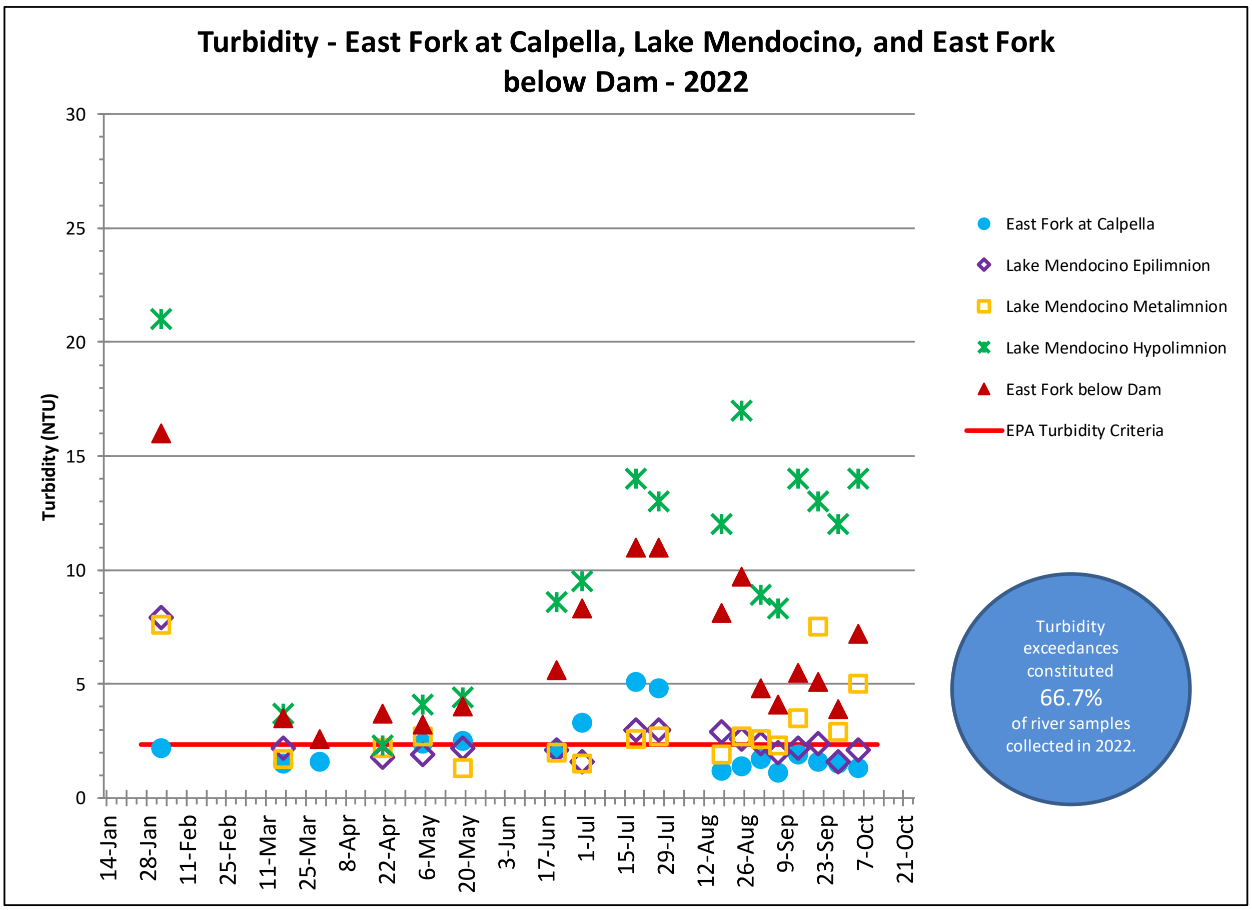

Figure 3-8. Sonoma Water Turbidity results for the East Fork Russian River at Calpella, Lake Mendocino, and East Fork Russian River below Coyote Valley Dam in 2022. Percent exceedances only apply to samples collected at river stations.

Turbidity values at Calpella were observed to remain relatively low through the monitoring season prior to and during the terms of the Order, with the exception of the sample collected on 21 April during a storm event that had a value of 83 NTU with a flow of 299 cfs (Table 3-2). The next highest value was 5.1 NTU, which occurred during the terms of the Order on 19 July with a flow of 87.9 cfs (Table 3-2). The EPA criteria was exceeded six (6) times out of eighteen (18) samples collected (33.3%) prior to and during the terms of the Order. The minimum value was 1.1 NTU, which occurred during the terms of the Order on 7 September with a flow of 16.8 cfs (Table 3-2 and Figure 3-8).

Turbidity levels exceeded the EPA criteria throughout the monitoring season prior to and during the terms of the Order (18 of 18 samples or 100%) at the East Fork below Coyote Valley Dam station (Table 3-6 and Figure 3-8). A maximum value of 16 NTU was observed on 2 February with a flow of 80 cfs (Table 3-6). The maximum value observed during the terms of the Order was 11 NTU, which occurred twice on 19 July and 27 July with flows of 291 cfs and 82 cfs, respectively (Table 3-6). Values were also observed to increase through the spring and summer before declining in September (Figure 3-8). The minimum turbidity value observed was 3.9 NTU on 28 September during the terms of the Order with a flow of 66 cfs (Table 3-6).

Chlorophyll a

The EPA criteria for *chlorophyll a* for rivers and streams in Aggregate Ecoregion III is 1.78 µg/L, or approximately 0.0018 mg/L (EPA, 2000). As mentioned above, lab analysis constraints in 2022 resulted in the MDL for *chlorophyll a* being higher than the EPA criteria for exceedances for *chlorophyll a* in rivers and streams. Therefore, some lab results for *chlorophyll a* in rivers and streams that are listed as non-detect (ND) could potentially have concentrations above the criteria and below the MDL. However, for reporting purposes, only those exceedances that are quantified will be included in the summation.

In 2022, the *chlorophyll a* criteria for rivers and streams was exceeded fourteen (14) times prior to and during the terms of the Order, representing 38.9% of the total samples collected (14 out of 36) in the East Fork Russian River at Calpella and East Fork Russian River below Coyote Valley Dam stations during the monitoring effort (Tables 3-2 and 3-6, and Figure 3-9).

The EPA criteria for *chlorophyll a* for lakes and reservoirs in Aggregate Ecoregion III is 3.40 µg/L, or approximately 0.0034 mg/L (EPA, 2001). The *chlorophyll a* criteria for lakes and reservoirs was exceeded thirty-six (36) times prior to and during the terms of the Order, representing 70.6% of the total samples collected (36 out of 51) in Lake Mendocino during the monitoring effort (Tables 3-3 through 3-5).

Chlorophyll a exceedances occurred most predominantly at the Lake Mendocino epilimnion and metalimnion stations and least predominantly at Calpella (Tables 3-2 through 3-6 and Figure 3-9).

Calpella had six (6) *chlorophyll a* exceedances (6 of 18 or 33.3%) and twelve (12) non-detects, including a maximum value of 0.0085 mg/L that occurred during the terms of the Order on 19 July with a flow of 87.9 cfs (Table 3-2 and Figure 3-9).

The Lake Mendocino epilimnion had seventeen (17) *chlorophyll a* exceedances (17 of 17 or 100%), including a maximum value of 0.034 mg/L that occurred on 2 February at a depth of 5 feet (Table 3-3 and Figure 3-9). The maximum concentration during the terms of the Order measured 0.013 mg/L on 5 October (Table 3-3).

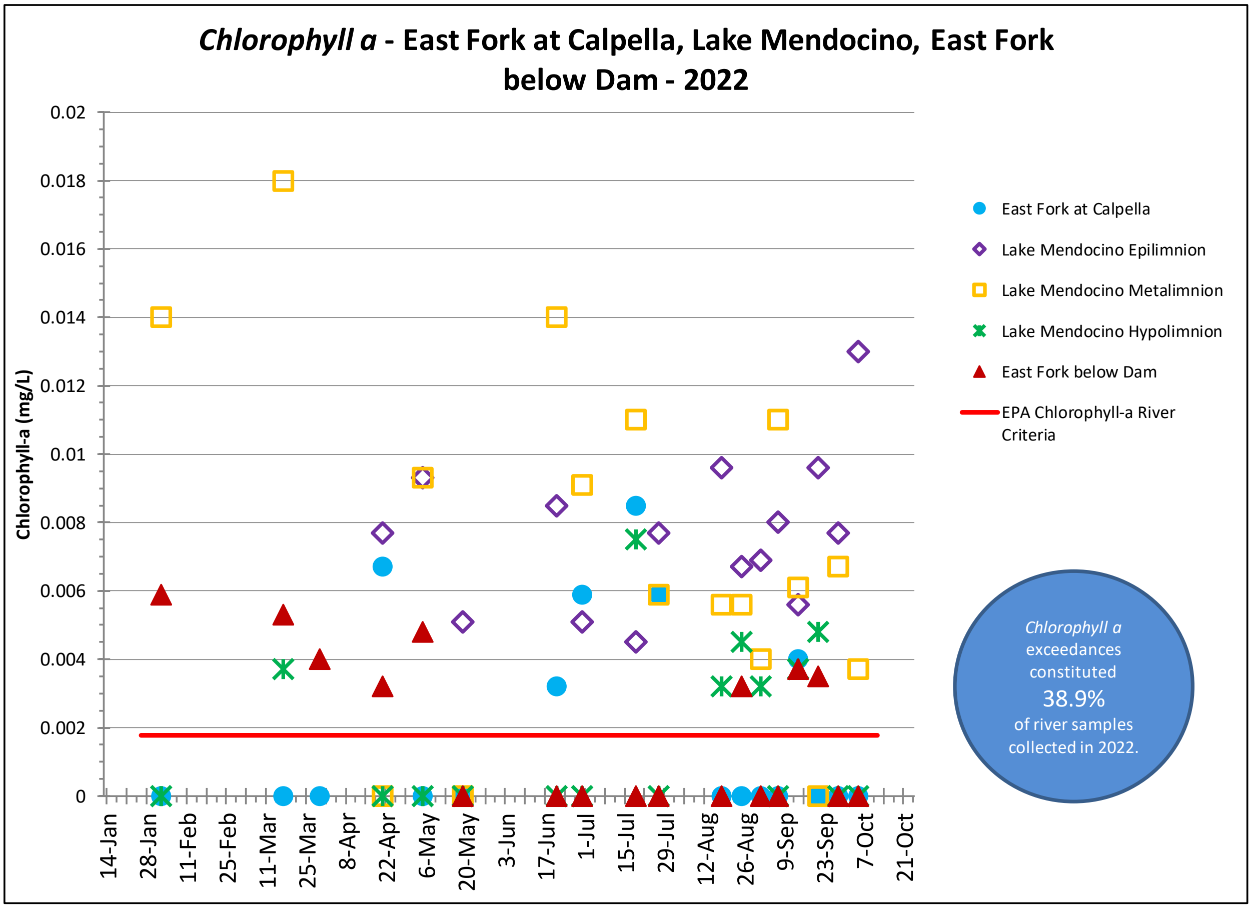

Figure 3-9. Sonoma Water Chlorophyll a results for the East Fork Russian River at Calpella, Lake Mendocino, and East Fork Russian River below Dam in 2022. Percent exceedances only apply to samples collected at East Fork river stations.

The Lake Mendocino metalimnion had fourteen (14) *chlorophyll a* exceedances (14 of 17 or 82.4%) and three (3) non-detects, including a maximum value of 0.018 mg/L that occurred on 17 March at a depth of 20 feet (Table 3-4 and Figure 3-9). The maximum concentration during the terms of the Order measured 0.014 mg/L on 21 June at a depth of 20 feet (Table 3-4).

The Lake Mendocino hypolimnion had five (5) *chlorophyll a* exceedances (5 of 17 or 29.4%) and ten (10) non-detects, including a maximum value of 0.0075 mg/L that occurred during the terms of the Order on 19 July at a depth of 70 feet (Table 3-5 and Figure 3-9).

The East Fork below Dam had eight (8) *chlorophyll a* exceedances (8 of 18 or 44.4%) and ten (10) non-detects, including a maximum value of 0.0059 mg/L that occurred on 2 February with a flow of 80 cfs (Table 3-6 and Figure 3-9). The maximum concentration during the terms of the Order measured 0.0037 mg/L on 14 September with a flow of 92 cfs (Table 3-6).

3.1.4 Sonoma Water Seasonal Mainstem Russian River Ambient Algae and Nutrient Grab Sampling

Ambient Algae

In 2022, Sonoma Water conducted biweekly ambient algae and cyanobacterial monitoring and sampling prior to and during the terms of the Order at four (4) stations including: the Hopland USGS gaging station north of Hopland; the Jimtown USGS gaging station in Alexander Valley; Syar Vineyards downstream of the confluence with Dry Creek; and Patterson Point in Villa Grande (Figure 3-10). This effort supports the NCRWQCB and Sonoma County DHS cyanotoxin monitoring and assessment for the potential for harmful algal blooms (HABs) dominated by cyanobacteria (cyanoHABs) in the Russian River. This effort is being conducted to identify algal and cyanobacterial genera in the Russian River, as well as to estimate algal cover, frequency, and seasonal growth patterns.

Figure 3-10. Sonoma Water 2022 Seasonal Mainstem Russian River Ambient Algae and Nutrient Grab Sampling Stations.

Methods

Algal monitoring includes identifying genera present, assessing frequency of detections in microscope slides, collecting cover data using a line-intercept method, and estimating microalgae (microscopic algae) thickness and macroalgae (relatively large filamentous algae) length along established transects at the four monitoring and sampling stations. Multi-habitat algae samples (as well as a separate phytoplankton sample) are collected from the range of algae habitats present in the littoral zone (depth at which light penetrates and supports photosynthesis) up to 100 feet (30 meters) upstream and downstream of the transect. Habitat variations sampled include different substrates (cobble, gravel, sand or mud), flow velocities, depths, shade, and incorporated emergent or floating aquatic vegetation, boulders, woody debris, edge water, and backwater, riffle, run and pool habitats. Genera present were identified by preparing wet slides of algae samples and evaluating taxa under 10X to 400X magnification. For each monitoring event, ten (10) slides were evaluated for each multi-habitat and phytoplankton sample collected to determine the frequency of occurrence of algal genera at each monitoring site. Frequency of occurrence equals the number of times a given taxa is detected divided by the total number of detections. Frequency can be calculated for each monitoring event or across the period of study.

For the convenience of analysis, algal groupings of genera are classified as: “Diatoms”; “Green Macrophytes” (filamentous and colonial green algae, desmids and *Vaucheria*); “Cyanobacteria”; and “Others” (including red algae, dinoflagellates, and golden brown algae). These groupings are convenient for separating algae types based on photosynthetic pigment (*chlorophyll a*, c, and phycobillins), morphology (filamentous, colonial or single celled), and microscopic and macroscopic scale.

These algal groupings follow formal taxonomy for “Diatoms” (members of the Division Bacillariophyta) and “Cyanobacteria” (members of the Division Cyanophyta or photosynthetic bacteria), which are both considered microalgae for the purposes of monitoring cover and thickness. The Genera incorporated in “Green Macrophytes” are considered macroalgae and include both filamentous and single celled members of the Division Chlorophyta (green algae) and filamentous members of Xanthophyta (yellow-green algae). Specifically, “Green Macrophytes” described here include both green and yellow green macroscopic genera dominant in the periphyton such as *Vaucheria* (yellow green), *Cladophora* (green), *Spirogyra* (green), *Mouegotia* (green), *Oedogonium* (green), *Zygnema* (green), and *Tribonema* (yellow-green). The “Others” grouping includes the Divisions Rhodophyta (red algae), Chrysophyta (golden brown algae), and Dinophyta (Dinoflagellates). Periphyton refers to the collection of organisms, including but not limited to algae and detritus, attached on the surface of unspecified substratum type.

Results

Given that 2022 was a dry year beginning in January, monitoring was conducted prior to the TUC Order taking effect in June to evaluate watershed conditions affecting algae growth leading up to the period in which the Order was active from 17 June through 14 December. Results are presented based on a diversity and frequency analysis and a cover and thickness evaluation.

Diversity and Frequency Analysis

Between 9 March and 16 November 2022, 815 slides were prepared and evaluated from multi-habitat and phytoplankton tow samples collected from the four monitoring stations. Genera present in the samples were detected and identified a total of 17,788 times. Table 3-7 illustrates the frequency of algal genera observed in the mainstem Russian River between 9 March 2022 and 16 November 2022 at the four algal monitoring stations. Table 3-7 displays which algal genera were detected, their taxonomic division, the number of detections, and the relative percent they were detected during sampling.

Figures 3-11 through 3-14 illustrate the shifts in frequency of the four algal groups through the monitoring season based on the number of detections of algae genera collected from the range of algae habitats. Relative abundance can be expressed as the number of times a taxa was identified out of the number of slides evaluated or as the number of times the genus was detected out of all detections.

Some direct observations are evident based upon seasonal collection of algal frequency. Diatoms were consistently found in the greatest frequency at all stations, with green macrophyte frequency surpassing the frequency of cyanobacteria at all sites. Diatom frequency was higher at all sites than the frequency of Green macrophytes and Cyanobacteria observations throughout the monitoring season. Figures 3-11 through 3-14 illustrate the seasonal changes in functional groups over time. In 2022 Cyanobacteria did not become prevalent until the middle of June at most sampling sites. Also at most sampling sites Green macrophytes tend to either hold steady or drop slightly in detections during the period of increasing cyanobacteria detections. This could be related to formation of bubble towers and loss of periphyton through cyanobacteria harmful algal bloom formation and release (cyanoHABs), or simply illustrate increasing contributions by cyanobacteria as the season progresses. At all sites detections of cyanobacteria follow a gradient that increases downstream. The abundance of heterocyst forming cyanobacteria (Nostocales) follows a similar downstream gradient. The balance of heterocyst forming versus non-heterocyst forming cyanobacteria is often used as an indicator of the lack of nitrogen availability. Figure 3-15 illustrates overall frequency of detections for algal groupings as a percentage calculated for all sites within the monitoring season. Diatoms accounted for the majority of all detections (approximately 61%). Green macrophytes comprised 24% of detections, cyanobacteria comprised 13%, while the Others only consisted of 2% of total detections.

Table 3-7. Algal Genera by Funtional Group Detected at Ambient Algae Monitoring Stations in the Russian River in 2022.

Division	Genus	Total Detections	Percentage Frequency
Diatoms	*Amphora*	673	3.78%
Diatoms	*Asterionella*	21	0.12%
Diatoms	*Aulacoseira*	387	2.18%
Diatoms	*Bacillaria*	40	0.22%
Diatoms	*Campylodiscus*	259	1.46%
Diatoms	*Cocconeis*	665	3.74%
Diatoms	*Cyclotella*	46	0.26%
Diatoms	*Cymatopleura*	256	1.44%
Diatoms	*Cymbella*	544	3.06%
Diatoms	*Diatoma*	676	3.80%
Diatoms	*Ellerbeckia*	321	1.80%
Diatoms	*Encyonema*	360	2.02%
Diatoms	*Epithemia*	343	1.93%
Diatoms	*Fragillaria*	563	3.17%
Diatoms	*Gomphonema*	562	3.16%
Diatoms	*Gyrosigma*	326	1.83%
Diatoms	*Hydrosera*	76	0.43%
Diatoms	*Melosira*	730	4.10%
Diatoms	*Navicula*	764	4.30%
Diatoms	*Nitzschia*	440	2.47%
Diatoms	*Pinnularia*	239	1.34%
Diatoms	*Rhoicosphenia*	401	2.25%
Diatoms	*Rhopalodia*	309	1.74%
Diatoms	*Surirella*	203	1.14%
Diatoms	*Synedra*	797	4.48%
Diatoms	*Ulnaria ulna*	797	4.48%
Total Diatoms Detections		**10,798**	**60.70%**
Green Macrophytes	*Actinastrum*	84	0.47%
Green Macrophytes	*Aphanochaete*	59	0.33%
Green Macrophytes	*Chlamydomonas*	154	0.87%
Green Macrophytes	*Cladophora*	453	2.55%
Green Macrophytes	*Closterium*	321	1.80%
Green Macrophytes	*Coelastrum*	45	0.25%
Green Macrophytes	*Cosmarium*	15	0.08%
Green Macrophytes	*Draparnaldia*	35	0.20%
Green Macrophytes	*Pandorina/Eudorina*	20	0.11%
Green Macrophytes	*Geminella*	16	0.09%
Green Macrophytes	*Gloeocystis*	51	0.29%
Green Macrophytes	*Golenkinia*	55	0.31%

Table 3-7. Continued. Algal Genera by Grouping Detected at Ambient Algae Monitoring Stations in the Russian River in 2022.

Division	Genus	Total Detections	Percentage Frequency
Green Macrophytes	*Gonatozygon*	6	0.03%
Green Macrophytes	*Gonium*	4	0.02%
Green Macrophytes	*Hydrodictyon*	57	0.32%
Green Macrophytes	*Microspora*	29	0.16%
Green Macrophytes	*Mougeotia*	363	2.04%
Green Macrophytes	*Oedogonium*	527	2.96%
Green Macrophytes	*Oocystis*	6	0.03%
Green Macrophytes	*Pediastrum/Stauridium*	77	0.43%
Green Macrophytes	*Penium*	2	0.01%
Green Macrophytes	*Rhizoclonium*	55	0.31%
Green Macrophytes	*Scenedesmus*	353	1.98%
Green Macrophytes	*Spirogyra (all spp.)*	499	2.81%
Green Macrophytes	*Sphaerocystis*	21	0.12%
Green Macrophytes	*Staurastrum*	11	0.06%
Green Macrophytes	*Stigeoclonium*	156	0.88%
Green Macrophytes	*Tetraspora*	14	0.08%
Green Macrophytes	*Tribonema*	334	1.88%
Green Macrophytes	*Ulothrix*	79	0.44%
Green Macrophytes	*Ulva*	150	0.84%
Green Macrophytes	*Vaucheria*	224	1.26%
Green Macrophytes	*Volvox*	1	0.01%
Green Macrophytes	*Zygnema*	84	0.47%
Total Green Macrophyte Detections		**4,360**	**24.51%**
Cyanobacteria	*Anabaena*	189	1.06%
Cyanobacteria	*Aphanizomenon*	2	0.01%
Cyanobacteria	*Aphanocapsa*	110	0.62%
Cyanobacteria	*Aphanothece*	138	0.78%
Cyanobacteria	*Arthrospira/Spirulina*	11	0.06%
Cyanobacteria	*Calothrix*	29	0.16%
Cyanobacteria	*Chamaesiphon*	23	0.13%
Cyanobacteria	*Coelosphaerium*	10	0.06%
Cyanobacteria	*Chroococcus*	18	0.10%
Cyanobacteria	*Cylindrospermum*	164	0.92%
Cyanobacteria	*Dolichospermum*	28	0.16%
Cyanobacteria	*Dolichospermum*	28	0.16%
Cyanobacteria	*Geitlerinema*	304	1.71%
Cyanobacteria	*Gloeotrichia*	57	0.32%
Cyanobacteria	*Hapalosiphon*	3	0.02%
Cyanobacteria	*Leptolyngbya*	361	2.03%

Table 3-7. Continued. Algal Genera by Grouping Detected at Ambient Algae Monitoring Stations in the Russian River in 2022.

Division	Genus	Total Detections	Percentage Frequency
Cyanobacteria	*Lyngbya*	60	0.34%
Cyanobacteria	*Merismopedia*	5	0.03%
Cyanobacteria	*Microcoleus*	221	1.24%
Cyanobacteria	*Microcystis*	6	0.03%
Cyanobacteria	*Nodularia*	26	0.15%
Cyanobacteria	*Nostoc*	168	0.94%
Cyanobacteria	*Oscillatoria*	171	0.96%
Cyanobacteria	*Phormidium*	129	0.73%
Cyanobacteria	*Planktothrix/Limnothrix*	52	0.29%
Total Cyanobacteria Detections		**2,285**	**12.85%**
Golden Brown	*Dinobryon*	39	0.22%
Golden Brown	*Mallomonas*	17	0.10%
Golden Brown	*Synura*	19	0.11%
Euglenoid	*Euglena*	41	0.23%
Euglenoid	*Lepocinclis*	27	0.15%
Euglenoid	*Monomorphina*	4	0.02%
Euglenoid	*Phacus*	6	0.03%
Dinoflagellate	*Ceratium*	26	0.15%
Dinoflagellate	*Peridinium*	2	0.01%
Red Algae	*Audouinella*	158	0.89%
Red Algae	*Batrachospermum*	5	0.03%
Red Algae	*Compsopogon*	1	0.01%
Total Other Algae Detections		**345**	**1.94%**
Grand Total Algae Detections		**17,788**	

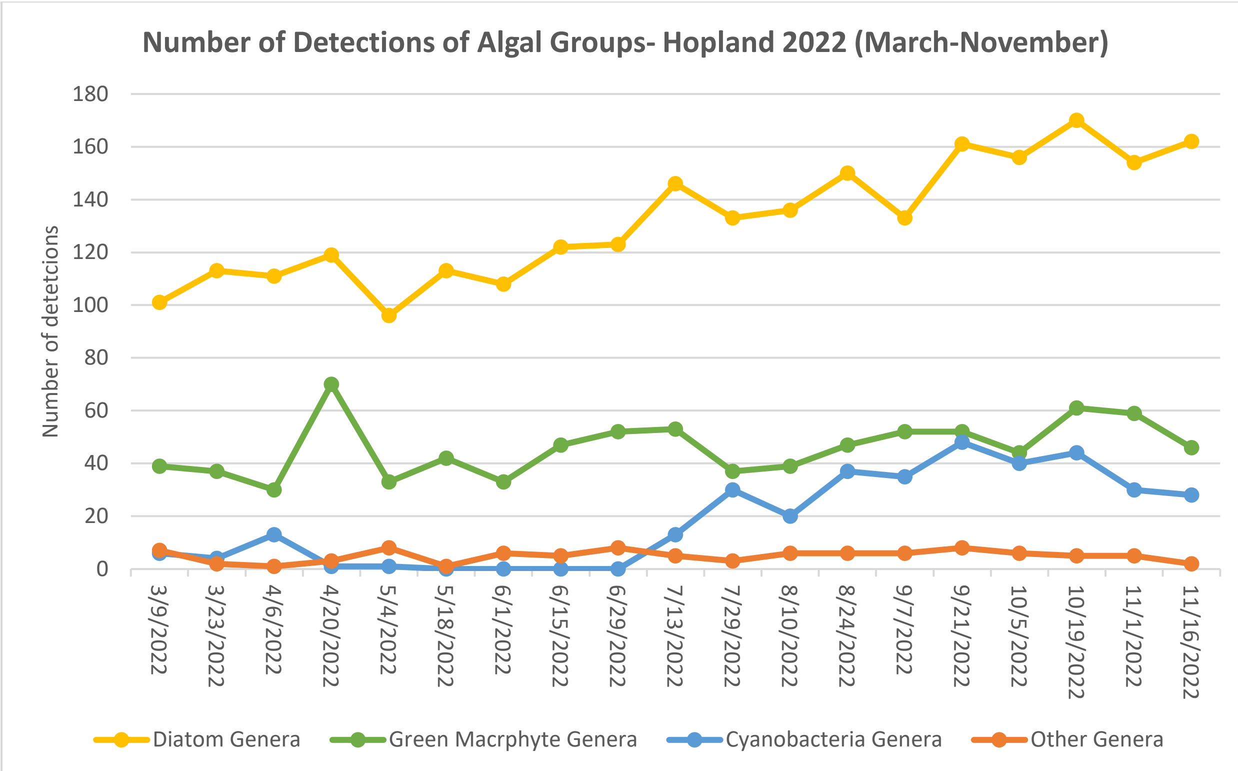

Figure 3-11. Number of Detections of Algal Groups at the Hopland Monitoring Station in 2022.

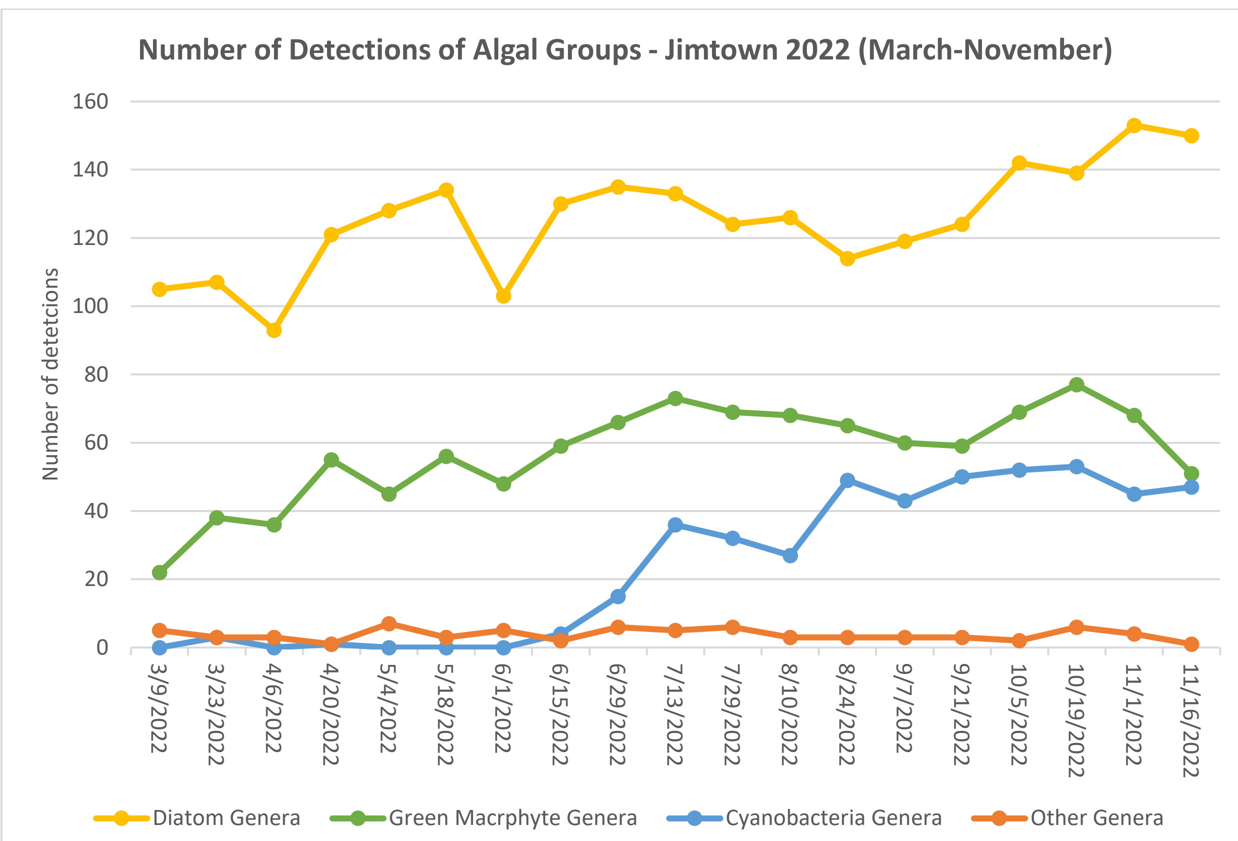

Figure 3-12. Number of Detections of Algal Groups at the Jimtown Monitoring Station in 2022.

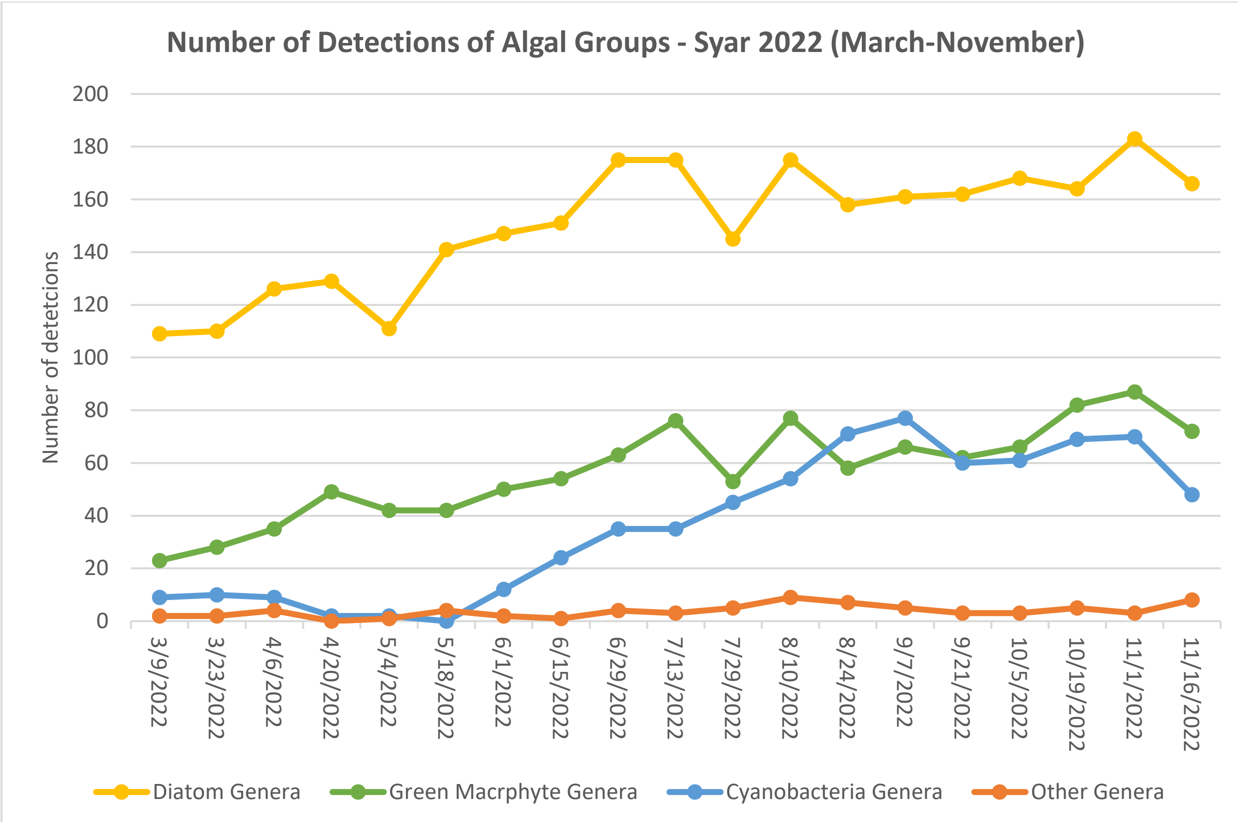

Figure 3-13. Number of Detections of Algal Groups at the Syar Monitoring Station in 2022.

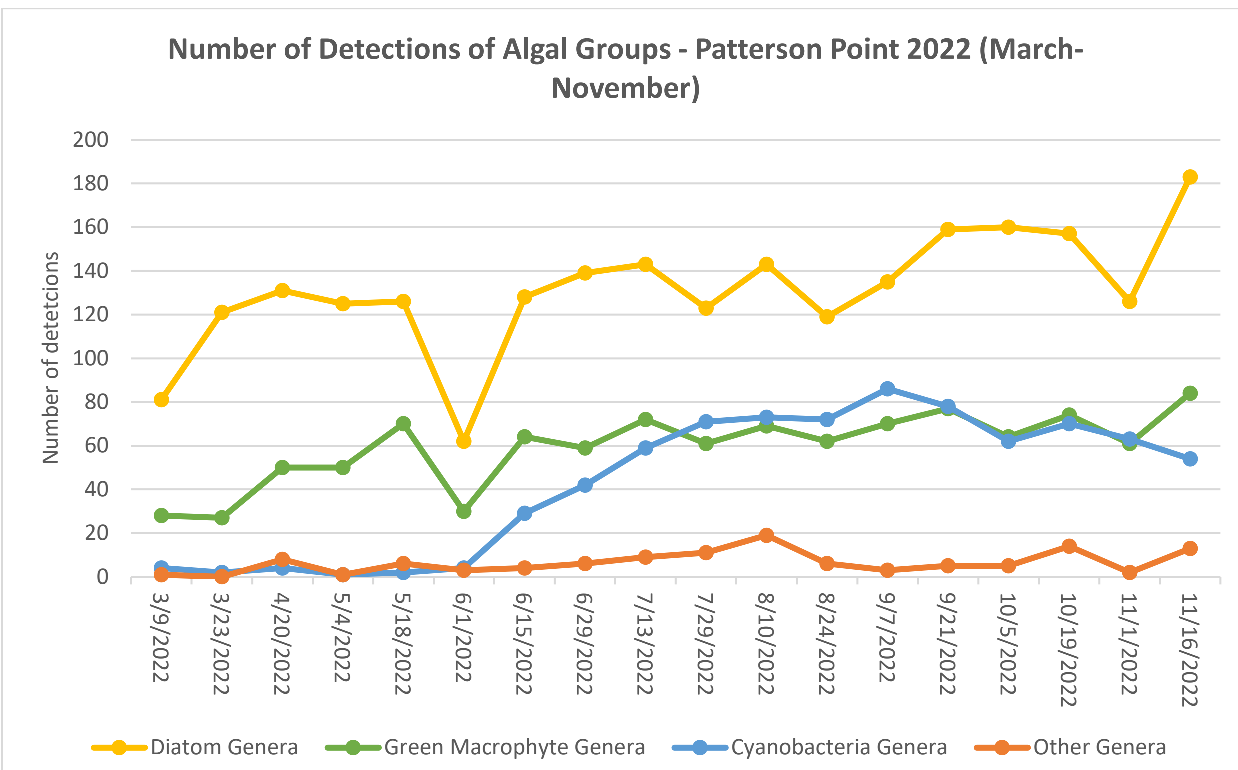

Figure 3-14. Number of Detections of Algal Groups at the Patterson Point Monitoring Station in 2022.

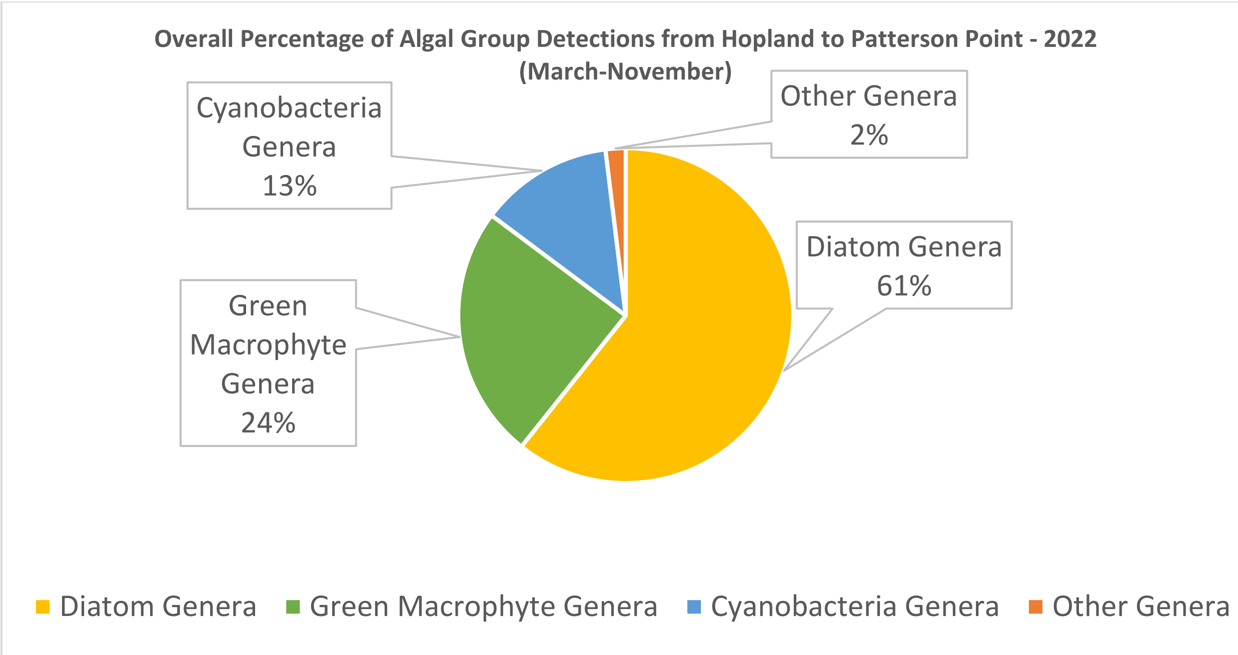

Figure 3-15. Overall Percentage of Algal Group Detections at Hopland, Jimtown, Syar, and Patterson Point in 2022.

Cover and Thickness Analysis

For estimating cover, the periphyton was divided into two groups differentiated by their visibility without microscopic evaluation. Microalgae forms a film or a coating on substrate and other algae. It is comprised of the microscopic algae genera in the periphyton dominated by diatoms and cyanobacteria, but also includes other benthic green, red, and yellow-green microscopic algal genera. Macroalgae are the larger filamentous members of the periphyton frequently colonized by microalgae, which often breaks off and forms drifting masses (or metaphyton) during phases of its lifecycle that can accumulate in backwater areas and shallow shorelines.

Percent cover is estimated by determining the presence of microalgae and/or macroalgae at a given point location across a linear transect in the littoral zone. The number of points microalgae and/or macroalgae is present along the transect, divided by the total number of points sampled, represents the percent cover. As a metric to quantify biomass, or density of algae in the littoral zone, the thickness of the microalgae is measured and the length of the macroalgae is measured to quantify the relative contributions of microalgae and macroalgae to the overall periphyton.

Figures 3-16 through 3-19 display estimated cover contributed by microalgae (diatoms and cyanobacteria) versus macroalgae (filamentous green and yellow-green algae) at each sampling site during the monitoring season. Microalgae cover was generally higher and stayed higher at Patterson, Syar, and Hopland sites than macroalgae cover throughout monitoring season. At Jimtown, with macroalgae cover so high, microalgal thickness was difficult to consistently evaluate. Diatoms and cyanobacteria dominate microalgae in the river. Uneven growth of these taxa on green macrophytes or shading of substrate affects the visual assessment of thickness across the river bottom. At Patterson and Jimtown cover by all groups generally increased over the season through September. At Hopland, there was an initial loss of cover by green macrophytes, which began to recover by November 2022. At Syar, initially high cover by diatoms largely remained at high levels during the monitoring season.

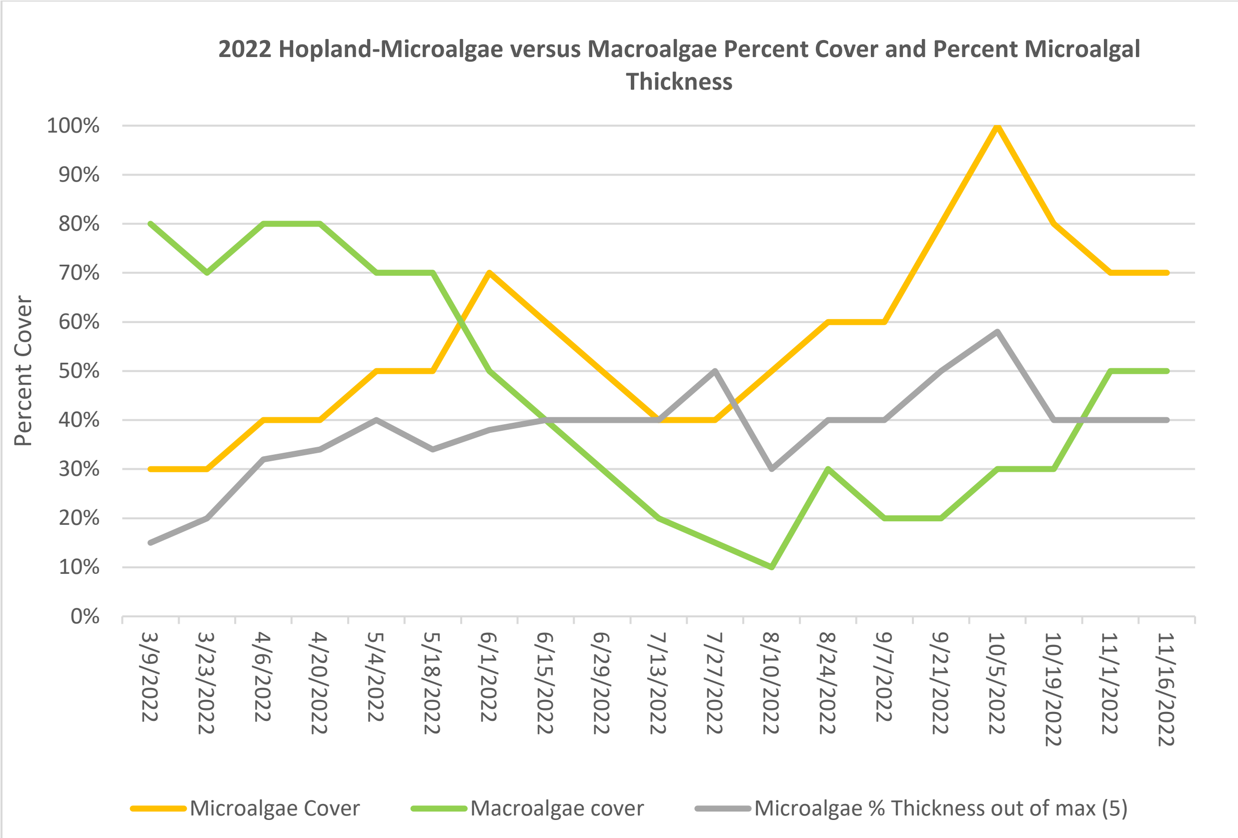

Figure 3-16. Microalgae versus Macroalgae Percent Cover and Percent Microalgae Thickness at Hopland in 2022.

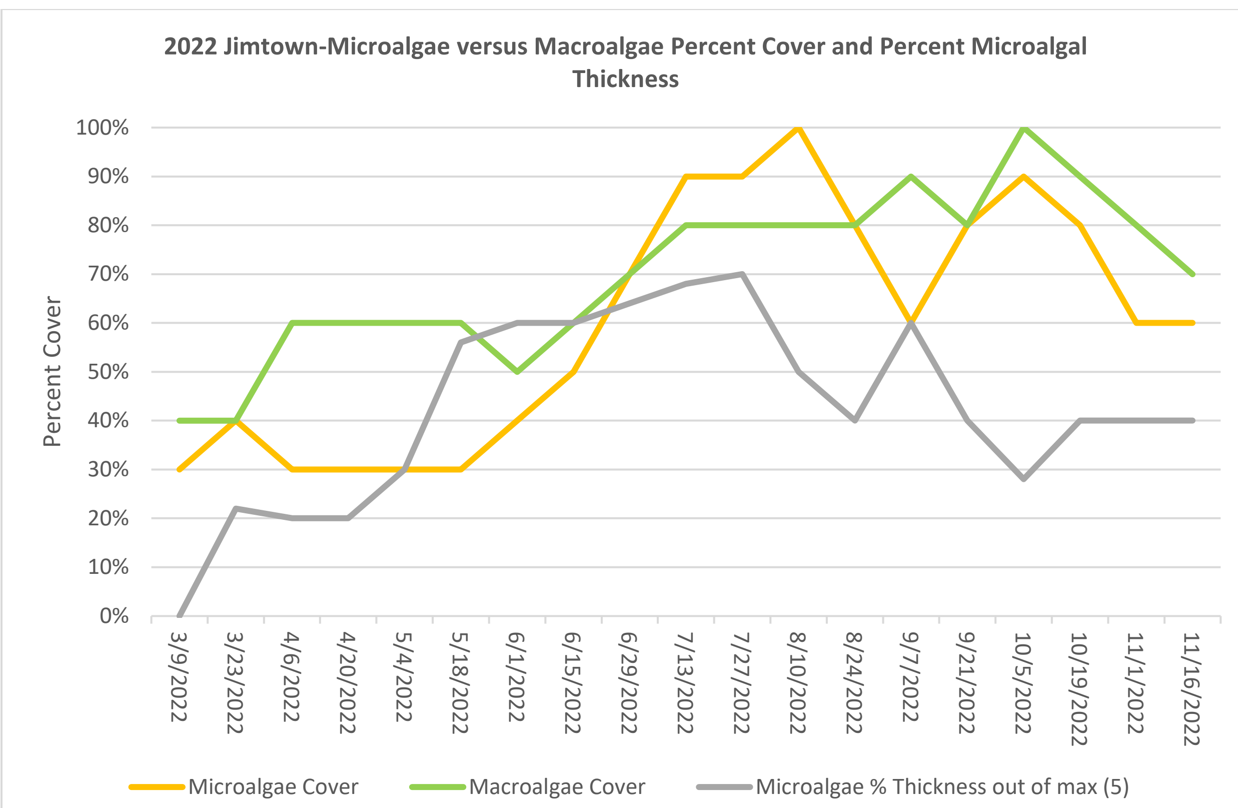

Figure 3-17. Microalgae versus Macroalgae Percent Cover and Percent Microalgae Thickness at Jimtown in 2022.

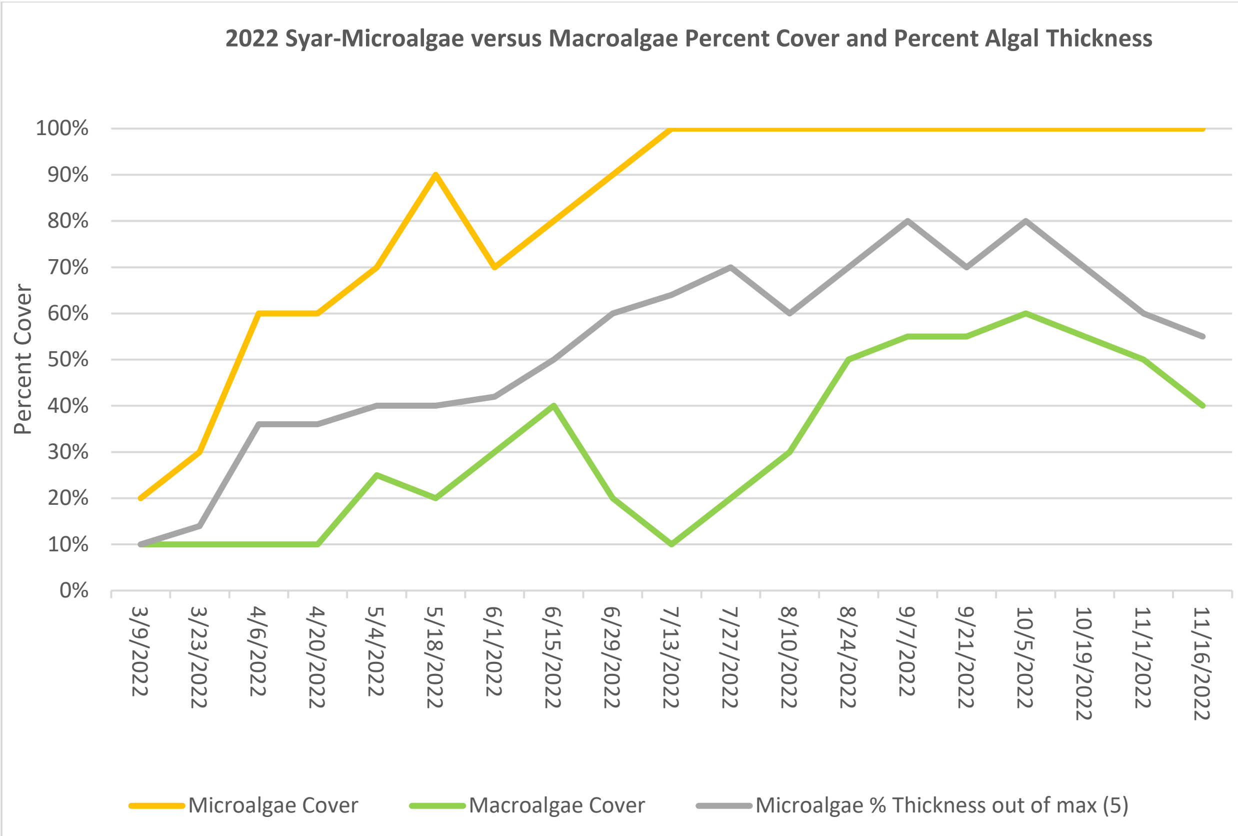

Figure 3-18. Microalgae versus Macroalgae Percent Cover and Percent Microalgae Thickness at Syar in 2022.

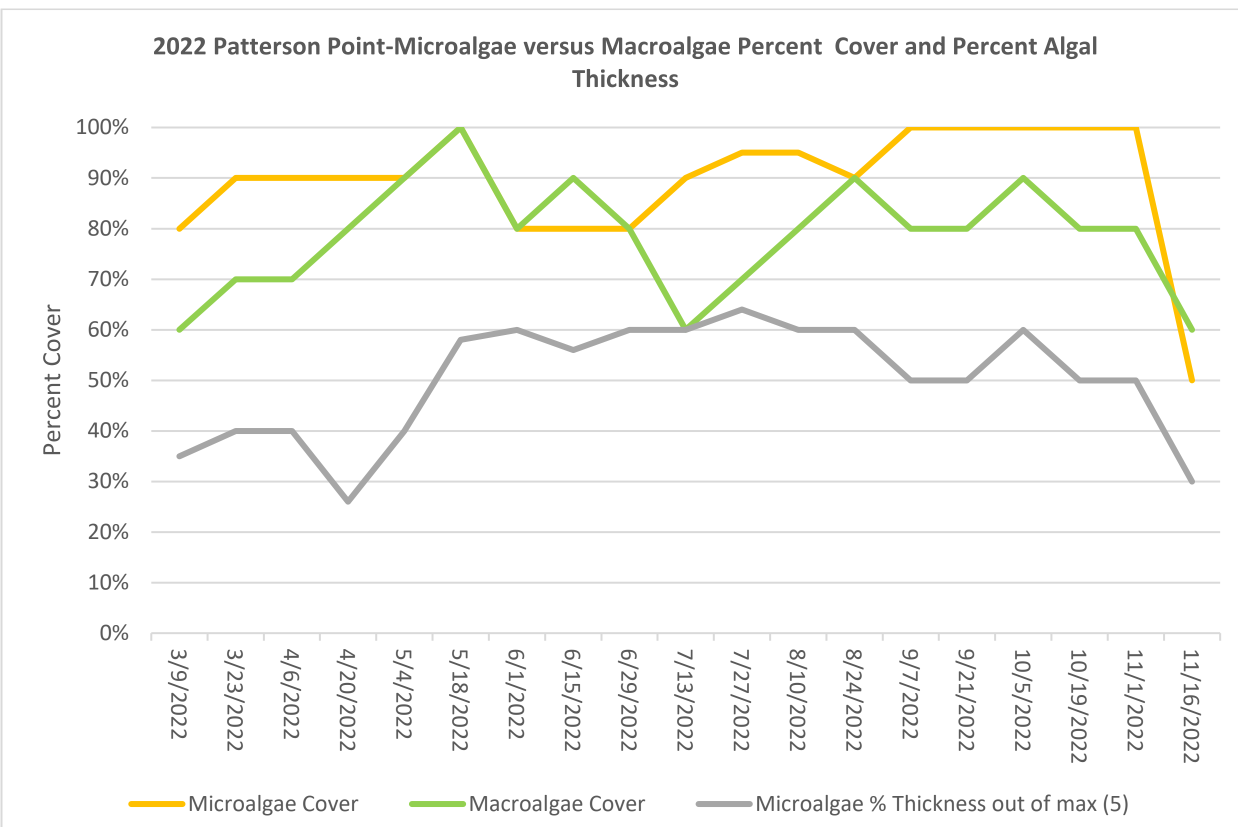

Figure 3-19. Microalgae versus Macroalgae Percent Cover and Percent Microalgae Thickness at Patterson Point in 2022.

Summary

Periphyton growth in the Russian River is strongly affected by the frequency and duration of high scouring flows during the winter and by the type of transition that occurs in a given year between high flow and low flow periods. Specifically, algal growth dynamics appear to be driven by what kind of transition takes place from high scouring winter and early spring flows to reservoir sustained low flows during the late spring, summer and fall. During drought conditions there are limited high flow periods through the late fall, winter and early spring. When high scouring flows do not occur, periphyton cover present in the summer through late fall is still present as flows switch from tributary and watershed augmented to reservoir released sustained flows. How quickly the periphyton develops in the following low flow season is tied to the degree of scour occurring in the channel during the winter and spring high flows, the degree of bed movement in the littoral zone, the survival of grazing organisms, and where deposits of early spring blooms accumulate, decay and provide resources for microalgae, including cyanobacteria. How quickly periphyton recolonizes the littoral zone is strongly influenced by invertebrate grazing and nutrient availability. As soon as tributary flows reduce to summer levels, nutrients are essentially recycled inside the periphyton community, or contributed from metaphyton drift, and shoreline accumulations. Generally, a few high scour events will clear out grazers and re-distribute gravels, and in the next low flow season green macrophytes quickly recolonize. If there are not scouring events, the algae present at the end of the Fall can persist through the Winter, unless environmental signals stimulate a reproductive event and the green macrophytes become planktonic.

Overall, 2022 algae growth in the Russian River was affected by high flows from rain events in late October 2021, late December 2021 and in April of 2022. However, none of these events cleared out the invertebrate grazers or substantially re-arranged the substrate. Algae present in Fall 2021 and Winter 2022 was also present in Spring 2022. This was similar to observations in 2020-21.

Macrophytes with outer cell walls conducive to epiphyte growth (including *Cladophora*, *Oedogonium*, and *Vaucheria*) established dominance after the December 2021 high flow event. As flows receded, an abundance of snails and herbivorous invertebrate larvae (including New Zealand mud snails) were still present and began to graze at all sites. In late April, the shoreline zone was lightly scoured in a high flow event, removing established green macrophytes by around half. Significant gravel and bed movement was only observed at Patterson Point (located in the lower Russian River). With decreasing flows in May, metaphyton drift began accumulating on shorelines providing nutrients and substrate for cyanobacterial growth. In May, after some moderate April flows, the dense diatom coverage and continued invertebrate grazing led to a shift in the composition of dominant filamentous macrophytes. Macrophytes with cell walls that are not conducive to colonization by epiphytes (*Spirogyra*, *Mougeotia*, and *Zygnema*) were dominating the composition and cover of the periphyton. This shift in green macrophyte dominance may have affected the development and type of cyanobacterial HAB generating zones. Based on observation collected during monitoring in the Russian River, cyanoHAB zones are either formed by cyanobacteria (usually heterocystous) in conjunction with green macrophytes, or by mixed periphyton dominated by mucilage forming diatoms and cyanobacteria, or are relatively pure mats of cyanobacteria that release from the substrate during their life cycles. All of these tend to form in shallow exposed areas. CyanoHAB generating zones were not observed in abundance until July 2022. Generally, these were observed developing by June in previous sampling years.

At Hopland, the *Vaucheria* cover, which was high at the end of 2021, was present in May but was mostly gone by June 2022 and stayed below 20% until late August. Despite loss in cover by last year's crop of *Vaucheria* in June, dominant filamentous genera at Hopland were still observed to be predominately *Vaucheria* but joined by *Oedogonium*. At Syar, the dominant filamentous genera were *Cladophora* and *Oedogonium*. *Oedogonium* is a fast-growing filamentous alga with a hard outer cell wall that allows for colonization by epiphytes in a similar way as *Cladophora*. Patterson Point and Jimtown were both characterized by *Spirogyra* as the dominant filamentous macrophyte, which does not allow for colonization by microalgae and so is not a genus often associated with cyanoHABs. Mats of *Microcoleus/Phormidium* (Oscillatorian genera) were present associated with layers of mucilaginous diatoms, and widespread by the end of August. This is at least a month later in the season than *Microcoleus/Phormidium* mat observations in 2021. Patterson and the off-stream pond at Syar supported abundant colonies of the heterocyst forming cyanobacteria Gloeotrichia, which forms floating amorphous gelatinous clumps, and is often entrained in patches of *Ludwigia*.

By mid-September Russian River monitoring sites at Hopland, Jimtown, and Syar started supporting widespread *Microcoleus/Phormidium* mat coverage in riffles on cobble, fine substrate within riparian vegetation in low flow, and on concrete boulders into November. Overall, based on observations of cover, abundance and density, the seasonal peak of periphyton occurred in mid/late September in 2022. The diatoms *Rhopalodia* and *Epithemia* (which are genera known to have cyanobacterial symbionts) were observed to be microscopically associated (imbedded in mucilage) with the cyanobacterial mats. Since these diatoms are associated with cyanobacteria, their occurrence is a sign that cyanobacteria are present. Other diatoms regularly observed associated with cyanobacteria colonies include stalked versions of *Gomphonema* and *Amphora*, and *Cymbella*. A wide variety of Oscillatorian cyanobacteria were observed associated with cyanobacterial mat development on finer substrates (sand and small gravels). Oscillatorian genera that were prevalent in 2022 included *Leptolyngba*, *Geitlerinema*, and several forms of *Phormidium* and *Oscillatoria* (Figure 3-21). Periphyton communities began to decline at the beginning of October as day length, light penetration in the water column, and water temperatures decreased into November.

Figure 3-20. Variety of Oscillatorian cyanobacteria genera and forms observed in 2022.

CyanoHABs

Factors that drive periphytic algal growth in rivers are primarily water temperature, light, available nutrients, available habitat, competition, allelopathy, grazing, epiphytic growth, and the presence and velocity of water. All that is driven by large-scale factors like climate, geology, and land use that affect the resources, biotic factors, and abiotic stressors that directly affect the function and structure of benthic algal assemblages. Every year conditions that support development of cyanoHABs occur in the Russian River regardless of minor differences in the low-flow condition. Development of cyanoHABs has been observed to be largely independent of low flow conditions and have been observed developing under very low nutrient conditions. Years with high and extended flows developed cyanoHABs in similar abundance and distribution as in drought years. Nutrient levels, while certainly a factor to consider for algal growth, are not the sole driver of cyanoHABs in the Russian River because most cyanobacteria are able to fix the nitrogen they need for metabolism and phosphorus is abundant and not a limiting nutrient. CyanoHABs have continued to occur during the last two drought years despite no runoff from land or change in water source.

The pattern of ecological factors that affect benthic algal abundance depends on if the factor has a direct effect and at what landscape habitat or cellular scale the factor operates. Direct actions that could reduce the influence of these factors are difficult to identify or rectify as several key factors that appear to drive cyanoHAB development operate at the climate and landscape level. Three forms of cyanoHAB have been observed in the Russian River. These include bubble towers (mostly formed with green macrophyte that allow colonization), mixed cyanobacterial diatom mats (gelatinous diatoms mixed with various smaller green macrophytes (that do not allow colonization), and relatively uniform cyanobacteria mats (*Oscillatoria, Phormidium* and *Microcoleus*).

Based on years of algae monitoring since 2017, a hypothesis has developed regarding factors that have been observed affecting development of cyanoHABs including:

- Scouring flows the previous Winter and Spring (landscape factor- Climate)
- Extended Spring flows that deposit metaphyton on the flood plain and not in the thalweg (landscape factor- Climate)
- Location in the river and position in the thalweg (habitat factor)
- Type of cyanobacteria making up the bloom (species level factor)
- Dominant type of algae-green macrophyte or diatom (species level factor)
- Extent of habitat along the river (wetted area) (flow related factor)

Each of these factors is discussed briefly below.

Scour- Heavy scour occurring in the winter at high flows at the habitat level reduces available propagules for re-establishment but also provides for space to grow, introduces fresh substrate that provides new nutrients into the system, and flushes out invertebrate grazers. Heavy scour will result in a faster establishing and growing periphyton because of the lack of grazing. Heavy scour appears to favor establishment of *Cladophora*, a green algae that favors cyanobacteria colonization. More *Cladophora* supports bubble tower HABs. Light or no scour appears to favor establishment of *Spirogyra* (which does not favor cyanobacteria colonization) and thick diatom layers. Light scour appears to favor mixed diatom mat HABs.

Extended spring flows- Extended spring flows can result in either the isolation of spring metaphyton on the flood plain, or spring metaphyton can be drawn down into the thalweg. Without the spring metaphyton in the thalweg there is less substrate to decay, provide habitat and nutrients for cyanobacteria growth. Cyanobacteria colonization and subsequent CyanoHABs usually develop first in the unattached drift decaying along the shoreline. Extended spring flows that trap algae out of the thalweg reduce available substrate, nutrients and carbon that would otherwise support cyanoHAB development.

Location in the river- Location can be tied to specific types of habitats and the tendency of certain cyanobacteria to favor different parts (upper, middle, and lower) of the river that generate cyanoHABs. Wide shallow areas in the middle and lower river support the most obvious HAB generating zones. The more wide shallow zones there are along a river the greater cyanoHAB development. The lower river supports more heterocystous forms of cyanobacteria. CyanoHABs develop a few weeks earlier in the lower river than the middle and upper river. CyanoHABs developing in the lower river are primarily bubble tower types initially and transition to a mix of bubble tower mixed cyanobacterial diatom mat, and cyanobacterial mat as the season progresses. The upper river supports more non-heterocystous forming cyanobacteria (specifically the Ocillatoriales group). While these taxa do not have heterocysts, they are known to fix atmospheric nitrogen. Many of these taxa are mobile and capable of moving themselves to the most desirable locations in the periphyton. These taxa mix with diatoms to form mixed cyanobacteria diatom mats or form near single species uniform mats.

Type of cyanobacteria- Different cyanobacteria genera produce different toxins, interact with green macrophytes and diatoms differently, and develop into different forms of cyanoHAB. There is an assumption of cyanobacteria interaction and that genera may have allelopathic effects on other algae as well including other cyanobacteria.

Dominant algae- The green macrophytes establishing that allow for epiphytic colonization versus the genera that do not support colonization affects the form of the cyanoHAB. If diatom cover on the substrate include abundant gelatinous matrix forming genera, the cyanoHAB will be in the form of a mixed cyanobacterial diatom mat. If green macrophytes are present that allow for cyanobacteria colonization, the cyanoHAB will form as a bubble tower.

Extent of habitat-River algae only grow where there is water to support them. During higher flows more wetted habitat is available for colonization. With lower flows less wetted area is available for colonization. Partially submerged gravel bars and other shallow areas support the best habitat for most algae to proliferate (particularly cyanobacteria) because of available light, warmer temperatures, and nutrient availability through metaphyton recycling. Shallow backwater areas also provide supportive habitat for cyanoHAB development.

These observations will continue to be evaluated during future algae monitoring. Other factors to consider include invertebrate analyses to relate the effect of algal composition on preferred grazing targets and invertebrate diversity, investigating temperature tolerances of Microcoleus/Phormidium mats, evaluating effect of different wetland vegetation at the gravel bar shoreline interface, and correlating cyanobacteria diversity and composition with toxin release (working with North Coast Regional Water Quality Control Board and Sonoma County Environmental Health Department).

Nutrients

Sonoma Water staff conducted biweekly nutrient grab sampling monitoring at five (5) stations in the mainstem Russian River including: the Hopland USGS gaging station, Cloverdale River Park in Cloverdale, the Jimtown USGS gaging station, Syar Vineyards, and Patterson Point (Figure 3-10).

All grab samples were analyzed for nutrients including: total organic nitrogen, ammonia, unionized ammonia, nitrate, nitrite, total Kjeldahl nitrogen, total nitrogen, total phosphorus, and total orthophosphate. Samples were also analyzed for total dissolved solids, total and dissolved organic carbon, turbidity, and *chlorophyll a,* which is a measurable parameter of algal growth that can be tied to excessive nutrient concentrations and reflect a biostimulatory response. Grab samples were submitted to Alpha Analytical Labs in Ukiah for analysis. Grab sample data was collected during Sonoma Water's ambient algae and cyanobacteria monitoring effort. However, sampling results are only included up to 5 October due to the timing of this report and delay associated with receiving sample results.

The sampling results for total nitrogen, total phosphorus, turbidity, and *chlorophyll a* are discussed below and summarized in Tables 3-8 through 3-10 and Figures 3-21 through 3-24. Highlighted values indicate those values exceeding EPA recommended ambient water quality criteria for "Rivers and Streams in Nutrient Ecoregion III" (EPA, 2000).

Lab analysis constraints in 2022 resulted in a method detection limit (MDL) for *chlorophyll a*, which is the level of accuracy for a given lab analysis to provide a valid concentration of a given constituent, that was higher than the EPA criteria for exceedances for *chlorophyll a* in rivers and streams. Put simply, the EPA exceedance criteria for *chlorophyll a* in rivers and streams is approximately 0.0018 mg/L, whereas the lab analysis MDL for *chlorophyll a* was 0.0030 mg/L. Therefore, some lab results for *chlorophyll a* that are listed as non-detect (ND) could potentially have concentrations above the criteria and below the MDL, which in turn could result in an under representation of the actual number of exceedances observed. However, for reporting purposes, only those exceedances that are quantified will be included in the summation. Additionally, it must be emphasized that the EPA criteria are not adopted standards and are therefore both subject to change (if it is determined that the guidelines or criteria are not accurate indicators) and are not currently enforceable.

Sampling results for other nutrient components, dissolved and total organic carbon, and total dissolved solids are included in the tables; however, a discussion of these constituents is not included in this report.

Estuary response and associated grab sampling data for 2022 is currently being compiled and will be discussed in greater detail in the Russian River Biological Opinion 2022-2023 annual report, which will be posted to Sonoma Water's website when available: https://www.sonomawater.org/biological-opinion-outreach.

Total Nitrogen

The EPA desired goal for total nitrogen in Aggregate Ecoregion III is 0.38 mg/L for rivers and streams (EPA, 2000).

Calculating total nitrogen values requires the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (referred to as Total Kjeldahl Nitrogen or TKN), and nitrate/nitrite nitrogen. The EPA criteria for Total Nitrogen was exceeded twenty-one (21) times prior to and during the terms of the Order, representing 23.3% of the total samples collected (21 out of 90) during the ambient algae monitoring effort (Tables 3-8 through 3-10, and Figure 3-21).

Hopland had ten (10) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of 16 samples collected (62.5%), under flows that ranged from 46.2 cfs to 115 cfs (Table 3-8 and Figure 3-21). The maximum seasonal value measured 1.0 mg/L on 9 February with a flow of 115 cfs (Table 3-8). The maximum seasonal value during the terms of the Order measured 0.57 mg/L on 13 July with a flow of 61.8 cfs (Table 3-8). The minimum seasonal value was 0.12 mg/L, which occurred during the terms of the Order on 10 August with a flow of 54.1 cfs. Nitrogen values were observed to generally decline from spring into summer, then periodically increase through summer and into the fall (Figure 3-21).

Cloverdale River Park had three (3) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of 16 samples collected (18.8%), under flows that ranged from 47.2 to 171 cfs (Table 3-8 and Figure 3-21). The maximum concentration measured 0.80 mg/L on 9 February with a flow of 171 cfs (Table 3-8). The maximum concentration during the terms of the Order measured 0.38 mg/L on 13 July with a flow of 47.2 cfs (Table 3-8).The minimum seasonal value was Non-Detect (ND), which occurred during the terms of the Order on 10 August with a flow of 57.0 cfs. Other than the three exceedances, nitrogen values were observed to generally decline from spring into summer, with values remaining relatively low through the monitoring season (Figure 3-21).

Jimtown had three (3) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of 16 samples collected (18.8%), under flows that ranged from 36.8 to 250 cfs (Table 3-9 and Figure 3-21). The maximum seasonal value measured 0.69 mg/L on 9 February with a flow of approximately 250 cfs (Table 3-9). The maximum seasonal value during the terms of the Order measured 0.43 mg/L on 13 July with a flow of approximately 36.8 cfs (Table 3-9).The minimum concentration was 0.077 mg/L, which occurred during the terms of the Order on 21 September with a flow of approximately 71.8 cfs. Nitrogen values at Jimtown were also observed to generally decline from spring into summer, with values remaining relatively low through the monitoring season (Figure 3-21).

Table 3-8. Sonoma Water 2022 Seasonal Mainstem Russian River Grab Sampling Results at Hopland and Cloverdale.

Hopland	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity***	Chlorophyll-a	USGS 11462500 RR near Hopland***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	Flow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
2/9/2022	13:50	11.1	8.2	0.38	ND	ND	0.66	ND	0.38	**1.0**	**0.041**	0.10	2.07	2.56	170	0.86	ND	115
3/9/2022	13:50	12.9	7.7	0.23	ND	ND	0.53	ND	0.23	**0.76**	**0.022**	0.054	1.94	2.36	160	1.4	**0.0040**	59.7
3/23/2022	14:00	15.8	7.6	0.34	ND	ND	0.38	ND	0.34	**0.72**	**0.025**	0.036	2.18	2.19	150	1.3	ND	44.1
4/6/2022	14:30	14.8	7.9	ND	ND	ND	0.28	ND	ND	0.28	0.018	ND	1.92	2.46	180	1.2	**0.0059**	41.5
4/20/2022	15:00	12.1	7.4	ND	ND	ND	0.24	ND	ND	0.24	**0.034**	0.057	2.53	3.19	130	**9.5**	ND	142
5/4/2022	13:30	16.3	8.1	ND	ND	ND	0.44	ND	ND	**0.44**	**0.038**	0.078	1.71	2.10	160	**2.8**	ND	68.3
5/18/2022	13:45	17.8	8.2	ND	ND	ND	0.15	ND	ND	0.15	**0.030**	ND	1.78	2.39	160	1.6	ND	43.1
6/15/2022	14:30	17.3	8.0	0.30	ND	ND	0.12	ND	0.30	**0.42**	**0.063**	0.11	3.32	3.87	130	**2.5**	**0.0045**	103
6/29/2022	14:30	19.7	8.1	0.34	ND	ND	0.21	ND	0.34	**0.55**	**0.073**	0.14	2.82	3.45	140	1.8	**0.0040**	46.2
7/13/2022	14:20	19.1	8.3	0.26	0.12	0.0084	0.19	ND	0.38	**0.57**	**0.067**	0.11	3.41	3.89	150	**2.4**	**0.0043**	61.8
7/27/2022	14:40	19.2	8.1	ND	ND	0.0035	0.16	ND	ND	0.164	**0.066**	0.11	3.45	4.16	130	**2.4**	ND	
8/10/2022	14:00	17.9	8.2	ND	ND	ND	0.12	ND	ND	0.12	**0.075**	0.12	3.44	4.27	120	2.3	**0.0048**	54.1
8/24/2022	14:00	18.8	8.5	0.30	ND	ND	0.20	ND	0.30	**0.50**	**0.093**	0.16	3.46	4.50	140	**2.8**	**0.0077**	66.3
9/7/2022	13:20	18.9	8.3	0.25	ND	ND	0.24	ND	0.25	**0.49**	**0.10**	0.18	3.05	3.75	130	1.6	**0.0043**	66.2
9/21/2022	14:10	17.0	8.3	0.23	ND	0.0024	0.27	0.050	0.23	**0.55**	**0.11**	0.26	2.87	3.57	140	1.2	ND	69.6
10/5/2022	13:50	16.8	7.6	ND	0.13	0.0018	0.36	ND	ND	0.36	**0.11**	0.28	2.75	3.23	160	1.6	**0.0061**	53.9

Cloverdale River Park	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity***	Chlorophyll-a	USGS 11463000 RR near Cloverdale***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	Flow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
2/9/2022	13:00	10.9	7.9	0.35	ND	ND	0.45	ND	0.35	**0.80**	0.015	ND	1.62	1.94	180	0.88	**0.0048**	171
3/9/2022	13:10	13.4	8.1	ND	ND	ND	0.33	ND	ND	0.33	0.0051	ND	1.34	1.60	190	0.67	ND	84.0
3/23/2022	13:20	17.0	8.0	0.37	ND	ND	0.20	ND	0.37	**0.57**	**0.024**	ND	1.29	1.43	210	0.71	ND	61.9
4/6/2022	13:40	16.7	8.0	ND	ND	ND	0.13	ND	ND	0.13	0.012	ND	1.31	1.64	240	1.3	ND	52.2
4/20/2022	14:20	12.8	7.4	ND	ND	ND	0.22	ND	ND	0.22	ND	ND	2.34	2.65	170	**3.6**	ND	197
5/4/2022	12:50	17.8	8.8	ND	ND	ND	0.14	ND	ND	0.14	ND	ND	1.50	1.73	180	1.6	ND	98.0
5/18/2022	12:10	19.1	8.4	ND	ND	ND	0.046	ND	ND	0.046	ND	ND	1.68	1.90	220	1.3	**0.0032**	54.0
6/15/2022	13:50	21.0	8.3	0.24	ND	ND	0.053	ND	0.24	0.293	ND	ND	2.46	2.98	150	1.2	**0.0043**	92.2
6/29/2022	13:40	23.9	8.5	0.21	ND	ND	ND	ND	0.21	0.21	**0.031**	ND	1.94	2.28	180	1.0	ND	35.4
7/13/2022	13:40	23.6	8.6	ND	0.12	0.019	0.065	ND	0.31	**0.38**	**0.033**	ND	2.68	3.02	160	0.71	**0.0040**	47.2
7/27/2022	14:10	23.5	8.5	ND	ND	0.011	0.065	ND	ND	0.076	**0.028**	ND	2.96	3.20	140	1.2	**0.0040**	55.6
8/10/2022	13:00	23.0	8.4	ND	ND	ND	ND	ND	ND	ND	**0.035**	0.030	3.24	3.27	150	0.96	**0.0048**	57.0
8/24/2022	13:20	23.6	8.4	ND	ND	ND	0.066	ND	ND	0.066	**0.037**	0.045	2.85	3.73	150	2.2	ND	62.7
9/7/2022	12:40	23.2	8.4	0.20	ND	ND	0.063	ND	0.20	0.263	**0.032**	0.044	2.49	2.96	150	0.70	ND	60.8
9/21/2022	13:30	19.0	9.0	0.23	ND	0.0055	0.058	ND	0.23	0.288	**0.053**	0.098	3.21	3.89	130	0.60	ND	72.8
10/5/2022	13:10	19.0	8.2	ND	0.13	0.0066	0.084	ND	ND	0.221	**0.035**	0.070	2.23	2.48	150	0.45	ND	52.7

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

*** United States Geological Survey (USGS) Continuous-Record Gaging Station.

**** Flow rates are preliminary and subject to final revision by USGS.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.02188 mg/L (21.88 ug/L) ≈ 0.022 mg/L

Total Nitrogen: 0.38 mg/L

Chlorophyll *a*: 0.00178 mg/L (1.78 ug/L) ≈ 0.0018 mg/L

Turbidity: 2.34 FTU/NTU

Syar also had three (3) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of 16 samples collected (18.8%) that occurred early in the season before the USGS 11465390 near Windsor gaging station was installed for the season, as well as during a flow of 121 cfs (Table 3-9 and Figure 3-21). The maximum seasonal value measured 0.55 mg/L on 9 February with an estimated flow of approximately 365 cfs (Table 3-9). The USGS near Windsor gaging station had not been installed for the season therefore estimated flow is based on a flow of 265 cfs at USGS RR near Healdsburg combined with a flow of 100 cfs at USGS Dry Creek near Mouth. The maximum seasonal value during the terms of the Order measured 0.43 mg/L on 24 August with a flow of 121 cfs (Table 3-9). The minimum seasonal value was 0.045 mg/L which occurred during the terms of the Order on 27 July with a flow of 123 cfs. Syar also had nitrogen values that generally declined from spring into summer, with overall values remaining relatively low through the monitoring season (Figure 3-21).

Patterson Point had two (2) exceedances of the total nitrogen criteria prior to and during the terms of the Order out of 26 samples collected (7.7%), under flows that ranged from 87.4 cfs to 439 cfs (Table 3-10 and Figure 3-21). The maximum seasonal value measured 0.46 mg/L on 9 February with a flow of 439 cfs (Table 3-10). The maximum seasonal value during the terms of the Order measured 0.460 mg/L on 27 September with a flow of 87.4 cfs (Table 3-10 and Figure 3-21). The minimum seasonal value was Non-Detect (ND), which occurred five (5) times prior to and during the terms of the Order with flows that ranged from 44.9to 219 cfs. Aside from the two exceedances, total nitrogen values remained relatively low at Patterson Point through the monitoring season.

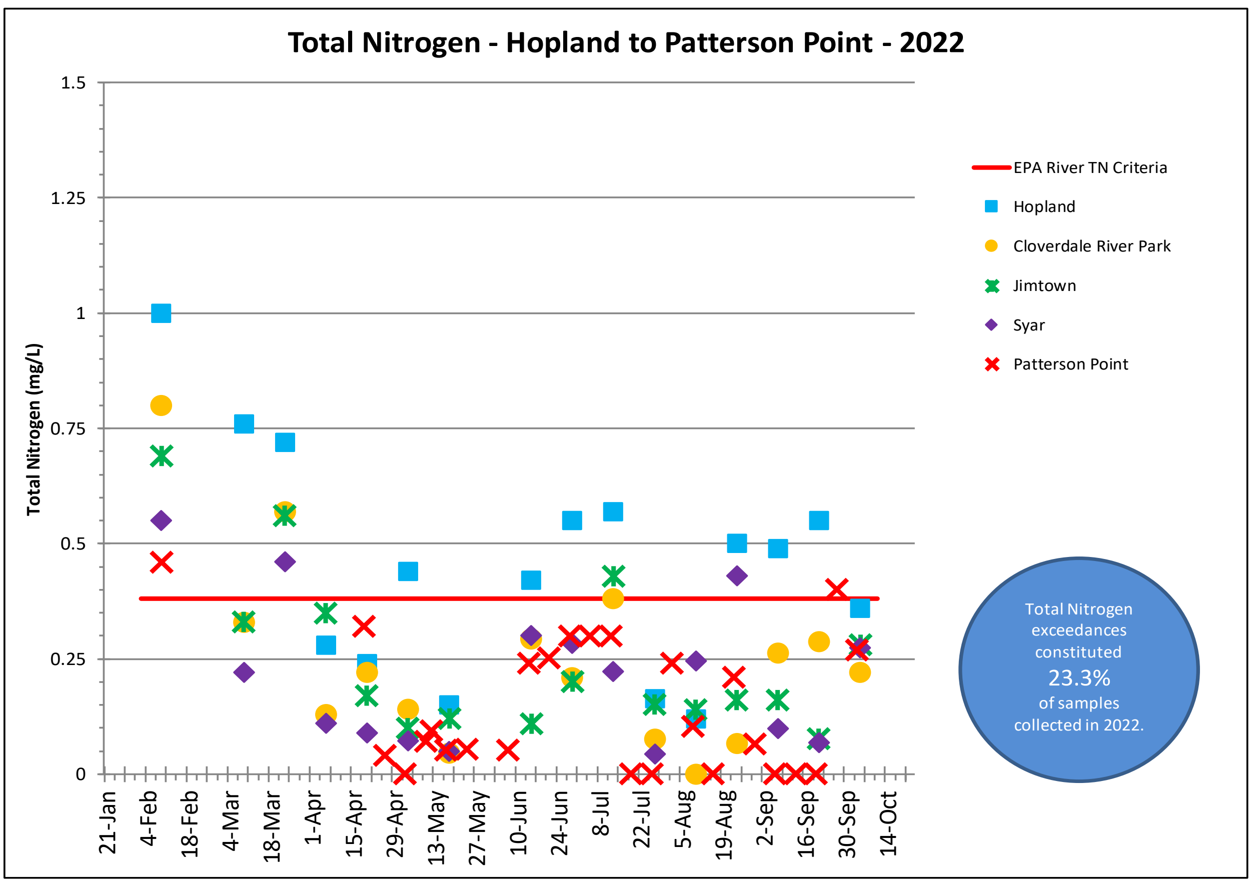

Figure 3-21. Sonoma Water Seasonal Mainstem Russian River Grab Sampling Total Nitrogen Results in 2022.

Total Phosphorus

The EPA's desired goal for total phosphates as phosphorus in Aggregate Ecoregion III has been established as 21.88 micrograms per liter (µg/L), or approximately 0.022 mg/L, for rivers and streams (EPA, 2000). All five monitoring stations were observed to have exceedances of the EPA criteria for total phosphorous during the monitoring season (Tables 3-8 through 3-10, and Figure 3-22). The EPA criteria was exceeded fifty-eight (58) times prior to and during the terms of the Order out of 90 samples collected at the five stations (64.4%). The Hopland and Patterson Point stations predominantly exceeded the total phosphorus criteria prior to and during the terms of the Order. Whereas the Cloverdale and Jimtown stations had only one exceedance each prior to the terms of the Order, and the Syar station only had exceedances that occurred during the terms of the Order.

The station at Hopland generally had higher concentrations than the other stations, with the exception of the Patterson Point station in the spring and early summer (Figure 3-23). Hopland exceeded the EPA criteria fifteen (15) times prior to and during the terms of the Order out of 16 samples collected (93.8%), under flows that ranged from 43.1 cfs to 142 cfs (Table 3-8 and Figure 3-22). The maximum concentration measured 0.11 mg/L, which occurred twice during the terms of the Order on 21 September and 5 October with flows of 69.6 cfs and 53.9 cfs, respectively (Table 3-8). The minimum concentration was 0.018 mg/L, which occurred on 6 April with a flow of approximately 41.5 cfs. The minimum concentration during the terms of the Order was 0.066 mg/L, which occurred on 27 July (Table 3-8). Total phosphorus values at Hopland were observed to generally increase from spring through summer and into the fall (Figure 3-22).

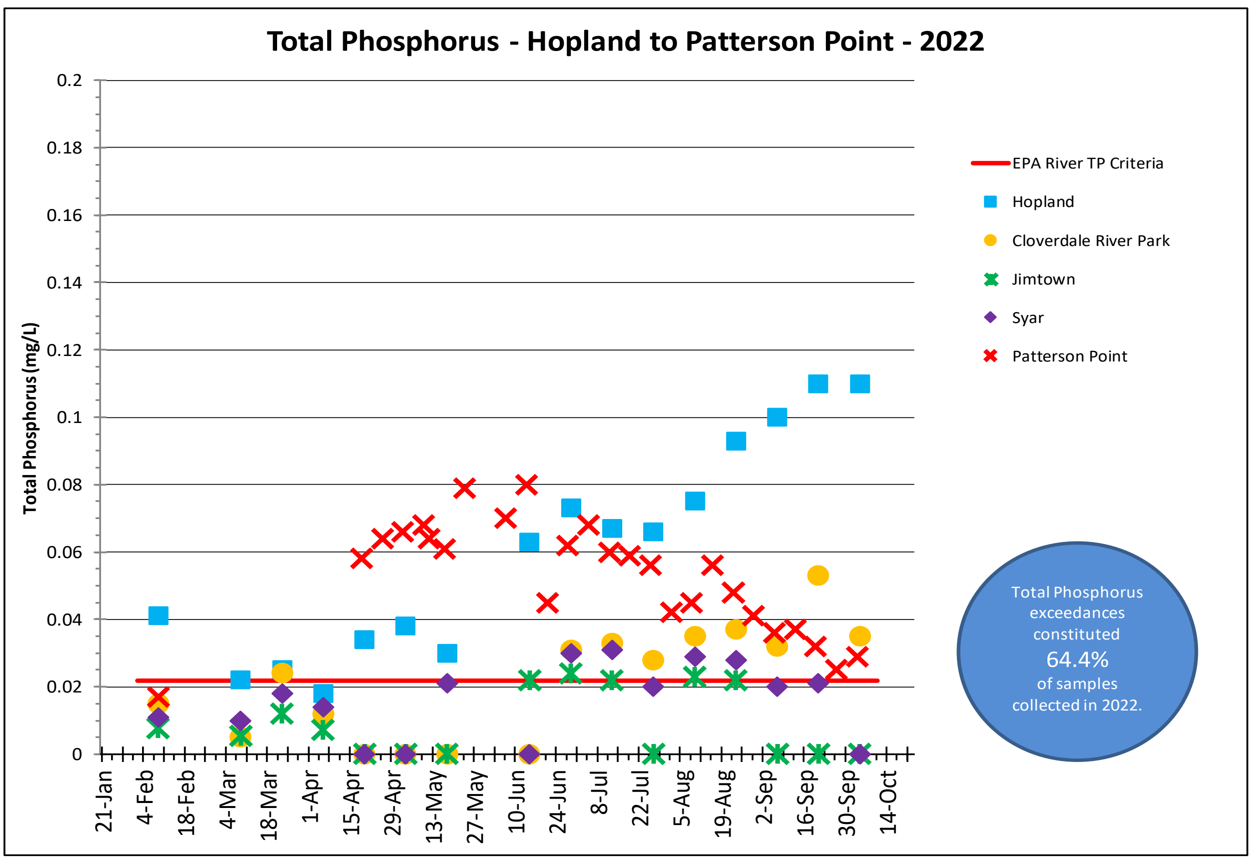

Figure 3-22. Sonoma Water Seasonal Mainstem Russian River Grab Sampling Total Phosphorus Results in 2022.

The Cloverdale River Park station also exceeded the total phosphorus EPA criteria for a majority of the season prior to and during the terms of the Order, including 9 of 16 samples (56.3%) under flows that ranged from 35.4 cfs to 72.8 cfs (Table 3-8 and Figure 3-22). The maximum concentration of 0.053 mg/L occurred during the terms of the Order on 21 September with a flow of 72.8 cfs (Table 3-8). The minimum concentration was ND, which occurred four times prior to the terms of the Order with flows ranging from 54.0 to 197 cfs. The minimum concentration during the terms of the Order was 0.028 mg/L, which occurred with a flow of 55.6 cfs (Table 3-8). Total phosphorus values at Cloverdale were observed to increase from spring into summer, where they remained relatively stable into fall (Figure 3-22).

Concentrations at the Jimtown station were significantly lower compared to the Hopland station, with five (5) exceedances (5 of 16 or 31.3%) of the EPA criteria that occurred prior to and during the terms of the Order with flows ranging from 33.7 cfs to 73.6 cfs (Table 3-9 and Figure 3-22). The maximum concentration measured 0.024 mg/L during the terms of the Order on 29 June with a flow of approximately 35.2 cfs (Table 3-9). The minimum seasonal value was ND, which occurred seven (7) times prior to and during the terms of the Order with flows that ranged from approximately 34.6 to 263 cfs (Table 3-9). Overall, concentrations were observed to increase slightly from spring into summer before declining as fall approached (Figure 3-22).

Syar Vineyards had four (4) exceedances (4 of 16 or 25%) of the total phosphorus EPA criteria that only occurred during the terms of the Order, with a maximum value of 0.031 mg/L that occurred on 13 July with a flow of 133 cfs (Table 3-9 and Figure 3-22). All four exceedances occurred in the summer (Table 3-9). The minimum seasonal value was ND, which occurred four times prior to and during the terms of the Order with flows that ranged from an estimated 133 cfs to 340 cfs (Table 3-9). Concentrations were observed to increase slightly from spring into summer before declining as fall approached, similar to Jimtown (Figure 3-22).

Patterson Point had twenty-five (25) exceedances prior to and during the terms of the Order of the total phosphorus criteria (25 of 26 or 96.2%) under flows that ranged from 43.7 cfs to 463 cfs (Table 3-10 and Figure 3-22). The maximum concentration measured 0.080 mg/L on 14 June with a flow of 130 cfs (Table 3-10). The maximum concentration during the terms of the Order measured 0.068 mg/L on 5 July with a flow of 51.1 cfs (Table 3-10). The minimum seasonal value was 0.017mg/L on 9 February with a flow of approximately 439 cfs (Table 3-10). The minimum value during the terms of the Order was 0.025mg/L on 27 September with a flow of 87.4cfs (Table 3-10). Concentrations were observed to generally increase through spring before declining slightly through summer and into fall (Figure 3-22).

Turbidity

The EPA recommended criteria for turbidity is 2.34 NTU (EPA, 2000). All five of the monitoring stations were observed to have exceedances of the EPA criteria, however three of the stations had only one exceedance each (Tables 3-8 through 3-10). Overall, the EPA criteria was exceeded thirteen (13) times prior to and during the terms of the Order out of 90 samples collected (14.4%) at the five stations (Tables 3-8 through 3-10 and Figure 3-23).

Turbidity levels at Hopland exceeded the EPA criteria periodically through the monitoring season, including prior to and during the terms of the Order (6 of 16 samples or 37.5%) with flows that ranged from 61.8 cfs to 142 cfs (Table 3-8 and Figure 3-23). The maximum seasonal value measured 9.5 NTU on 20 April with a flow of 142 cfs (Table 3-8). The maximum value during the terms of the Order measured 2.8 NTU on 24 August with a flow of 66.3 cfs (Table 3-8). The minimum seasonal value was 0.86 NTU on 29 February with a flow of 115 cfs (Table 3-8). The minimum value during the terms of the Order was 1.2 NTU on 21 September with a flow of 69.6 cfs (Table 3-8). Values were observed to remain relatively low prior to and during the terms of the Order with a few periodic exceedances in the spring and summer (Figure 3-23).

Table 3-9. Sonoma Water 2022 Seasonal Mainstem Russian River Grab Sampling Results at Jimtown and Syar.

Jimtown	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	USGS 11463682 RR at Jimtown***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	Flow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
2/9/2022	12:00	12.3	7.9	0.30	ND	ND	0.39	ND	0.30	**0.69**	0.0078	ND	1.37	1.70	190	0.97	**0.012**	250
3/9/2022	12:20	14.6	7.6	ND	ND	ND	0.33	ND	ND	0.33	0.0054	ND	1.09	1.29	200	0.65	**0.0040**	111
3/23/2022	12:20	17.2	7.4	0.33	ND	ND	0.23	ND	0.33	**0.56**	0.012	ND	0.986	1.08	190	0.51	ND	89.2
4/6/2022	12:40	17.6	7.4	0.20	ND	ND	0.15	ND	0.20	0.35	0.0071	ND	0.902	1.15	220	1.3	ND	73.6
4/20/2022	13:20	14.3	7.3	ND	ND	ND	0.17	ND	ND	0.17	ND	ND	1.99	2.44	190	2.2	**0.0056**	263
5/4/2022	11:50	18.2	8.0	ND	ND	ND	0.10	ND	ND	0.10	ND	ND	1.18	1.43	190	1.3	ND	152
5/18/2022	11:20	18.7	7.7	ND	ND	ND	0.12	ND	ND	0.12	ND	ND	0.956	1.35	220	0.82	ND	83.8
6/15/2022	12:40	21.7	7.7	ND	ND	ND	0.11	ND	ND	0.11	**0.022**	ND	1.33	1.76	180	0.90	**0.0056**	73.6
6/29/2022	12:40	20.8	7.4	ND	ND	ND	0.20	ND	ND	0.20	**0.024**	ND	0.695	0.923	250	0.69	ND	35.2
7/13/2022	12:30	21.0	7.6	ND	ND	0.0068	0.20	ND	0.23	**0.43**	**0.022**	ND	1.12	1.45	220	0.34	**0.0035**	36.8
7/27/2022	13:00	21.4	7.6	ND	ND	0.0014	0.15	ND	ND	0.151	ND	ND	1.15	1.62	200	0.98	**0.0040**	34.9
8/10/2022	12:10	20.6	7.5	ND	ND	ND	0.14	ND	ND	0.14	**0.023**	ND	1.15	1.77	220	0.94	**0.0059**	33.7
8/24/2022	12:00	21.4	7.7	ND	ND	ND	0.16	ND	ND	0.16	**0.022**	ND	1.24	2.36	200	**2.5**	**0.018**	36.2
9/7/2022	11:40	21.6	7.7	ND	ND	ND	0.16	ND	ND	0.16	ND	ND	1.04	1.44	200	0.45	**0.0048**	34.6
9/21/2022	12:10	19.8	8.3	ND	ND	0.0033	0.074	ND	ND	0.077	ND	ND	1.49	1.97	180	0.60	**0.0093**	71.8
10/5/2022	12:00	18.9	7.3	ND	0.15	0.00097	0.13	ND	ND	0.281	ND	ND	1.14	1.31	210	0.45	**0.0069**	49.2

Syar	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	USGS 11465390 RR near Windsor***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	Flow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
2/9/2022	11:10	11.4	8.0	0.29	ND	ND	0.26	ND	0.29	**0.55**	0.011	ND	1.49	1.73	190	1.0	**0.0088**	Out for season
3/9/2022	11:30	13.5	7.8	ND	ND	ND	0.22	ND	ND	0.22	0.010	ND	1.34	1.59	170	1.1	ND	Out for season
3/23/2022	11:10	15.1	7.7	0.28	ND	ND	0.18	ND	0.28	**0.46**	0.018	ND	1.31	1.41	180	0.93	ND	Out for season
4/6/2022	11:30	15.4	7.8	ND	ND	ND	0.11	ND	ND	0.11	0.014	ND	1.31	1.58	200	1.0	**0.0035**	Out for season
4/20/2022	12:00	14.7	7.5	ND	ND	ND	0.089	ND	ND	0.089	ND	ND	2.14	2.65	160	**2.8**	**0.0059**	Out for season
5/4/2022	11:00	17.4	8.1	ND	ND	ND	0.072	ND	ND	0.072	ND	ND	1.39	1.66	190	1.4	**0.0075**	286
5/18/2022	10:20	18.2	7.9	ND	ND	ND	0.049	ND	ND	0.049	0.021	ND	1.31	1.76	160	1.2	**0.0064**	213
6/15/2022	11:30	18.6	8.0	0.21	ND	ND	0.095	ND	0.21	0.30	ND	ND	1.53	1.91	120	1.4	**0.0040**	270
6/29/2022	11:20	19.1	8.2	0.24	ND	ND	0.043	ND	0.24	0.283	**0.030**	ND	1.43	1.72	160	1.0	**0.0043**	122
7/13/2022	11:20	19.1	8.0	ND	0.15	0.0049	0.068	ND	ND	0.223	**0.031**	ND	1.82	2.04	150	0.94	**0.0061**	133
7/27/2022	12:00	19.0	8.0	ND	ND	0.0035	0.041	ND	ND	0.045	0.020	ND	1.76	2.25	140	1.6	**0.0051**	123
8/10/2022	11:10	18.4	8.1	ND	ND	ND	0.046	ND	0.20	0.246	**0.029**	ND	1.75	2.58	140	1.0	**0.0085**	119
8/24/2022	11:00	18.4	8.2	0.34	ND	ND	0.093	ND	0.34	**0.43**	**0.028**	ND	1.79	2.45	140	1.5	**0.0037**	121
9/7/2022	10:50	18.7	7.8	ND	ND	ND	0.098	ND	ND	0.098	0.020	ND	1.57	1.92	130	0.80	ND	122
9/21/2022	11:00	18.9	9.0	ND	ND	0.015	0.054	ND	ND	0.069	0.021	ND	1.52	1.93	130	1.0	ND	143
10/5/2022	10:30	16.5	7.8	ND	0.17	0.0036	0.10	ND	ND	0.274	ND	ND	1.59	1.82	150	0.75	**0.0035**	Out for season

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

*** United States Geological Survey (USGS) Continuous-Record Gaging Station.

**** Flow rates are preliminary and subject to final revision by USGS.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.02188 mg/L (21.88 ug/L) ≈ 0.022 mg/L

Total Nitrogen: 0.38 mg/L

Chlorophyll *a*: 0.00178 mg/L (1.78 ug/L) ≈ 0.0018 mg/L

Turbidity: 2.34 FTU/NTU

Cloverdale River Park had one (1) exceedance of the EPA criteria that occurred prior to the terms of the Order out of 16 samples collected (1 of 16 or 6.3%), with a maximum value of 3.6 NTU measured on 20 April during a flow of 197 cfs (Table 3-8 and Figure 3-23). The maximum value during the terms of the Order was 2.2 NTU on 24 August with a flow of 62.7 cfs (Table 3-8). The minimum seasonal value of 0.45 NTU occurred during the terms of the Order on 5 October with a flow of approximately 52.7 cfs (Table 3-8). Other than the exceedance during elevated flows in April, values were observed to remain consistently low through the monitoring season (Figure 3-23).

Jimtown had one exceedance (1 of 16 or 6.3%) of the EPA criteria in 2022 (Table 3-9 and Figure 3-23), with a maximum seasonal value of 2.5 NTU that occurred during the terms of the Order on 24 August with a flow of approximately 36.2 cfs (Table 3-9). The minimum seasonal value was 0.34 NTU, which occurred during the terms of the Order on 13 July with a flow of approximately 36.8 cfs (Table 3-9). Turbidity values remained consistently low through the monitoring season (Figure 3-23).

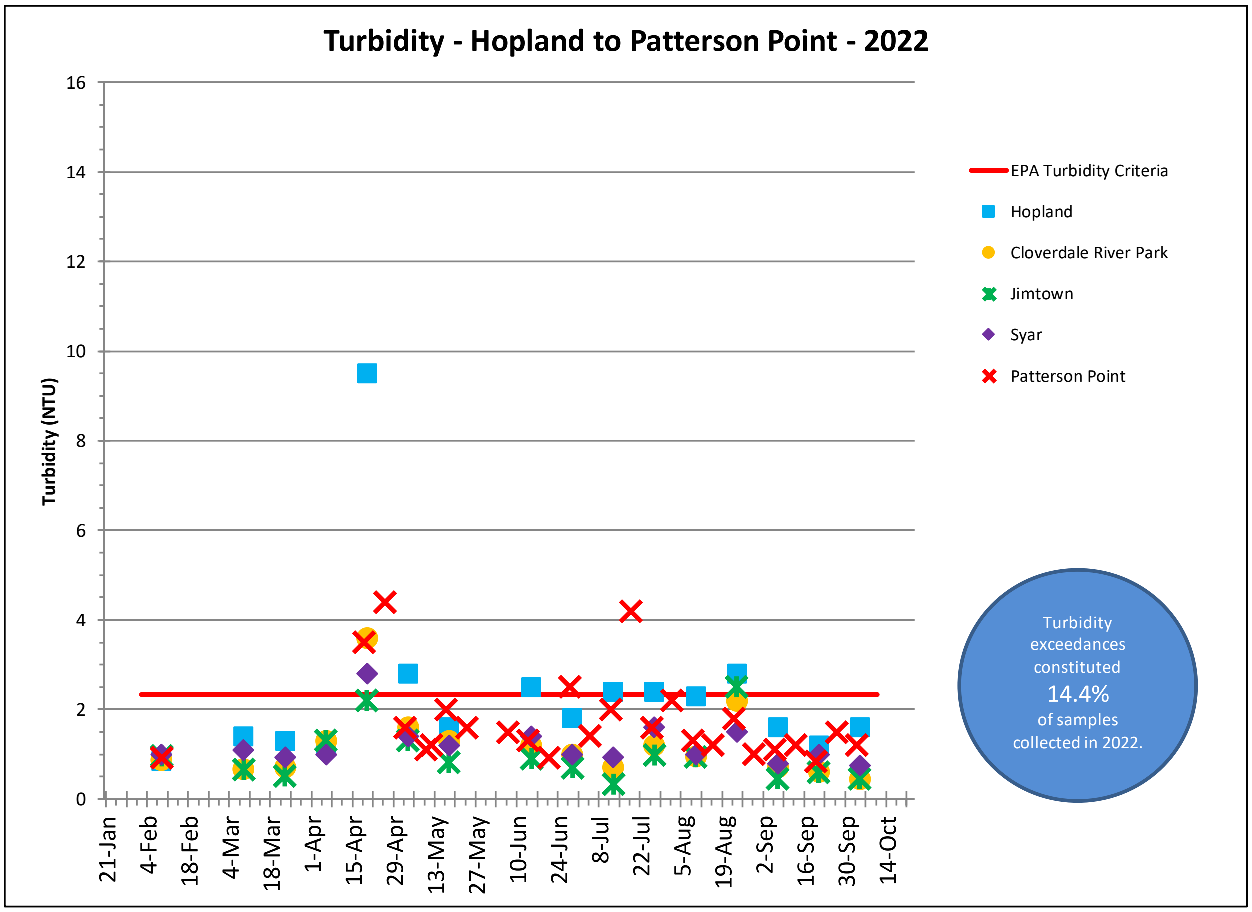

Figure 3-23. Sonoma Water Seasonal Mainstem Russian River Grab Sampling Turbidity in 2022.

Syar Vineyards had one (1) exceedance of the turbidity criteria (1 of 16 or 6.3%) that occurred prior to the terms of the Order (Table 3-9 and Figure 3-23), with a maximum seasonal value of 2.8 NTU on 20 April with an estimated flow of 340 cfs (Table 3-9). The maximum value during the terms of the Order was 1.6 NTU, which occurred on 27 July with a flow of 123 cfs (Table 3-9). The minimum seasonal value was 0.75 NTU, which occurred during the terms of the Order on 5 October with an estimated flow of 133 cfs (Table 3-9). Estimated flows are based on flow at the USGS RR at Healdsburg gage combined with flow at the USGS Dry Creek near Mouth gage. Other than the exceedance during elevated flows in April, values were observed to remain consistently low through the monitoring season (Figure 3-23).

Table 3-10. Sonoma Water 2022 Seasonal Mainstem Russian River Grab Sampling Results at Patterson Point.

Patterson Point	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	USGS 11467000 RR near Guerneville (Hacienda)***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.30	0.020	0.030	0.200	0.300	10	0.10	0.0030	Flow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
2/9/2022	9:40	11.2	7.6	0.29	ND	ND	0.17	ND	0.29	**0.46**	0.017	ND	1.71	2.12	190	0.93	**0.0040**	439
4/19/2022	10:30	15.0	7.5	0.23	ND	ND	0.095	ND	0.23	0.32	**0.058**	0.14	3.07	3.21	170	**3.5**	**0.0059**	424
4/26/2022	8:20	17.0	8.1	ND	ND	ND	0.041	ND	ND	0.041	**0.064**	0.12	3.23	3.75	150	**4.4**	**0.0048**	463
5/3/2022	9:50	17.7	7.8	ND	ND	ND	ND	ND	ND	ND	**0.066**	0.15	2.20	2.85	180	1.6	ND	219
5/10/2022	10:20	17.0	7.9	ND	ND	ND	0.072	ND	ND	0.072	**0.068**	0.16	2.16	2.62	170	1.1	ND	153
5/12/2022	9:50	17.7	8.0	ND	ND	ND	0.095	ND	ND	0.095	**0.064**	0.14	1.91	2.47	170	1.2	**0.0083**	141
5/17/2022	9:40	20.1	7.8	ND	ND	ND	0.053	ND	ND	0.053	**0.061**	0.12	1.75	2.20	180	2.0	ND	110
5/24/2022	8:40	22.1	7.9	ND	ND	ND	0.054	ND	ND	0.054	**0.078**	0.18	1.94	2.30	180	1.2	**0.0064**	75.2
6/7/2022	9:40	22.3	7.8	ND	ND	ND	0.053	ND	ND	0.053	**0.070**	0.15	1.58	1.89	190	1.5	**0.0043**	73.7
6/14/2022	9:20	23.2	7.6	0.24	ND	ND	ND	ND	0.24	0.24	**0.080**	0.18	2.06	2.48	170	1.3	ND	130
6/21/2022	9:30	22.2	7.9	0.20	ND	ND	0.053	ND	0.20	0.253	**0.045**	0.081	1.94	2.12	150	0.93	ND	96.7
6/28/2022	9:10	23.3	7.9	0.27	ND	ND	ND	ND	0.27	0.30	**0.062**	0.11	1.73	2.07	170	**2.5**	**0.0048**	48.5
7/5/2022	11:40	22.8	8.1	0.30	ND	ND	ND	ND	0.30	0.30	**0.068**	0.14	1.70	2.09	160	1.4	ND	51.1
7/12/2022	10:00	23.9	7.9	0.30	ND	ND	ND	ND	0.30	0.30	**0.060**	0.12	1.99	2.79	150	2.0	ND	54.2
7/19/2022	9:20	23.7	8.0	ND	ND	ND	ND	ND	ND	ND	**0.059**	0.12	2.24	2.56	150	**4.2**	**0.0048**	47.7
7/26/2022	10:00	22.9	8.0	ND	ND	ND	ND	ND	ND	ND	**0.056**	0.099	1.99	2.52	160	1.6	ND	44.9
8/2/2022	10:10	23.5	7.8	0.24	ND	ND	ND	ND	0.24	0.24	**0.042**	0.078	2.06	2.66	150	2.2	**0.0048**	43.7
8/9/2022	9:40	23.2	7.8	ND	0.10	0.0031	ND	ND	ND	0.1031	**0.045**	0.057	1.97	2.33	150	1.3	ND	51.3
8/16/2022	8:40	23.5	7.8	ND	ND	ND	ND	ND	ND	ND	**0.056**	0.079	1.91	2.24	140	1.2	**0.0051**	43.7
8/23/2022	8:20	23.3	8.1	0.21	ND	ND	ND	ND	0.21	0.21	**0.048**	0.077	1.90	2.24	140	1.8	**0.0040**	53.8
8/30/2022	9:40	22.3	7.8	ND	ND	ND	0.065	ND	ND	0.065	**0.041**	0.071	1.68	2.07	140	1.0	**0.0045**	58.8
9/6/2022	9:50	23.5	7.8	ND	ND	ND	ND	ND	ND	ND	**0.036**	0.053	1.75	2.09	150	1.1	ND	50.8
9/13/2022	9:10	21.8	7.5	ND	ND	0.00074	ND	ND	ND	0.0007	**0.037**	0.064	1.64	2.01	150	1.2	ND	64.0
9/20/2022	8:40	19.9	7.6	ND	ND	0.00014	ND	ND	ND	0.0001	**0.032**	0.038	1.71	2.17	140	0.85	ND	88.6
9/27/2022	8:50	19.9	7.6	0.40	ND	0.00023	ND	ND	0.40	**0.40**	**0.025**	0.034	1.63	2.06	170	1.5	ND	87.4
10/4/2022	8:40	19.1	7.7	ND	0.20	0.0033	0.066	ND	ND	0.2693	**0.029**	0.040	1.54	1.80	160	1.2	ND	78.1

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

*** United States Geological Survey (USGS) Continuous-Record Gaging Station.

**** Flow rates are preliminary and subject to final revision by USGS.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.02188 mg/L (21.88 ug/L) ≈ 0.022 mg/L

Total Nitrogen: 0.38 mg/L

Chlorophyll *a*: 0.00178 mg/L (1.78 ug/L) ≈ 0.0018 mg/L

Turbidity: 2.34 FTU/NTU

The Patterson Point station had four (4) exceedances of the turbidity criteria (4 of 26 or 15.4%) prior to and during the terms of the Order with flows ranging from 47.7 cfs to 463 cfs (Table 3-10 and Figure 3-23). The maximum seasonal value was 4.4 NTU on 26 April with a flow of approximately 463 cfs (Table 3-10). The maximum value during the terms of the Order was 4.2 NTU on 19 July with a flow of 47.7 cfs (Table 3-10). The minimum seasonal value was 0.85 NTU, which occurred during the terms of the Order on 20 September with a flow of 88.6 cfs (Table 3-10). Other than the four exceedances, including two prior to the terms of the Order during elevated spring flows, values were observed to remain consistently low through the monitoring season (Figure 3-23).

Chlorophyll a

The EPA criteria for *chlorophyll a* in Aggregate Ecoregion III is 1.78 µg/L, or approximately 0.0018 mg/L for rivers and streams (EPA, 2000). *Chlorophyll a* results were observed to periodically exceed the EPA criteria at all five stations prior to and during the terms of the Order (50 of 90 samples or 55.6%), most predominantly at Jimtown and Syar and least predominantly at Cloverdale River Park (Tables 3-8 through 3-10 and Figure 3-24). *Chlorophyll a* values varied through the season with several ND values occurring at all five stations (Figure 3-24).

As mentioned above, lab analysis constraints in 2022 resulted in the MDL for *chlorophyll a* being higher than the EPA criteria for exceedances for *chlorophyll a* in rivers and streams. Therefore, some lab results for *chlorophyll a* that are listed as non-detect (ND) could potentially have concentrations above the criteria and below the MDL. However, for reporting purposes, only those exceedances that are quantified will be included in the summation.

Hopland had nine (9) *chlorophyll a* exceedances (9 of 16 or 56.3%) and seven (7) non-detects prior to and during the terms of the Order, including a maximum value of 0.0077 mg/L that occurred during the terms of the Order on 24 August with a flow of 66.3 cfs (Table 3-8 and Figure 3-24). Hopland had exceedances periodically throughout the monitoring period, but more predominantly during the latter half of the monitoring period (Table 3-8).

Cloverdale River Park had six (6) *chlorophyll a* exceedances (6 of 16 or 37.5%) and ten (10) non-detects prior to and during the terms of the Order, including a maximum value of 0.0048 mg/L that occurred prior to and during the terms of the Order on 9 February and 10 August with flows of 171 cfs and 57.0 cfs, respectively (Table 3-8 and Figure 3-24). Similar to Hopland, exceedances were more predominant during the latter half of the monitoring period (Table 3-8).

Jimtown had eleven (11) *chlorophyll a* exceedances (11 of 16 or 68.8%) and five (5) non-detects prior to and during the terms of the Order, including a maximum value of 0.018 mg/L that occurred during the terms of the Order on 24 August with a flow of 36.2 cfs (Table 3-9 and Figure 3-24). Jimtown also had exceedances periodically throughout the monitoring period, but more predominantly during the latter half of the monitoring period (Table 3-9).

Syar Vineyards had twelve (12) *chlorophyll a* exceedances (12 of 16 or 75%) and four (4) non-detects prior to and during the terms of the Order, including a maximum value of 0.0088 mg/L that occurred on 9 February with an estimated flow of approximately 365 cfs (Table 3-9 and Figure 3-24). The maximum value during the terms of the Order was 0.0085 mg/L on 10 August with a flow of 119 cfs (Table 3-9). Estimated flow is based on a flow of 265 cfs at USGS RR at Healdsburg gage combined with a flow of 100 cfs at USGS Dry Creek near Mouth gage. Exceedances at Syar occurred throughout the monitoring period (Table 3-9).

Patterson Point had twelve (12) *chlorophyll a* exceedances (12 of 26 or 46.2%) and fourteen (14) non-detects prior to and during the terms of the Order, including a maximum value of 0.0083 mg/L that occurred on 12 May with a flow of approximately 141 cfs at Hacienda (Table 3-10 and Figure 3-24). The maximum value during the terms of the Order was 0.0067 mg/L with a flow of 51.3 cfs (Table 3-10). Exceedances at Patterson Point occurred periodically through the spring and summer, with several non-detects occurring during the terms of the Order at the end of the monitoring period (Table 3-10).

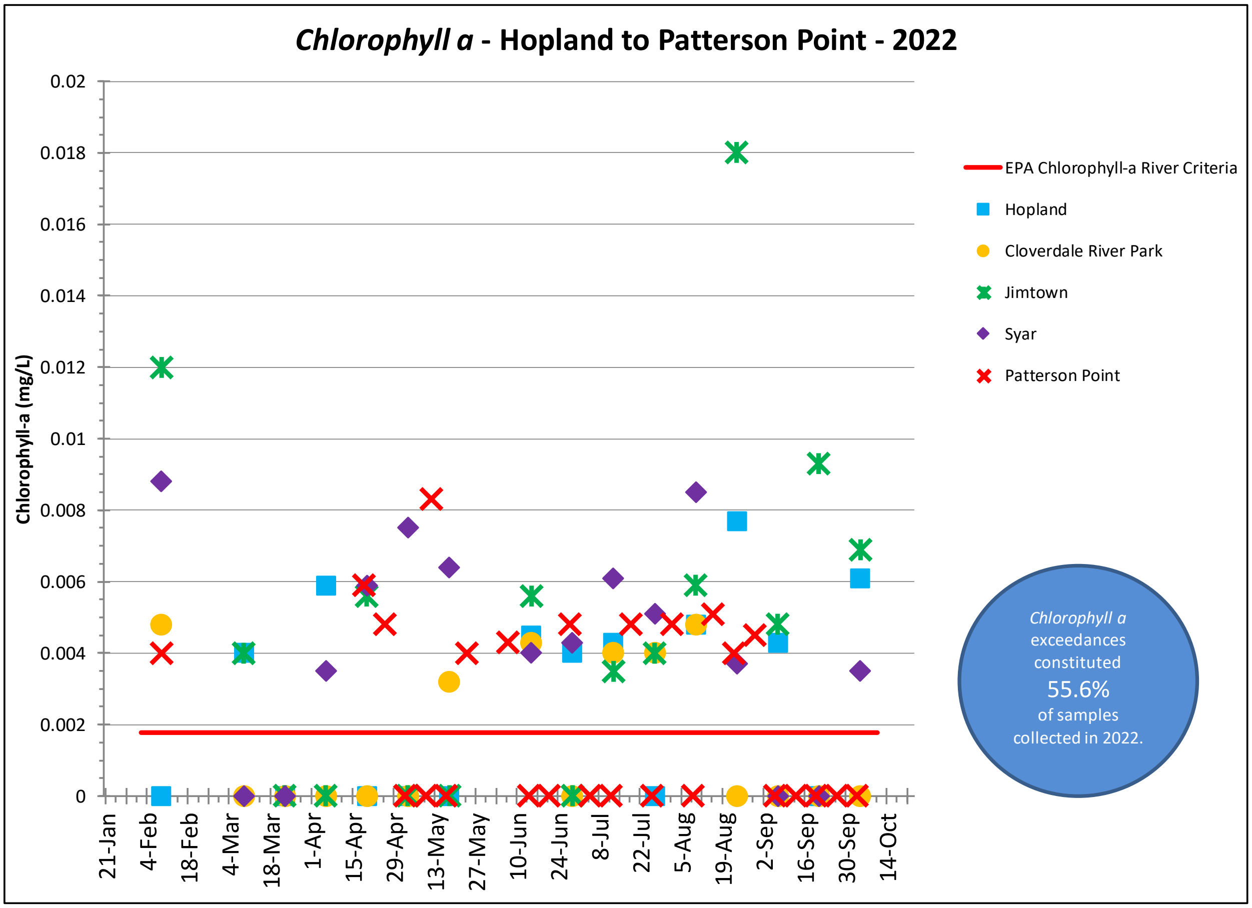

Figure 3-24. Sonoma Water Seasonal Mainstem Russian River Grab Sampling *Chlorophyll a* Results in 2022.

3.2 Sonoma Water Russian River Estuary Water Quality Monitoring

The changes in lower Russian River minimum instream flow requirements authorized by the Order allowed flows at Hacienda to decline below D1610 minimum instream flows of 85 cfs for most of the monitoring season (Figure 2-4). However, lower Russian River flows did not decline below the TUC minimum flows of 35 cfs, or the instantaneous minimum flow of 25 cfs authorized by the Order (Figure 2-4). Long-term water quality monitoring and weekly grab sampling was conducted prior to and during the term of the Order in the lower, middle, and upper reaches of the Russian River Estuary and the upper extent of inundation and backwatering during lagoon formation, referred to as the maximum backwater area (MBA). The three reaches of the estuary experience saline water conditions of various degrees with the upper reach extending up to the Duncans Mills area near the confluence with Austin Creek. The MBA does not experience any saline water migration and is located in the mainstem from Austin Creek to Vacation Beach in Guerneville. Long-term monitoring stations and grab sampling sites were located between Patty's Rock at Jenner and Vacation Beach in Guerneville, including in two tributaries.

Saline water is denser than freshwater and a salinity "wedge" forms as freshwater outflow passes over the denser tidal inflow. During the lagoon management period (15 May to 15 October), the lower and middle reaches of the Estuary up to Sheephouse Creek are predominantly saline environments with a thin freshwater layer that flows over the denser saltwater. The upper reach of the Estuary transitions to a predominantly freshwater environment, which is periodically underlain by a denser, saltwater layer that migrates upstream to Duncans Mills during low flow conditions and barrier beach closure.

Sonoma Water staff continued to collect long-term monitoring data to: establish baseline information on water quality in the Estuary and assess the availability of aquatic habitat in the Estuary; gain a better understanding of the longitudinal and vertical water quality profile during the ebb and flow of the tide; and track changes to the water quality profile that may occur during periods of low flow conditions, barrier beach closure, lagoon outlet channel implementation, and reopening. Long-term monitoring datasondes were deployed at five (5) stations in the Russian River estuary, including two tributary stations during the 2022 monitoring season (Figure 3-25). Sonoma Water submits an annual report to the National Marine Fisheries Service (NMFS) and California Department of Fish and Wildlife (CDFW) documenting the status updates of Sonoma Water's efforts in implementing the Biological Opinion. The water quality monitoring data for 2022 is currently being compiled and will be discussed in the Russian River Biological Opinion 2022-2023 annual report, which will be posted to Sonoma Water's website when available: https://www.sonomawater.org/biological-opinion-outreach.

Sonoma Water staff conducted weekly grab sampling from 19 April to 18 October at three stations in the lower mainstem Russian River, including: Vacation Beach, Monte Rio, and Patterson Point (Figure 3-25). . All samples were analyzed for bacterial indicators (Total Coliform, *E. coli*, and *Enterococcus*), nutrients, *chlorophyll a*, total and dissolved organic carbon, total dissolved solids, and turbidity. However, sampling results are only included up to 4 October for nutrients, *chlorophyll a*, total and dissolved organic carbon, total dissolved solids, and turbidity, and 11 October for bacterial indicators due to the timing of this report and delay associated with receiving sample results. Additional grab sampling was conducted at Patterson Point for nutrients, *chlorophyll a*, total and dissolved organic carbon, total dissolved solids, and turbidity in February. Sonoma Water submitted samples to the Sonoma County DHS Public Health Division Lab in Santa Rosa for bacteria analysis. Samples for all other constituents were submitted to Alpha Analytical Labs in Ukiah for analysis.

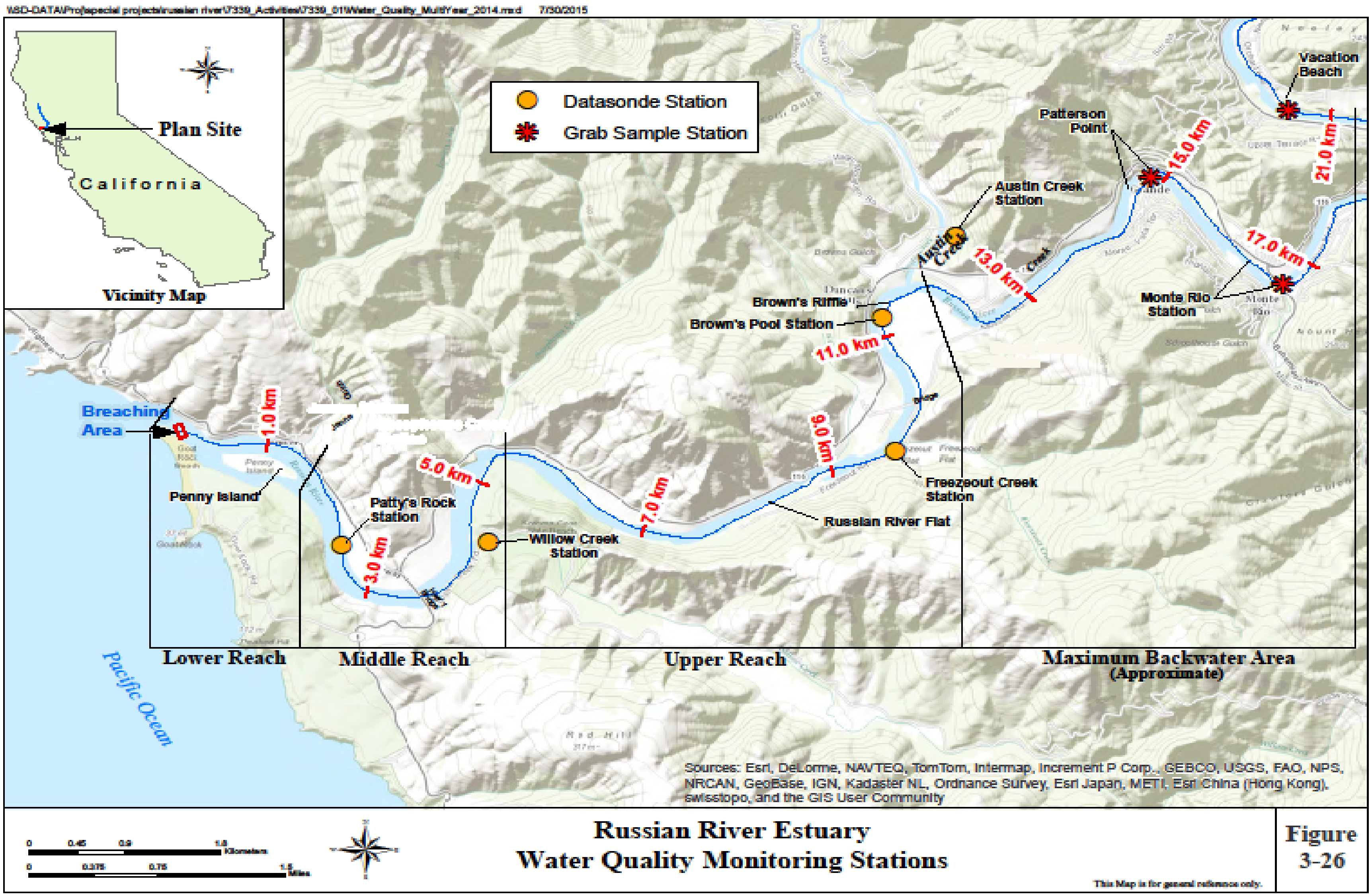

Figure 3-25. Sonoma Water 2022 Russian River Estuary water quality monitoring stations.

The grab sample sites are shown in Figure 3-25, and the results are summarized in Tables 3-11 through 3-16 and Figures 3-26 through 3-32. Highlighted values indicate those values exceeding California Department of Public Health Draft Guidance (CDPH guidelines) for Fresh Water Beaches for Indicator Bacteria (CDPH, 2011), EPA Recreational Water Quality Criteria (EPA, 2012), and EPA Ambient Water Quality Criteria Recommendations for Rivers and Streams in Nutrient Ecoregion III (EPA, 2000).

Lab analysis constraints in 2022 resulted in a method detection limit (MDL) for *chlorophyll a*, which is the level of accuracy for a given lab analysis to provide a valid concentration of a given constituent, that was higher than the EPA criteria for exceedances for *chlorophyll a* in rivers and streams. Put simply, the EPA exceedance criteria for *chlorophyll a* in rivers and streams is approximately 0.0018 mg/L, whereas the lab analysis MDL for *chlorophyll a* was 0.0030 mg/L. Therefore, some lab results for *chlorophyll a* that are listed as non-detect (ND) could potentially have concentrations above the criteria and below the MDL, which in turn could result in an under representation of the actual number of exceedances observed. However, for reporting purposes, only those exceedances that are quantified will be included in the summation.

Additionally, it must be emphasized that the draft CDPH guidelines and EPA criteria are not adopted standards, and are therefore subject to change (if it is determined that the guidelines or criteria are not accurate indicators) and are not currently enforceable.

Bacteria

Samples were collected in the lower river prior to and during the terms of the Order in 2022 for diluted and undiluted analysis of Total Coliform and *E. coli* for comparative purposes and the results are included in Tables 3-11 through 3-13 and Figures 3-26 and 3-27. Total Coliform and *E. coli* data presented in Figures 3-26 and 3-27 utilize undiluted sample results unless the reporting limit has been exceeded, at which point the diluted results are utilized. Samples collected for *Enterococcus* prior to and during the terms of the Order were undiluted only and results are included in Tables 3-11 through 3-13 and Figure 3-28. The CDPH guideline for Total Coliform is 10,000 MPN per 100 mL, and the EPA BAV is 235 MPN per 100 mL for *E. coli* and 61 MPN per 100 mL for *Enterococcus*.

NCRWQCB staff indicated in 2014 that *Enterococcus* was not being utilized as a fecal indicator bacteria for beach posting purposes in freshwater environments of the Russian River due to evidence that *Enterococcus* colonies can be persistent in the water column and therefore its presence at a given freshwater site may not always be associated with a fecal source. Sonoma Water staff will continue to collect *Enterococcus* samples and record and report the data however, *Enterococcus* results will not be relied upon when coordinating with the NCRWQCB and Sonoma County DHS about potentially posting warning signs at freshwater beach sites or to discuss potential adaptive management actions.

Total Coliform

There was one exceedance (1 of 75 or 1.3%) of the CDPH guideline for Total Coliform during the 2022 monitoring season at the lower river stations (Tables 3-11 through 3-13 and Figure 3-26). The exceedance occurred during the terms of the Order on 21 June at the Vacation Beach station (1 of 25 or 4%), with a maximum value of 11,119 MPN/100mL during open estuary conditions and a flow of 97.4 cfs (Table 3-11 and Figure 3-26). The minimum concentration at Vacation Beach measured 307.6 MPN/100mL prior to the terms of the Order on 3 May during open estuary conditions and a flow of 219 cfs (Table 3-11 and Figure 3-26). The minimum concentration at Vacation Beach during the terms of the Order was 1046.2 MPN/100mL on 11 October during open estuary conditions and a flow of 79.7 cfs (Table 3-11 and Figure 3-26). Aside from the exceedance at Vacation Beach, Total Coliform concentrations remained low at all three stations during the monitoring season (Figure 3-26).

Table 3-11. 2022 Vacation Beach bacteria concentrations for samples collected by Sonoma Water. This site experiences freshwater conditions.

Vacation Beach	Time	Temperature	pH	Total Coliforms (Collilert)	Total Coliforms Diluted 1:10 (Collilert)	E. coli (Collilert)	E. coli Diluted 1:10 (Collilert)	Enterococcus (Enterolert)	USGS 11467000 RR near Guerneville (Hacienda)**
MDL*				<1	<10	<1	<10	<1	Flow Rate***
Date		°C		MPN/100mL	MPN/100mL	MPN/100mL	MPN/100mL	MPN/100mL	(cfs)
4/26/2022	9:20	16.7	8.1	1986.3	933	83.9	109	25.6	463
5/3/2022	10:50	17.6	8.0	307.6	389	6.3	20	3.1	219
5/10/2022	11:10	17.1	7.9	344.8	384	5.2	<10	2.0	153
5/12/2022	10:50	16.2	7.9	517.2	350	15.5	<10	8.6	141
5/17/2022	10:30	20.5	7.8	1119.9	1664	11.0	40	**85.7**	110
5/24/2022	10:00	22.7	8.0	2419.6	3076	8.6	20	5.2	75.2
6/7/2022	10:40	22.9	8.1	2419.6	2382	45.7	10	13.4	73.7
6/14/2022	10:10	22.6	8.0	2419.6	3076	63.0	63	16.0	130
6/21/2022	10:20	22.3	8.0	>2419.6	**11199**	60.2	20	**146.7**	97.4
6/28/2022	9:50	23.8	8.1	>2419.6	8664	14.5	20	18.5	48.6
7/5/2022	12:20	23.1	7.8	2419.6	2359	6.3	10	6.3	51.4
7/12/2022	10:50	24.5	8.1	2419.6	5475	17.3	<10	7.4	54.8
7/19/2022	10:20	24.4	8.1	>2419.6	9208	13.5	<10	41	47.7
7/26/2022	10:50	23.3	8.1	>2419.6	31	**344.8**	<11	1.0	44.9
8/2/2022	10:10	23.5	7.8	>2419.6	6488	2	10	8.4	43.7
8/9/2022	9:40	23.2	7.8	>2419.6	2282	3.0	<10	2.0	51.3
8/16/2022	9:50	24.0	7.8	1986.3	1597	12.2	10	31	43.7
8/23/2022	9:10	23.7	8.1	1986.3	1439	13.5	<10	4.1	53.8
8/30/2022	10:40	22.6	8.1	>2419.6	1956	17.3	10	22.1	58.8
9/6/2022	10:40	24.1	8.0	2419.6	3654	23.1	31	7.5	50.8
9/13/2022	9:50	22.3	7.9	2419.6	3076	63.7	31	15.5	64.0
9/20/2022	9:30	19.6	7.8	1986.3	2098	59.1	52	25.9	88.6
9/27/2022	9:20	19.6	7.7	2419.6	1918	25.6	10	32.3	87.4
10/4/2022	9:40	19.0	7.8	1119.9	1658	12.2	10	5.2	78.1
10/11/2022	9:30	18.3	7.9	1046.2	**14281**	19.9	20	22.8	79.7

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.
** United States Geological Survey (USGS) Continuous-Record Gaging Station
*** Flow rates are preliminary and subject to final revision by USGS.

Recommended California Department of Public Health (CDPH) Draft Guidance - Single Sample Maximum (SSM):
Total Coliform (SSM): 10,000 per 100ml
Environmental Protection Agency (EPA) Recreational Water Quality Criteria - Beach Action Value (BAV):
E. coli (BAV): 235 per 100 ml *Enterococcus* (BAV): 61 per 100 ml
(Beach notification is recommended when indicator organisms exceed the SSM for Total Coliform or the BAV for *E. coli*) - Indicated by red text

The maximum Total Coliform concentration observed at Monte Rio was >2419.6 MPN/100mL, which occurred three times prior to and during the terms of the Order on 26 April, 17 May, and 12 July during open estuary conditions and flows of 463 cfs, 110 cfs, and 54.8 cfs, respectively (Table 3-12 and Figure 3-26). The minimum concentration measured 365.4 MPN/100mL on 3 May during open estuary conditions and a flow of 219 cfs (Table 3-12 and Figure 3-26). The minimum concentration during the terms of the Order measured 958 MPN/100mL on 16 August during open estuary conditions and a flow of 43.7 cfs (Table 3-12 and Figure 3-26).

The maximum Total Coliform concentration observed at Patterson Point was >2419.6 MPN/100mL, which occurred on 26 April, during open estuary conditions and a flow of 463 cfs (Table 3-13 and Figure 3-26). The maximum Total Coliform concentration observed during the terms of the Order was 2419.6 MPN/100mL, which twice occurred on 12 July and 20 September, during open estuary conditions and flows of 54.8 cfs and 88.6 cfs, respectively (Table 3-13 and Figure 3-26). The minimum concentration measured 344.8 MPN/100mL on 3 May during open estuary conditions and a flow of 219 cfs (Table 3-13 and Figure 3-26). The minimum concentration during the terms of the Order measured 816.4 MPN/100mL on 26 July during open estuary conditions and a flow of approximately 44.9 cfs (Table 3-13 and Figure 3-26).

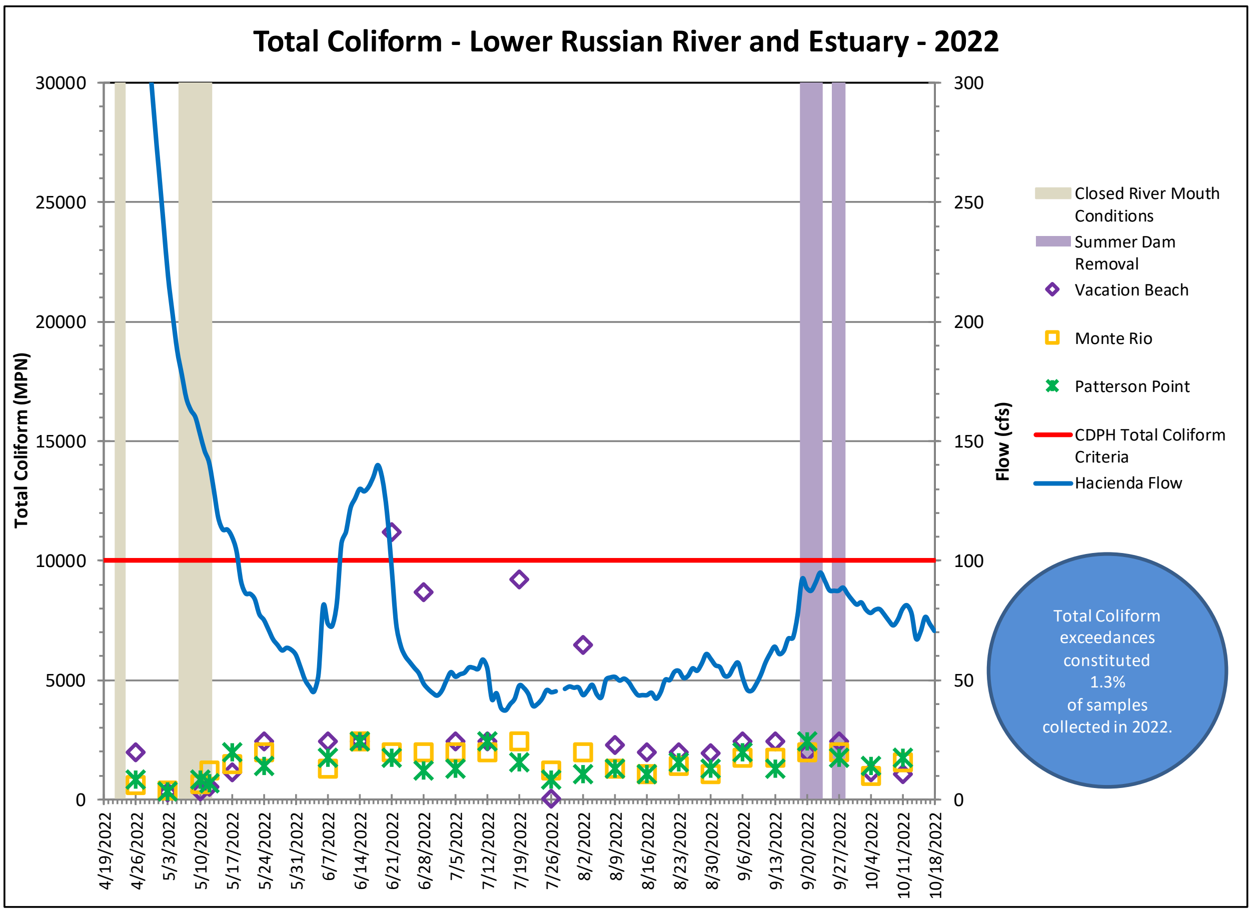

Figure 3-26. Total Coliform results for the Russian River from Vacation Beach to Patterson Point in 2022.

E. coli

There was one exceedance (1 of 75 or 1.3%) of the EPA criteria for *E. coli* during the 2022 monitoring season at the lower river stations (Tables 3-11 through 3-13 and Figure 3-27).

The exceedance was observed during the terms of the Order on 26 July at the Vacation Beach station (1 of 25 or 4%), with a maximum value of 344.8 MPN/100mL during open estuary conditions and a flow of 44.9 cfs (Table 3-11 and Figure 3-27). The minimum concentration measured 2 MPN/100mL during the terms of the Order on 2 August during open estuary conditions and a flow of 43.7 cfs (Table 3-11 and Figure 3-27).

The maximum *E. coli* concentration observed at Monte Rio was 70.6 MPN/100mL, which occurred during the terms of the Order on 20 September during open estuary conditions and a flow of 88.6 cfs (Table 3-12 and Figure 3-27). The minimum concentration measured 2.0 MPN/100mL on 3 May during open estuary conditions and a flow of 219 cfs (Table 3-12 and Figure 3-27). The minimum concentration during the terms of the Order measured 10.8 MPN/100mL on 16 August during open estuary conditions and a flow of 43.7 cfs (Table 3-12 and Figure 3-27).

Table 3-12. 2022 Monte Rio bacteria concentrations for samples collected by Sonoma Water. This site experiences freshwater conditions.

Monte Rio	Time	Temperature	pH	Total Coliforms (Collilert)	Total Coliforms Diluted 1:10 (Collilert)	E. coli (Collilert)	E. coli Diluted 1:10 (Collilert)	Enterococcus (Enterolert)	USGS 11467000 RR near Guerneville (Hacienda)**
MDL*				<1	<10	<1	<10	<1	Flow Rate***
Date		°C		MPN/100mL	MPN/100mL	MPN/100mL	MPN/100mL	MPN/100mL	(cfs)
4/26/2022	9:00	16.7	8.0	>2419.6	624	17.5	20	18.3	463
5/3/2022	10:20	18.0	8.0	365.4	201	2.0	<10	4.1	219
5/10/2022	10:50	17.3	8.0	648.8	823	49.5	41	42.8	153
5/12/2022	10:20	17.3	7.9	1203.3	932	46.5	31	**65.1**	141
5/17/2022	10:10	20.4	7.7	>2419.6	1467	17.3	<10	5.2	110
5/24/2022	9:40	22.0	7.9	1986.3	2909	42.0	20	27.5	75.2
6/7/2022	10:10	22.4	7.9	1299.7	1396	18.9	20	29.2	73.7
6/14/2022	9:40	23.7	7.7	2419.6	1850	23.8	20	10.8	130
6/21/2022	10:00	22.5	7.8	1986.3	2064	46.2	10	22.6	97.4
6/28/2022	9:30	23.2	7.9	1986.3	1918	22.8	10	9.8	48.6
7/5/2022	12:00	23.0	7.8	1986.3	2282	38.4	75	21.3	51.4
7/12/2022	10:30	23.7	7.9	>2419.6	1989	18.7	41	49.5	54.8
7/19/2022	10:00	23.9	8.0	2419.6	2046	39.3	41	56.3	47.7
7/26/2022	10:30	23.1	8.1	1203.3	1670	14.6	20	44.1	44.9
8/2/2022	9:50	23.2	7.8	1986.3	1354	21.6	20	18.5	43.7
8/9/2022	9:20	23.6	7.9	1299.7	2978	23.3	20	13.2	51.3
8/16/2022	9:20	23.6	7.8	1046.2	958	10.8	<10	10.9	43.7
8/23/2022	8:50	23.5	7.9	1413.6	1500	19.9	31	8.4	53.8
8/30/2022	10:10	22.2	8.1	1046.2	1720	12.2	<10	9.7	58.8
9/6/2022	10:20	23.7	7.8	1732.9	2143	30.9	41	7.5	50.8
9/13/2022	9:30	21.9	7.8	1732.9	**12997**	17.5	10	7.5	64.0
9/20/2022	9:10	19.8	7.6	1986.3	1467	70.6	85	21.3	88.6
9/27/2022	9:10	19.8	7.7	1986.3	2359	51.2	41	53.7	87.4
10/4/2022	9:10	18.9	7.7	980.4	1162	23.1	31	12.1	78.1
10/11/2022	9:10	17.9	7.7	1553.1	1014	73.3	10	27.5	79.7

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** United States Geological Survey (USGS) Continuous-Record Gaging Station

*** Flow rates are preliminary and subject to final revision by USGS.

Recommended California Department of Public Health (CDPH) Draft Guidance - Single Sample Maximum (SSM):

Total Coliform (SSM): 10,000 per 100ml

Environmental Protection Agency (EPA) Recreational Water Quality Criteria - Beach Action Value (BAV):

E. coli (BAV): 235 per 100 ml *Enterococcus* (BAV): 61 per 100 ml

(Beach notification is recommended when indicator organisms exceed the SSM for Total Coliform or the BAV for *E. coli*) - Indicated by red text

The maximum *E. coli* concentration observed at Patterson Point was 93.3 MPN/100mL, which occurred on 3 May during open estuary conditions and a flow of 219 cfs (Table 3-13 and Figure 3-27). The maximum concentration during the terms of the Order measured 65.7 MPN/100mL on 6 September during open estuary conditions and a flow of 50.8 cfs (Table 3-13 and Figure 3-27). The minimum concentration measured 4.1 MPN/100mL, which occurred twice on 17 May and 2 August during open estuary conditions and flows of 110 cfs and 43.7 cfs, respectively (Table 3-13 and Figure 3-27).

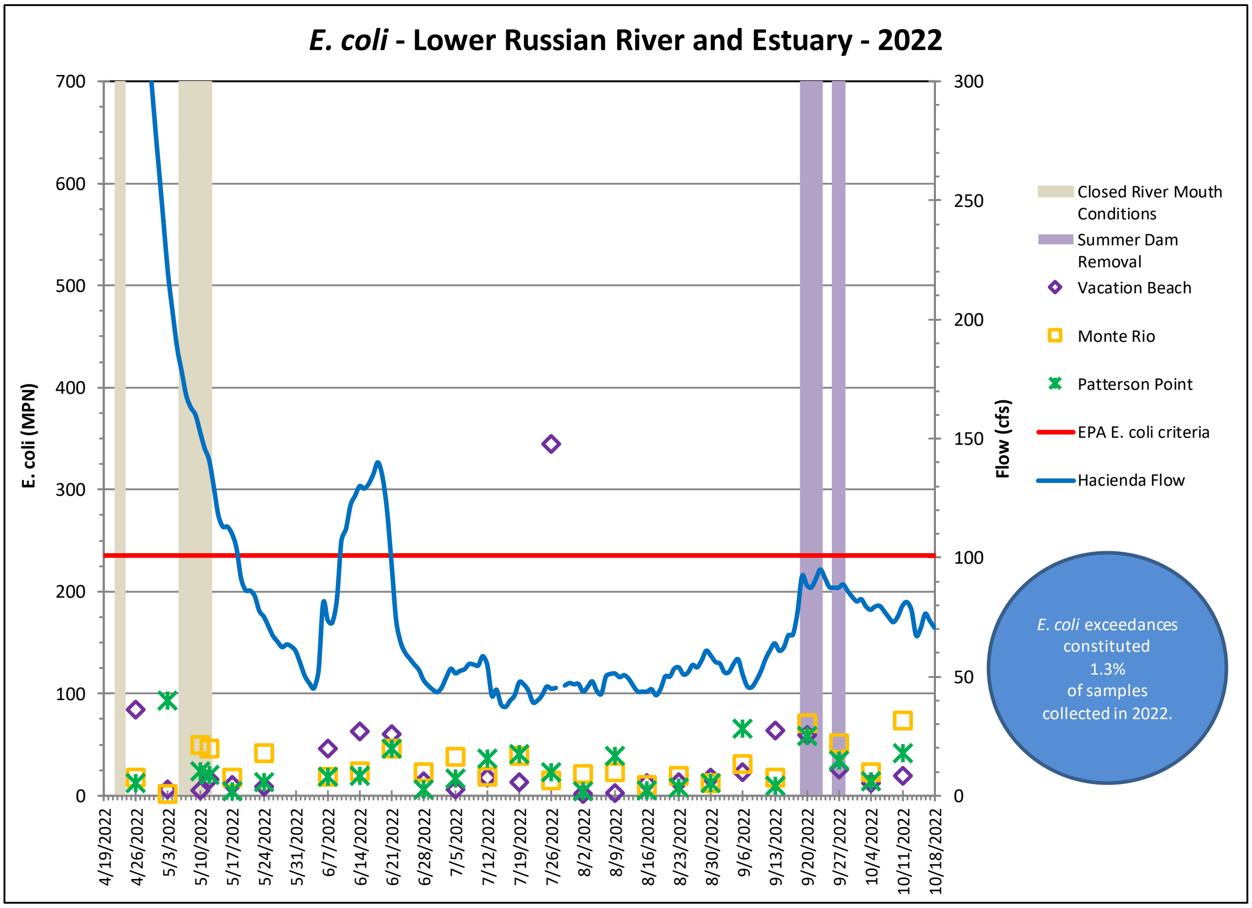

Figure 3-27. *E. coli* results for the Russian River from Vacation Beach to Patterson Point in 2022.

Enterococcus

There were six (6) exceedances (6 of 75 or 8%) of the EPA criteria for *Enterococcus* at the lower river stations prior to and during the terms of the Order, with flows that ranged from 47.7 to 141 cfs at the Hacienda USGS gage (Tables 3-11 through 3-13 and Figure 3-28).

The Vacation Beach station had two (2) exceedances of the EPA criteria for *Enterococcus* prior to and during the terms of the Order (2 of 25 or 8%), including a maximum concentration of 146.7 MPN/100mL that occurred during the terms of the Order on 21 June during open estuary conditions and a flow of 97.4 cfs (Table 3-11 and Figure 3-28). The minimum seasonal concentration measured 1.0 MPN/100mL and occurred during the terms of the Order on 26 July during open estuary conditions and a flow of 44.9 cfs (Table 3-11 and Figure 3-28).

The Monte Rio station had one (1) exceedance of the EPA criteria for *Enterococcus* that occurred prior to the terms of the Order (1 of 25 or 4%), with a maximum concentration of 65.1 MPN/100mL on 12 May during closed estuary conditions and a flow of 141 cfs (Table 3-12 and Figure 3-28). The maximum concentration during the terms of the Order measured 56.3 MPN/100mL on 19 July during open estuary conditions and a flow of 47.7 cfs (Table 3-12 and Figure 3-28). The minimum concentration measured 4.1 MPN/100mL on 3 May during open estuary conditions and a flow of approximately 219 cfs at the Hacienda USGS gage (Table 3-12 and Figure 3-28). The minimum concentration during the terms of the Order measured 7.5 MPN/100mL, which occurred twice on 6 September and 13 September during open estuary conditions and flows of 50.8 cfs and 64.0 cfs, respectively (Table 3-12 and Figure 3-28).

The Patterson Point station had three (3) exceedances of the EPA criteria for *Enterococcus* (3 of 25 or 12%) that occurred during the terms of the Order, including a maximum concentration of 151.5 MPN/100mL on 20 September during open estuary conditions and a flow of 88.6 cfs (Table 3-13 and Figure 3-28). The minimum concentration at Patterson Point measured 2.0 MPN/100mL, which occurred three times during the terms of the Order on 5 July, 2 August, and 13 September during open estuary conditions and flows of 51.4 cfs, 43.7 cfs, and 64.0 cfs, respectively (Table 3-13 and Figure 3-28).

Table 3-13. 2022 Patterson Point bacteria concentrations for samples collected by Sonoma Water. This site experiences freshwater conditions.

Patterson Point	Time	Temperature	pH	Total Coliforms (Colilert)	Total Coliforms Diluted 1:10 (Colilert)	E. coli (Colilert)	E. coli Diluted 1:10 (Colilert)	Enterococcus (Enterolert)	USGS 11467000 RR near Guerneville (Hacienda)**
MDL*				<1	<10	<1	<10	<1	Flow Rate***
Date		°C		MPN/100mL	MPN/100mL	MPN/100mL	MPN/100mL	MPN/100mL	(cfs)
4/26/2022	8:20	17.0	8.1	>2419.6	816	12.2	10	21.1	463
5/3/2022	9:50	17.7	7.8	344.8	435	93.3	121	4.1	219
5/10/2022	10:20	17.0	7.9	816.4	776	24	41	19.9	153
5/12/2022	9:50	17.7	8.0	686.7	323	20.1	31	7.5	141
5/17/2022	9:40	20.1	7.8	1986.3	2412	4.1	<10	8.6	110
5/24/2022	8:40	22.1	7.9	1413.6	1439	13.5	<10	6.3	75.2
6/7/2022	9:40	22.3	7.8	1732.9	1259	18.7	20	9.8	73.7
6/14/2022	9:20	23.2	7.6	2419.6	1616	19.9	31	30.9	130
6/21/2022	9:30	22.2	7.9	1732.9	1439	46.4	20	52.1	97.4
6/28/2022	9:10	23.3	7.9	1203.3	1169	6.3	<10	6.3	48.6
7/5/2022	11:40	22.8	8.1	1299.7	1500	17.1	20	2.0	51.4
7/12/2022	10:00	23.9	7.9	2419.6	1860	35.9	31	39.9	54.8
7/19/2022	9:20	23.7	8.0	1553.1	1314	41	<10	**63**	47.7
7/26/2022	10:00	22.9	8.0	816.4	959	23.1	20	16.0	44.9
8/2/2022	9:20	23.1	7.9	1046.2	1017	4.1	10	2.0	43.7
8/9/2022	8:50	23.2	7.8	1299.7	2140	39.3	31	27.5	51.3
8/16/2022	8:40	23.5	7.8	1046.2	789	5.2	<10	5.2	43.7
8/23/2022	8:20	23.3	8.1	1553.1	1236	7.5	41	8.6	53.8
8/30/2022	9:40	22.3	7.8	1299.7	1720	12.1	<10	3.1	58.8
9/6/2022	9:50	23.5	7.8	1986.3	2014	65.7	135	**65.1**	50.8
9/13/2022	9:10	21.8	7.5	1299.7	1515	9.7	10	2.0	64.0
9/20/2022	8:40	19.9	7.6	2419.6	3282	58.3	63	**151.5**	88.6
9/27/2022	8:50	19.9	7.6	1732.9	1850	34.5	52	60.9	87.4
10/4/2022	8:40	19.1	7.7	1413.6	1296	14.4	10	14.5	78.1
10/11/2022	8:50	18.2	7.7	1732.9	880	41.4	30	23.8	79.7

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.
** United States Geological Survey (USGS) Continuous-Record Gaging Station
*** Flow rates are preliminary and subject to final revision by USGS.

Recommended California Department of Public Health (CDPH) Draft Guidance - Single Sample Maximum (SSM):
Total Coliform (SSM): 10,000 per 100ml
Environmental Protection Agency (EPA) Recreational Water Quality Criteria - Beach Action Value (BAV):
E. coli (BAV): 235 per 100 ml — *Enterococcus* (BAV): 61 per 100 ml
(Beach notification is recommended when indicator organisms exceed the SSM for Total Coliform or the BAV for *E. coli*) - Indicated by red text

External factors including contact recreation, river mouth/estuary closure, and summer dam installation and removal in Guerneville likely had an effect on elevated *Enterococcus* concentrations observed in the Monte Rio to Patterson Point area during the 2022 monitoring season (Figure 3-28).

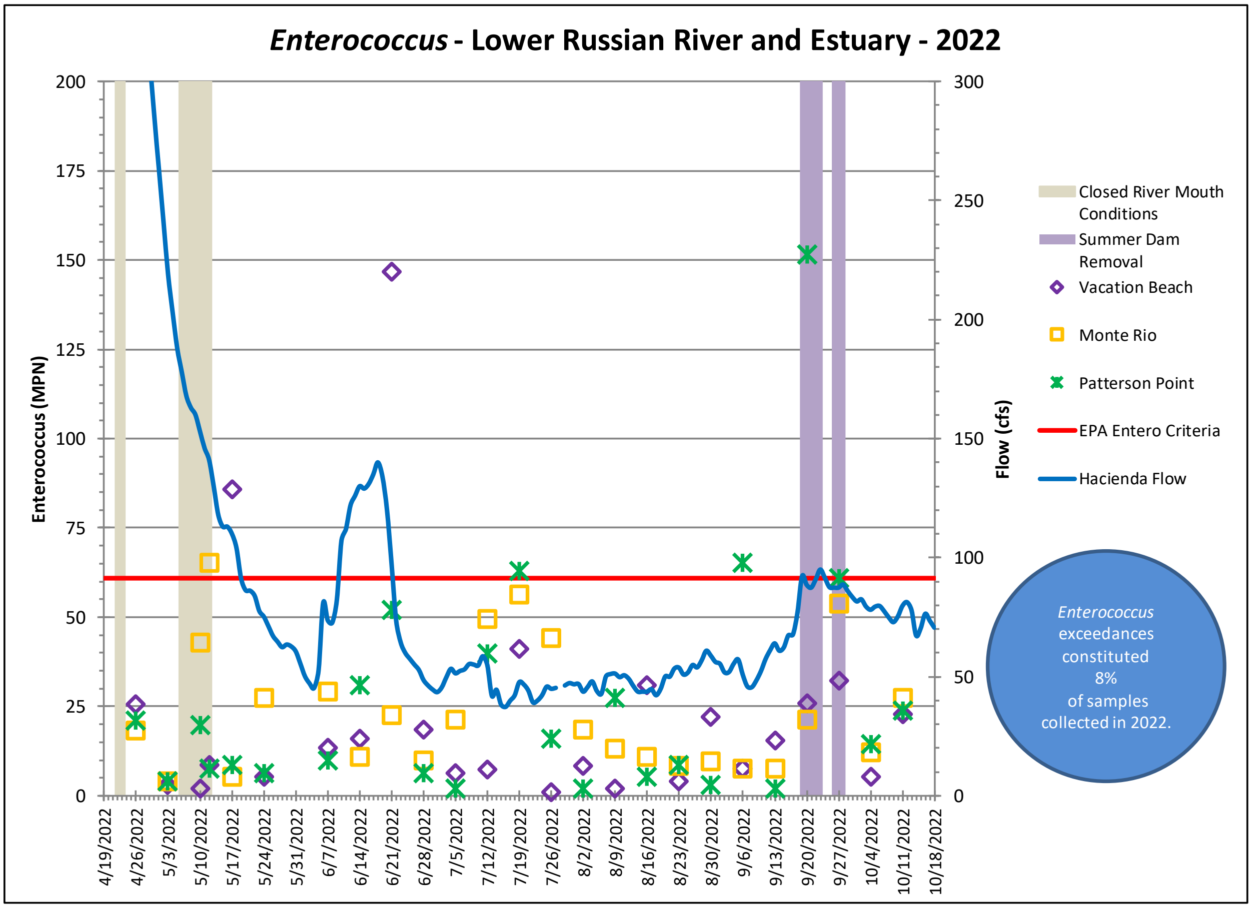

Figure 3-28. *Enterococcus* results for the Russian River from Vacation Beach to Patterson Point in 2022.

Total Nitrogen

There were three (3) exceedances (3 of 76 or 4.0%) of the EPA criteria for total nitrogen that occurred prior to and during the terms of the Order at the lower river stations, with flows that ranged from 47.7 to 439 cfs (Tables 3-14 through 3-16 and Figure 3-29). Exceedances were observed at Vacation Beach and Patterson Point, but there were no exceedances at Monte Rio (Figure 3-29).

The Vacation Beach station had one (1) exceedance of the EPA total nitrogen criteria (1 of 25 or 4%) that occurred during the terms of the Order on 19 July with a maximum concentration of 0.50 mg/L during open estuary conditions and a flow of 47.7 cfs (Table 3-14 and Figure 3-29). The minimum concentration at Vacation Beach was ND, which occurred eight (8) times prior to and during the terms of the Order during open and closed estuary conditions and flows that ranged from 43.7 to 153 cfs (Table 3-14).

There were no exceedances of the total nitrogen criteria at the Monte Rio station in 2022. The maximum total nitrogen concentration observed at Monte Rio was 0.34 mg/L, which occurred prior to the terms of the Order on 19 April during open estuary conditions with a flow of 424 cfs (Table 3-15 and Figure 3-29). The maximum concentration during the terms of the Order was 0.31 mg/L on 12 July during open conditions and a flow of 54.8 cfs (Table 3-15 and Figure 3-29). The minimum concentration at Monte Rio was ND, which occurred seven (7) times prior to and during the terms of the Order during open estuary conditions and flows that ranged from 43.7 to 219 cfs (Table 3-15).

The Patterson Point station had two (2) exceedances of the EPA total nitrogen criteria (2 of 26 or 7.7%) prior to and during the terms of the Order, including a maximum concentration of 0.46 mg/L that occurred prior to the terms of the Order on 9 February during open estuary conditions and a flow of 439 cfs (Table 3-16 and Figure 3-29). The maximum concentration during the terms of the Order was 0.40 mg/L on 27 September during open conditions and a flow of 87.4 cfs (Table 3-16 and Figure 3-29). The minimum concentration at Patterson Point was ND, which occurred five (5) times prior to and during the terms of the Order during open estuary conditions and flows that ranged from 43.7 to 219 cfs (Table 3-16).

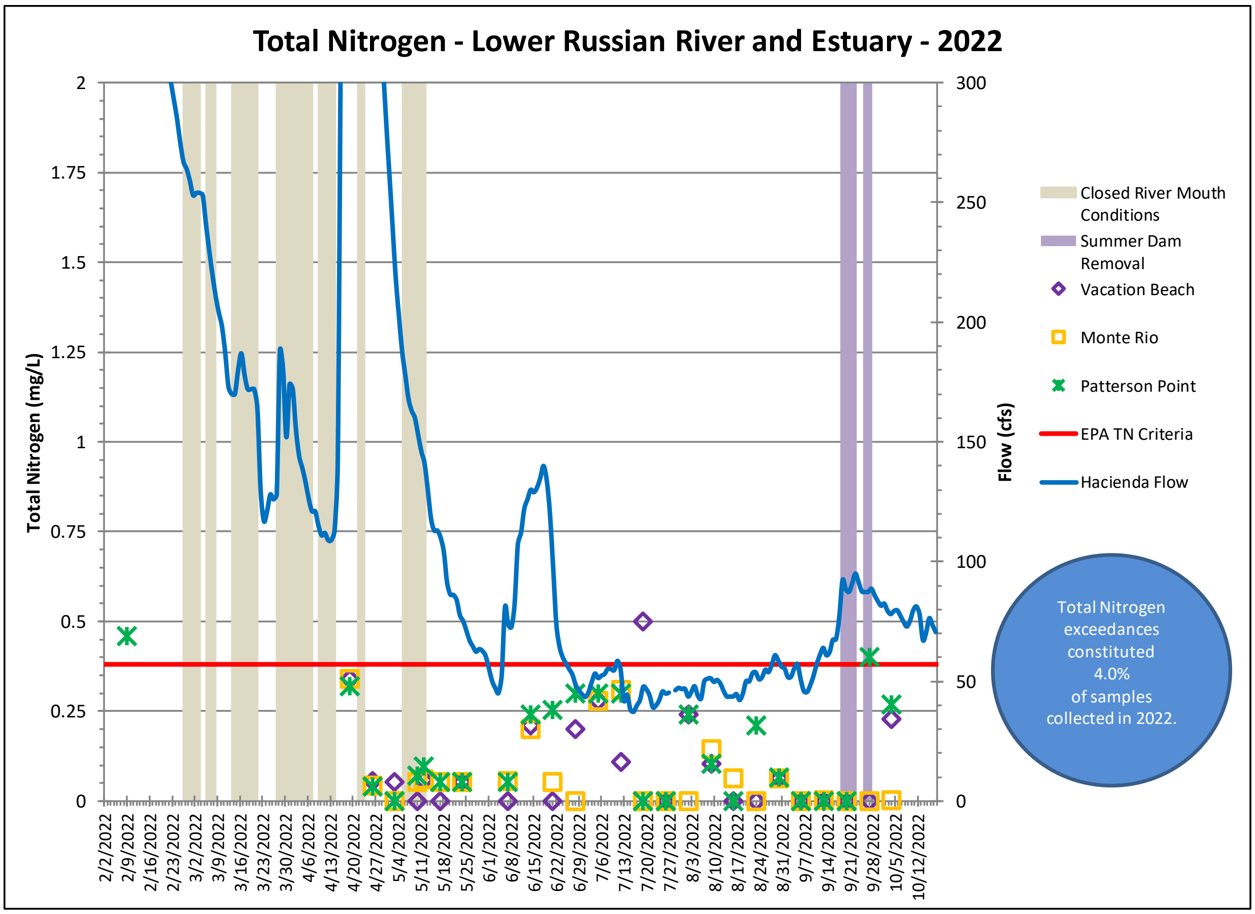

Figure 3-29. Total Nitrogen results for the Russian River from Vacation Beach to Patterson Point in 2022.

Total Phosphorus

All three lower river stations predominantly exceeded the EPA criteria for total phosphorous (75 of 76 or 98.7%) prior to and during the terms of the Order with flows that ranged from 43.7 cfs to 463 cfs, continuing a trend of consistent exceedances observed in previous years (Tables 3-14 through 3-16 and Figure 3-30). Exceedances occurred during open and closed estuary conditions and generally trended downward through the monitoring season (Figure 3-30).

Vacation Beach had twenty-five (25) exceedances of the EPA total phosphorus criteria (25 of 25 or 100%) that occurred prior to and during the terms of the Order, including a maximum concentration of 0.071 mg/L that occurred during the terms of the Order on 7 June during open estuary conditions and a flow of 73.7 cfs (Table 3-14 and Figure 3-30). The minimum concentration at Vacation Beach was 0.026 mg/L, which occurred during the terms of the Order on 6 September during open estuary conditions and a flow of 50.8 cfs. Finally, the lowest flow recorded during sampling was approximately 43.7 cfs, which occurred twice during the terms of the Order, on 2 August and 16 August during open estuary conditions, with concentrations of 0.042 mg/L and 0.044 mg/L, respectively (Table 3-14).

Monte Rio had twenty-five (25) exceedances of the EPA total phosphorus criteria (25 of 25 or 100%) that occurred prior to and during the terms of the Order, including a maximum concentration of 0.079 mg/L that occurred on prior to the terms of the Order on 24 May during open estuary conditions and a flow of 75.2 cfs (Table 3-15 and Figure 3-30). The maximum concentration during the terms of the Order was 0.69 mg/L on 5 July during open estuary conditions and a flow of 51.4 cfs (Table 3-15 and Figure 3-30). The minimum concentration at Monte Rio was 0.028 mg/L, which occurred during the terms of the Order on 27 September during open estuary conditions and a flow of 87.4 cfs. Finally, the lowest flow recorded during sampling was approximately 43.7 cfs, which occurred twice during the terms of the Order, on 2 August and 16 August during open estuary conditions, with concentrations of 0.052 mg/L and 0.051 mg/L, respectively (Table 3-15).

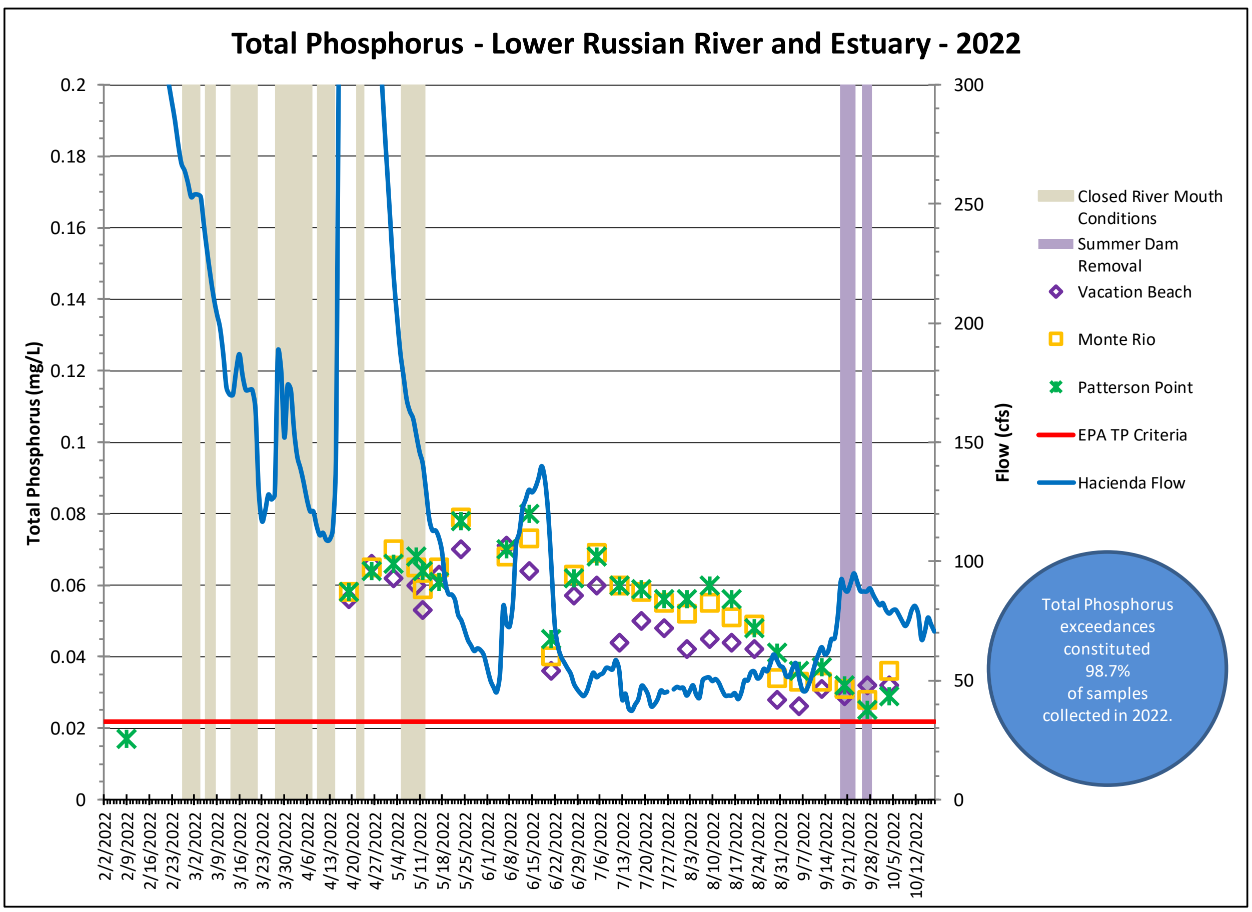

Figure 3-30. Total Phosphorus results for the Russian River from Vacation Beach to Patterson Point in 2022.

Patterson Point had twenty-five (25) exceedances of the EPA total phosphorus criteria (25 of 26 or 96.2%) that occurred prior to and during the terms of the Order, including a maximum concentration of 0.080 mg/L that occurred prior to the terms of the Order on 14 June during open estuary conditions and a flow of 130 cfs (Table 3-16 and Figure 3-30). The maximum concentration during the terms of the Order was 0.068 mg/L on 5 July during open estuary conditions and a flow of 51.4 cfs (Table 3-16 and Figure 3-30). The minimum concentration at Patterson Point was 0.017 mg/L, which occurred prior to the terms of the Order on 9 February during open estuary conditions and a flow of 439 cfs (Table 3-16 and Figure 3-30). The minimum concentration during the terms of the Order was 0.025 mg/L on 27 September during open estuary conditions and a flow of 87.4 cfs (Table 3-16 and Figure 3-30). Finally, the lowest flow recorded during sampling was approximately 43.7 cfs, which occurred twice during the terms of the Order, on 2 August and 16 August during open estuary conditions, with concentrations of 0.056 mg/L, respectively (Table 3-16).

Turbidity

The EPA criteria for turbidity was exceeded five times each at Vacation Beach and Monte Rio and four times at Patterson Point (14 of 76 or 18.4%) prior to and during the terms of the Order (Tables 3-14 through 3-16). Exceedances were observed to periodically occur throughout the monitoring season with open and closed estuary conditions, summer dam removal, and Hacienda flows ranging from 43.7 cfs to 463 cfs (Figure 3-31).

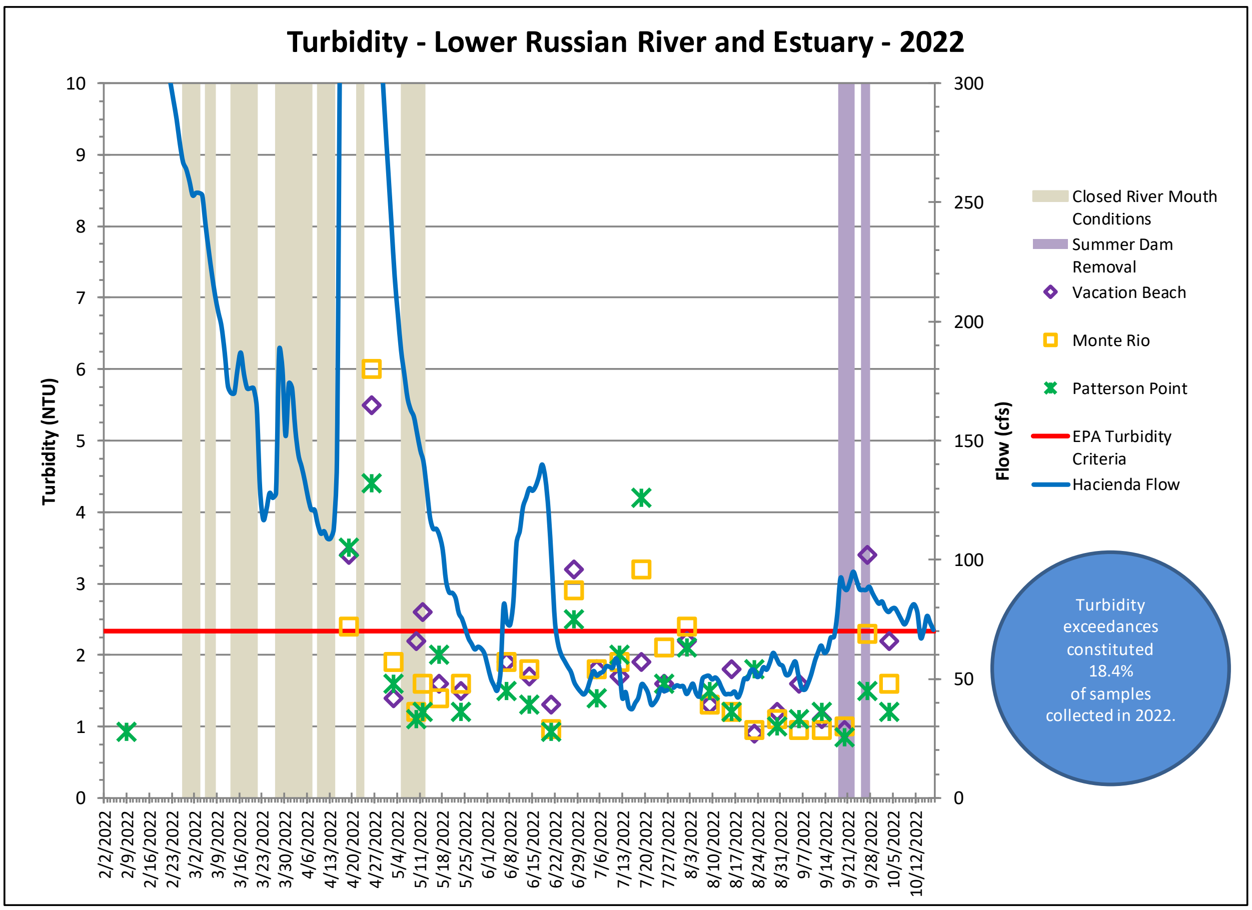

Figure 3-31. Turbidity results for the Russian River from Vacation Beach to Patterson Point in 2022.

The maximum turbidity value observed at Vacation Beach occurred prior to the terms of the Order and was 5.5 NTU on 26 April during open estuary conditions and a flow of 463 cfs (Table 3-14 and Figure 3-31). The maximum turbidity value observed during the terms of the Order and was 3.4 NTU on 27 September during open estuary conditions and a flow of 87.4 cfs (Table 3-14 and Figure 3-31). The minimum value at Vacation Beach was 0.90 NTU, which occurred during the terms of the Order on 23 August during open estuary conditions and a flow of 53.8 cfs (Table 3-14). Finally, the lowest flow recorded during sampling was approximately 43.7 cfs, which occurred twice during the terms of the Order, on 2 August and 16 August during open estuary conditions, with values of 2.2 NTU and 1.8 NTU, respectively.

The maximum turbidity value observed at Monte Rio occurred prior to the terms of the Order and was 6.0 NTU on 26 April during open estuary conditions and a flow of 463 cfs (Table 3-15 and Figure 3-31). The maximum turbidity value observed during the terms of the Order and was 3.2 NTU on 19 July during open estuary conditions and a flow of 47.7 cfs (Table 3-15 and Figure 3-31). The minimum value at Monte Rio was 0.95 NTU, which occurred three times during the terms of the Order, on 23 August, 6 September, and 13 September during open estuary conditions and flows of 53.8 cfs, 50.8 cfs, and 64.0 cfs, respectively (Table 3-15). Finally, the lowest flow recorded during sampling was approximately 43.7 cfs, which occurred on twice during the terms of the Order, on 2 August and 16 August during open estuary conditions, with values of 2.4 NTU and 1.2 NTU, respectively.

The maximum turbidity value observed at Patterson Point occurred prior to the terms of the Order and was 4.4 NTU on 26 April during open estuary conditions and a flow of 463 cfs (Table 3-16 and Figure 3-31). The maximum turbidity value observed during the terms of the Order and was 4.2 NTU on 19 July during open estuary conditions and a flow of 47.7 cfs (Table 3-16 and Figure 3-31). The minimum value at Patterson Point was 0.85 NTU, which occurred during the terms of the Order on 20 September during open estuary conditions and a flow of 88.6 cfs. Finally, the lowest flow recorded during sampling was approximately 43.7 cfs, which occurred twice during the terms of the Order, on 2 August and 16 August during open estuary conditions, with values of 2.1 NTU and 1.2 NTU, respectively.

Chlorophyll a

Algal (*chlorophyll a*) results exceeded the EPA criteria sixteen (16) times at Vacation Beach, eight (8) times at Monte Rio, and twelve (12) times at Patterson Point (36 of 76 or 47.4%) prior to and during the terms of the Order under open and closed estuary conditions and flows that ranged from 43.7 to 463 cfs (Tables 3-14 through 3-16 and Figure 3-32). *Chlorophyll a* values varied through the monitoring season with several ND values occurring at all three stations prior to and during the terms of the Order, including during estuary closure in May and summer dam removal in September (Figure 3-32).

As mentioned above, lab analysis constraints in 2022 resulted in the MDL for *chlorophyll a* being higher than the EPA criteria for exceedances for *chlorophyll a* in rivers and streams. Therefore, some lab results for *chlorophyll a* that are listed as non-detect (ND) could potentially have concentrations above the criteria and below the MDL. However, for reporting purposes, only those exceedances that are quantified will be included in the summation.

The maximum *chlorophyll a* concentration observed at Vacation Beach occurred prior to the terms of the Order and was 0.0096 mg/L on 26 April during open estuary conditions and a flow of 463 cfs (Table

3-14 and Figure 3-32). The maximum value observed during the terms of the Order and was 0.0067 mg/L on 9 August during open estuary conditions and a flow of 51.3 cfs (Table 3-14 and Figure 3-32). The minimum value at Vacation Beach was ND, which occurred nine (9) times prior to and during the terms of the Order during open and closed estuary conditions, summer dam removal, and flows that ranged from 47.7 to 219 cfs (Table 3-14).

The maximum *chlorophyll a* concentration observed at Monte Rio occurred prior to the terms of the Order and was 0.0064 mg/L on 26 April during open estuary conditions and a flow of 463 cfs (Table 3-15 and Figure 3-32). The maximum value observed during the terms of the Order and was 0.0045 mg/L, which occurred twice on 19 July and 2 August during open estuary conditions and flows of 47.7 cfs and 43.7 cfs, respectively (Table 3-15 and Figure 3-32). The minimum value at Monte Rio was ND, which occurred seventeen (17) times prior to and during the terms of the Order during open and closed estuary conditions, summer dam removal, and flows that ranged from 43.7 to 153 cfs (Table 3-15).

The maximum *chlorophyll a* concentration observed at Patterson Point occurred prior to the terms of the Order and was 0.0083 mg/L on 12 May during closed estuary conditions and a flow of 141 cfs (Table 3-16 and Figure 3-32). The maximum value observed during the terms of the Order and was 0.0051 mg/L, which occurred 16 August during open estuary conditions and a flow of 43.7 cfs (Table 3-16 and Figure 3-32). The minimum value at Patterson Point was ND, which occurred fourteen (14) times prior to and during the terms of the Order during open and closed estuary conditions, summer dam removal, and flows that ranged from 44.9 to 219 cfs (Table 3-16).

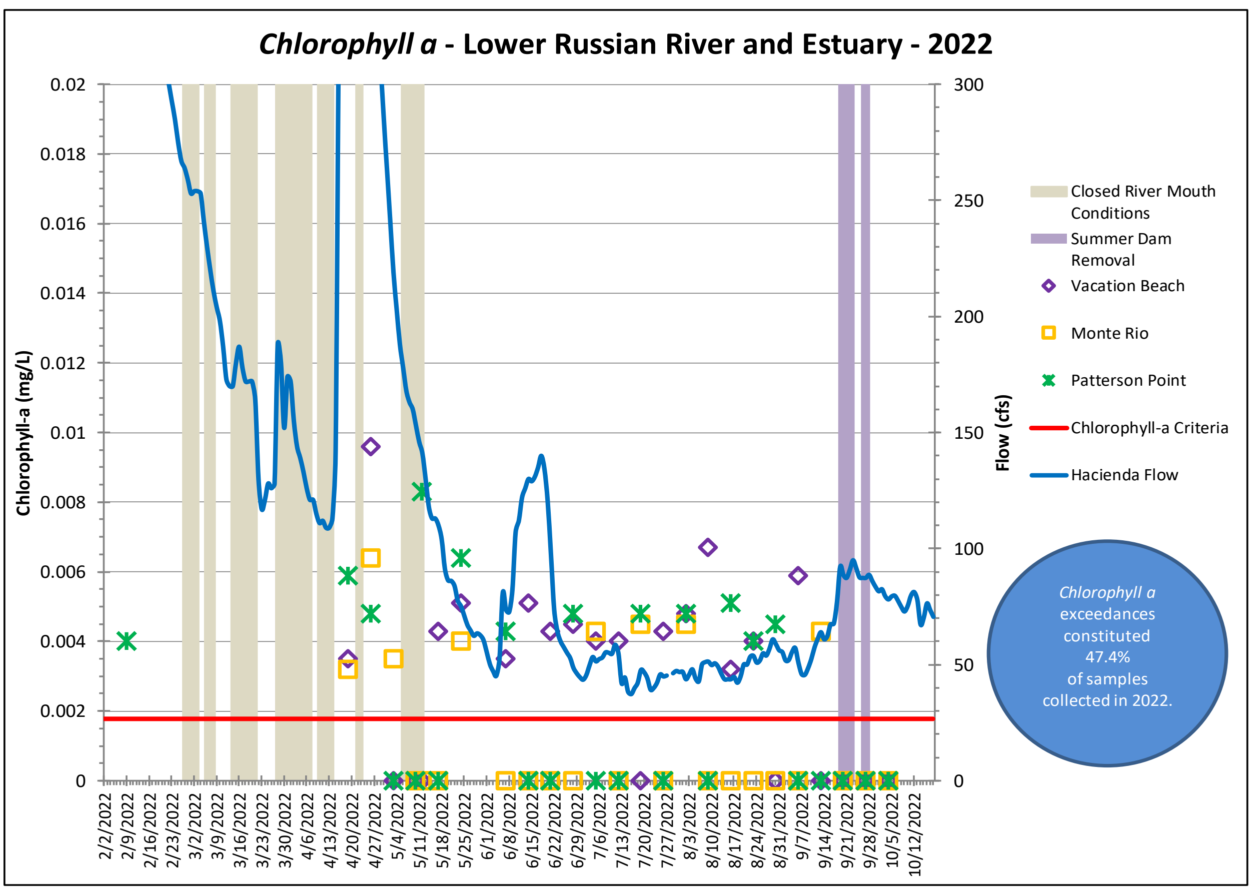

Figure 3-32. *Chlorophyll a* results for the Russian River from Vacation Beach to Patterson Point in 2022.

Table 3-14. 2022 Vacation Beach nutrient grab sample results. This site experiences freshwater conditions.

Vacation Beach	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	USGS 11467000 RR near Guerneville (Hacienda)***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.50	0.010	0.030	0.600	0.300	10	0.10	0.0010	Flow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
4/19/2022	11:50	15.3	7.9	0.24	ND	ND	0.10	ND	0.24	0.34	**0.056**	0.12	3.03	3.47	160	**3.4**	**0.0035**	424
4/26/2022	9:20	16.7	8.1	ND	ND	ND	0.056	ND	ND	0.056	**0.066**	0.13	3.06	3.62	160	**5.5**	**0.0096**	463
5/3/2022	10:50	17.6	8.0	ND	ND	ND	0.054	ND	ND	0.054	**0.062**	0.13	2.26	2.72	170	1.4	ND	219
5/10/2022	11:10	17.1	7.9	ND	ND	ND	ND	ND	ND	ND	**0.060**	0.12	1.88	2.29	170	2.2	ND	153
5/12/2022	10:50	16.2	7.9	ND	ND	ND	0.058	ND	ND	0.058	**0.053**	0.11	1.77	2.28	180	**2.6**	ND	141
5/17/2022	10:30	20.5	7.8	ND	ND	ND	ND	ND	ND	ND	**0.063**	0.17	1.80	2.34	170	1.6	**0.0043**	110
5/24/2022	10:00	22.7	8.0	ND	ND	ND	0.053	ND	ND	0.053	**0.070**	0.14	1.84	2.13	190	1.5	**0.0051**	75.2
6/7/2022	10:40	22.9	8.1	ND	ND	ND	ND	ND	ND	ND	**0.071**	0.14	1.64	1.94	180	1.9	**0.0035**	73.7
6/14/2022	10:10	22.6	8.0	0.21	ND	ND	ND	ND	0.21	0.21	**0.064**	0.13	1.88	2.31	160	1.7	**0.0051**	130
6/21/2022	10:20	22.3	8.0	ND	ND	ND	ND	ND	ND	ND	**0.036**	0.061	2.17	2.14	160	1.3	**0.0043**	97.4
6/28/2022	9:50	23.8	8.1	ND	ND	ND	ND	ND	0.20	0.20	**0.057**	0.093	1.83	2.15	180	**3.2**	**0.0045**	48.6
7/5/2022	12:20	23.1	7.8	0.28	ND	ND	ND	ND	0.28	0.28	**0.060**	0.11	1.72	2.22	160	1.8	**0.0040**	51.4
7/12/2022	10:50	24.5	8.1	ND	0.11	ND	ND	ND	ND	0.11	**0.044**	0.077	1.98	2.77	140	1.7	**0.0040**	54.8
7/19/2022	10:20	24.4	8.1	0.47	ND	ND	ND	ND	0.47	**0.50**	**0.050**	0.089	2.07	2.56	150	1.9	ND	47.7
7/26/2022	10:50	23.3	8.1	ND	ND	ND	ND	ND	ND	ND	**0.048**	0.076	2.01	2.44	150	1.6	**0.0043**	44.9
8/2/2022	10:10	23.5	7.8	0.24	ND	ND	ND	ND	0.24	0.24	**0.042**	0.078	2.06	2.66	150	2.2	**0.0048**	43.7
8/9/2022	9:40	23.2	7.8	ND	0.10	0.0031	ND	ND	ND	0.1031	**0.045**	0.057	1.97	2.33	150	1.3	**0.0067**	51.3
8/16/2022	9:50	24.0	7.8	ND	ND	ND	ND	ND	ND	ND	**0.044**	0.043	2.04	2.19	140	1.8	**0.0032**	43.7
8/23/2022	9:10	23.7	8.1	ND	ND	ND	ND	ND	ND	ND	**0.042**	0.049	1.86	2.18	150	0.90	**0.0040**	53.8
8/30/2022	10:40	22.6	8.1	ND	ND	ND	0.063	ND	ND	0.063	**0.028**	0.042	1.67	2.07	130	1.2	ND	58.8
9/6/2022	10:40	24.1	8.0	ND	ND	ND	ND	ND	ND	ND	**0.026**	ND	1.62	1.96	140	1.6	**0.0059**	50.8
9/13/2022	9:50	22.3	7.9	ND	ND	0.00068	ND	ND	ND	0.0007	**0.031**	0.039	1.67	2.07	130	1.1	ND	64.0
9/20/2022	9:30	19.6	7.8	ND	ND	0.00065	ND	ND	ND	0.0007	**0.029**	0.034	1.62	2.04	94	0.95	ND	88.6
9/27/2022	9:20	19.6	7.7	ND	ND	0.00012	ND	ND	ND	0.0001	**0.032**	0.030	1.56	1.88	170	**3.4**	ND	87.4
10/4/2022	9:40	19.0	7.8	ND	0.16	0.0038	0.064	ND	ND	0.2278	**0.032**	0.04	1.47	1.75	170	2.2	ND	78.1

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

*** United States Geological Survey (USGS) Continuous-Record Gaging Station

**** Flow rates are preliminary and subject to final revision by USGS.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.02188 mg/L (21.88 ug/L) ≈ 0.022 mg/L

Total Nitrogen: 0.38 mg/L

Chlorophyll *a* : 0.00178 mg/L (1.78 ug/L) ≈ 0.0018 mg/L

Turbidity: 2.34 FTU/NTU

Table 3-15. 2022 Monte Rio nutrient grab sample results. This site experiences freshwater conditions.

Monte Rio	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	USGS 11467000 RR near Guerneville (Hacienda)***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.50	0.010	0.030	0.600	0.300	10	0.10	0.0010	Flow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
4/19/2022	11:10	15.1	7.6	0.26	ND	ND	0.082	ND	0.26	0.34	**0.058**	0.13	2.88	3.67	260	**2.4**	**0.0032**	424
4/26/2022	9:00	16.7	8.0	ND	ND	ND	0.042	ND	ND	0.042	**0.065**	0.13	3.51	3.69	150	**6.0**	**0.0064**	463
5/3/2022	10:20	18.0	8.0	ND	ND	ND	ND	ND	ND	ND	**0.070**	0.15	2.31	2.83	180	1.9	**0.0035**	219
5/10/2022	10:50	17.3	8.0	ND	ND	ND	0.053	ND	ND	0.053	**0.065**	0.15	2.02	2.44	200	1.2	ND	153
5/12/2022	10:20	17.3	7.9	ND	ND	ND	0.061	ND	ND	0.061	**0.059**	0.13	1.87	2.35	180	1.6	ND	141
5/17/2022	10:10	20.4	7.7	ND	ND	ND	0.053	ND	ND	0.053	**0.065**	0.12	1.78	2.26	190	1.4	ND	110
5/24/2022	9:40	22.0	7.9	ND	ND	ND	0.054	ND	ND	0.054	**0.079**	0.17	1.93	2.33	200	1.6	**0.0040**	75.2
6/7/2022	10:10	22.4	7.9	ND	ND	ND	0.055	ND	ND	0.055	**0.068**	0.15	1.61	1.92	190	1.9	ND	73.7
6/14/2022	9:40	23.7	7.7	0.20	ND	ND	ND	ND	0.20	0.20	**0.073**	0.17	1.91	2.34	160	1.8	ND	130
6/21/2022	10:00	22.5	7.8	ND	ND	ND	0.054	ND	ND	0.054	**0.040**	0.077	1.93	2.24	180	0.96	ND	97.4
6/28/2022	9:30	23.2	7.9	ND	ND	ND	ND	ND	ND	ND	**0.063**	0.12	1.77	2.07	200	**2.9**	ND	48.6
7/5/2022	12:00	23.0	7.8	0.28	ND	ND	ND	ND	0.28	0.28	**0.069**	0.13	1.75	2.05	160	1.8	**0.0043**	51.4
7/12/2022	10:30	23.7	7.9	0.25	ND	ND	0.063	ND	0.25	0.31	**0.060**	0.11	1.92	2.62	150	1.9	ND	54.8
7/19/2022	10:00	23.9	8.0	ND	ND	ND	ND	ND	ND	ND	**0.058**	0.11	1.98	2.50	160	**3.2**	**0.0045**	47.7
7/26/2022	10:30	23.1	8.1	ND	ND	ND	ND	ND	ND	ND	**0.055**	0.099	2.03	2.41	150	2.1	ND	44.9
8/2/2022	9:50	23.2	7.8	ND	ND	ND	ND	ND	ND	ND	**0.052**	0.098	2.25	2.73	170	**2.4**	**0.0045**	43.7
8/9/2022	9:20	23.6	7.9	ND	0.14	0.0049	ND	ND	ND	0.1449	**0.055**	0.085	1.96	2.39	160	1.3	ND	51.3
8/16/2022	9:20	23.6	7.8	ND	ND	ND	0.063	ND	ND	0.063	**0.051**	0.071	1.87	2.29	140	1.2	ND	43.7
8/23/2022	8:50	23.5	7.9	ND	ND	ND	ND	ND	ND	ND	**0.049**	0.069	1.88	2.21	160	0.95	ND	53.8
8/30/2022	10:10	22.2	8.1	ND	ND	ND	0.063	ND	ND	0.063	**0.034**	0.059	1.65	2.07	130	1.1	ND	58.8
9/6/2022	10:20	23.7	7.8	ND	ND	ND	ND	ND	ND	ND	**0.033**	0.041	1.68	2.03	140	0.95	ND	50.8
9/13/2022	9:30	21.9	7.8	ND	ND	0.0013	ND	ND	ND	0.0013	**0.033**	0.056	1.78	2.16	150	0.95	**0.0043**	64.0
9/20/2022	9:10	19.8	7.6	ND	ND	0.00058	ND	ND	ND	0.0006	**0.031**	0.034	1.72	2.11	120	1.0	ND	88.6
9/27/2022	9:10	19.8	7.7	ND	ND	0.00083	ND	ND	ND	0.0008	**0.028**	0.030	1.57	1.89	170	2.3	ND	87.4
10/4/2022	9:10	18.9	7.7	ND	0.18	0.0030	0.063	ND	ND	0.0030	**0.036**	0.036	1.67	1.79	160	1.6	ND	78.1

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

*** United States Geological Survey (USGS) Continuous-Record Gaging Station

**** Flow rates are preliminary and subject to final revision by USGS.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.02188 mg/L (21.88 ug/L) ≈ 0.022 mg/L

Total Nitrogen: 0.38 mg/L

Chlorophyll *a* : 0.00178 mg/L (1.78 ug/L) ≈ 0.0018 mg/L

Turbidity: 2.34 FTU/NTU

Table 3-16. 2022 Patterson Point nutrient grab sample results. This site experiences freshwater conditions.

Patterson Point	Time	Temperature	pH	Total Organic Nitrogen	Ammonia as N	Ammonia as N Unionized	Nitrate as N	Nitrite as N	Total Kjeldahl Nitrogen	Total Nitrogen**	Phosphorus, Total	Total Orthophosphate	Dissolved Organic Carbon	Total Organic Carbon	Total Dissolved Solids	Turbidity	Chlorophyll-a	USGS 11467000 RR near Guerneville (Hacienda)***
MDL*				0.20	0.10	0.00010	0.040	0.050	0.20	0.50	0.010	0.030	0.600	0.300	10	0.10	0.0010	Flow Rate****
Date		°C		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	NTU	mg/L	(cfs)
2/9/2022	9:40	11.2	7.6	0.29	ND	ND	0.17	ND	0.29	**0.46**	0.017	ND	1.71	2.12	190	0.93	**0.0040**	439
4/19/2022	10:30	15.0	7.5	0.23	ND	ND	0.095	ND	0.23	0.32	**0.058**	0.14	3.07	3.21	170	**3.5**	**0.0059**	424
4/26/2022	8:20	17.0	8.1	ND	ND	ND	0.041	ND	ND	0.041	**0.064**	0.12	3.23	3.75	150	**4.4**	**0.0048**	463
5/3/2022	9:50	17.7	7.8	ND	ND	ND	ND	ND	ND	ND	**0.066**	0.15	2.20	2.85	180	1.6	ND	219
5/10/2022	10:20	17.0	7.9	ND	ND	ND	0.072	ND	ND	0.072	**0.068**	0.16	2.16	2.62	170	1.1	ND	153
5/12/2022	9:50	17.7	8.0	ND	ND	ND	0.095	ND	ND	0.095	**0.064**	0.14	1.91	2.47	170	1.2	**0.0083**	141
5/17/2022	9:40	20.1	7.8	ND	ND	ND	0.053	ND	ND	0.053	**0.061**	0.12	1.75	2.20	180	2.0	ND	110
5/24/2022	8:40	22.1	7.9	ND	ND	ND	0.054	ND	ND	0.054	**0.078**	0.18	1.94	2.30	180	1.2	**0.0064**	75.2
6/7/2022	9:40	22.3	7.8	ND	ND	ND	0.053	ND	ND	0.053	**0.070**	0.15	1.58	1.89	190	1.5	**0.0043**	73.7
6/14/2022	9:20	23.2	7.6	0.24	ND	ND	ND	ND	0.24	0.24	**0.080**	0.18	2.06	2.48	170	1.3	ND	130
6/21/2022	9:30	22.2	7.9	0.20	ND	ND	0.053	ND	0.20	0.253	**0.045**	0.081	1.94	2.12	150	0.93	ND	97.4
6/28/2022	9:10	23.3	7.9	0.27	ND	ND	ND	ND	0.27	0.30	**0.062**	0.11	1.73	2.07	170	**2.5**	**0.0048**	48.6
7/5/2022	11:40	22.8	8.1	0.30	ND	ND	ND	ND	0.30	0.30	**0.068**	0.14	1.70	2.09	160	1.4	ND	51.4
7/12/2022	10:00	23.9	7.9	0.30	ND	ND	ND	ND	0.30	0.30	**0.060**	0.12	1.99	2.79	150	2.0	ND	54.8
7/19/2022	9:20	23.7	8.0	ND	ND	ND	ND	ND	ND	ND	**0.059**	0.12	2.24	2.56	150	**4.2**	**0.0048**	47.7
7/26/2022	10:00	22.9	8.0	ND	ND	ND	ND	ND	ND	ND	**0.056**	0.099	1.99	2.52	160	1.6	ND	44.9
8/2/2022	9:20	23.1	7.9	ND	ND	ND	ND	ND	ND	0.24	**0.056**	0.11	2.11	2.58	180	2.1	**0.0048**	43.7
8/9/2022	8:50	23.2	7.8	ND	0.12	0.0038	ND	ND	ND	0.1031	**0.060**	0.093	2.02	2.43	160	1.5	ND	51.3
8/16/2022	8:40	23.5	7.8	ND	ND	ND	ND	ND	ND	ND	**0.056**	0.079	1.91	2.24	140	1.2	**0.0051**	43.7
8/23/2022	8:20	23.3	8.1	0.21	ND	ND	ND	ND	0.21	0.21	**0.048**	0.077	1.90	2.24	140	1.8	**0.0040**	53.8
8/30/2022	9:40	22.3	7.8	ND	ND	ND	0.065	ND	ND	0.065	**0.041**	0.071	1.68	2.07	140	1.0	**0.0045**	58.8
9/6/2022	9:50	23.5	7.8	ND	ND	ND	ND	ND	ND	ND	**0.036**	0.053	1.75	2.09	150	1.1	ND	50.8
9/13/2022	9:10	21.8	7.5	ND	ND	0.00074	ND	ND	ND	0.0007	**0.037**	0.064	1.64	2.01	150	1.2	ND	64.0
9/20/2022	8:40	19.9	7.6	ND	ND	0.00014	ND	ND	ND	0.0001	**0.032**	0.038	1.71	2.17	140	0.85	ND	88.6
9/27/2022	8:50	19.9	7.6	0.40	ND	0.00023	ND	ND	0.40	**0.40**	**0.025**	0.034	1.63	2.06	170	1.5	ND	87.4
10/4/2022	8:40	19.1	7.7	ND	0.20	0.0033	0.066	ND	ND	0.2693	**0.029**	0.040	1.54	1.80	160	1.2	ND	78.1

* Method Detection Limit - limits can vary for individual samples depending on matrix interference and dilution factors, all results are preliminary and subject to final revision.

** Total nitrogen is calculated through the summation of the different components of total nitrogen: organic and ammoniacal nitrogen (together referred to as Total Kjeldahl Nitrogen or TKN) and nitrate/nitrite nitrogen.

*** United States Geological Survey (USGS) Continuous-Record Gaging Station

**** Flow rates are preliminary and subject to final revision by USGS.

Recommended EPA Criteria based on Aggregate Ecoregion III

Total Phosporus: 0.02188 mg/L (21.88 ug/L) ≈ 0.022 mg/L

Total Nitrogen: 0.38 mg/L

Chlorophyll *a* : 0.00178 mg/L (1.78 ug/L) ≈ 0.0018 mg/L

Turbidity: 2.34 FTU/NTU

3.3 Discussion and Observations

The mainstem Russian River experienced less rainfall and lower flows in 2022 compared to Normal Water Year flow rates. These lower flows from a dry winter and spring resulted in a Dry Spring Water Year designation that allowed D1610 flows to be reduced to the Dry Spring Water Year minimum flow rates of 75 cfs in the upper Russian River and 85 cfs in the lower Russian River. This Dry Spring Water Year condition, coupled with significantly low levels of water supply storage in Lake Mendocino, precipitated the request and issuing of a TUC Order to reduce minimum instream flow requirements below D1610 Dry Spring Water Year requirements to preserve water storage in Lake Mendocino.

Monitoring conducted for the TUC Order was similar (methods, locations) to monitoring conducted prior years when TUC Orders were issued in response to dry watershed conditions and low reservoir storage levels, as well as to comply with Biological Opinion proposed mainstem flows. Given that 2022 was a dry year beginning in January, monitoring was conducted prior to the terms of the TUC Order taking effect in June to provide additional context on conditions in the watershed prior to the term of the Order, which was active from 17 June through 14 December.

Based on the assemblage of data collected by Sonoma County DHS, USACE, CDFW, USGS, and Sonoma Water, it does not appear that lower flows observed in 2022 negatively affected water quality or the availability of aquatic habitat, or provided a significant contribution to biostimulatory conditions when compared to data collected during years with Normal Water Year flow rates, such as 2019.

A brief comparison of several streamflow data points from 2019; a Normal Water Year under D1610, and 2022; a dry water year, is provided for context. The 2019 data is available in the Russian River Water Quality Summary for the 2019 Temporary Urgency Change (Sonoma Water, 2020).

The 2019 daily average flows in the Upper Russian River between Talmage and Diggers Bend generally ranged between 125 and 175 cfs during the months of July through October (Figure 3-33).

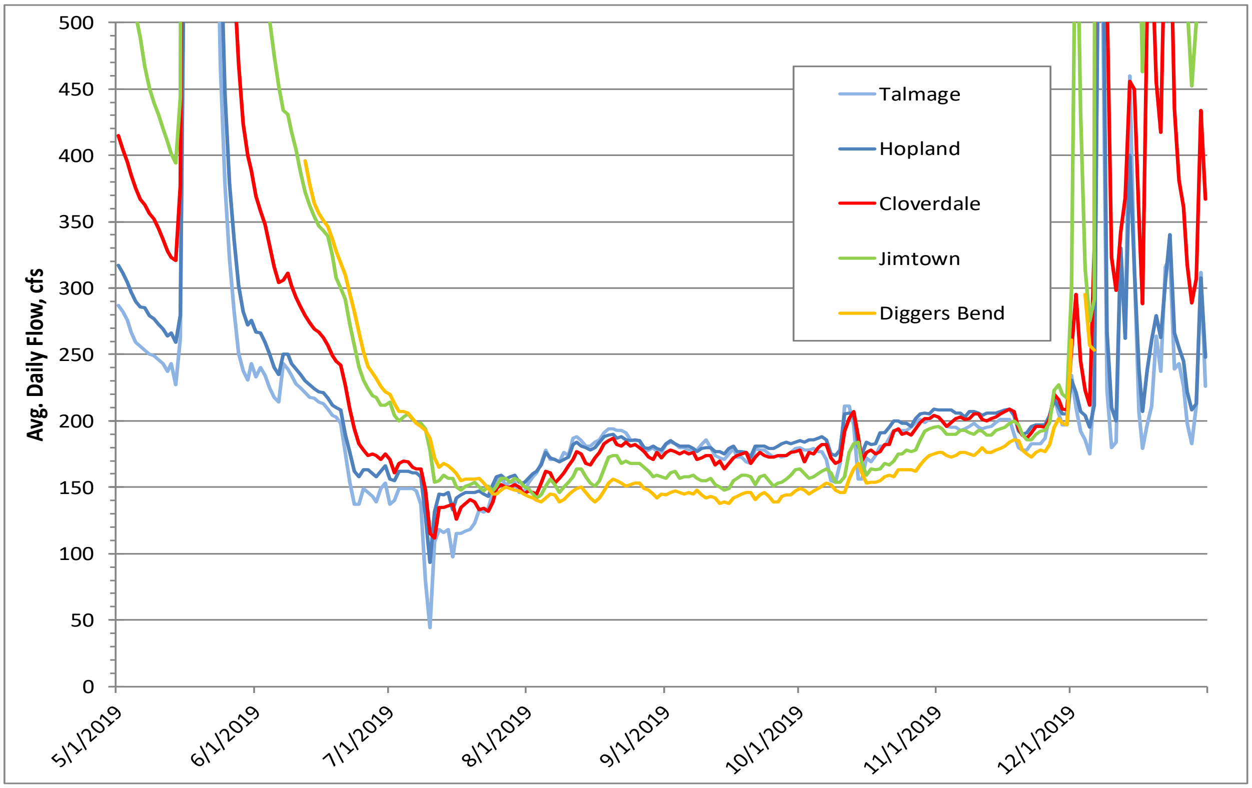

Figure 3-33. 2019 average daily flows in the Upper Russian River as measured at USGS gages above the Dry Creek confluence in cubic feet per second. Flow rates are preliminary and subject to final revision by USGS.

Whereas, 2022 daily average flows in the upper river between Talmage and Diggers Bend generally ranged between 25 and 75 cfs during the months of July through October (Figure 3-34).

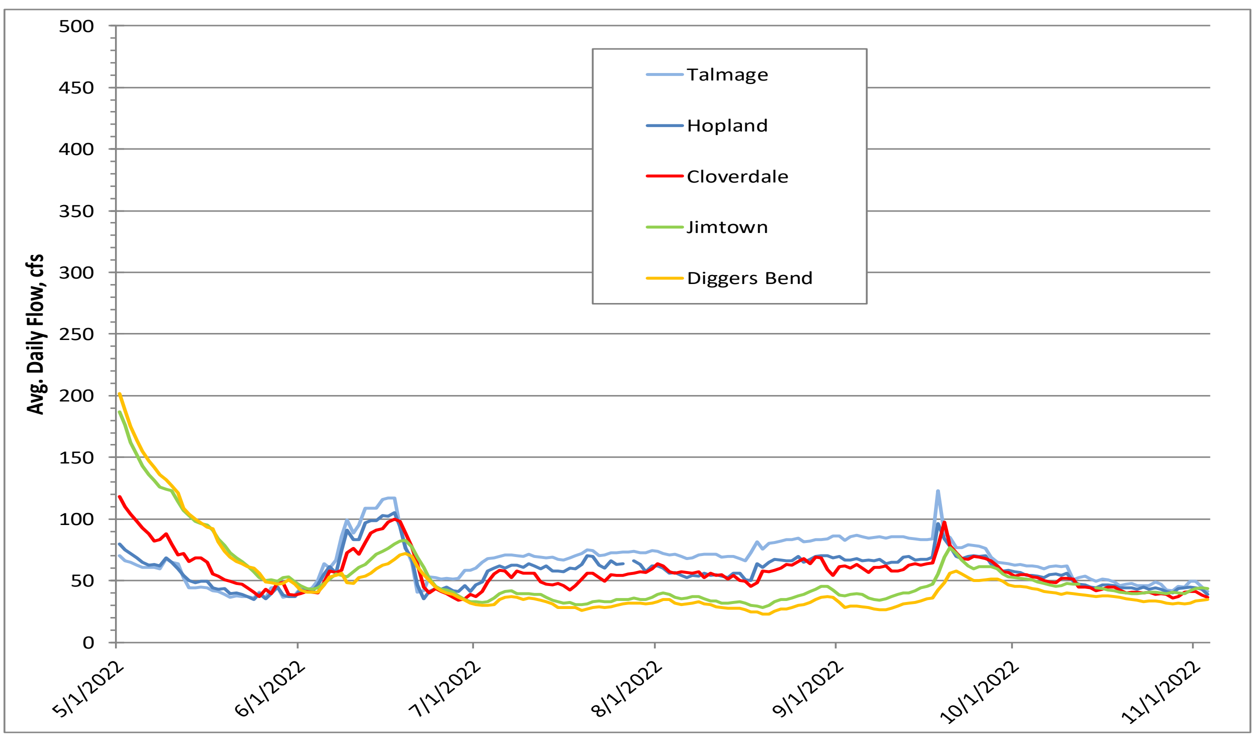

Figure 3-34. 2022 average daily flows in the Upper Russian River as measured at USGS gages above the Dry Creek confluence in cubic feet per second. Flow rates are preliminary and subject to final revision by USGS.

In the lower river, a late season storm in 2019 significantly elevated flows from approximately 600 cfs to over 3000 cfs at Hacienda in mid-May. Flows remained above 500 cfs into early June, resulting in mainstem flows decreasing to base summertime flows later in the dry season compared to previous years, including 2022 (Figure 3-35).

In contrast, a dry winter and spring in 2022 resulted in flows at Hacienda decreasing to under 100 cfs in mid-May. Flows increased briefly from mid to late June to just under 150 cfs, before decreasing and remaining between 35 and 95 cfs through October (Figure 3-35).

Summertime base flows in the lower river at Hacienda remained above 150 cfs in 2019, whereas summertime base flows in 2022 were generally below 75 cfs (Figure 3-35).

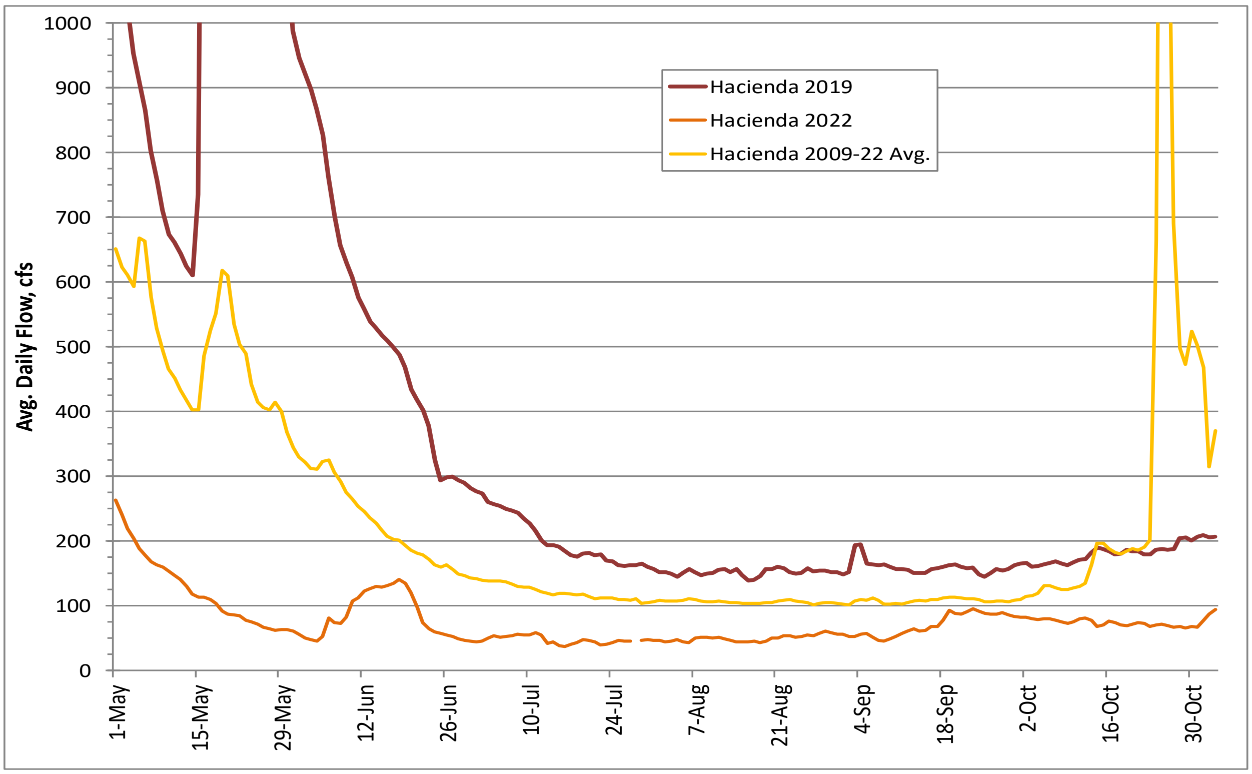

Figure 3-35. Comparison of 2019, 2022 and 2009-2022 average daily flows in the Lower Russian River as measured at USGS Hacienda gage in cubic feet per second. Flow rates are preliminary and subject to final revision by USGS.

Overall, observed exceedances of EPA and CDPH criteria in the upper and lower river in 2022 were generally consistent with, and in some cases less frequent, than in 2019. Included below is a brief discussion and comparison of some of the data collected in 2019 and 2022 that demonstrate that lower flows in 2022 did not negatively affect water quality or the availability of aquatic habitat, or significantly contribute to biostimulatory conditions compared to Normal Water Years, including 2019.

In 2019, Sonoma County DHS reported three (3) total coliforms exceedances out of 153 total samples collected (2.0%) and two (2) *E. coli* exceedances out of 153 total samples collected (1.3%) at the ten beach monitoring stations. Conditions for total coliforms were similar in 2022 with eight (8) total coliform exceedances out of 152 total samples collected (5.3%). Similarly, in 2022 Sonoma County DHS reported eight (8) *E. coli* exceedances out of 152 total samples collected (5.3%) at the ten stations.

In 2019, Sonoma Water reported two (2) total coliforms exceedances out of 75 total samples collected (2.7%) and three (3) *E. coli* exceedances out of 75 total samples collected (4.0%) at the three lower river monitoring stations. Similarly in 2022, Sonoma Water reported one (1) total coliforms exceedance out of 75 total samples collected (1.3%) and one (1) *E. coli* exceedance out of 75 total samples collected (1.3%) at the three lower river stations.

DHS did not conduct cyanotoxin monitoring at the ten beach monitoring stations in 2019 or 2022 so there are no comparative values.

The TUC Order required recommendations for minimizing cyanoHAB outbreaks during the current and future water years under similar flow conditions to those experienced under the Order. Algae monitoring conducted in the Russian River since 2016 indicates that cyanoHABs will occur annually at some level regardless of changes to summertime reservoir releases. Nutrient monitoring indicates that during drought conditions and periods of low river flow sustained only by reservoir releases, the input of biostimulating nutrients is typically less than during periods of abundant rainfall and higher river flows. CyanoHAB formation is inevitable in the Russian River if there is water present in the system in the dry summer months. To minimize cyanoHAB outbreaks, efforts to reduce point source and over land addition of nutrients to the Russian River in general would be the most effective. Additionally, the presence of invertebrate grazers as well as rearrangement of the littoral zone during high storm flows have been observed to affect the timing and composition of cyanoHABs.

As such, Sonoma Water staff would recommend continued coordination and comprehensive monitoring across agencies (including the North Coast Regional Water Quality Control Board and DHS) to assess river conditions and specifically those conditions that may contribute to an elevated potential for cyanoHAB outbreaks. These conditions include but are not limited to nutrient availability, invertebrate grazing, water clarity, temperature, the timing and intensity of storm events, streamflow, and the potential for changing hydrology and bed scour to influence development of algal biomass. Sonoma Water staff would continue to promote the preservation of the cold water pool in Lake Mendocino through responsible reservoir management and river flow operations.

Total nitrogen exceedances and concentrations at the upper river stations were fairly consistent from 2019 to 2022, with 2019 having ten (10) exceedances of 49 total samples (20.4%) and 2022 having twenty-one (21) exceedances of 90 total samples (23.3%). Hopland was also observed to have the most total nitrogen exceedances of the four upper river stations in 2019 and in 2022.

Total nitrogen exceedances in 2019 and 2022 were also consistent at the lower river stations of Vacation Beach, Monte Rio, and Patterson Point, with 2019 experiencing eight (8) exceedances of 75 total samples (10.6%) and 2022 experiencing three (3) exceedances of 76 samples (4.0%).

Total phosphorus concentrations and numbers of exceedances were fairly consistent from 2019 to 2022 in Hopland, but were significantly lower in Cloverdale and Syar and to a lesser degree at Jimtown in 2022. In 2019, Cloverdale had six (6) exceedances of 6 samples collected (100%), Jimtown had six (6) exceedances of 12 samples collected (50%) and Syar had 11 exceedances of 18 samples collected (61.1%). Whereas in 2022, Cloverdale had nine (9) exceedances of 16 samples collected (56.3%), Jimtown had five (5) exceedances out of 16 samples collected (31.3%) and Syar had four (4) exceedances out of 16 samples collected (25%). Total phosphorus exceedances and concentrations at the three lower river stations were consistently high in 2019 and 2022, with values typically declining in September and October during both years. These exceedances in both 2019 and 2022 continue a pattern of chronic elevated total phosphorus in the lower river area.

Turbidity values in the upper river were significantly lower in 2022 than in 2019, especially at Hopland and Cloverdale. Turbidity values at Hopland exceeded the criteria through the entire 2019 season (12 of 12 or 100%), with most values being above 10 NTU including a maximum value of 29 NTU. Whereas in 2022, Hopland only had six (6) exceedances of 16 samples (37.5%), with most values below 3 NTU and a maximum of 9.5 NTU. Cloverdale also exceeded the criteria through the entire 2019 season (7 of 7 or 100%) with most values above 5 NTU and a maximum value of 15 NTU. Whereas, Cloverdale only experienced one (1) exceedance out of 16 samples collected (6.3%) in 2022, with most values below 2 NTU and a maximum value of 3.6 NTU. Jimtown had six (6) exceedances of 12 samples collected (50%) and a maximum value of 6.6 NTU in 2019, but only one (1) exceedance of 16 samples collected (6.3%) and a maximum value of 2.5 NTU in 2022. Syar had 14 exceedances of 18 samples collected (77.8%) with a maximum value of 30 NTU in 2019, but only one (1) exceedance of 16 samples collected (6.3%) and a maximum value of 2.8 NTU in 2022.

Turbidity values were significantly lower at Vacation Beach, Monte Rio and Patterson Point in 2022 compared to 2019, especially during the first half of the monitoring season. Vacation Beach had 20 exceedances out of 25 samples collected (80%) in 2019 compared with five (5) exceedances of 25 samples collected (20%) in 2022. Monte Rio had nine (9) exceedances of 25 samples collected (36%) in 2019 compared with five (5) exceedances of 25 samples collected (20%) in 2021. Patterson Point had eleven (11) exceedances of 25 samples collected (44%) in 2019 compared with four (4) exceedances of 25 samples collected (25%) in 2022. The majority of exceedances at Monte Rio and Patterson Point in 2019 occurred during the first half of the season when flows were still elevated from late season storms in May. Similarly, exceedances in 2022 occurred at all three stations at the beginning of the monitoring season during elevated storm flows, as well as periodically through the season with flows ranging from 43.7 to 141 cfs.

A comparison of *chlorophyll a* exceedances between 2019 and 2022 is not possible due to the higher lab MDL for *chlorophyll a* concentrations in 2022 that did not allow a quantification of values that may fall between the EPA criteria of approximately 0.0018 mg/L and the MDL of 0.0030 mg/L. Even so, there were more exceedances at Hopland in 2022 (9 of 16 or 56.3%) than in 2019 (2 of 12 or 16.7%) and concentrations were generally higher in 2022. *Chlorophyll a* concentrations that were quantifiable in 2022 were also slightly higher at the other upper river stations compared to 2019. This may have been influenced by the increased clarity of the water and lower turbidity in 2022 allowing for greater light penetration into the water column.

Again, a comparison of *chlorophyll a* exceedances between 2019 and 2022 is not possible due to the higher lab MDL for *chlorophyll a* concentrations in 2022. However, maximum *chlorophyll a* concentrations were somewhat similar in the lower river in 2022 compared to 2019, even with improved water clarity. In 2019, Vacation Beach had less exceedances (12 of 25 or 48%) and maximum value of 0.0069 mg/L, compared with 2022 (16 of 25 or 64%) and a maximum value of 0.0096 mg/L. However, Monte Rio had more exceedances in 2019 (13 of 25 or 52%) and a maximum value of 0.11

mg/L, compared with 2022 (8 of 25 or 32%) and a maximum value of 0.0064 mg/L. Finally, Patterson Point had 11 of 25 exceedances (44%) in 2019 with a maximum value of 0.0064 mg/L, compared with 12 of 26 exceedances (46.2%) and a maximum value of 0.0083 mg/L in 2022.

Chlorophyll a exceedances in the lower river in 2019 occurred predominantly during the first half of the season while flows were still elevated from late season storms. Whereas, *chlorophyll a* exceedances were periodic in 2022.

Year to year variability in the percentage of exceedances, and concentrations and values, for the constituents discussed above can be attributed in large part to: the frequency, timing, and severity of storm events; fluctuating stream flow rates; atmospheric conditions; and contact recreation. Additionally, in the lower river the frequency and timing of barrier beach closures, the strength of tidal cycles, and summer dam removal also contribute to the year to year variability in exceedances, concentrations, and values.

4.0 Additional Monitoring

4.1 Sonoma Water and USGS Permanent and Seasonal Datasondes

In coordination with the USGS, Sonoma Water maintains three, multi-parameter water quality sondes on the Russian River located at Russian River near Hopland, Russian River at Digger Bend near Healdsburg, and Russian River near Guerneville (aka Hacienda). These three sondes are referred to as "permanent" because Sonoma Water contracts with the USGS to maintain them as part of Sonoma Water's early warning detection system for use year-round (Figure 4.1). The sondes take real time readings of water temperature, pH, dissolved oxygen content (DO), specific conductivity, turbidity, and depth, every 15 minutes. Sonoma Water also maintains a permanent sonde on the East Fork of the Russian River approximately one-third of a mile (1/3 mi.) downstream of Lake Mendocino. However, this station is not a real-time station or part of the early warning detection system.

In addition to the permanent sondes, Sonoma Water, in cooperation with the USGS, installed four seasonal sondes with real-time telemetry at the USGS river gage stations at East Fork near Calpella (upstream of Lake Mendocino), Russian River near Cloverdale (north of Cloverdale at Comminsky Station Road), Russian River at Jimtown (Alexander Valley Road Bridge), and at Johnson's Beach in Guerneville (Figure 4.1). The three seasonal sondes at Calpella, Cloverdale, and Jimtown are included by the USGS on its "Real-time Data for California" website: https://waterdata.usgs.gov/ca/nwis/rt.

The data collected by the sondes described above are evaluated in Section 4.2 in response to the terms of the SWRCB TUC Order to evaluate whether and to what extent the reduced flows authorized by the Order caused any impacts to water quality or availability of aquatic habitat for salmonids. In addition, the 2021 data will help provide information to evaluate potential changes to water quality and availability of habitat for aquatic resources resulting from the proposed permanent changes to D1610 minimum instream flows that are mandated by the Biological Opinion and will be included in the Biological Opinion Annual Monitoring Report. The annual report will be available on Sonoma Water's website: https://www.sonomawater.org/biological-opinion-outreach.

Figure 4-1. 2022 Sonoma Water and USGS Russian River permanent and seasonal datasonde monitoring stations.

4.2 Aquatic Habitat for Salmonids

4.2.1 Introduction

In Term 7 of the Temporary Urgency Change Order (Order) the State Water Resource Control Board (SWRCB) tasked Sonoma Water with evaluating impacts associated with reductions in minimum instream flows authorized by the Order to water quality and the availability of aquatic habitat for Russian River salmonids. This section of the report summarizes temperature and dissolved oxygen (DO) conditions in the Russian River during the Order and relates these conditions to fisheries monitoring data collected by Sonoma Water.

4.2.2 Russian River Salmonid Life Stages

Salmonids in the Russian River can be affected by flow, temperature, and dissolved oxygen (DO) changes at multiple life stages. The Russian River supports three species of salmonids, coho salmon, steelhead, and Chinook salmon. These species follow similar life history patterns with adults migrating from the ocean to the river and moving upstream to spawn in the fall and winter. Because all three species of Russian River anadromous salmonids spend a period of time freshwater, individuals must cope with the freshwater conditions they encounter including flow, temperature, and DO. While all three species follow a similar life history, each species tends to spawn and rear in different locations and are present in the Russian River watershed at slightly different times. These subtle but important differences may expose each species to a different set of freshwater conditions.

Coho Timing and Distribution

Wild coho salmon populations in the Russian River are at alarmingly low levels and recovery measures rely mainly on fish released from Don Clausen Warm Springs Hatchery as part of the Russian River Coho Salmon Captive Broodstock Program (RRCSCBP). Data collected at Sonoma Water's Mirabel inflatable dam on an underwater video camera system from 2011 through 2013 indicate that adult coho salmon begin migrating past the dam in late October and continue through at least January and that the bulk of adult coho migrate through that portion of the river from November through February (in 2013, 97% of coho were observed after November 20 (Martini-Lamb and Manning 2014)). Spawning and rearing occurs in certain tributaries to the Russian River (NMFS 2008) and data from downstream migrant trapping in some of those tributaries indicate that coho smolt emigration starts before April and continues through mid-June (Obedzinski et al. 2006). Although coho smolts have been captured as late as mid-July in downstream migrant traps operated by Sonoma Water on the mainstem Russian River at the Mirabel dam (Martini-Lamb and Manning 2011), most emigrate from the Russian River from March through May. Only the Russian River coho adult life stage is present in the mainstem during the Order; therefore, only temperature and DO data relating to this life stage will be analyzed for this report. There is limited coho spawning habitat upstream of Healdsburg although there is evidence that coho have spawned in the Maacama system in recent years. Therefore, water quality data from only the Hacienda and Digger Bend sites will be summarized for coho salmon in this report.

Steelhead Timing and Distribution

Based on video monitoring at Sonoma Water's Mirabel inflatable dam and returns to the Warm Springs Hatchery, adult steelhead return to the Russian River later than Chinook. Deflation of the inflatable dam and removal of the underwater video camera system preclude a precise measure of adult return timing or numbers. However, continuous video monitoring at the inflatable dam during late fall through spring in 2006-2007, timing of returns to the hatchery, and data gathered from steelhead angler report cards (SCWA unpublished data, Jackson 2007) suggest that steelhead return to the Russian River from December through March with the majority returning in January and February.

Many steelhead spawn and rear year-round in tributaries of the Russian River and in the upper mainstem Russian River (NMFS 2008, Cook 2003). Cook (2003) found that summer rearing of steelhead in the mainstem Russian River were distributed in the highest concentrations between Hopland and Cloverdale (Canyon Reach). Steelhead were also found in relatively high numbers (when compared to habitats downstream of Cloverdale) in the section of river between the Coyote Valley Dam and Hopland. The Canyon Reach is the highest gradient section of the mainstem Russian River and contains high velocity habitats that include riffles and cascades (Cook 2003). Due to flow releases from Lake Mendocino, both the Canyon and Ukiah reaches generally have cooler water temperatures when compared to other mainstem reaches.

The steelhead smolt migration in the Russian River begins at least as early as March and continues through June, with most steelhead emigrating from March through May (SCWA unpublished data, Martini-Lamb and Manning 2011). The Russian River steelhead juvenile and adult life stages are present in the mainstem during the Order while most smolts emigrate before the Order; therefore, only temperature and DO data relating to the juvenile and adult life stages will be analyzed for steelhead in this report.

Chinook Timing and Distribution

Based on video monitoring at Sonoma Water's Mirabel inflatable dam (river Km 39.67), adult Chinook are typically observed in the Russian River before coho and steelhead. Chinook enter the Russian River as early as September and migration is complete by early February with the majority of migration occurring prior to mid-December in most years. Chinook are mainstem spawners and deposit their eggs into the stream bed of the mainstem Russian River and in Dry Creek during the fall (Chase et al. 2005 and 2007, Cook 2003, Martini-Lamb and Manning 2011). Chinook offspring rear for approximately two to four months before emigrating to sea in the spring. The bulk of Chinook smolt emigration occurs from April through mid-July. Russian River Chinook smolt and adult life stages are present in the mainstem during the Order; therefore, only temperature and DO data relating to these two life stages will be analyzed for Chinook salmon this report.

4.2.3 Methods

Sonoma Water uses underwater video, downstream migrant traps, and water quality data collected in the Russian River to depict water quality conditions when salmonids where present. To estimate the number of adult Chinook that return to the Russian River upstream of the Mirabel inflatable dam, Sonoma Water typically operates an underwater video camera in the fish ladder located at the dam. Sonoma Water also operates downstream migrant traps to enumerate salmonid smolts. USGS stream gages and Sonoma Water operated data sondes were used to provide water quality data in the mainstem Russian River.

Physical and water quality conditions (flow, water temperature, and DO) were collected at multiple sites in the Russian River. USGS stream gages located on the Russian River at Hacienda, Digger Bend, Jimtown, Cloverdale, and Hopland provided flow, water temperature, and DO data. Data sondes that collected temperature and DO data in the mainstem Russian River were located near the confluence with Pieta Creek (approximately 5 miles downstream of Hopland) and in the east fork Russian River 0.5 km downstream of Coyote Valley Dam, near Ukiah (Figure 4-1 and Table 4-1). These sondes were operated by Sonoma Water. Water quality conditions at these sites were compared to literature-based thresholds for temperature and DO (Tables 4-2 through Table 4-5).

Figure 4-1. The river Km for sites on the Russian River where continuous temperature and dissolved oxygen data was collected by USGS or Sonoma Water in 2022 and used in this report.

Table 4-1. The name and river Km for sites on the Russian River where continuous temperature and dissolved oxygen data was collected by USGS or Sonoma Water in 2022.

Tributary	River Km	Site
East Fork Russian River	1.35	Downstream of Coyote Valley Dam
Russian River	136.49	USGS 11462500 Russian River near Hopland
	120.02	Pieta Creek confluence
	114.27	USGS 11463000 Russian River near Cloverdale
	77.81	USGS 11463682 Russian River at Jimtown
	61.36	USGS 11463980 Russian River at Digger Bend
	34.77	USGS 11467000 Russian River at Hacienda Bridge

Table 4-2. Adult salmonid water temperature (°C) thresholds used for migration when describing water quality conditions during the term of the Temporary Urgency Change Order. Criteria are from SCWA (2016).

Description	Chinook	Coho	Steelhead
optimal upper limit	15.6	11.1	11.1
suitable upper limit	17.8	15.0	15.0
stressful upper limit	19.4	21.1	21.1
acutely stressful upper limit	23.8	23.8	23.8
potentially lethal lower limit	23.9	23.9	23.9

Table 4-3. Juvenile salmonid rearing temperature (°C) thresholds used for describing water quality conditions during the term of the Temporary Urgency Change Order. Criteria are from SCWA (2016).

Description	Chinook	Coho	Steelhead
optimal upper limit	16.9	13.9	16.9
suitable upper limit	17.8	16.9	18.9
stressful upper limit	20.0	17.8	21.9
acutely stressful upper limit	23.8	23.8	23.8
potentially lethal lower limit	23.9	23.9	23.9

Table 4-4. Salmonid smolting temperature (°C) thresholds used for describing water quality conditions during the term of the Temporary Urgency Change Order. Criteria are from SCWA (2016).

Description	Chinook	Coho	Steelhead
optimal upper limit	16.9	10.0	11.1
suitable upper limit	17.8	13.9	12.8
stressful upper limit	20.0	16.9	15.0
acutely stressful upper limit	23.8	23.8	23.8
potentially lethal lower limit	23.9	23.9	23.9

Table 4-5. Dissolved oxygen (mg/L) thresholds for all salmonid life stages used for describing water quality conditions during the term of the Temporary Urgency Change Order. Criteria are from SCWA (2016).

Description	Dissolved Oxygen (mg/L)
optimal	>12
suitable	8.0-11.9
stressful	5.0-7.9
acutely stressful	3.0-4.9
potentially lethal upper limit	<3

To evaluate temperature- and DO-related impacts from flow changes we compared count data (when available) to water quality information only where fish would either pass a water quality station before being detected at a particular counting station. For instance, because most steelhead rearing habitat in the mainstem Russian River occurs upstream of Hopland, this report presents the water quality data from the USGS Hopland gaging station when analyzing temperature- and DO-related impacts to juvenile steelhead. Salmonid smolts of all three species moving downstream out of Dry Creek and the upper Russian River pass our downstream migrant trap on the Russian River at Mirabel then pass the Hacienda USGS stream gage before entering the ocean. Therefore, we paired salmonid smolt data from the Russian River downstream migrant trap to Hacienda water quality data to describe the conditions these fish likely experienced as they moved downstream through the lower Russian River. This report summarizes data from when the Order went into effect on June 17, 2022, to October 31, 2022.

4.2.4 Results

Flow

The TUCO went into effect on June 17, 2022. From June 17 to October 31, 2022, the Russian River was generally controlled by reservoir releases and not strongly influenced by tributary in-flow (Figure 4-2).

Temperature

Adult Salmonid Migration

The underwater video camera at the Mirabel dam was installed on September 1, 2022. Video was reviewed and daily counts of adult salmonids were summarized. In total 105 adult chinook and 6 adult coho were observed on the Mirabel video camera between September 1 and October 31, 2022.

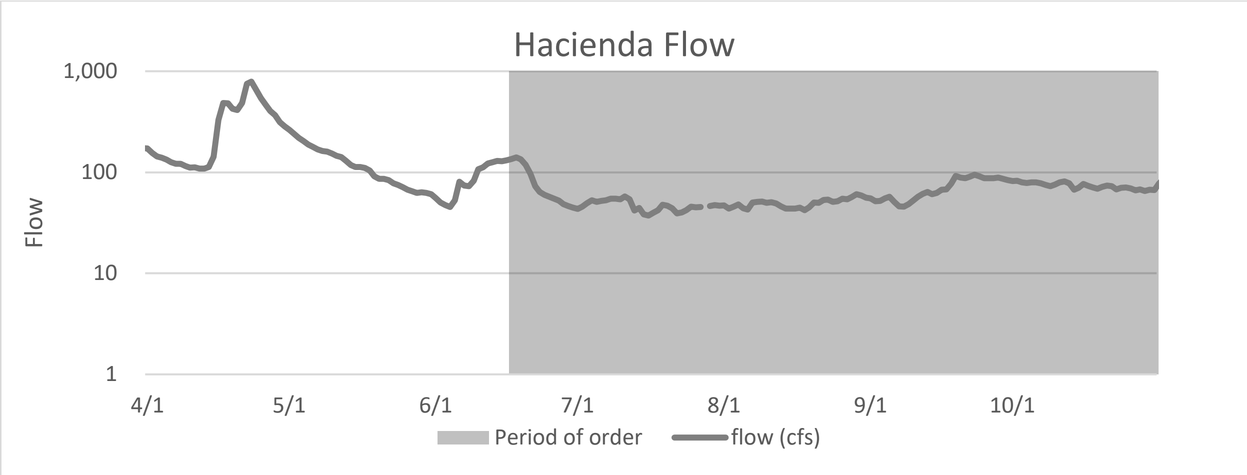

Figure 4-2. Flow in cubic feet per second (cfs) in the Russian River at the U.S. Geological Survey Hacienda stream gage (USGS gage number 11467000) from June 17 to October 31, 2022. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022.

Chinook

Water temperatures for Chinook salmon were favorable after mid-October when most Chinook are typically observed in the Russian River. At the Hacienda gage the temperature ranged from optimal to acutely stressful for adult salmonids (based on the criteria in Table 4-2 and Figure 4-3). However, temperatures at Hacienda were generally suitable to optimal when the majority of Chinook are typically observed at Mirabel (mid-October to mid-December). Moving upstream from Hacienda, Chinook would have experienced water temperatures similar to Hacienda at Digger Bend, Jimtown, the confluence with Pieta creek and Hopland (Figures 4-3 through 4-8).

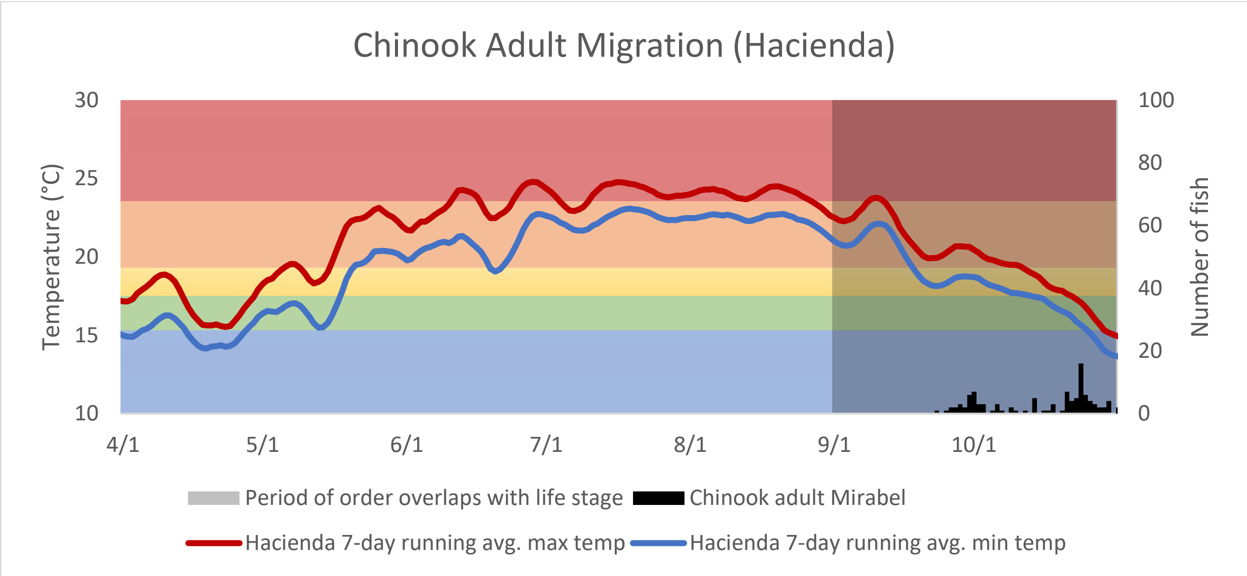

Figure 4-3. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000) from April 1 to October 31, 2022, and number of adult Chinook observed on the Mirabel video camera. Also show are optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for adult Chinook based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022 that overlaps with this species and life stage being assessed.

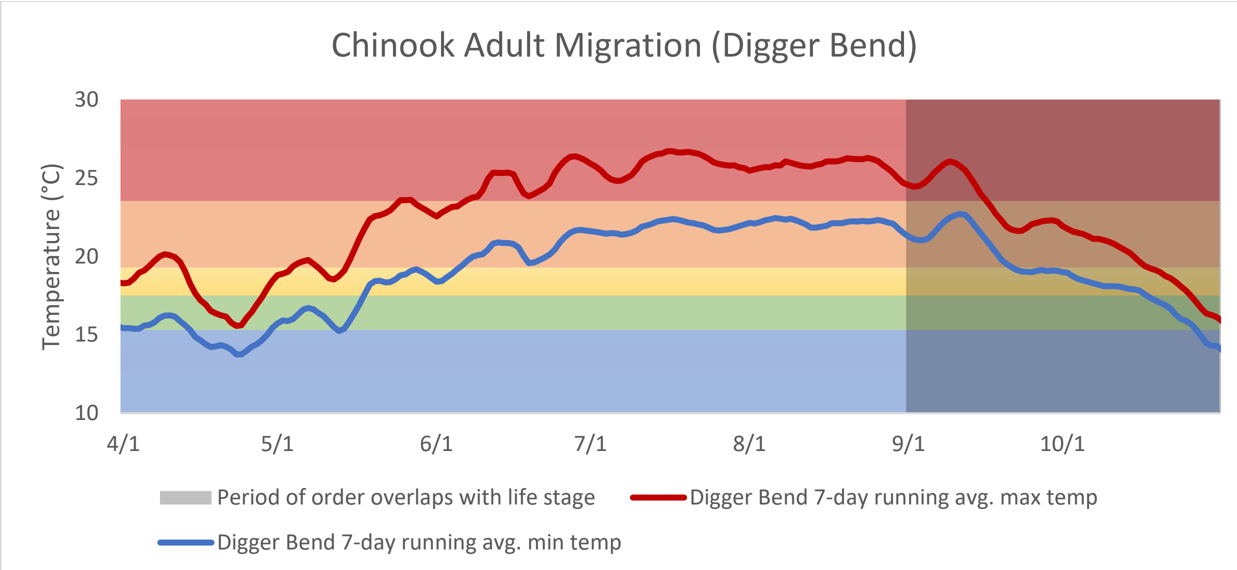

Figure 4-4. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Digger Bend (11463980) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022 that overlaps with this species and life stage being assessed.

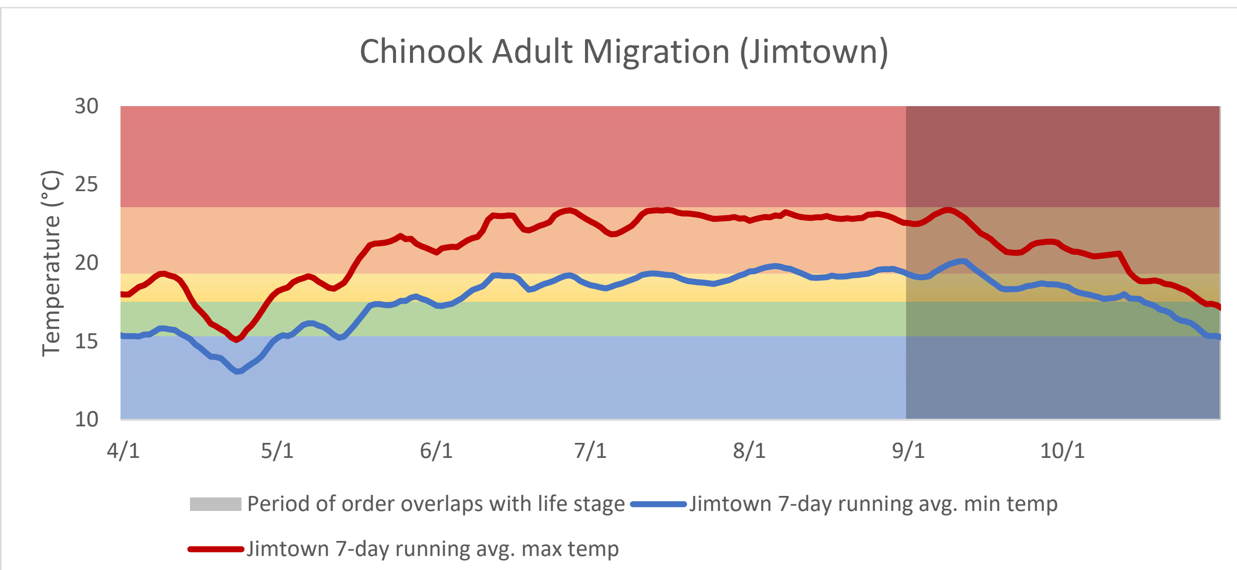

Figure 4-5. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Jimtown (USGS gage number 11463682) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022 that overlaps with this species and life stage being assessed.

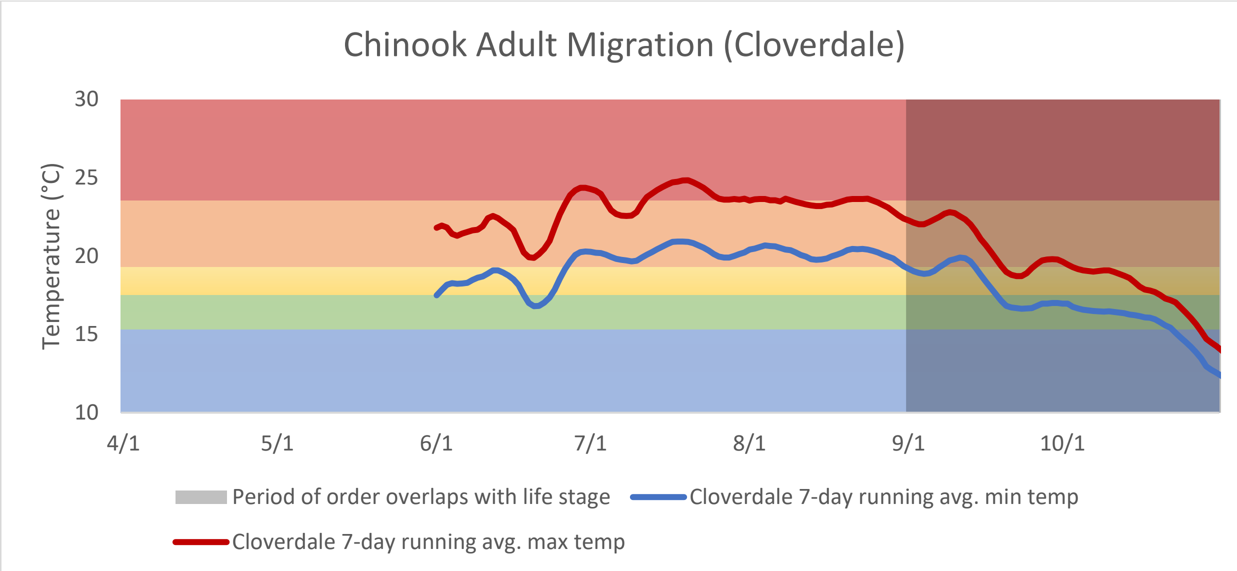

Figure 4-6. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Cloverdale (USGS gage number 11463000) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022 that overlaps with this species and life stage being assessed.

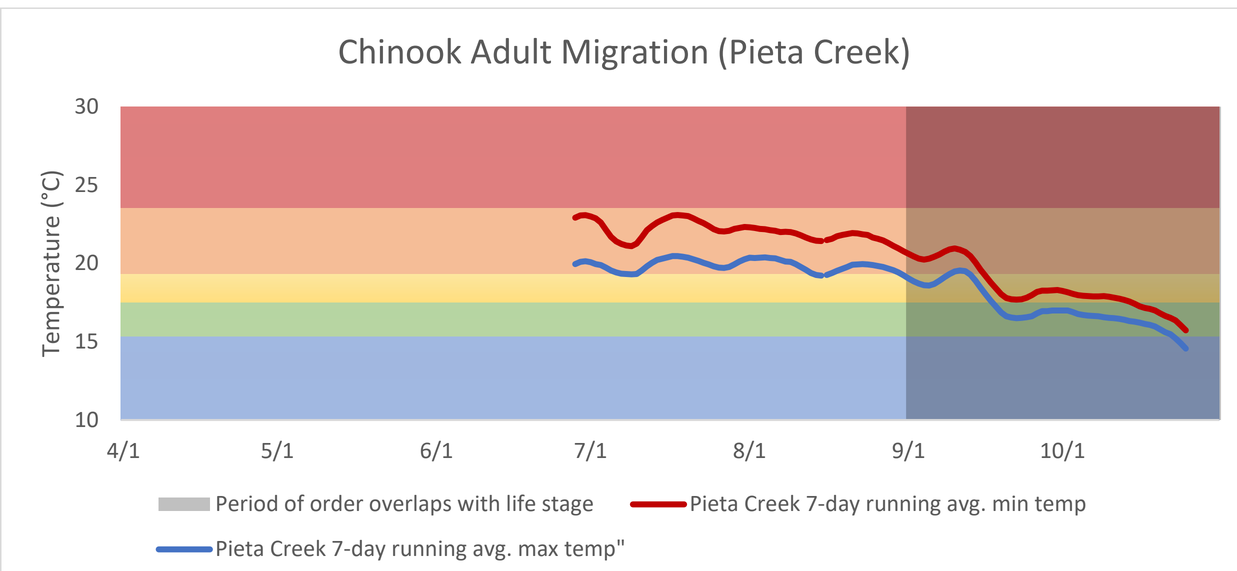

Figure 4-7. The 7-day running average of the minimum and maximum water temperatures collected in the mainstem Russian River at the confluence with Pieta Creek from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful and lethal water temperature zones for Chinook adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022 that overlaps with this species and life stage being assessed.

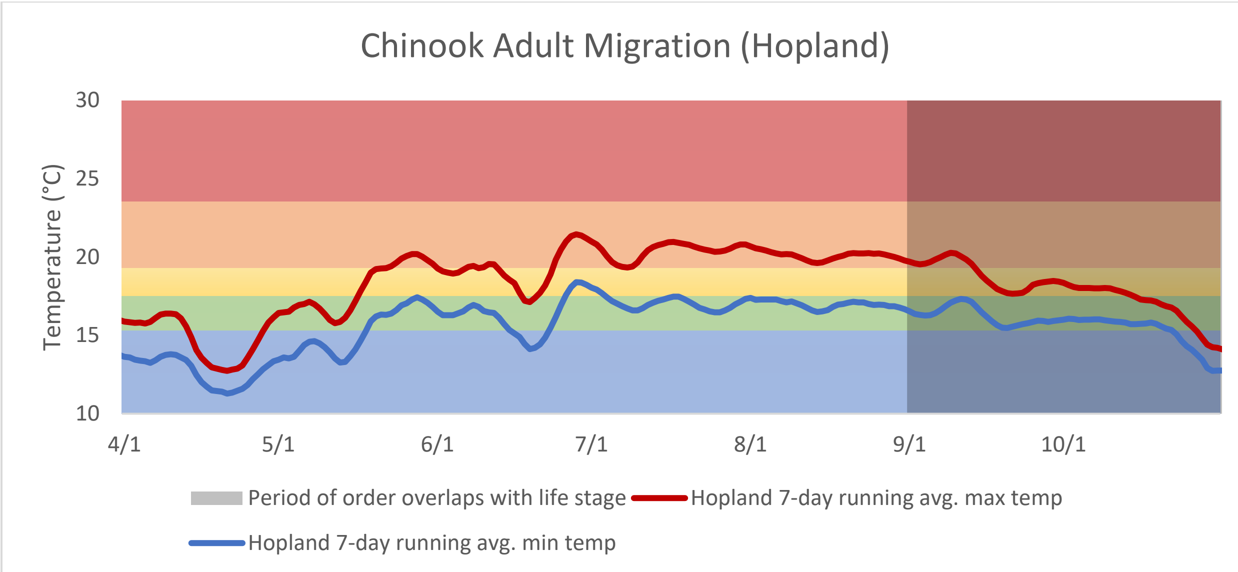

Figure 4-8. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Hopland (11462500) from April 1 to October 31, 2022,shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022 that overlaps with this species and life stage being assessed.

Water temperature in the east fork Russian River downstream of Coyote Valley Dam ranged from optimal to stressful during the Chinook migration period (Figure 4-9). The warmer water temperature in the east fork Russian River in late October is related to releases from Coyote Valley Dam and temperature conditions in Lake Mendocino.

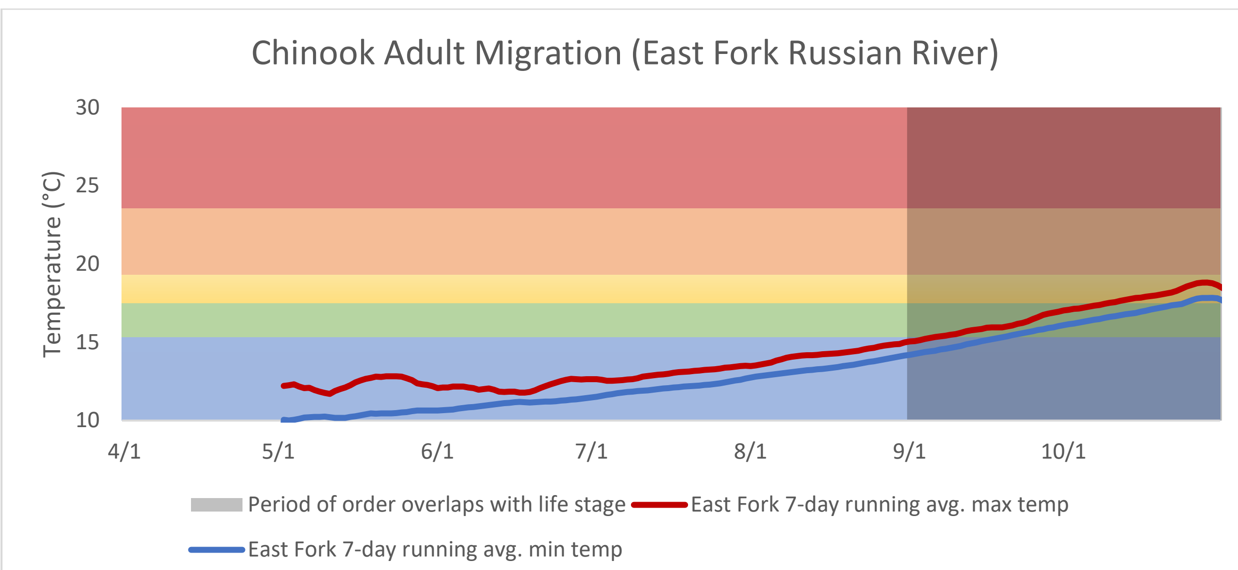

Figure 4-9. The 7-day running average of the minimum and maximum water temperatures collected in the east fork of the Russian River 0.5 km downstream of Coyote Valley Dam from April 1 to October 31, 2022. Shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022 that overlaps with this species and life stage being assessed.

Coho

The coho adult migration period typically begins in November. Temperature for adult coho were generally favorable during the time period that adult coho migrate upstream. Adult coho temperature suitability criteria is displayed with water temperature data collected up to October 31, 2022, for this report (Figures 4-10 and 4-11). However, because adult coho typically migrate after November 1, it is recommended that data collected after November 1 be used for interpreting the temperature conditions that adult coho experienced in 2022.

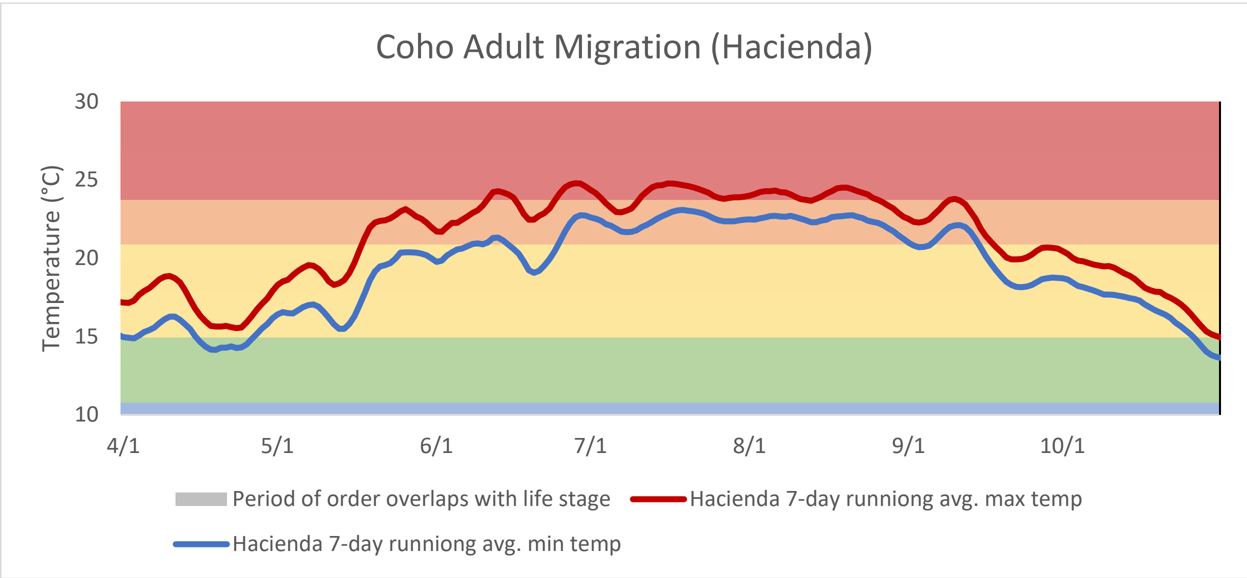

Figure 4-10. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000) from April 1 to October 31, 2022. Also show are optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for adult coho based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

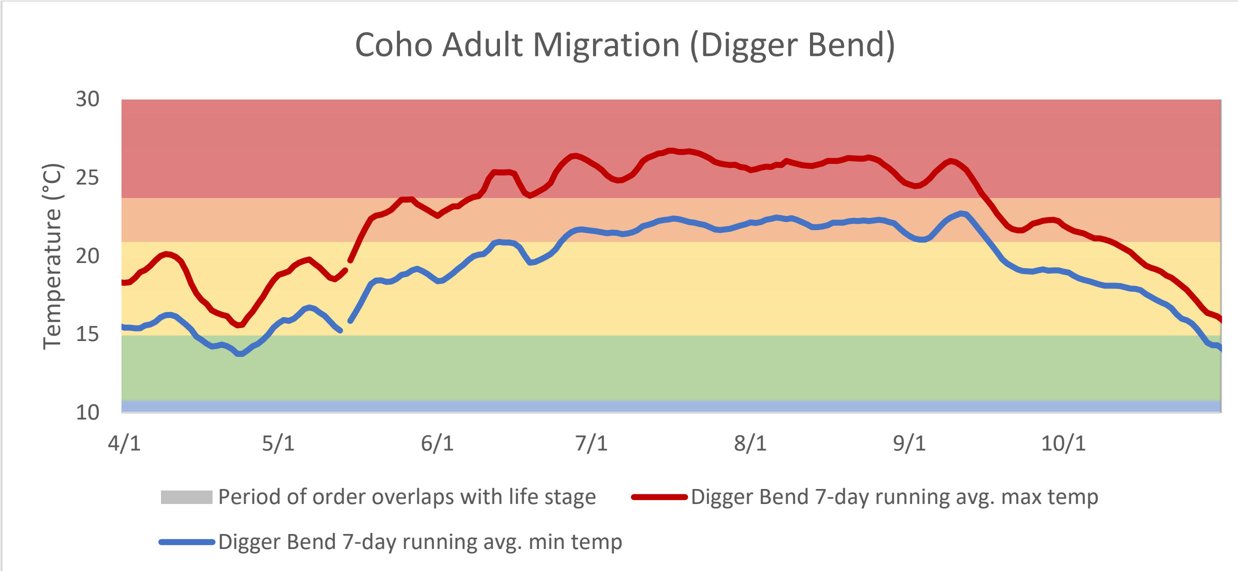

Figure 4-11. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Digger Bend (11463980) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for coho adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

Steelhead

The adult steelhead migration period typically begins in December. In most years water temperature for adult steelhead is favorable during the time period that steelhead adults migrate upstream. Steelhead adult temperature suitability criteria is displayed with water temperature data collected up to October 31, 2022, for this report (Figures 4-12 through 4-18). Because adult steelhead typically migrate after December 1, it is recommended that data collected after December 1, be used for interpreting the temperature conditions that adult steelhead experienced in 2022.

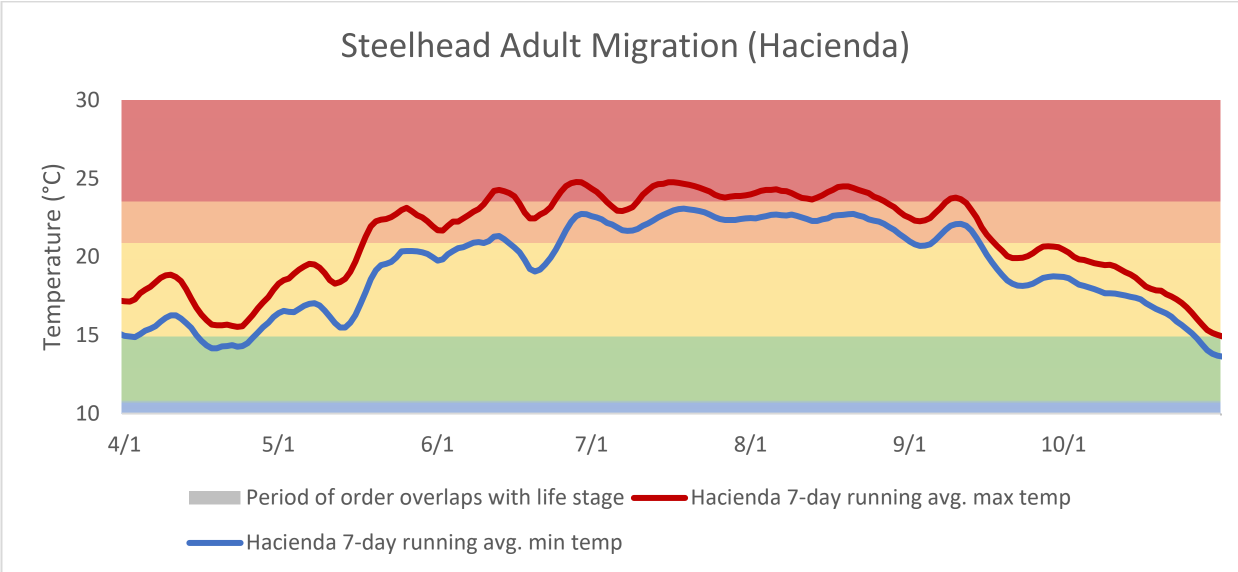

Figure 4-12. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000) from April 1 to October 31, 2022. Also show are optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for adult steelhead based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

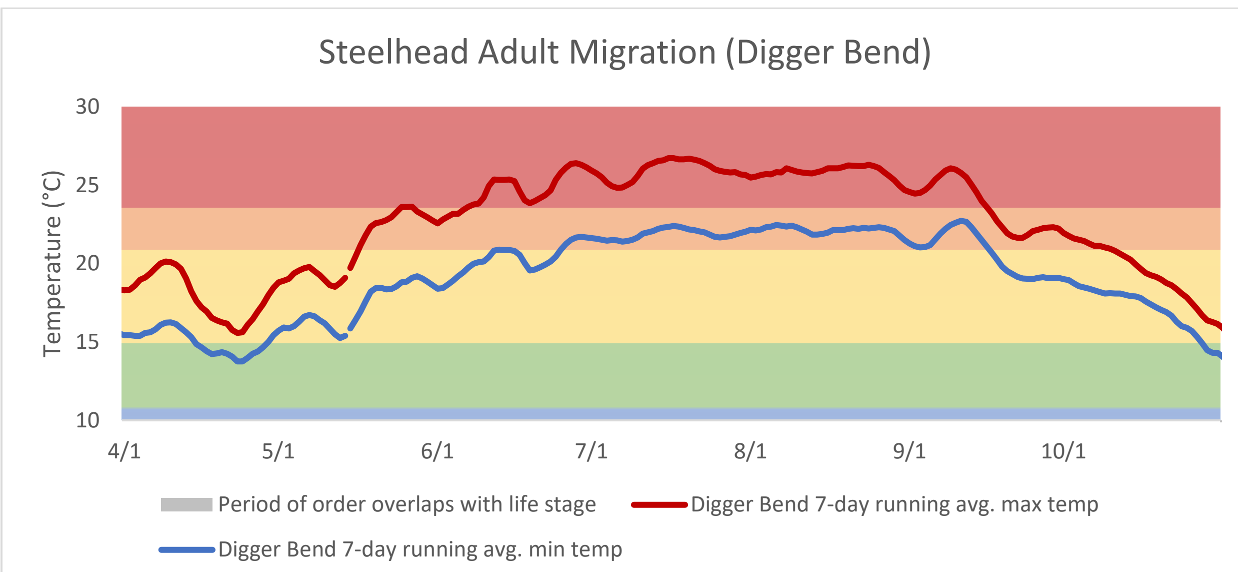

Figure 4-13. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Digger Bend (11463980) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

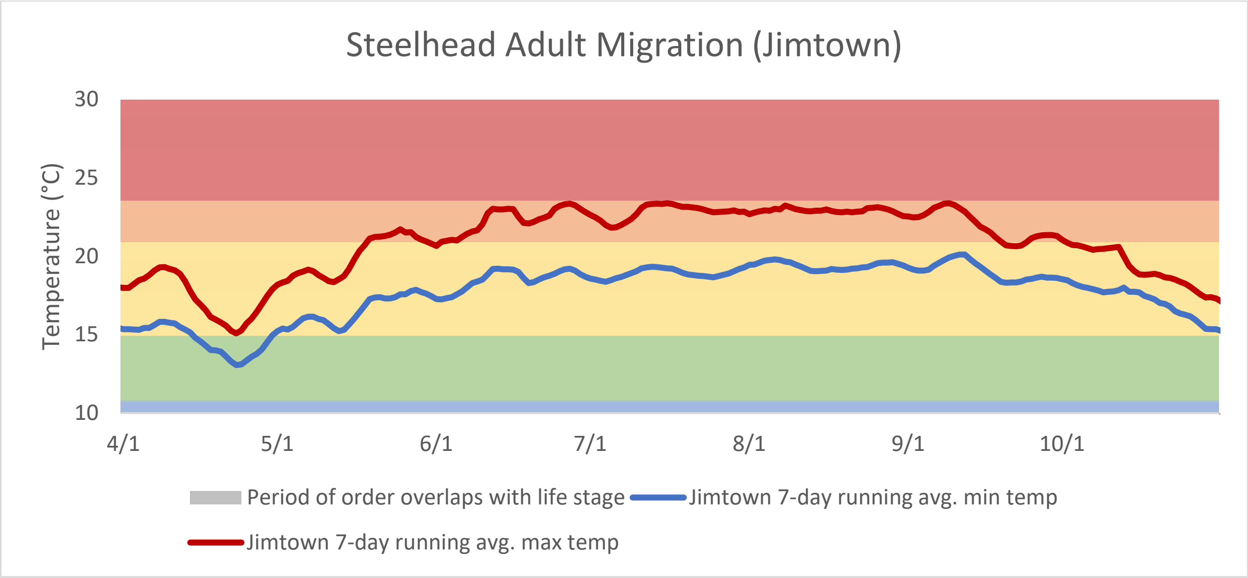

Figure 4-14. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Jimtown (USGS gage number 11463682) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

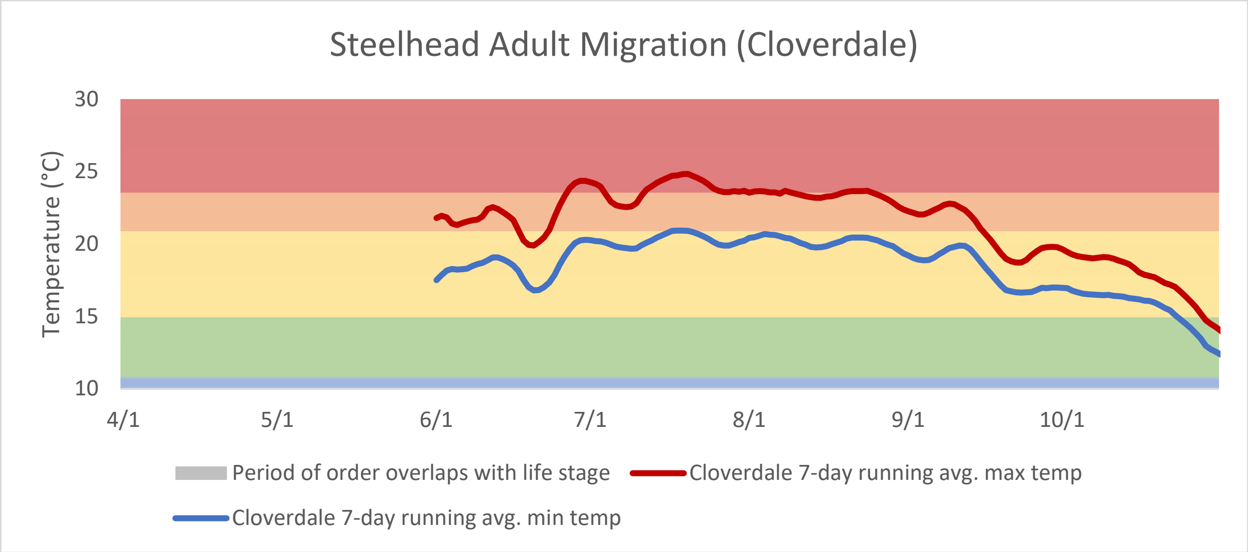

Figure 4-15. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Cloverdale (11463000) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

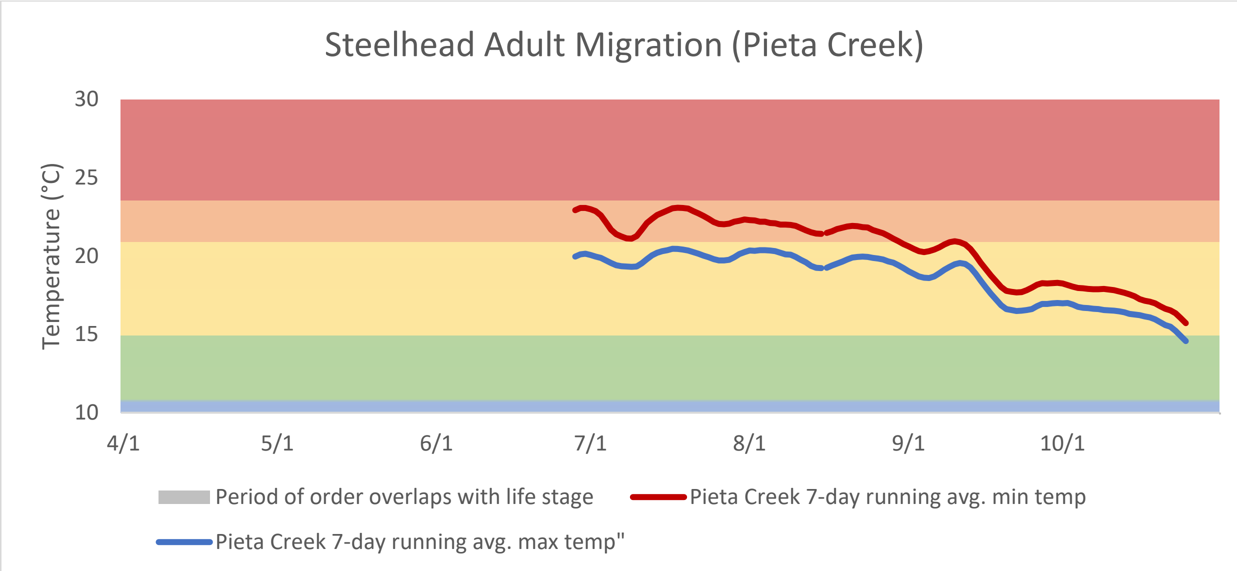

Figure 4-16. The 7-day running average of the minimum and maximum water temperatures collected in the mainstem Russian River at the confluence with Pieta Creek from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

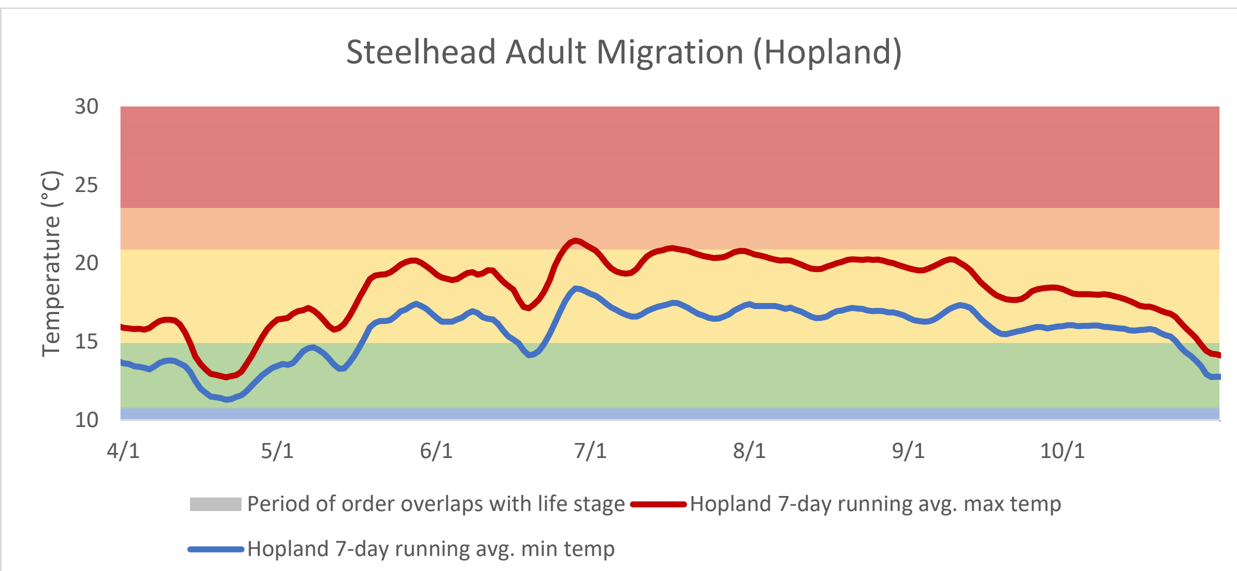

Figure 4-17. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Hopland (11462500) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

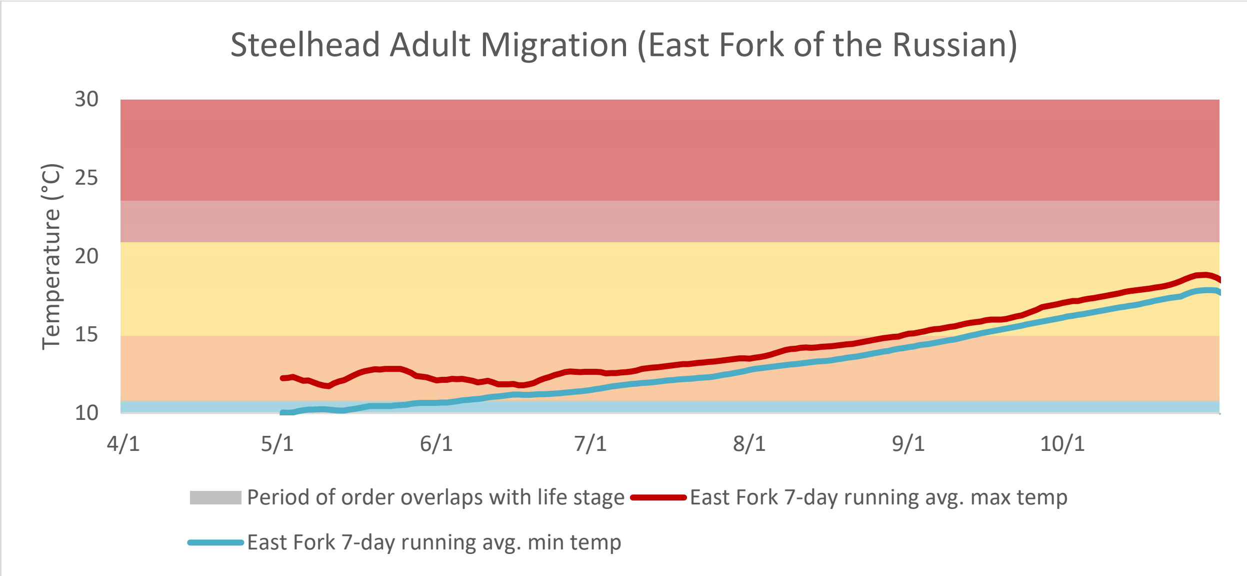

Figure 4-18. The 7-day running average of the minimum and maximum water temperatures collected in the East fork of the Russian River 0.5 km downstream of Coyote Valley Dam from April 1 to October 31, 2022. Shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead adult migration based on Table 4-1. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

Salmonid Rearing

In the Russian River basin much of the salmonid rearing habitat is in tributaries to the Russian River including Dry Creek, but Chinook and steelhead rear in the mainstem Russian River as well. Chinook emerge from redds constructed in the upper Russian River in the early spring and begin rearing in the shallow portions of the stream margins. In the mainstem Russian River, Chinook finish rearing in the early spring when water temperatures are still relatively cool. Because juvenile Chinook salmon may be found rearing near any of the Russian River water quality monitoring sites, water temperatures from all Russian River monitoring sites are shown in relation to juvenile Chinook salmon rearing criteria. Steelhead rear in freshwater for one or more years and are primarily in tributaries of the Russian River and those portions of the Russian River where water released from the cold-water pool (the bottom portion of the lake) in Lake Mendocino has the greatest cooling effect on mainstem rearing habitat near Coyote Valley Dam. This cooling effect has largely diminished by the time water reaches Cloverdale approximately 50 km downstream. We relate steelhead water temperature criteria to water temperature collected in the east fork of Russian River downstream of Coyote Valley Dam, at Hopland, in the Russian River near the confluence of Pieta Creek (approximately 8 km downstream of Hopland) and at Cloverdale as these sites are within the section of the Russian River that can provide year-round rearing opportunities for juvenile steelhead. Juvenile coho salmon do not rear in the mainstem of the Russian River.

Chinook

During the time period that the Order overlaps with the presence of rearing Chinook Salmon water temperatures for rearing Chinook ranged from optimal to lethal depending on the site and time period within the Chinook rearing season. It is important to note that Chinook in the Russian River migrate downstream and out to sea in the spring thus avoiding high temperatures and by June the majority of Chinook smolts have emigrated from the Russian River (see Salmonid Smolt Outmigration). Although stressful and eventually acutely stressful conditions did occur at those sites in late spring and summer, water temperatures were optimal for Chinook salmon rearing in the east fork Russian River downstream of Coyote Valley Dam (Figure 4-19). Water temperature near the USGS stream gage at Hopland (gage number 11462500) ranged from optimal to acutely stressful (Figure 4-20). At Pieta Creek water temperature was stressful to acutely stressful during the period of Chinook rearing season when data was available (Figure 4-21). Water temperature at Cloverdale ranged from suitable to acutely stressful (Figure 4-22). Water temperature at Jimtown and ranged from stressful to acutely stressful (Figure 4-23). At Digger Bend water temperature became stressful and eventually acutely stressful or even potentially lethal by mid-June (Figure 4-24). At Hacienda Water temperature ranged from stressful to acutely stressful for rearing Chinook Salmon (Figure 4-25).

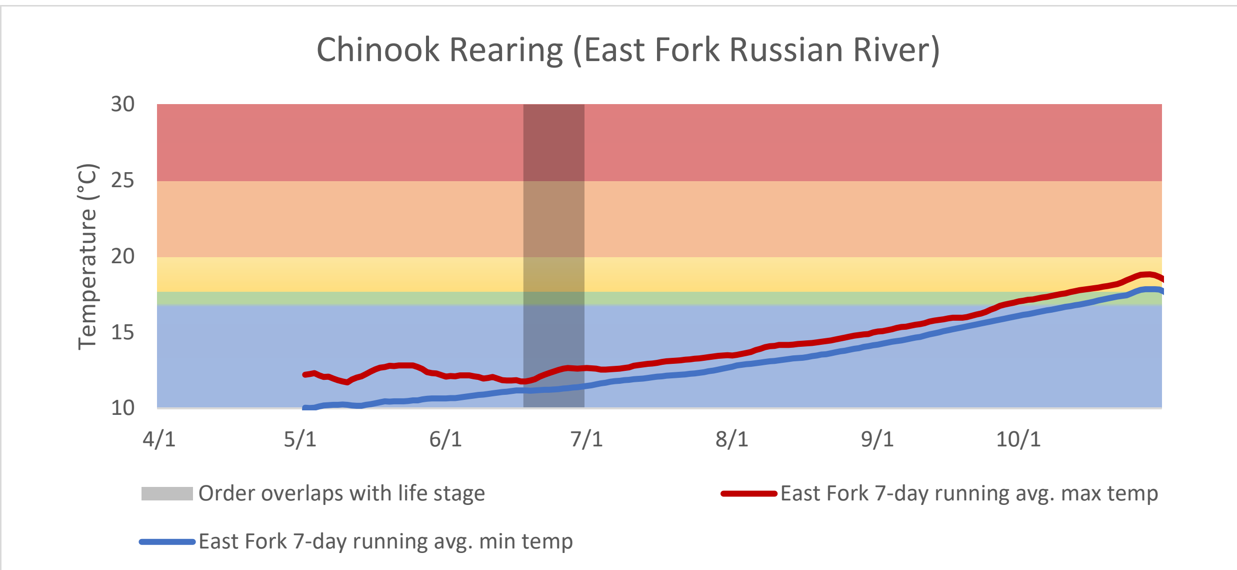

Figure 4-19. The 7-day running average of the minimum and maximum water temperatures collected by Sonoma Water in the east fork Russian River 0.5 km downstream of Coyote Valley Dam shown from April 1 to October 31, 2022, with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook rearing based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

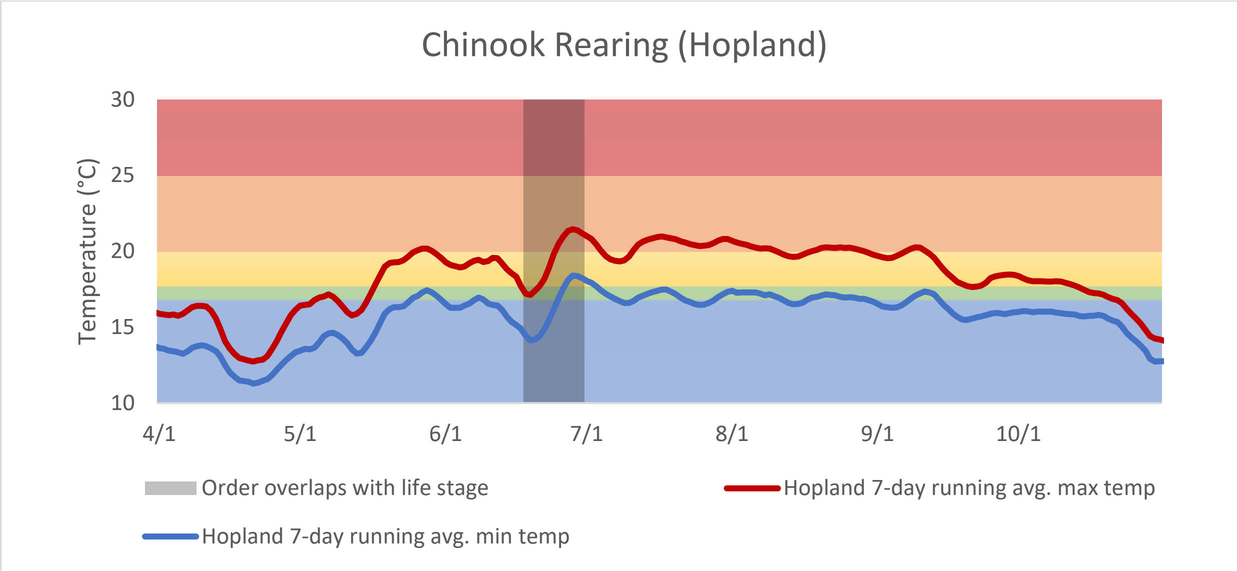

Figure 4-20. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Hopland (11462500) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook rearing based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

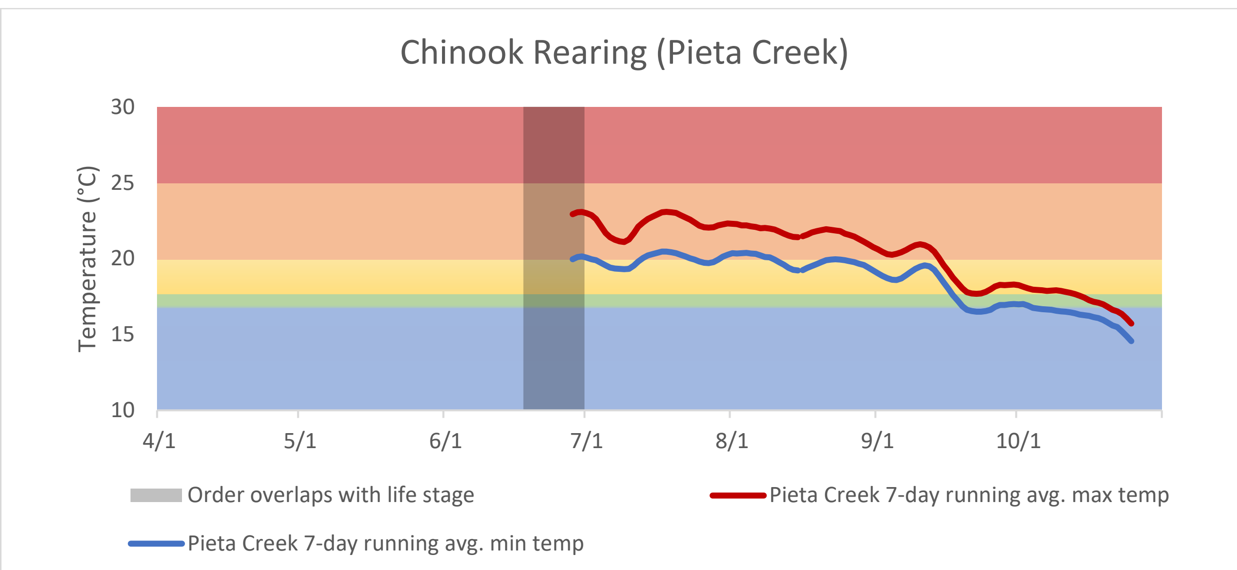

Figure 4-21. The 7-day running average of the minimum and maximum water temperatures collected in the Russian River near the confluence with Pieta Creek approximately 5 miles downstream of Hopland from April 1 to October 31, 2022, shown with the optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook rearing based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

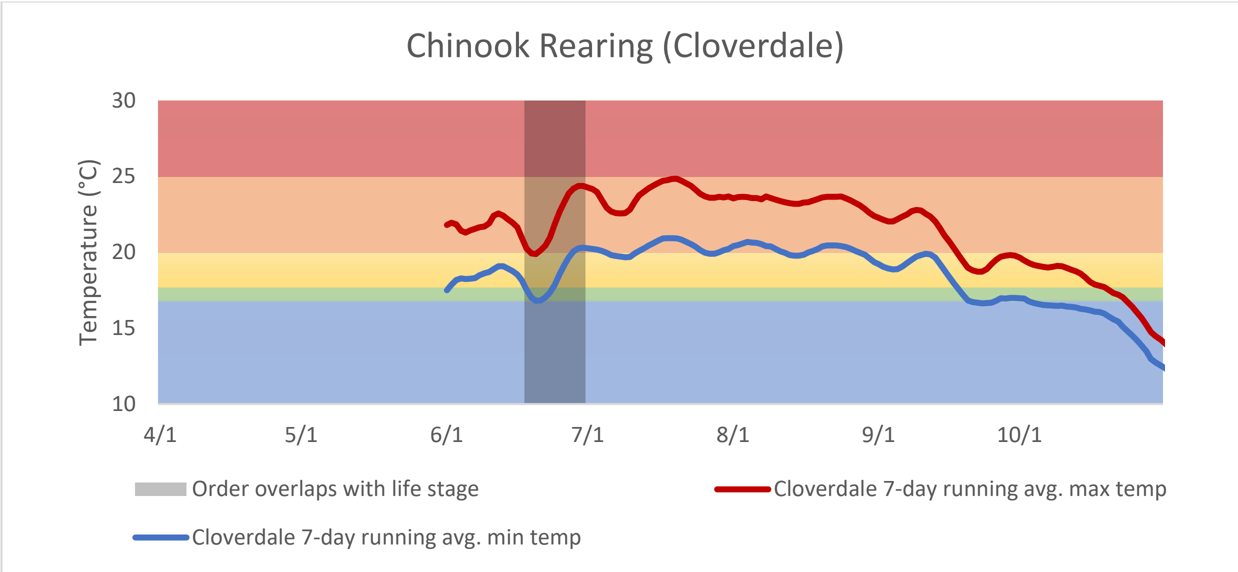

Figure 4-22. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Cloverdale (USGS gage number 11463000) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook rearing based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

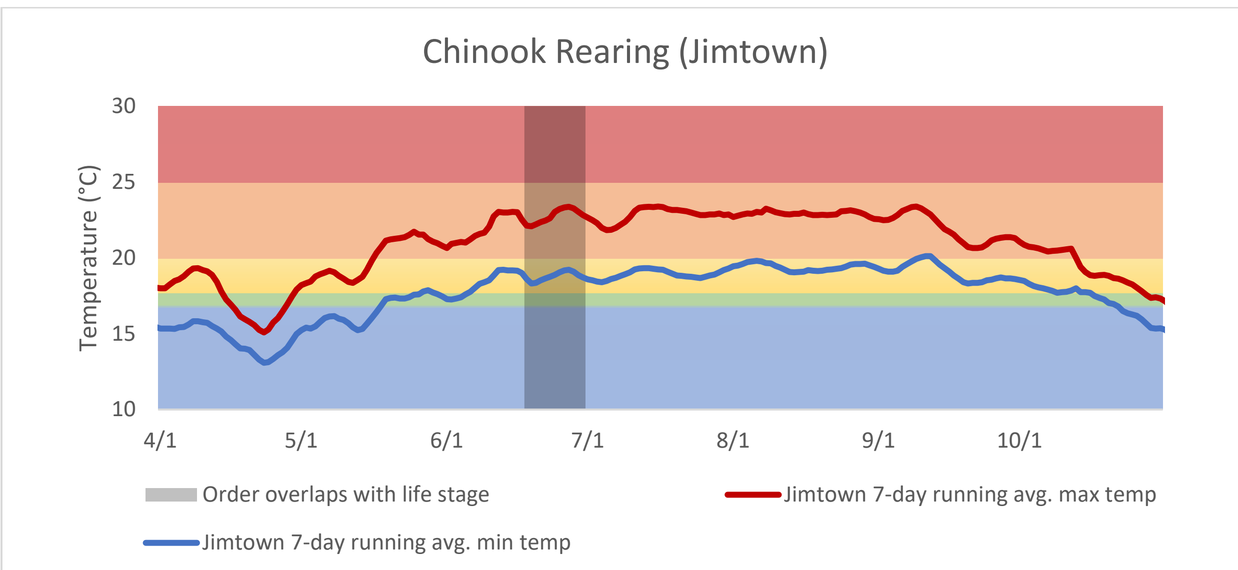

Figure 4-23. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Jimtown (USGS gage number 11463682) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook rearing based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

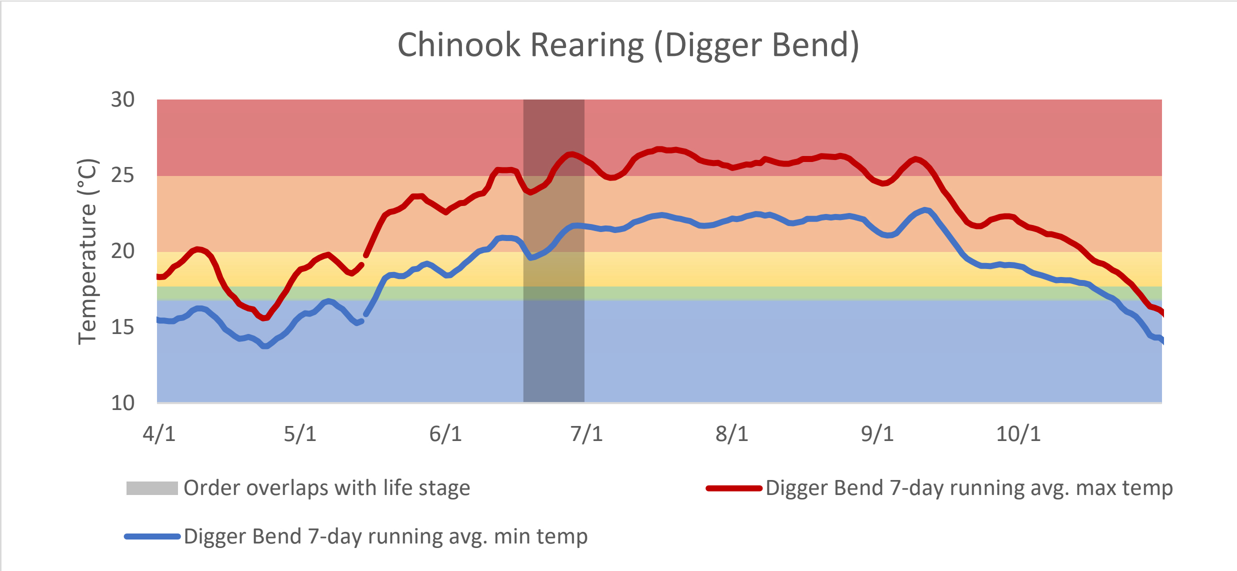

Figure 4-24. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Digger Bend (11463980) from April 1 to October 31, 2022, shown with the optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook rearing based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

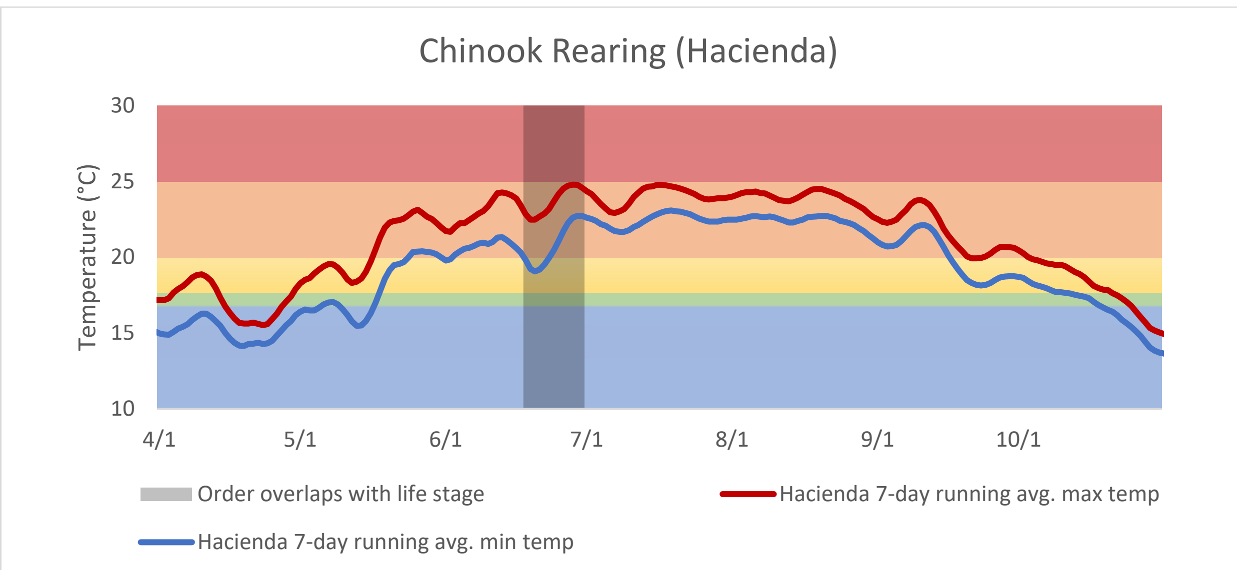

Figure 4-25. The 7-day running average of the minimum and maximum water temperatures collected at the USGS stream gage at Hacienda (gage number 11467000) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook rearing based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

Steelhead

Steelhead parr rear year-round in portions of the upper Russian River. Based on water quality conditions, it is likely that steelhead rear in that portion of the river that is most influenced by cold water released from Lake Mendocino (i.e., upstream of Cloverdale). During the period covered by the Order, water temperature in the east fork of the Russian River downstream of Coyote Valley Dam was optimal until October, then water temperatures gradually increased becoming stressful by the end October (Figure 26). At the USGS stream gage at Hopland, water temperature was generally suitable to stressful for steelhead rearing (Figure 4-27). In the Russian River near the confluence with Pieta Creek water temperature was stressful to acutely stressful for most of the steelhead rearing period (Figure 4-28). At Cloverdale water temperatures ranged from optimal to potentially lethal (Figure 29).

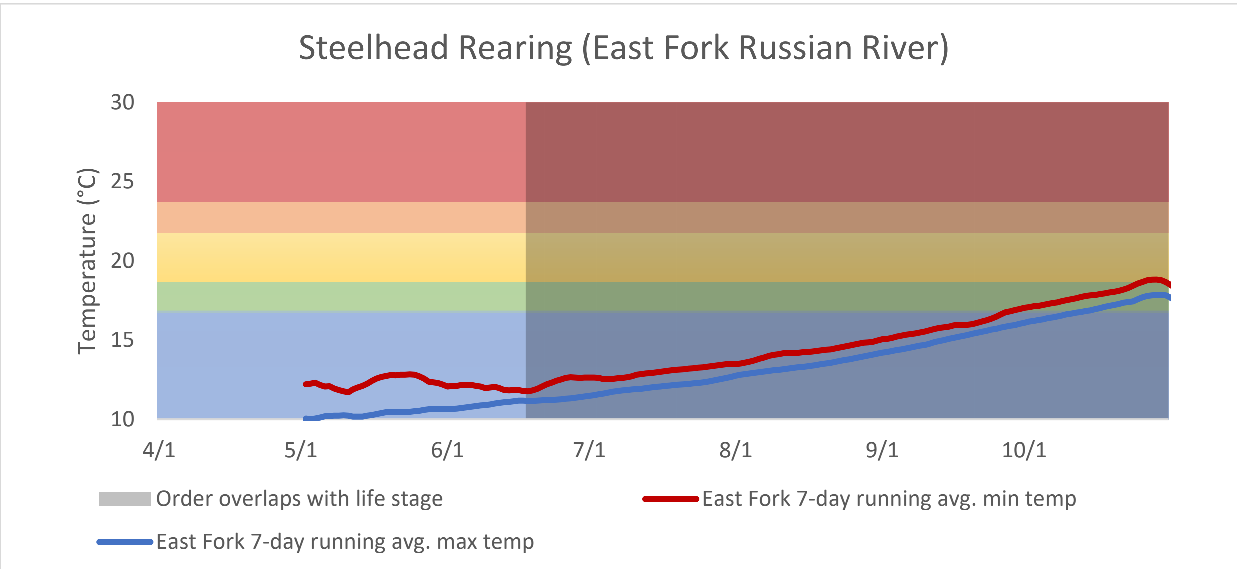

Figure 4-26. The 7-day running average of the minimum and maximum water temperatures collected by Sonoma Water at the east fork Russian River downstream of Coyote Valley Dam from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead parr based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

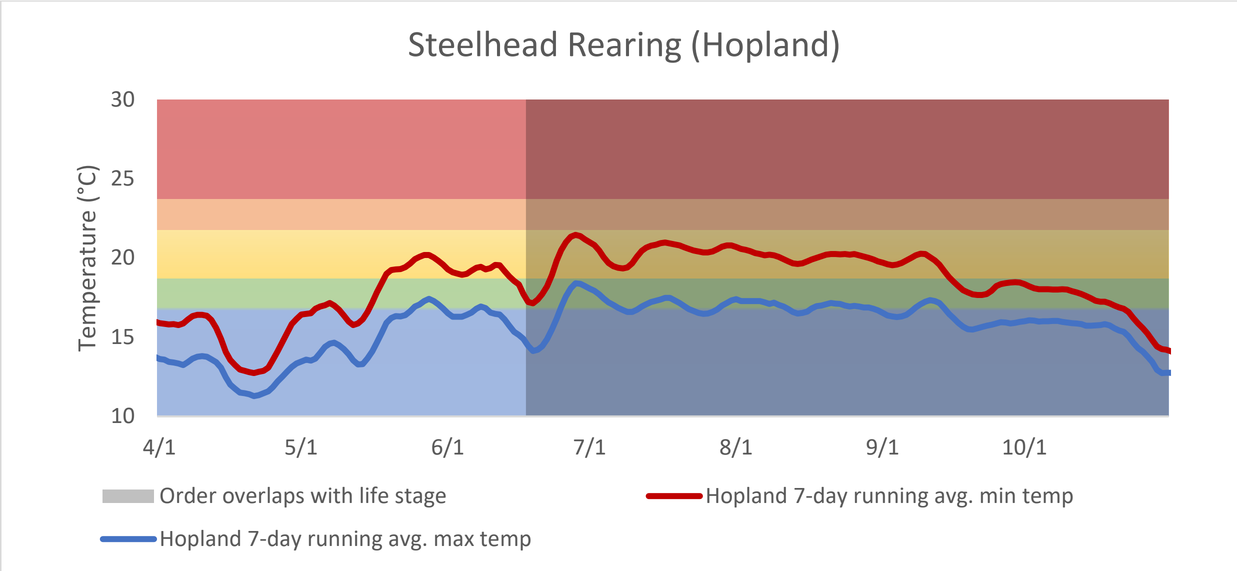

Figure 4-27. The 7-day running average of the minimum and maximum water temperatures collected at Hopland (USGS stream gage number 11462500) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead parr based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

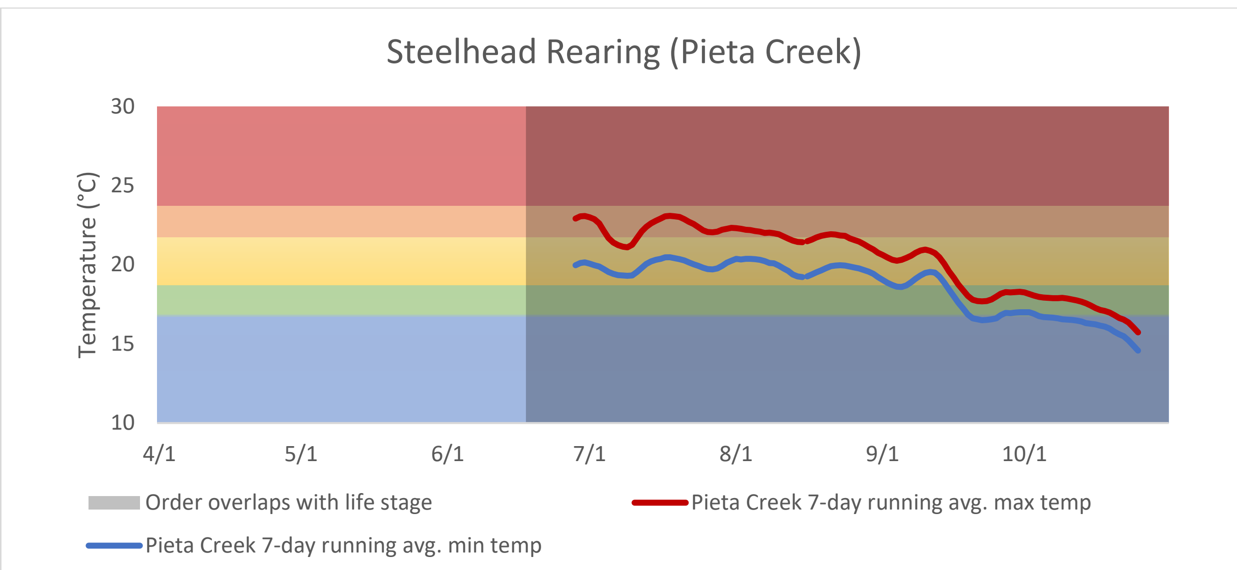

Figure 4-28. The 7-day running average of the minimum and maximum water temperatures collected in the Russian River near the confluence with Pieta Creek approximately 5 miles downstream of Hopland from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead parr based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

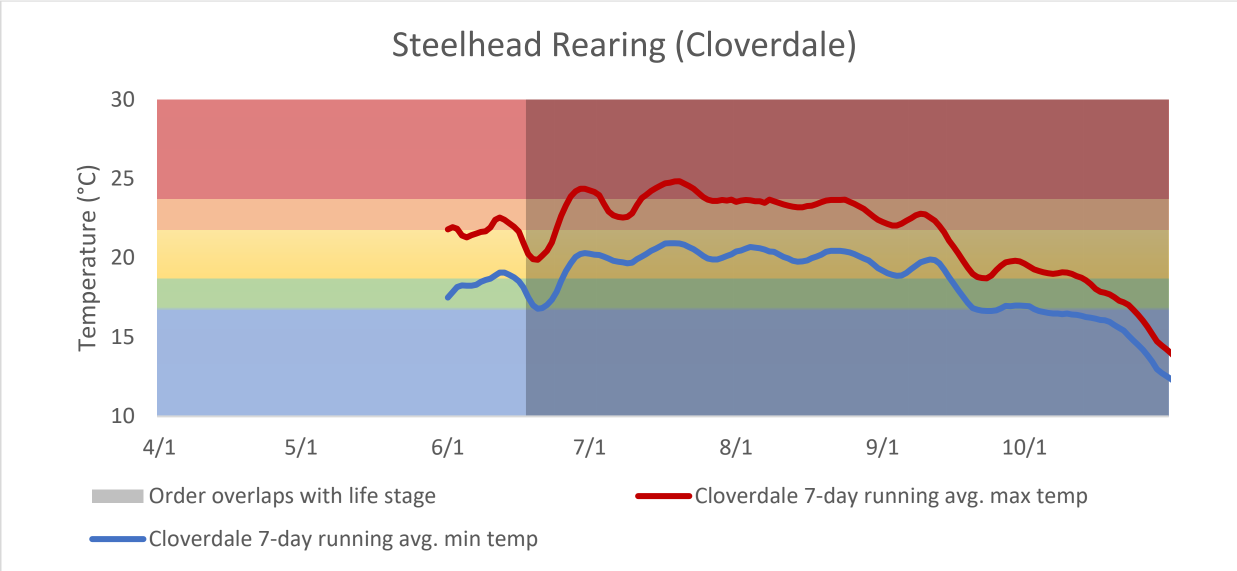

Figure 4-29. The 7-day running average of the minimum and maximum water temperatures collected at Cloverdale (USGS stream gage number 11463000) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead parr based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

Salmonid Smolt Outmigration

For smolts produced in the upper portion of the watershed, Russian River water temperatures for the east fork Russian River downstream of Coyote Valley Dam, Hopland, confluence with Pieta Creek, Jimtown, and Digger Bend gages was summarized and shown with water temperature criteria for Chinook smolts. Because the Mirabel trap site is located near the Hacienda stream gage, Chinook smolt catches at Mirabel are also displayed for water temperature collected at the Hacienda gage. It is noteworthy that many Chinook smolts (over 18,000 captured in the trap) emigrated from the Russian River before the Order went into effect. Because so few coho and steelhead smolts typically emigrate through the lower river during the period of time that the Order was in effect (based on the historical Mirabel trap catch), we did not evaluate lower river temperature effects on smolts of these two species and instead restricted our analysis for smolt migration to Chinook.

Chinook

Water temperature in the upper Russian River near the Coyote Valley Dam was generally favorable for Chinook smolts during the period of time that the Order overlaps with when Chinook are expected to emigrate from that potion of the Russian river (Figure 4-30). However, water temperature became stressful to potentially lethal at some sites located downstream of Hopland (Figure 4-31 through Figure 4-36). It is important to note that Chinook have evolved to emigrate during the spring before water temperatures become lethal and that many Chinook captured at the Mirabel downstream migrant trap emigrated before the Order went in effect in June (Figure 4-36).

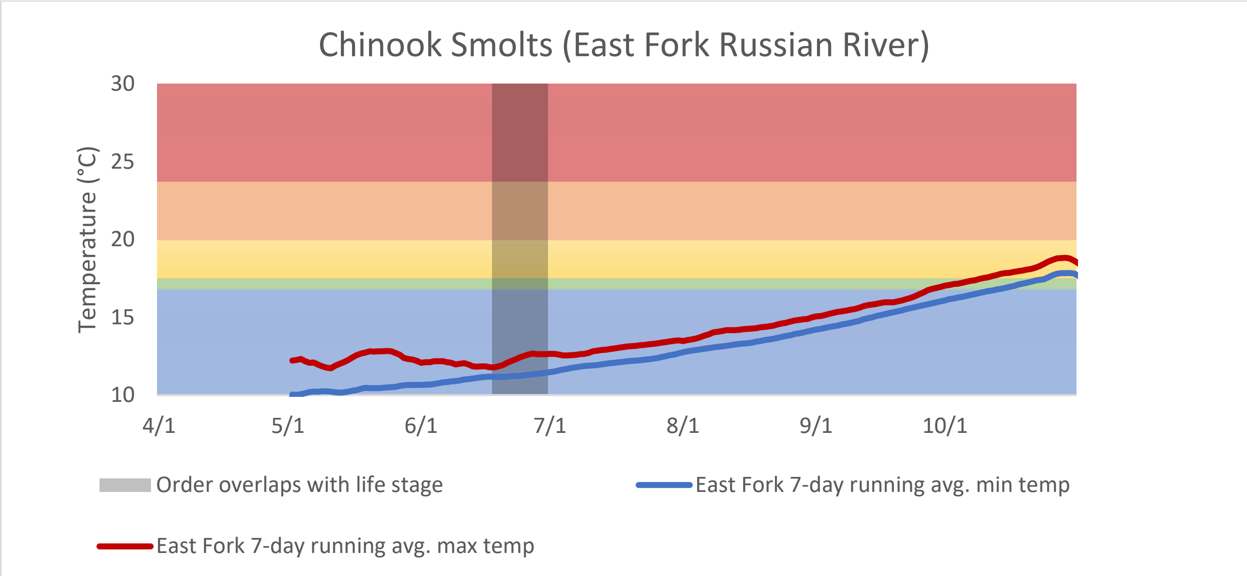

Figure 4-30. The 7-day running average of the minimum and maximum water temperatures collected by Sonoma Water at the east fork of the Russian River downstream of the Coyote Valley Dam from April 1 to October 31, 2022. Shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook smolts based on Table 4-3. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

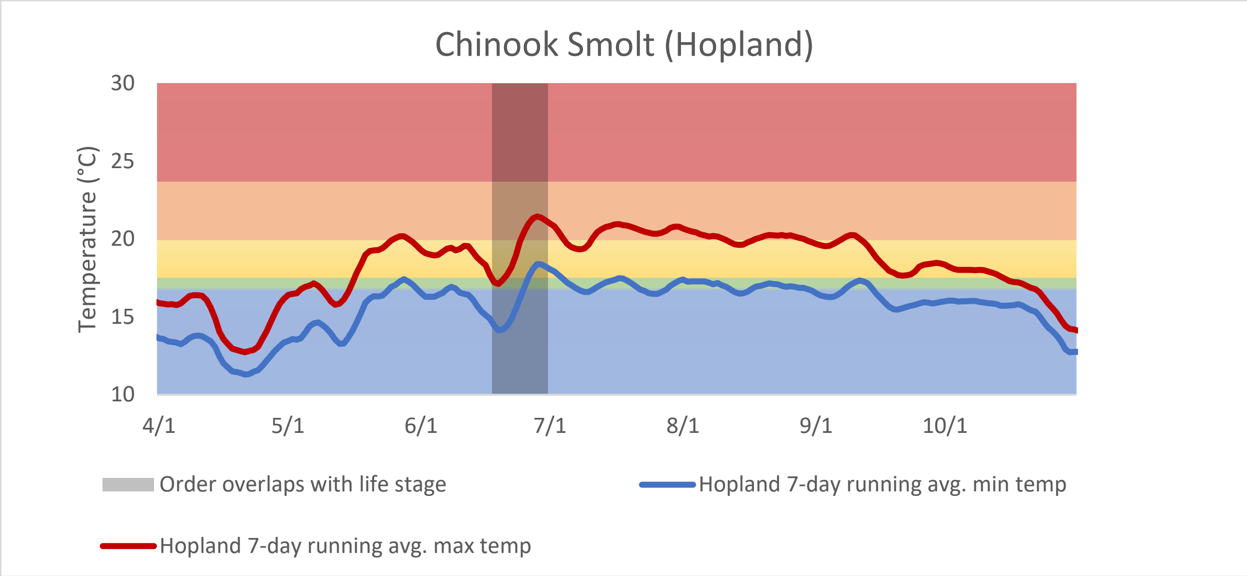

Figure 4-31. The 7-day running average of the minimum and maximum water temperatures collected at Hopland (USGS stream gage number 11462500) from April 1 to October 31, 2022. Shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook smolts based on Table 4-3. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

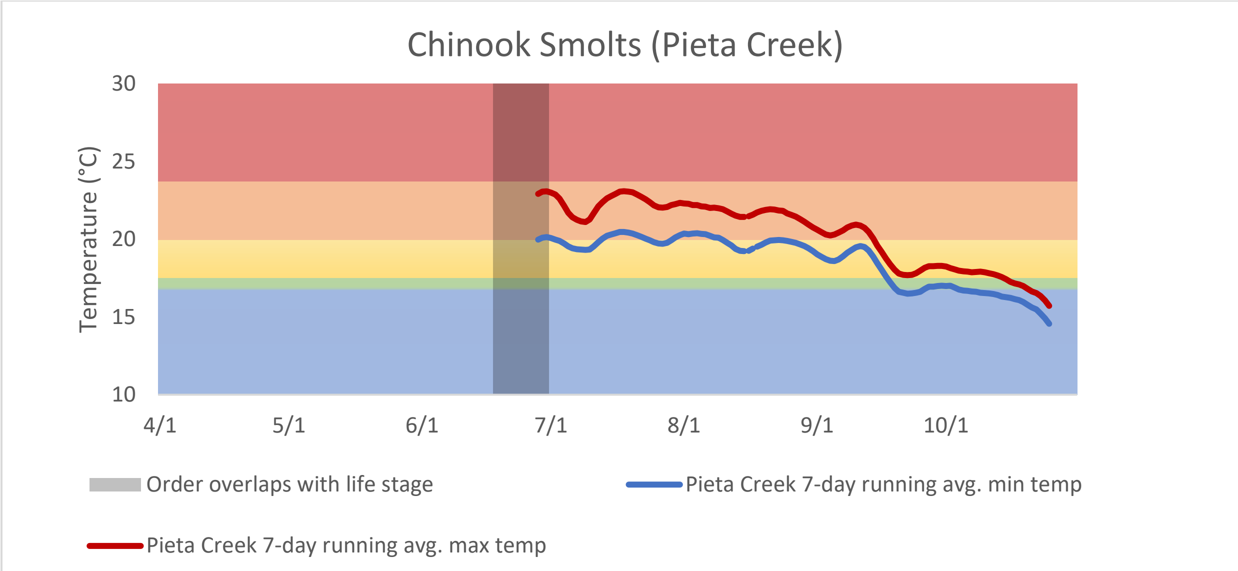

Figure 4-32. The 7-day running average of the minimum and maximum water temperatures collected in the Russian River near the confluence with Pieta Creek approximately 5 miles downstream of Hopland from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook smolts based on Table 4-3. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

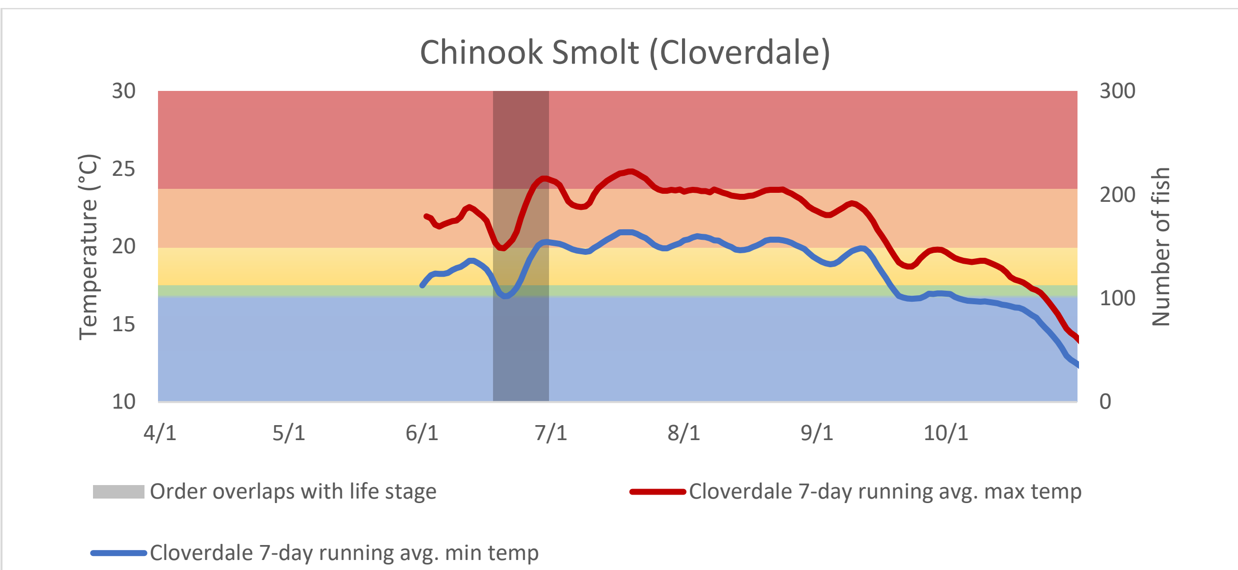

Figure 4-33. The 7-day running average of the minimum and maximum water temperatures collected at the Cloverdale USGS stream Gage (11463000) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook smolts based on Table 4-3. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

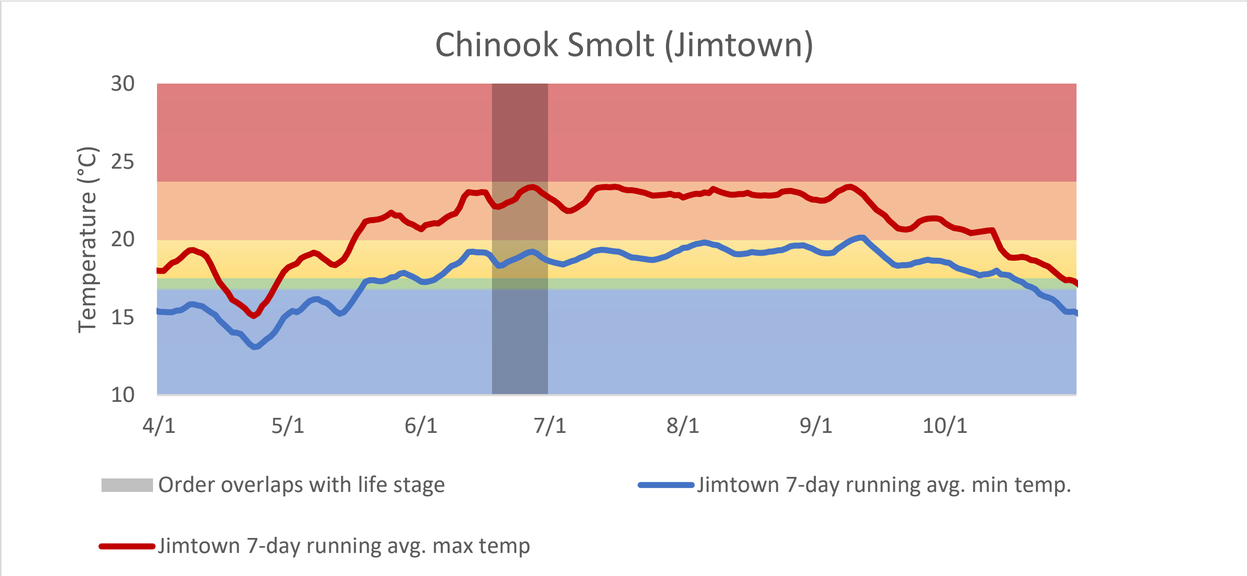

Figure 4-34. The 7-day running average of the minimum and maximum water temperatures collected at the Jimtown USGS stream Gage (1146382) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook smolts based on Table 4-3. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

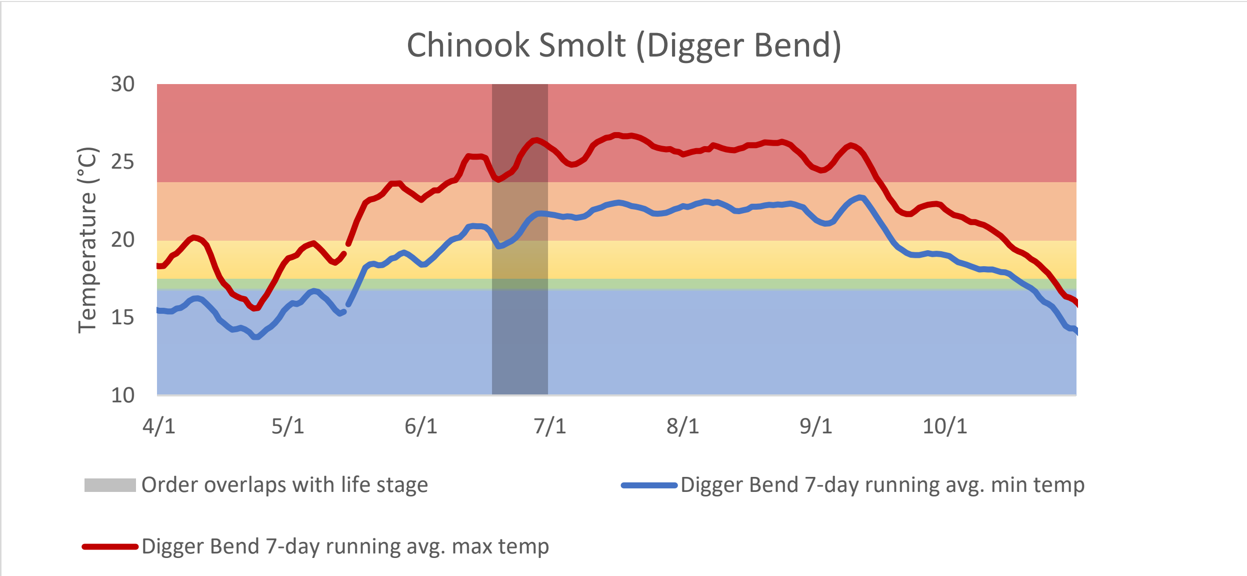

Figure 4-35. The 7-day running average of the minimum and maximum water temperatures collected at the Digger Bend USGS stream gage (11463980) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook smolts based on Table 4-3. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

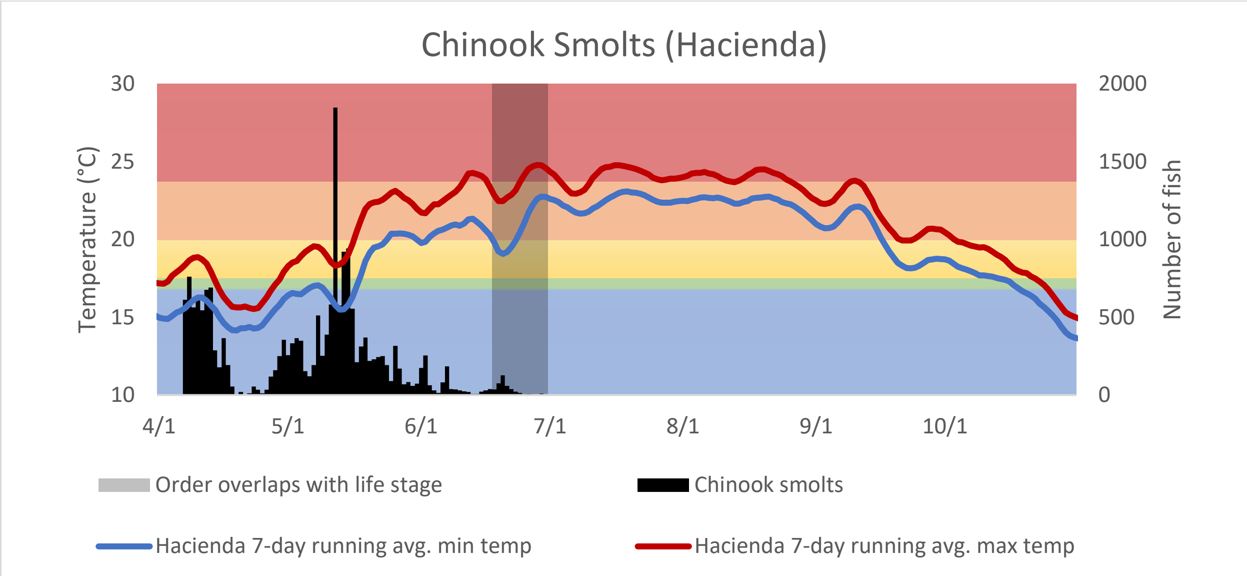

Figure 4-36. The 7-day running average of the minimum and maximum water temperatures collected at Hacienda (USGS gage number 11467000) from April 1 to October 31, 2022, shown with the Chinook smolt catch from the Mainstem Russian River near Mirabel and optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for Chinook smolts based on Table 4-3. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

Dissolved Oxygen

At most sites, dissolved oxygen generally ranged from suitable to stressful for salmonids in the Russian River throughout the Order. However, dissolved oxygen was potentially lethal in the east fork Russian River downstream of Coyote Valley Dam (Figure 4-37). It is worth noting that dissolved oxygen in summer and early fall is typically poor immediately downstream of Coyote Valley Dam due to reservoir releases and that dissolved oxygen generally recovers fairly quickly downstream of the dam.

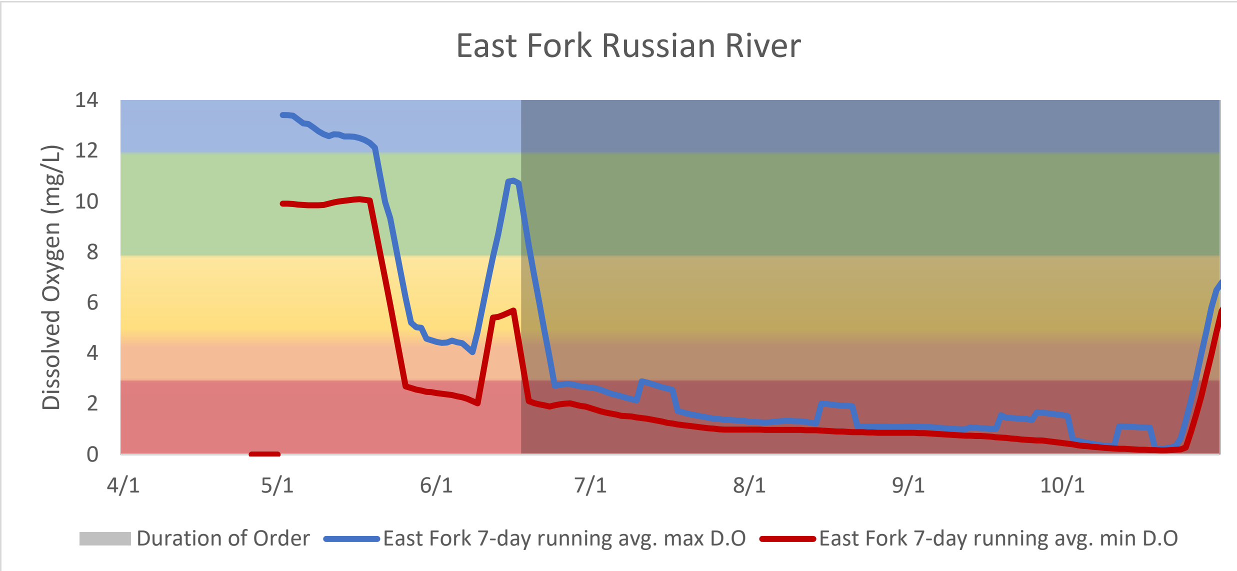

Figure 4-37. The 7-day running average of the minimum and maximum dissolved oxygen collected by Sonoma Water in the east fork of the Russian River downstream of Coyote Valley Dam from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

At Hopland, the Russian River near the confluence of Pieta Creek, Cloverdale, Jimtown, Digger Bend, and Hacienda, maximum daily average dissolved oxygen levels were generally suitable whereas the minimum daily dissolved oxygen levels were often stressful (Figures 4-38 through 4-43).

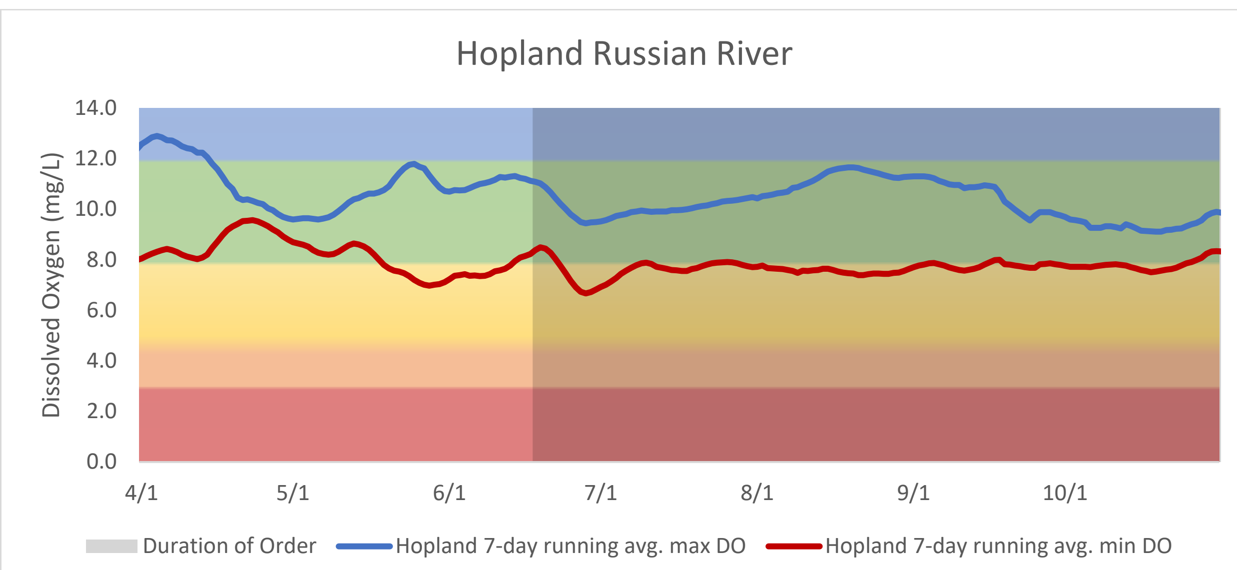

Figure 4-38. The 7-day running average of the minimum and maximum dissolved oxygen collected at Hopland (USGS stream gage number 11462500) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

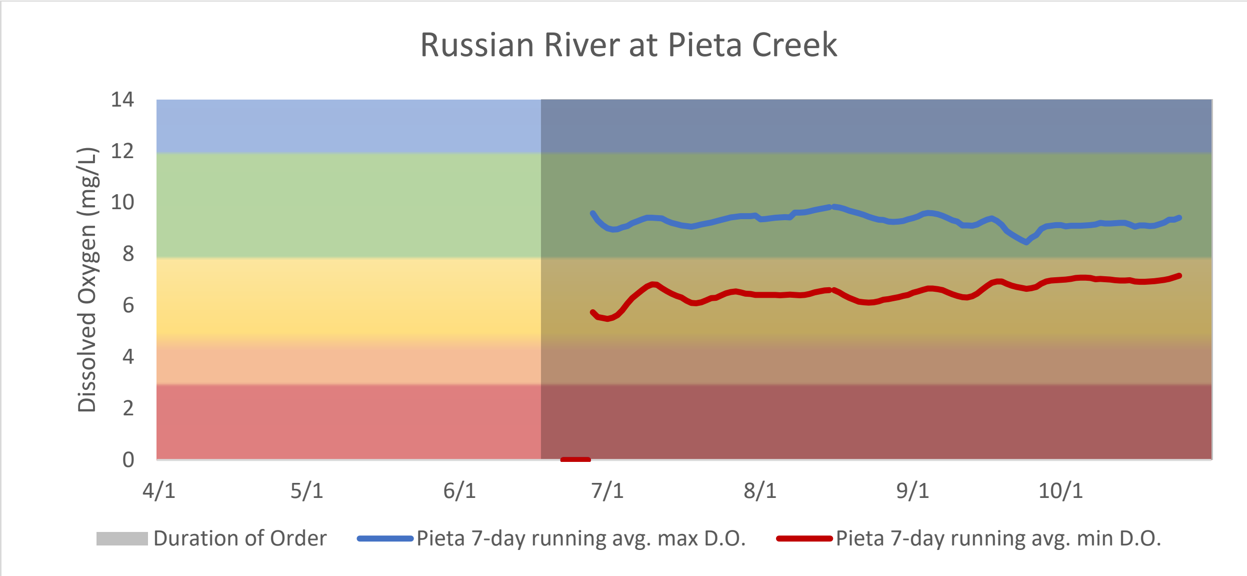

Figure 4-39. The 7-day running average of the minimum and maximum dissolved oxygen collected in in the Russian River near the confluence with Pieta Creek approximately 5 miles downstream of Hopland from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

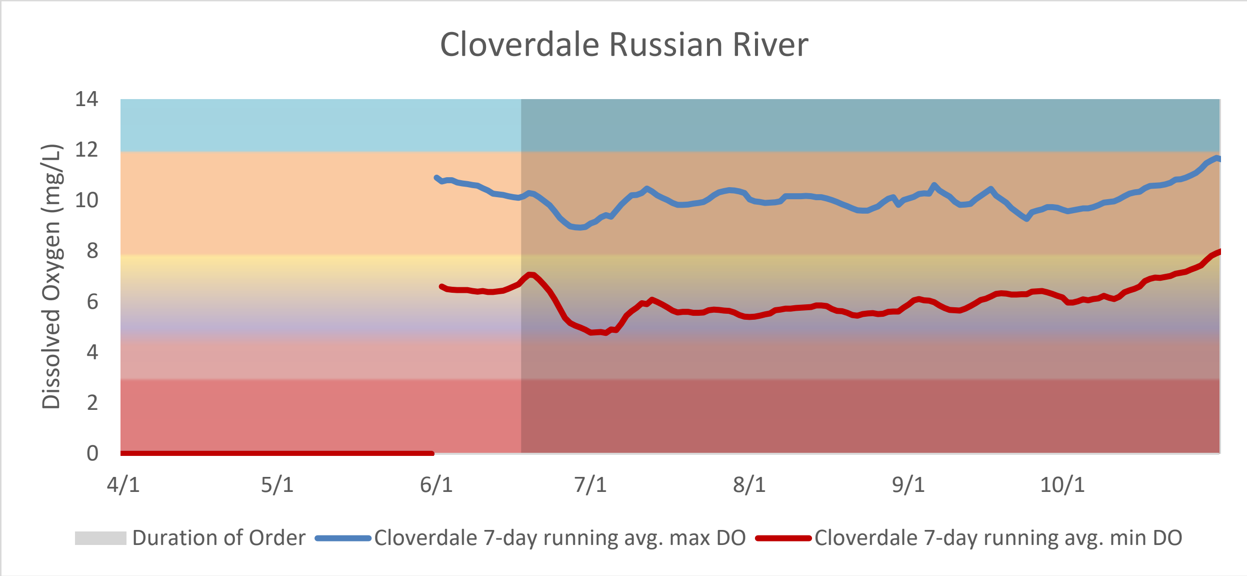

Figure 4-40. The 7-day running average of the minimum and maximum dissolved oxygen collected at the Cloverdale USGS stream Gage (11463000) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

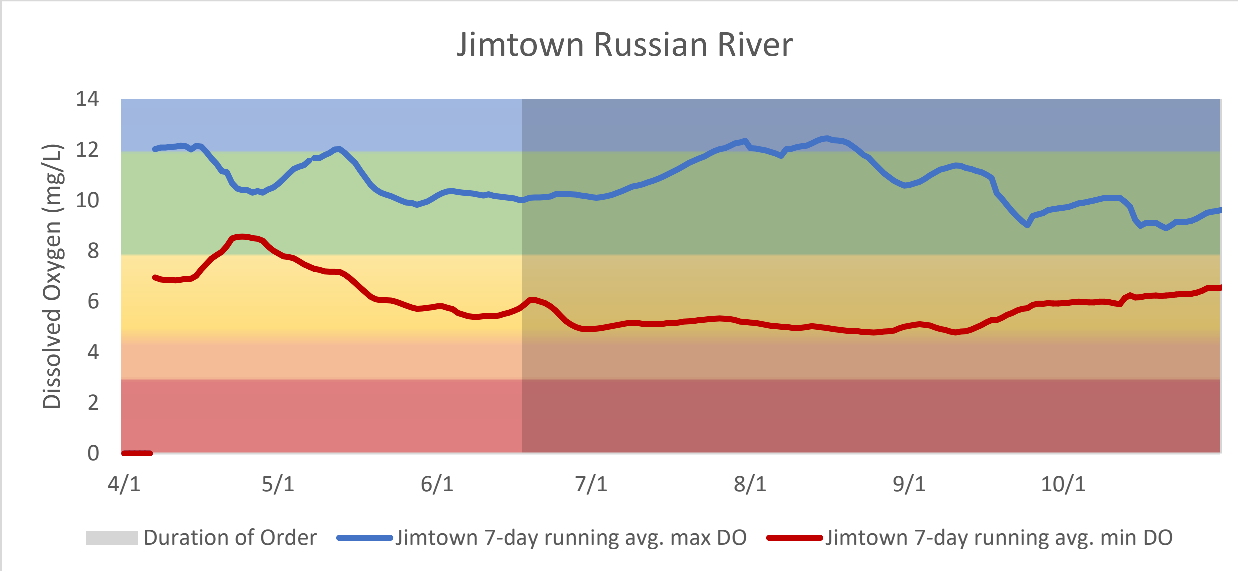

Figure 4-41. The 7-day running average of the minimum and maximum dissolved oxygen collected at the Jimtown USGS stream Gage (1146382) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

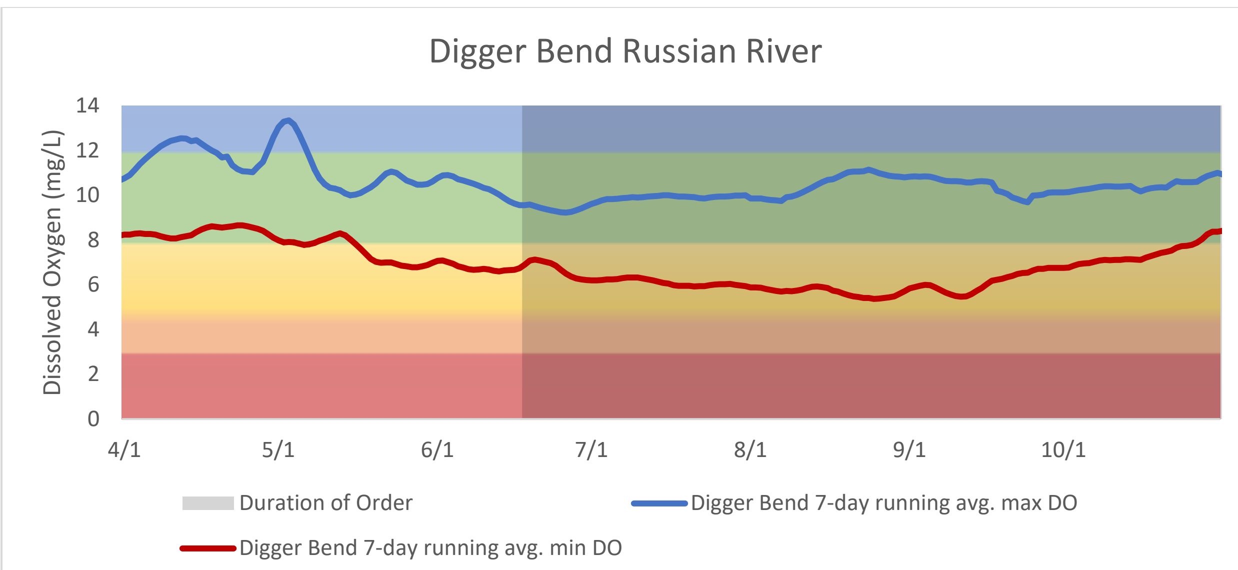

Figure 4-42. The 7-day running average of the minimum and maximum dissolved oxygen collected at the Digger Bend USGS stream gage (11463980) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

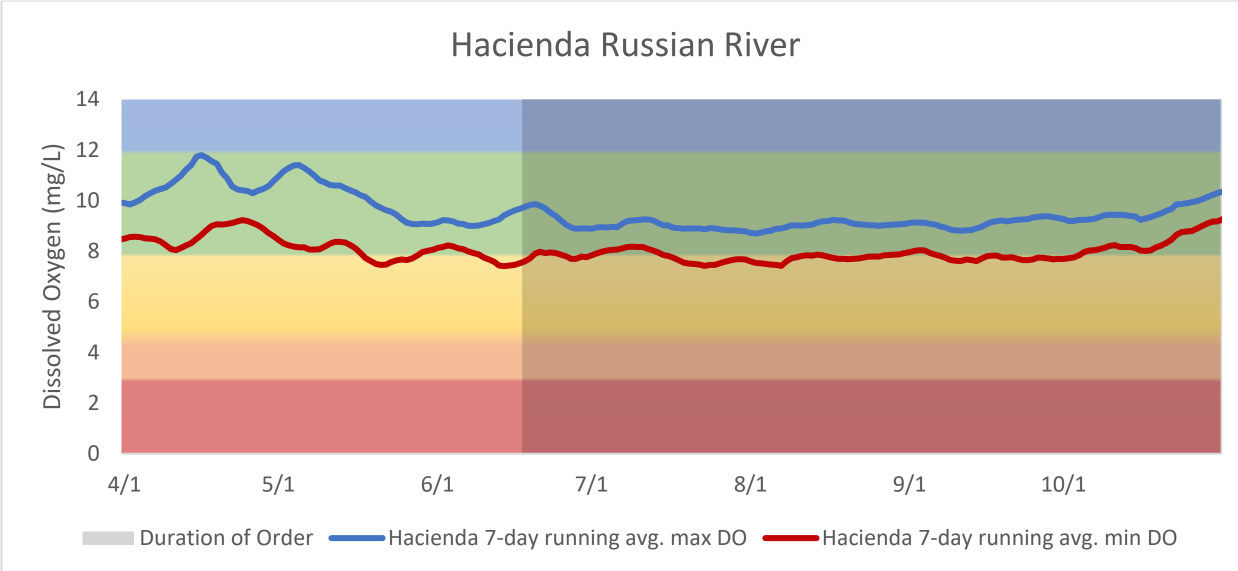

Figure 4-43. The 7-day running average of the minimum and maximum dissolved oxygen collected at the Hacienda USGS stream gage (1146700) from April 1 to October 31, 2022, shown with optimal, suitable, stressful, acutely stressful, lethal dissolved oxygen zones based on criteria in Table 4-4. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

4.2.5 Summary

During the typical onset of upstream migration of adult Chinook, water temperature at Hacienda was acutely stressful, but temperature changed to suitable and optimal by mid-October when the bulk of adult Chinook typically enter the river. Water temperatures at sites upstream of Hacienda followed a similar trend where temperatures were potentially lethal, acutely stressful, or stressful early in the migration period then temperature conditions improved as air temperatures decreased with the onset of fall. While temperatures were at times unfavorable for adult salmonids it is important to note that (1) these fish have evolved to cope with seasonally warm water temperatures by returning to the river in the fall when water temperatures are beginning to cool and (2) the vast majority of adult salmonids return to the Russian River after water temperatures in the river have become favorable.

For juvenile Chinook, water temperatures were favorable for rearing in the early spring at most sites before the Order went into effect but became unfavorable by the end of the rearing season. Fish that remained in the river and emigrated as smolts late in the rearing season encountered unfavorable water temperatures as they moved downstream and out to sea. It is important to note that Chinook in the Russian River migrate downstream and out to sea in the spring thus avoiding high temperatures and by June the majority of Chinook smolts have emigrated from the Russian River.

For steelhead rearing, water temperatures in the east fork Russian River ranged from optimal to stressful. The increase in water temperature at this site was likely due to depletion of the cold water pool in the reservoir. Water temperature in the east fork Russian River was cooler in 2022 when compared to 2021 (Figure 4-37). This is due to improved water quality conditions in Lake Mendocino in 2022. At Hopland, water temperature for steelhead rearing ranged from optimal to stressful. In the Russian River near the confluence with Pieta Creek, water temperature was typically stressful to acutely stressful for rearing steelhead. At Cloverdale maximum daily water temperatures occasionally became potentially lethal.

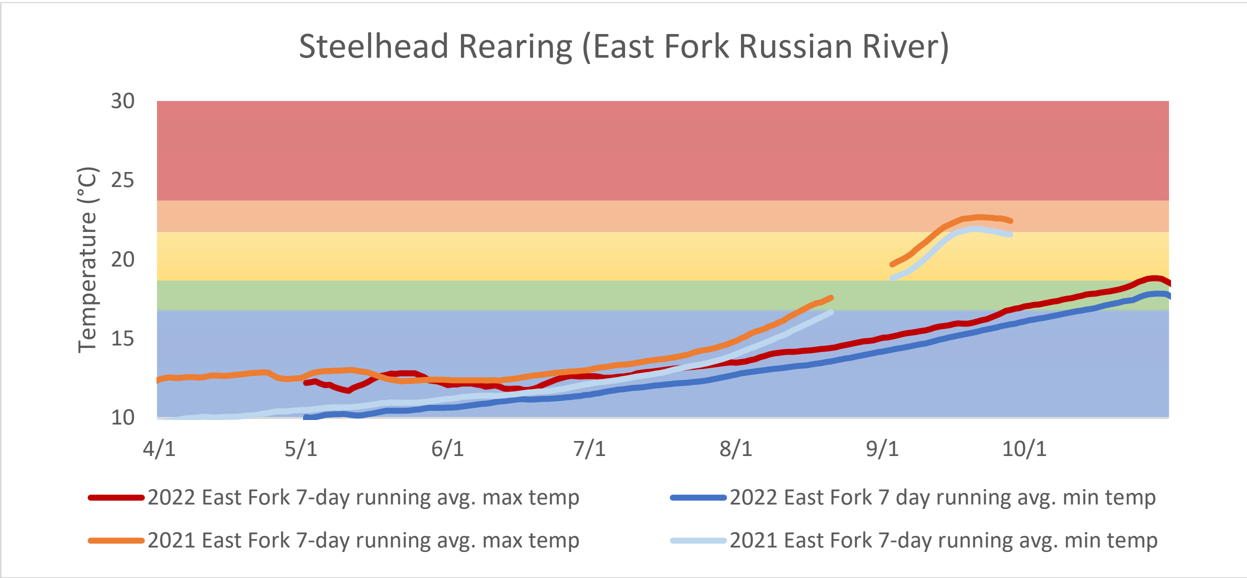

Figure 4-37. The 7-day running average of the minimum and maximum water temperatures collected in the East fork of the Russian River 0.5 km downstream of Coyote Valley Dam in 2021 and 2022 from April 1 to October 31. Shown with optimal, suitable, stressful, acutely stressful, and lethal water temperature zones for steelhead rearing based on Table 4-2. Gray indicates the period included in the TUC Order issued by the State Water Resources Control Board on June 17, 2022, that overlaps with this species and life stage being assessed.

Chinook salmon experienced suitable to acutely stressful water temperatures for smolt migration at Hopland and in the Russian River at the confluence with Pieta Creek. Water temperatures became acutely stressful and even potentially lethal after mid-June at the downstream monitoring sites; however, the bulk of Chinook smolts emigrate from the Russian River prior to mid-June when water temperatures are more favorable. In 2022, over 18,000 (98%) Chinook smolts were captured at the Mirabel downstream migrant trap (not adjusted for trap efficiency) before the Order went into effect on June 17.

Dissolved oxygen was poor during the Order in the east fork of the Russian River. The east fork data sonde is located 0.5 km downstream from the outlet of Coyote Valley Dam. Dissolved oxygen usually recovers near the confluence with the west fork of the Russian River (based on limited data collected in the past by Sonoma Water). The 7-day running average of the minimum dissolved oxygen was stressful for salmonids at Hopland, in the Russian river near the confluence with Pieta Creek, Jimtown, and Digger Bend. At Hacienda, the 7-day running average of the minimum dissolved oxygen was generally suitable for salmonids.

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Appendix A-9

State Waterboard **Temporary Urgency Change Petition**

You completed application 446830 on 10/27/2022 09:30:19

Section A.1 - Petition for Temporary Urgency Change (Water Code 1435)

General Information

Complete this form to submit a temporary urgency change to your water right(s) pursuant to Water Code section 1435. Each water right being changed constitutes a separate petition, however one petition form may be used if the changes are adequately described in an attachment to the petition. Provide attachments as necessary. **Incomplete forms may not be accepted.** A Temporary Urgency Change Petition cannot involve an increase in the amount of appropriation or the season of use. In addition, a Temporary Urgency Change may be effective for a period of one hundred eighty days or less.

Instructions for Filing Petition for Temporary Urgency Change

Filing Fees
Your petition form(s) will not be accepted for initial review unless it is accompanied by the required filing fees, including the following:

1. Fee payable to the State Water Resources Control Board. Instructions for calculating the fee are available at: Water Rights Fees (http://www.waterboards.ca.gov/waterrights/water_issues/programs/fees/). **Send fee to the State Water Resources Control Board.**

2. Fee of $850 payable to the California Department of Fish and Wildlife. An $850 fee is required for all change petitions, with certain exceptions. See specific exceptions in Public Resources Code, division 10, § 10005 (https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=PRC&sectionNum=10005.). **Send the California Department of Fish and Wildlife fee to the State Water Resources Control Board.**

Transmittal Checklist
Before submitting your Petition for a Temporary Urgency Change to the Division, please check to make sure you have completed or provided all of the following items:

1. Complete the following Temporary Urgency Change Petition form. When the form is complete you will receive a notice of submittal that **must be mailed to the Division**

2. Include required petition filing fees with the mailed notice of submittal.

3. Complete the Environmental Information for Petitions form. The form can be found on the Division's Water Rights Online Forms Portal here (https://public2.waterboards.ca.gov/mt/sites/site?siteName=WROF).
   The following will be required to complete the Environmental Information for Petitions form:

   I. Map(s) prepared in accordance with Cal. Code Regs., tit. 23, §§ 715 et seq. & 794 (https://govt.westlaw.com/calregs/Document/I9A273720D45A11DEA95CA4428EC25FA0?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)).

   II. Proof that the petition information was provided to, and consultation was requested with, the appropriate Regional Water Quality Control Board. (Cal. Code Regs., tit. 23, § 794, (b).) (https://govt.westlaw.com/calregs/Document/IB9C38FC0D45A11DEA95CA4428EC25FA0?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)).

   III. Proof that the petition information was provided to, and consultation was requested with, the California Department of Fish and Wildlife if it has not already provided on the Environmental Petition Form. (Cal. Code Regs., tit. 23, § 794, (b).) (https://govt.westlaw.com/calregs/Document/IB9C38FC0D45A11DEA95CA4428EC25FA0?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)).

When you complete the process by transmitting 1) this form, 2) the Environmental Information for Petitions form, 3) any attachments, and 4) the required filing fees, your petition will be reviewed to determine whether the petition can be accepted. If your petition form(s) are found to be incomplete, Division staff will contact you to provide instructions regarding the supplemental information required and provide time to complete the form(s). Petition form(s) not accepted for filing are subject to a $250 non-refundable initial review fee for each petition filed.

☑ I acknowledge that I have read and understand the above information, and that I will not be able to complete my petition form unless I have compiled and provided all required information.

Public Record Acknowledgement

The State Water Resources Control Board, Division of Water Rights, (the Water Board) is requesting personal information on this form. This form shall become a public record upon receipt by the Board. The Water Board may post the petition to its internet website and may mail the petition upon request.

☑ I acknowledge that I have read and understand the above information. I also consent to disclosure by the Board of information provided on this form by posting to the Board's internet website, by direct or electronic mailing, or as otherwise required for the Board to act upon the petition. This consent allows the disclosure of personal information pursuant to Civil Code section 1798.24, subdivision (b) (http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=CIV&sectionNum=1798.24.#:~:text=An%20agency%20shall%20not%20disclose,to%20whom%20the%20information%20pertains.).

Section A.2 - Water Right and Owner Information

Water Right Information:

In order to fill out the table, press the green "+" symbol in the top right-hand corner. Once information has been entered, the green + symbol on the right side of that row must be clicked to confirm the information. For additional rows, press the green "+" symbol at the end of a row.

At least one of the following water right ID numbers must be filled out. If the petition for change form is related to other water rights, please provide the corresponding water right information in the table below.

Application or Statement IDs should follow this format A####### or S######.

Water Right Type	Application or Statement ID	Permit Number	License Number
Appropriative Permit	A012919A	12947A	
Appropriative Permit	A019351	16596	
Appropriative Permit	A015736	12949	
Appropriative Permit	A015737	12950	

If you are filing this form for changes to multiple rights associated with the same project and the online form is too restrictive to allow you to enter the information needed, you may describe the changes in an attachment. **Check the box below if the online form is not sufficient to describe your change(s) to multiple water rights** and you will be prompted to attach descriptions of the proposed changes.

☐ Click here if you meet the above conditions

Owner Information:

If you are filing as a company, government entity, city, etc. leave the first name and last name blank.

First Name:

Last Name:

Organization Name: Sonoma County Water Agency

Contact Person: Todd Schram

Phone Number: (707) 524-1173

Email: tschram@scwa.ca.gov

If entering a P.O. Box for the address, please include "P.O. Box" in the Address field.
Example: *P.O. Box 1234*.

Address: 404 Aviation Blvd

City: Santa Rosa

State/Province: CA

Zipcode: 95403

Agent Information:

Do you wish to designate an agent? ○ Yes ◉ No

Section B.1 - Requested Changes

Use the following navigation buttons to return to the previous pages:

Section A.1 - Introduction

Check all requested changes that apply:

- [ ] Point of Diversion
- [ ] Point of Rediversion
- [ ] Purpose of Use
- [ ] Place of Use
- [ ] Redistribution of Storage
- [x] Terms and Conditions

Section B.3 - Duration of Change

The temporary urgency change(s) cannot exceed 180 days and is to be effective from:

Start Date 12/14/2022 to End Date 06/11/2023

*Please select a start date prior to an end date.

**If you are experiencing issues, select any date from the calendar pop-up and edit the numbers within the textbox by typing.

Section B.6 - Terms and Conditions

Describe any proposed changes to existing water right terms and conditions.

Change hydrologic index for determining water supply condition categories that set the minimum instream flow requirements for the three regulatory reaches in the Russian River watershed as found in the following terms: Term 20 of Permit 12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596. Existing permit terms use cumulative inflow into Lake Pillsbury as the primary hydrologic index. Proposed change would use a hydrologic index based on water storage in Lake Mendocino to establish water supply conditions. See Section 4.0 in attached document for complete details of requested changes.

If you have any additional attachments that will aid Division of Water Rights staff in processing the petition, upload the files in the provided space.

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Section C.1 - Urgent Need

Use the following navigation buttons to return to the previous pages:

Section A.1 - Introduction

Section B.1 - Requested Changes

Explain the “Urgent Need” (Water Code 1435(c) (http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=1435&lawCode=WAT)) that is the basis of this temporary urgency change petition (attach additional information as necessary):

See Section 3.1 in attached document.

Upload Documents here (optional)

No file selected

Upload

(Uploaded files:)

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Section C.2 - Injury to Users

Describe how this temporary urgency change will be made without injury to any lawful user of water.

See Section 3.2 in attached document.

Upload Documents here (optional)

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Section C.3 - Other Diverters

Is any person(s) taking water from the stream between the old point of diversion or rediversion and the proposed point?

○ Yes

○ No ◉ Not Applicable

Section C.4 - Effect on Fish/Wildlife

Describe how this temporary urgency change may be made without unreasonable effect upon fish, wildlife, and other instream beneficial uses.

See Section 3.3 in attached document.

Upload Documents here (optional)

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Section C.5 - California Department of Fish and Wildlife

Have you consulted the California Department of Fish and Wildlife concerning this proposed temporary change? ◉ Yes ○ No

State the name and phone number of the person contacted and the opinion concerning the potential effects of your proposed temporary urgency change on fish and wildlife and state the measures required for mitigation:

Name	Phone Number
Morgan Kilgour	(916) 212-1268

Provide any additional explanation here on feedback provided by CDFW staff. Please also upload available correspondence or proposed conditions provided by CDFW staff.

On October 21, 2022, at the bi-weekly meeting with U.S. Army Corps of Engineers, National Marine Fisheries Service (NMFS), California Department of Fish and Wildlife (CDFW), and North Coast Regional Water Quality Control Board (NCRWQCB), this filing was discussed. These meetings are held per Term 6 of the June 17, 2022, Temporary Urgency Change Order. This meeting addressed the pending filing of these temporary urgency change petitions. Additional consultation with the resource agencies, including CDFW, is planned for the November 4th meeting. The potential effects and mitigation measures will be discussed in the upcoming meeting.

You may upload any relevant attachments here

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Section D.1 - Review

Use the following navigation buttons to return to the previous pages:

Section A.1 - Introduction | Section B.1 - Requested Changes | Section C.2 - Injury To Users

You can view a summary of your petition before submitting by clicking here (/MT/TakeSurvey/Summary?surveysTakenId=446830&surveyId=1125). The summary will open in a new tab. To return to this screen, simply close the tab with the petition summary. If you need to make changes to your petition , you may use the navigation buttons at the bottom of this page, the Prev button to return to previous pages. You will not be able to edit your petition after you submit.

Section D.2 - Certification

I (we) declare under penalty of perjury that the above is true and correct to the best of my (our) knowledge and belief.

By entering your name on the signature line, you are certifying the above (entering your name qualifies as signing the petition form).

I am the:

◉ Water Right Owner ○ Authorized Agent

Signature: Todd Schram

Date: 10/27/2022

State Waterboard **Environmental Info For Petitions**

You completed application 446831 on 10/28/2022 08:24:41

Section A.1 - Introduction of Environmental Information for Petition(s)

GENERAL INFORMATION

This form is required for all petitions, including change petitions, time extension petitions, water right splits, wastewater change petitions and instream flow dedication petitions.

Before the State Water Resources Control Board (State Water Board) can approve a petition, the State Water Board must consider the information contained in an environmental document prepared in compliance with the California Environmental Quality Act (CEQA). This form is not a CEQA document. If a CEQA document has not yet been prepared, a determination must be made of who is responsible for its preparation. As the petitioner, you are responsible for all costs associated with the environmental evaluation and preparation of the required CEQA documents. Please answer the following questions to the best of your ability and submit any studies that have been conducted regarding the environmental evaluation of your project. If you need more space to completely answer the questions, please number and attach additional sheets.

Certification

☑ I acknowledge that I have read and understand the above information and that I will not be able to complete my petition form unless I have compiled all the required information.

Please enter the form number of the petition to which this environmental information corresponds. You can find this form number on your notice of submittal you received via email when submitting your petition form. The form number will be listed as WRA######. **Input just the numbers after WRA below.** If you have not yet completed a petition form, please do so first and then return to this form.

Form Number 446830

If this environmental information form corresponds to multiple petitions forms, please list each additional form number in its own box below.

Form Number 2

Form Number 3

Form Number 4

Form Number 5

Public Record Acknowledgement

The State Water Resources Control Board, Division of Water Rights, (the Water Board) is requesting personal information on this form. This form shall become a public record upon receipt by the Board. The Water Board may post the petition to its internet website and may mail the petition upon request.

☑ I acknowledge that I have read and understand the above information. I also consent to disclosure by the Board of information provided on this form by posting to the Board's internet website, by direct or electronic mailing, or as otherwise required for the Board to act upon the petition. This consent allows the disclosure of personal information pursuant to Civil Code section 1798.24, subdivision (b).

Section A.2 - Description of Changes

Water Right Information:

This form is required for all petitions, including change petitions, time extension petitions, water right splits, wastewater change petitions and instream flow dedication petitions.

In order to fill out the table, press the green "+" symbol in the top right-hand corner. Once information has been entered, the green + symbol on the right side of that row must be clicked to confirm the information. For additional rows, press the green "+" symbol at the end of a row.

At least one of the following water right numbers must be filled out. If this form is related to other water rights, please provide the corresponding water right information in the table below.

Application or Statement IDs should follow this format A####### or S#######.

Water Right Type	Application or Statement ID	Permit Number	License Number
Appropriative Permit	A012919A	12947A	
Appropriative Permit	A019351	16596	
Appropriative Permit	A015736	12949	
Appropriative Permit	A015737	12950	

DESCRIPTION OF PROPOSED CHANGES OR WORK REMAINING TO BE COMPLETED

Provide a description of the proposed changes to your project including, but not limited to:

- Type of construction activity,
- Structures that are existing and that may be built,
- Area to be graded or excavated,
- Increase in water diversion or use,
- Changes in land use,
- Project operational changes, including changes in the timing of diversions or uses, or changes in how the water will be used.

For a petition for extension of time, provide a description of what work has been completed and what remains to be done. Include in your description any of the above elements that will occur during the requested extension period.

Include in your description any of the above elements that will occur during the requested extension period. (Note: Text box size can be adjusted by clicking on the bottom right corner of the text box and dragging to the desired size.)

See 'Supplement to the October 2022 Temporary Urgency Change Petitions' for a summary of the requested changes.

Upload Documents here (optional)

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Section B.1 - Environmental Documents

Has any California public agency prepared an environmental document for your project? ◉ Yes ○ No

Section B.2 - Environmental Documents - Already Prepared

Submit a copy of the latest environmental document(s) prepared, including a copy of the notice of determination adopted by the California public agency.

Name of California Public agency: Sonoma County Water Agency

State Clearing House Number: 20221006

State Clearing House Document Date: 10/27/2022

Upload Documents here (optional)

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Section C.1 - Coordination with Regional Water Quality Control Board

Use the following navigation buttons to return to the previous pages:

Section A.1 - Introduction | Section B.1 - Environmental Documents

Petitioners must request consultation with the appropriate Regional Water Quality Control Board (RWQCB) regarding the potential effects of your proposed change on water quality and other instream beneficial uses. (Cal. Code Regs., tit. 23, § 794, (b). (https://govt.westlaw.com/calregs/Document/IB9C38FC0D45A11DEA95CA4428EC25FA0?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default))) To determine the appropriate RWQCB office for consultation, see: https://www.waterboards.ca.gov/waterboards_map.html (https://www.waterboards.ca.gov/waterboards_map.html)

Provide the RWQCB contact information and the date you submitted the request for consultation below:

Person Contacted First Name: Bryan

Person Contacted Last Name: McFadin

Date of Contact: 10/21/2022

Office: Santa Rosa

Phone Number: (707) 576-2751

Permit Type Required for Project (if any):

Permit Status (if applicable):

Will your project, during construction or operation, (1) generate waste or wastewater containing sewage, industrial chemicals, metals, or agricultural chemicals, or (2) cause erosion, turbidity or sedimentation? ○ Yes ● No

Will a waste discharge permit be required for the project? ○ Yes ● No

Section C.2 - Coordination with the California Department of Fish and Wildlife

Petitioners must request consultation with the Department of Fish and Wildlife (DFW) regarding the potential effects of your proposed change on fish, wildlife, and plant resources, and their habitats. (Cal. Code Regs., tit. 23, § 794, (b). (https://govt.westlaw.com/calregs/Document/IB9C38FC0D45A11DEA95CA4428EC25FA0?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default))) To determine the DFW appropriate office for consultation, see: http://www.wildlife.ca.gov/Regions (http://www.wildlife.ca.gov/Regions)

Person Contacted First Name: Morgan

Person Contacted Last Name: Kilgour

Date of Contact: 10/21/2022

Office: Bay Delta

Phone Number: (916) 212-1268

Permit Type Required for Project and/or Consultation Status: Ongoing weekly meetings under current TUCO

Describe any concerns identified by CDFW staff, or whether CDFW stated there were no concerns related to this project. If your project has the potential to impact any threatened and endangered species or if there are any other known environmental impacts, also provide the information here.

Upload any related correspondence with CDFW or additional explanation if available.

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Section C.3 - Local Permits

For **temporary transfers only**, you must submit a copy of the Petition for Transfer and Environmental Information form to the board of supervisors for the county(ies) both for where you currently store or use water and where you propose to transfer the water. (Wat. Code § 1726. (http://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=1726&lawCode=WAT))

Person Contacted First Name: Person Contacted Last Name:

Date of Contact: Department: Phone Number:

For **change petitions only**, you should contact your local planning or public works department and provide the information below.

Person Contacted First Name: Person Contacted Last Name:

Date of Contact: Department: Phone Number:

County Zoning Designation:

Are any county permits required for your project? ○ Yes ◉ No

Section C.4 - Federal and State Permits

Provide information for any additional Federal and/or State agencies that may require permits or other approvals for your project.:

Some Federal/State agencies that may require permits or other approvals are:

- Regional Water Quality Control Board (https://www.waterboards.ca.gov/about_us/contact_us/rwqcbs_directory.html)
- California Coastal Commission (https://www.coastal.ca.gov/)
- U.S. Forest Service (https://www.fs.usda.gov/)
- Natural Resources Conservation Service (https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/)
- State Water Resources Control Board (https://www.waterboards.ca.gov/)
- Department of Fish and Wildlife (https://wildlife.ca.gov/)
- Department of Water Resources, Division of Safety of Dams (https://water.ca.gov/Programs/All-Programs/Division-of-Safety-of-Dams)
- State Reclamation Board (https://www.usbr.gov/mp/)
- U.S. Army Corps of Engineers (https://www.usace.army.mil/)
- Federal Energy Regulatory Commission (https://www.ferc.gov/)
- Bureau of Land Management (https://www.blm.gov/california)

For each agency from which a permit is required, provide the following information:

Agency	Permit Type	Person(s) Contacted	Contact Date	Phone Number	Status

If you selected a status of "Other", please explain:

Have you obtained any of the permits listed above? ○ Yes ◉ No ○ None Required

Section C.5 - Construction and Grading Activity

Does the project involve any construction or grading activity that has significantly altered or would significantly alter the bed, bank, or riparian habitat of any stream or lake?

○ Yes ◉ No

Section C.6 - Environmental Setting

Attach **two complete sets of color photographs**, clearly dated and labeled, showing the vegetation that exists at the below-listed four locations. For time extension petitions, the photographs should document only those areas of the project that will be impacted during the requested extension period.

- Along the stream channel immediately downstream from the proposed point(s) of diversion.
- Along the stream channel immediately upstream from the proposed point(s) of diversion.
- At the proposed point(s) of diversion.
- At the place(s) where the water is to be used.

Upload Documents here — No file selected

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Section C.7 - Maps

For all petitions other than time extensions, attach maps labeled in accordance with the regulations showing all applicable features, both present and proposed, including but not limited to: point of diversion, point of rediversion, distribution of storage reservoirs, place of use, and location of instream flow dedication reach. (Cal. Code Regs., tit. 23, §§ 715 et seq. & 794 (https://govt.westlaw.com/calregs/Document/I9A273720D45A11DEA95CA4428EC25FA0?viewType=FullText&originationContext=documenttoc&transitionType=CategoryPageItem&contextData=(sc.Default)))

Pursuant to California Code of Regulations, title 23, section 794, petitions for change submitted without maps may not be accepted.

Upload Documents here (optional) — No file selected

Upload

(Uploaded files:) Delete EnviroInfo_TUCP_Map_26oct2022.pdf (/MT/TakeSurvey/Download?fileName=1110_446831_79247_EnvironmentalIn__UploadofMaps_1.pdf)

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Section D.1 - Review

Use the following navigation buttons to return to the previous pages:

Section A.1 - Introduction | Section B.1 - Environmental Documents | Section C.1 - Coordination with RWQCB

You can view a summary of your form before submitting by clicking here (/MT/TakeSurvey/Summary?surveysTakenId=446831&surveyId=1110). The summary will open in a new tab. To return to this screen, simply close the tab with the summary. If you need to make changes to your form, you may use the navigation buttons at the top of this page, or the Prev button below to navigate to previous pages. You will not be able to edit your form after you submit.

Section D.2 - Certification

☑ **I (we) declare under penalty of perjury that the information within this survey is true and correct to the best of my (our) knowledge and belief.**

By entering your name on the signature line, you are certifying the above (entering your name qualifies as signing the form).

I am the:

◉ Water Right Owner ○ Authorized Agent

Signature: Todd Schram

Date: 10/28/2022

Sonoma County Water Agency

Supplement to the October 2022 Temporary Urgency Change Petitions

The Sonoma County Water Agency (Sonoma Water) seeks temporary urgency changes to its four water-right permits used to provide wholesale water to cities and water districts in Sonoma and Marin Counties. These changes are necessary to ensure that the water supply condition and corresponding minimum instream flow requirements in the Russian River watershed are aligned with actual watershed hydrologic conditions. This is essential to maintain sustainable reservoir and river operations to protect municipal water supply and listed salmon species in the Russian River.

Based on Sonoma Water's water right permits' terms established under State Water Resources Control Board (State Water Board) Decision 1610, the water supply condition for the Russian River is determined using cumulative inflow into Lake Pillsbury as the hydrologic index. Lake Pillsbury is a storage reservoir located in the Eel River watershed for Pacific Gas & Electric Company's (PG&E) Potter Valley Hydroelectric Project (PVP), which transfers water into the East Fork of the Russian River. The Federal Energy Regulatory Commission (FERC) license for the PVP expired on April 14, 2022, and the PVP now operates on an annual license. PG&E has elected to surrender the operating license and decommission the PVP and developed a plan and schedule that was approved by FERC on July 29, 2022. Per PG&E's schedule, a final license surrender application and decommissioning plan will be submitted by January 29, 2025. FERC's license-surrender proceedings will likely take several years before PVP operations and long-term rules governing any imports to the Russian River watershed are resolved.

Notwithstanding these long-term issues, the suitability of using Lake Pillsbury cumulative inflow as a hydrologic index for the Russian River has diminished due to the recent transformer bank failure at the PVP powerhouse. This failure caused PVP hydropower generation to cease and, with it, the associated discretionary transfers of Eel River water to the East Fork of the Russian River. PG&E informed the Drought Working Group in October 2021 of the failure and the anticipated repair requirements that would take up to two years at a cost of five to ten million dollars. PG&E announced its intent to make the necessary repairs and restart power generation, but the status of this project is unknown at this time.

The PVP has a rated design flow rate up to 240 cubic feet per second (cfs) through the powerhouse for power generation. The bypass for the PVP powerhouse can pass flow rates up to 135 cfs to meet FERC license requirements for minimum instream releases into the East Fork of the Russian River and water supply contract requirements with the Potter Valley Irrigation District (PVID).

Currently, the PVP is operating under a FERC order that approved a temporary variance on the license flow requirements on July 27, 2022. The order effectively reduced the minimum instream releases into the East Fork of the Russian River from 75 cfs to 5 cfs. PG&E's current transfer obligation under the FERC variance and the PVID contract from now until April 14, 2023, is 10 cfs. The variance is expected to be terminated after Lake Pillsbury storage reaches 36,000 acre-feet. Upon termination, PG&E transfer obligations will total 45 cfs until April 14, 2023. On April 15, 2023, the transfer requirement to the East Fork of the Russian River will be reassessed based on the water supply condition under the FERC license.

PG&E has indicated that without the ability to generate hydropower, PG&E will not likely make discretionary transfers through the PVP above its FERC license and contract obligations. Discretionary transfers to generate hydropower can occur up until early April if hydrologic conditions on the Eel River and at Lake Pillsbury are met. Without the discretionary transfer of Eel River water to generate hydropower, the total transfer through the PVP will be reduced by up to 456 acre-feet per day.

Under these PVP operating conditions, the influence of the Eel River water imports on downstream hydrologic conditions in the Russian River will be greatly diminished. Therefore, there will be little to no correlation between cumulative inflow into Lake Pillsbury and the hydrologic conditions in the Russian River watershed. Consequently, Sonoma Water requests that storage thresholds in Lake Mendocino be used as the hydrologic index to determine the water supply condition in the Russian River watershed on which minimum instream requirements are based. A similar approach using storage thresholds was requested by Sonoma Water in prior Temporary Urgency Change Petitions

(TUCP) filed in December 2013, January 2021, and November 2021; and approved by the State Water Board in orders issued on December 31, 2013, February 4, 2021, and December 10, 2021, respectively. Under the current TUCP request, the storage thresholds have been updated to incorporate the current operational conditions present in the Russian River (see Section 4.0).

The current drought that began in the spring of 2020 has contributed to Sonoma Water filing five TUCPs. Projected critically low storage levels in Lake Mendocino were major drivers for the TUCPs. These low storage levels were due to the combination of dry watershed conditions and reduced transfers of Eel River water through the PVP as a result of variances filed with FERC by PG&E. With water conservation, water rights curtailments and actions under the recent Temporary Urgency Change Orders, Lake Mendocino water levels were sustained to allow continuous reservoir releases and are in a significantly improved condition from one year ago. Lake Sonoma, however, remains at its second lowest level for this time of year since filling in 1986. Consequently, it is critical that the water supply condition and corresponding minimum instream flows in the Russian River be determined by a hydrologic index representative of the Russian River watershed.

1.0 BACKGROUND

Sonoma Water controls and coordinates water supply releases from Lake Mendocino and Lake Sonoma to implement the minimum instream flow requirements as established in Decision 1610, which the State Water Board adopted on April 17, 1986. Decision 1610 specifies minimum instream flow requirements for the Upper Russian River, Dry Creek and the Lower Russian River.[1] These minimum flow requirements vary based on hydrologic conditions, which are also specified in Decision 1610. The Decision 1610 requirements for the Upper Russian River and Lower Russian River are contained in Term 20 of

[1] The Upper Russian River is the stream reach from the confluence of the East Fork of the Russian River and West Fork of the Russian River to the Russian River's confluence of Dry Creek. The Lower Russian River is the stream reach from the confluence of Dry Creek and the Russian River to the Pacific Ocean.

Sonoma Water's water-right Permit 12947A (Application 12919A). The Decision 1610 requirements for the Lower Russian River are contained in Term 17 of Sonoma Water's water-right Permit 12949 (Application 15736) and Term 17 of Sonoma Water's water-right Permit 12950 (Application 15737). The Decision 1610 requirements for Dry Creek and the Lower Russian River are contained in Term 13 of Sonoma Water's water-right Permit 16596 (Application 19351).

Sonoma Water's operations are also subject to the Russian River Biological Opinion issued by the National Marine Fisheries Service on September 24, 2008, and the consistency determination issued by the California Department of Fish and Wildlife on November 9, 2009.

1.1 Minimum Flow Requirements

Decision 1610 requires a minimum flow of 25 cubic feet per second (cfs) in the East Fork of the Russian River from Coyote Valley Dam to the confluence with the West Fork of the Russian River under all water supply conditions. From this point to Dry Creek, terms adopted by Decision 1610 require minimum Russian River flows as follows: from April through August, 185 cfs, and from September through March, 150 cfs, during *Normal* water supply conditions; 75 cfs during *Dry* conditions; and 25 cfs during *Critical* conditions. Decision 1610 further specifies two variations of the *Normal* water supply condition, commonly known as *Dry Spring 1* and *Dry Spring 2*. These conditions provide for lower required minimum flows in the Upper Russian River during times when the combined storage in Lake Pillsbury and Lake Mendocino on May 31 is unusually low. *Dry Spring 1* conditions exist if the combined storage in Lake Pillsbury and Lake Mendocino is less than 150,000 acre-feet on May 31. Under *Dry Spring 1* conditions, the required minimum flow in the Upper Russian River between the confluence of the East Fork and West Fork and Healdsburg is 150 cfs from June through March, with a reduction to 75 cfs during October through December if Lake Mendocino storage is less than 30,000 acre-feet during those months. *Dry Spring 2* conditions exist if the combined storage in Lake Pillsbury and Lake Mendocino is less than 130,000 acre-feet on May 31. Under *Dry Spring 2* conditions, the required minimum flows in the Upper Russian River are 75 cfs from June through December and 150 cfs from January through March.

From Dry Creek to the Pacific Ocean, the required minimum flows in the Lower Russian River are 125 cfs during *Normal* water supply conditions, 85 cfs during *Dry* conditions, and 35 cfs during *Critical* conditions.

In Dry Creek below Warm Springs Dam, the required minimum flows are 75 cfs from January through April, 80 cfs from May through October and 105 cfs in November and December during *Normal* water supply conditions. During *Dry* and *Critical* conditions, these required minimum flows are 25 cfs from April through October and 75 cfs from November through March.

Figure 1 shows all of the required minimum instream flows specified in Decision 1610 by river reach, the gauging stations used to monitor compliance, and the definitions of the various water supply conditions.

1.2 Water Supply Conditions

There are three main water supply conditions that are defined in Decision 1610, which set the minimum instream flow requirements for the Russian River system based on the hydrologic conditions. These water supply conditions are determined based on criteria for the calculated cumulative inflow into Lake Pillsbury from October 1 to the first day of each month from January to June. Decision 1610 defines cumulative inflow for Lake Pillsbury as the algebraic sum of releases from Lake Pillsbury, change in storage and lake evaporation.

Dry water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 8,000 acre-feet as of January 1;
- 39,200 acre-feet as of February 1;
- 65,700 acre-feet as of March 1;
- 114,500 acre-feet as of April 1;
- 145,600 acre-feet as of May 1; and
- 160,000 acre-feet as of June 1.

Under Decision 1610, *Critical* water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

- 4,000 acre-feet as of January 1:
- 20,000 acre-feet as of February 1;
- 45,000 acre-feet as of March 1;
- 50,000 acre-feet as of April 1;
- 70,000 acre-feet as of May 1; and
- 75,000 acre-feet as of June 1.

Normal water supply conditions exist whenever a *Dry* or *Critical* water supply condition is not present. As indicated above, Decision 1610 further specifies three variations of the *Normal* water supply condition based on the combined storage in Lake Pillsbury and Lake Mendocino on May 31. These three variations of the *Normal* water supply condition determine the required minimum instream flows for the Upper Russian River. This provision of Decision 1610 does not provide for any changes in the required minimum instream flows in Dry Creek or the Lower Russian River. A summary of the required minimum flows in the Upper Russian River for *Normal*, *Normal — Dry Spring 1* and *Normal — Dry Spring 2* water supply conditions is provided here:

1. *Normal*: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year exceeds 150,000 acre-feet or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through August 31	185 cfs
From September 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

2. *Normal-Dry Spring 1*: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year is between 150,000 acre-feet

or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less, and 130,000 acre-feet or 80 percent or the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through March 31	150 cfs
From April 1 through May 31	185 cfs
If from October 1 through December 31, storage in Lake Mendocino is less than 30,000 acre-feet	75 cfs

3. *Normal-Dry Spring 2*: When the combined water in storage in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 acre-feet or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through December 31	75 cfs
From January 1 through March 31	150 cfs
From April 1 through May 31	185 cfs

2.0 WATER SUPPLY CONDITIONS

On May 31, 2022, the cumulative inflow for the water year (starting October 1) into Lake Pillsbury was 228,109 acre-feet and combined storage in Lake Pillsbury and Lake Mendocino was 106,803 acre-feet. Consequently, the water supply condition is categorized as *Normal Dry Spring 2* for the remainder of 2022. Sonoma Water is currently managing the Russian River as authorized by the State Water Board amended temporary urgency change order dated October 11, 2022. The amended order modified the original order dated June 17, 2022, that approved Sonoma Water's May 2022 TUCP. The approved changes authorized a reduction in minimum instream flow requirements to *Critical* water supply condition levels for the Upper and Lower Russian River. These changes were necessary because of the critically dry hydrology and very low storage at Lake Mendocino and Lake

Sonoma. The State Water Board's October 11, 2022 amended order expires after December 13, after which the minimum instream flow requirements would return to a *Normal Dry Spring II* water supply condition for the Upper and Lower Russian River. For the remainder of the year, the corresponding minimum instream flow requirements would increase from 25 cfs to 75 cfs on the Upper Russian River and from 35 cfs to 125 cfs on the Lower Russian River.

Without an additional temporary urgency change order approving the requested changes, the hydrologic index based on cumulative inflow into Lake Pillsbury will be misaligned with actual Russian River watershed conditions and storage levels at Lake Mendocino and Lake Sonoma. This would require releases from the two reservoirs to meet minimum instream flow requirements that would further exacerbate the depletion of the reservoirs to potentially severely low levels.

2.1 Potter Valley Hydroelectric Project

The PVP, owned and operated by PG&E, is located on the East Fork of the Russian River and the Eel River in Mendocino and Lake Counties. PVP's Lake Pillsbury is impounded by Scott Dam. Eel River natural flows and releases from Scott Dam can be diverted downstream at Cape Horn Dam through PG&E's generation facilities. Those generation facilities then release that water to the East Fork of the Russian River.

As discussed above, the PVP powerhouse is inoperable for the foreseeable future, which will severely reduce the transfer of Eel River water through the PVP. PG&E has indicated that it plans to repair the facility even though it is preparing a license surrender application and decommissioning plan as required by FERC. However, PG&E has not released a plan or schedule for repairing the transformer bank.

2.2 Lake Mendocino

As of October 24, 2022, the water supply storage level in Lake Mendocino was 38,563 acre-feet (AF). This storage level is approximately 49 percent of the available water conservation pool for this time of year. This corresponds to approximately the 20th percentile storage level for this time of year. Figure 2 shows observed storage in Lake Mendocino for 2014 through October 24, 2022.

Lake Mendocino is operating under a Planned Major Deviation (Deviation) of the Coyote Valley Dam/Lake Mendocino Water Control Manual that was approved by the U.S. Army Corps of Engineers (USACE) in February 2021. The Deviation was approved to remain in effect through Water Year (WY) 2026 at the request of the Lake Mendocino Forecast Informed Reservoir Operations (FIRO) Steering Committee. The Deviation allows USACE flood control managers to store up to an additional 11,650 acre-feet of water in the flood control pool at their discretion. Furthermore, it authorizes USACE flood control managers to leverage a Decision Support Model (DSM) developed by Sonoma Water as part of the tools and protocols USACE uses to manage reservoir operations at Lake Mendocino. Based on an operational hydrologic ensemble of streamflow forecasts provided by the California-Nevada River Forecast Center, current reservoir storage, and current and anticipated downstream conditions, the DSM provides a recommended release to help inform operational decisions. Unfortunately, drought conditions since March 2020 have resulted in storage levels at Lake Mendocino that are well below the flood control pool. Hence, the FIRO DSM has not been able to improve storage levels.

2.3 Lake Sonoma

As of October 24, 2022, the water supply storage level in Lake Sonoma was 105,599 acre-feet. This storage level is approximately 43 percent of the available water conservation pool. This is the lowest storage level for this time of year since Lake Sonoma filled in 1986. The second lowest level on record was last year, which was over 10,000 acre-feet higher. Figure 3 shows observed storage in Lake Sonoma for 2014 through October 24, 2022.

3.0 CRITERIA FOR APPROVING TEMPORARY UNGENCY CHANGE TO PERMITS 12947A, 12949, 12950, AND 16596

As required by Water Code section 1435, subdivision (b), the Board must make the following findings before issuing a temporary change order:

1. The permittee or licensee has an urgent need to make the proposed change;

2. The proposed change may be made without injury to any other lawful user of water;
3. The proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses; and
4. The proposed change is in the public interest.

3.1 Urgency of the Proposed Change

Under Water Code section 1435, subdivision (c), an urgent need to make a proposed change exists when the State Water Board concludes that the proposed temporary change is necessary to further the constitutional policy that the water resources of the State be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented.

For these petitions, an urgent need exists to implement the proposed change due to the drastic reduction of potential Eel River water imports through the PVP resulting from the inoperability of the powerhouse for the foreseeable future. The volume of imported Eel River water that can be transferred with the powerhouse being inoperable results in little or no correlation between cumulative inflow into Lake Pillsbury and the hydrologic condition in the Russian River. Without the proposed changes, the applicable minimum instream flow requirements may require releases of water from Lake Mendocino and Lake Sonoma at levels that would risk significant depletions of storage to severely low levels. Such depletions in storage could cause serious impacts to human health and welfare and reduce water supplies needed for fishery protection.

3.2 No Injury to Any Other Lawful User of Water

If this petition is approved, Sonoma Water still will be required to maintain specific minimum instream flows in the Russian River. Because these minimum flows will be present, all other legal users of water still will be able to divert and use the amounts of water that they may legally divert and use. Accordingly, granting this petition will not result in any injury to any other lawful user of water.

3.3 No Unreasonable Effect upon Fish, Wildlife, or Other Instream Beneficial Uses

If these petitions are approved, monthly storage thresholds in Lake Mendocino would determine the water supply condition that sets the Russian River minimum instream flow requirements. This change would align Sonoma Water's reservoir operations and the applicable minimum streamflows with the Russian River watershed's hydrology. The change therefore could result in lower instream flows in the Russian River. Any effects associated with such flow reductions would not be unreasonable, considering the potential catastrophic impacts to fish, wildlife and other instream beneficial uses that could occur under minimum instream flow requirements that the Russian River watershed and reservoirs cannot sustain.

3.4 The Proposed Change is in the Public Interest

Approval of these petitions would provide alternative criteria for determining minimum instream flow requirements for the Russian River that would be based on a more accurate assessment of water supply conditions in the Russian River watershed. This would result in minimum instream flow requirements that more likely can be sustained with releases from Lake Mendocino and Lake Sonoma without severely depleting storage. It is in the public interest to manage these water supplies based on an index that is more reflective of the hydrologic conditions of the Russian River watershed.

4.0 REQUESTED TEMPORARY URGENCY CHANGE TO PERMITS 12947A, 12949, 12950, AND 16596

To address the inoperability of the PVP powerhouse and corresponding loss of Eel River water imports through the PVP, Sonoma Water is filing these petitions requesting that the State Water Board make the following temporary changes to the Decision 1610 requirements:

Starting December 14, 2022, the minimum instream flow requirements for the Russian River will be established using an index based on water storage in Lake Mendocino, rather than the current index based on cumulative inflow into Lake Pillsbury. This temporary change is requested to ensure that the water supply condition for the Russian River is determined by an index that is reflective of actual watershed conditions. Specifically, Sonoma Water proposes that the storage values listed below be used, in lieu of cumulative Lake Pillsbury inflow, to determine the water supply conditions that determine which minimum instream flow requirements in Term 20 of Permit 12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596 will apply to the Russian River:

a. *Dry* water supply conditions will exist when storage in Lake Mendocino is less than:

    45,000 acre-feet as of January 1
    60,000 acre-feet as of February 1
    71,000 acre-feet as of March 1
    75,000 acre-feet as of March 16
    77,000 acre-feet as of April 1
    76,500 acre-feet as of April 16
    76,000 acre-feet as of May 1
    75,500 acre-feet as of May 16
    75,000 acre-feet as of June 1

b. *Critical* water supply conditions exist when storage in Lake Mendocino is less than:

    31,000 acre-feet as of January 1
    41,000 acre-feet as of February 1
    53,500 acre-feet as of March 1
    56,000 acre-feet as of March 16
    56,500 acre-feet as of April 1
    56,000 acre-feet as of April 16
    55,000 acre-feet as of May 1
    54,000 acre-feet as of May 16
    53,500 acre-feet as of June 1

c. *Normal* water supply conditions exist in the absence of defined *Dry* or *Critical* water supply conditions.

Because the proposed criteria for determining the applicable minimum instream flow requirements would be tied to Lake Mendocino storage, they would more accurately reflect the hydrologic conditions in the Russian River and would adjust through June 1 if the remainder of the winter and spring yields improvements in the hydrologic conditions. The proposed criteria, therefore, mimic the logic underlying the year types and associated streamflow requirements of Decision 1610. It would shift the criteria for establishing hydrologic conditions in the Russian River watershed to local conditions rather than inflows to Lake Pillsbury in the Eel River watershed, which no longer are representative of Russian River hydrologic conditions.

These storage thresholds in Lake Mendocino were developed by Sonoma Water engineering staff using its Russian River Simulation Model. The modeling scenarios assume: (1) current Russian River system losses; (2) WY 1911 to WY 2017 unimpaired flow hydrology, and (3) Potter Valley Project operations based on the Reasonable and Prudent Alternatives contained in the 2004 Potter Valley Project Biological Opinion. The thresholds were developed to approximately replicate the frequency of occurrence of the water supply conditions of Decision 1610, with an 86 percent occurrence of *Normal* conditions, a 10 percent occurrence of *Dry* conditions, and a 4 percent occurrence of *Critical* conditions from January to June. A detailed description of the hydrologic analysis is presented in Attachment A.

5.0 PROPOSED ACTIONS BY SONOMA WATER

To inform State Water Board staff and interested stakeholders in the Russian River watershed regarding reservoir and watershed conditions, Sonoma Water will prepare a weekly hydrologic status report that contains the following information:

- Current reservoir levels and reservoir storage hydrographs for Lake Mendocino and Lake Sonoma;
- The daily rate of change in storage, inflow and reservoir release for Lake Mendocino and Lake Sonoma; and
- Cumulative rainfall plot for current water year versus historical

precipitation range for Ukiah. Cumulative rainfall forecasts for 3-day, 7-day and 16-day.

These reports will be made available on Sonoma Water's website during the term of the order approving Sonoma Water's requested temporary changes.

6.0 WATER CONSERVATION ACTIVITIES

The following water conservation activities reflect the efforts of Sonoma Water and the Sonoma-Marin Saving Water Partnership (Partnership). The Partnership represents 13 North Bay water utilities in Sonoma and Marin counties that have joined together to provide regional solutions for water use efficiency. The utilities (Partners) are: the Cities of Santa Rosa, Rohnert Park, Petaluma, Sonoma, Cloverdale, Cotati, Healdsburg; North Marin, Valley of the Moon, and Marin Municipal Water Districts; California American Water Company - Larkfield; the Town of Windsor, and Sonoma Water. The Partnership was formed to identify and recommend water use efficiency projects and to maximize the cost-effectiveness of water use efficiency programs in our region.

Sonoma and Mendocino were the first counties placed under a region-specific drought state of emergency on April 21, 2021, by Gov. Gavin Newsom. The Sonoma County Board of Supervisors took action on April 27, 2021, proclaiming a local emergency due to drought conditions in support of actions needed to mitigate the adverse environmental, economic, health, welfare and social impacts of the drought. As required by Government Code section 8630, the Board of Supervisors must review the proclamation of local emergency every 60 days and determine if there is a need for continuing the local emergency. The Sonoma County Board of Supervisors has approved the continuation of the drought emergency conditions every 60 days since April 2021, with the most recent extension occurring September 13, 2022. It is expected that drought emergency conditions will remain in effect through 2022.

Since the summer of 2021, Sonoma Water and its contractors have continued to implement shortage response actions consistent with those adopted for a shortage level of up to twenty percent (Level 2). These actions match the requirements of the Governor's Executive Order N-7-22 and are also consistent with the actions detailed in Sonoma Water's and the contractors' annual Water Shortage Assessment reports submitted to the California Department of Water Resources prior to July 1, 2022. Sonoma Water's report concluded there was sufficient water supply to meet projected demands from July 2022 through June 2023 if the following year were to be dry. Given ongoing drought conditions, however, Sonoma Water and its contractors agreed that meeting a 20 percent reduction in diversions from the Russian River was appropriate from July 2022 through October 2022 in order to preserve water supply in Lake Sonoma should drought conditions continue into a fourth year.

Sonoma Water and its customers are achieving a 30.5 percent reduction in Russian River diversions for the period July 1 through October 24, 2022, as compared to the same period in 2020. Consequently, it is expected that the 20 percent diversion reduction goal through October will be met or exceeded. Shortage response actions are anticipated to continue after October, however, given current dry conditions and the applicability of the Governor's ongoing Executive Order. Sonoma Water and its contractors will be undertaking work on next year's Annual Water Supply and Demand Assessment starting in December, to include monitoring and early forecasting of water supply conditions and to develop updated demand forecasts for the next two years. As was done last winter into spring and summer, this annual process will be relied on to determine appropriate shortage response actions in consideration of any precipitation received this winter.

Outreach Campaign

Sonoma Water, its contractors, and the other member agencies of the Partnership continue to run a multi-media drought outreach campaign to maintain customer awareness of low reservoir levels and the need for continued water savings due to a third consecutive dry year. The campaign emphasizes reducing water waste by adhering to statewide water waste prohibitions and local restrictions on irrigation and other non-essential uses of water. As previously mentioned, drought restrictions have been in effect continuously since summer of 2021.

The Partnership outreach campaign being implemented this fall and winter includes topical advertising for installing drip irrigation systems, how to care for trees during drought, greywater systems, rainwater harvesting, information on water smart plants, and timely reminders to turn off irrigation systems for winter. This advertising utilizes streaming content online, print and digital ads, videos, social media placements, and radio. A weekly graphic showing current reservoir storage levels is ongoing in the Santa Rosa Press Democrat print and online news publications and on Sonoma Water's and the Partnership's websites. Sonoma Water has also been conducting monthly Drought Town Hall meetings hosted by a member of the Sonoma County Board of Supervisors / Sonoma Water Board of Directors, with guest presenters providing the latest information on drought conditions. The next Drought Town Hall meeting is scheduled for November 3, 2022.

A drought outreach subcommittee of the Partnership continues to meet monthly to coordinate development of new advertising and to finalize outreach plans through the fall and winter period. The Partnership recently completed a series of Saving Water Summer Pop-Up events, culminating at the Fiesta de Independencia held at the Luther Burbank Center for the Arts on September 18, 2022. In total, the Partnership hosted 27 pop-ups over the summer to share drought information and water saving tools with participants. Six pop-ups occurred simultaneously on August 20, 2022, in collaboration with home improvement stores throughout Sonoma and Marin counties, where total customer engagement numbered in the thousands. Overall, the ongoing drought outreach campaign continues to be effective in meeting the Governor's call for a 15% reduction as compared to 2020 use. For the July 2021 through August 2022 period, the Partnership is maintaining a 21% reduction in total water production as compared to the same period in 2020.

Figures

Cumulative inflow to Lake Pillsbury (acre-feet) from Oct 1 through

	1/1	2/1	3/1	4/1	5/1	6/1	Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
NORMAL	≥8,000	≥39,200	≥65,700	≥114,500	≥145,600	≥160,000	
DRY	<8,000	<39,200	<65,700	<114,500	<145,600	<160,000	
CRITICAL	<4,000	<20,000	<45,000	<50,000	<70,000	<75,000	

LEGEND

All flows are minimums, expressed in cubic feet per second.

* - Unless Lake Sonoma elevation is below 292.0, or if prohibited by the United States Government.

AF - Acre-Feet

● - USGS Stream Gage Compliance Points

East Fork

Coyote Dam

Mouth of East Fork Russian River

ALWAYS East Fork Russian River Coyote Dam to Russian River 25 CFS

Russian River

NORMAL

1/1 - 3/31 150 CFS
4/1 - 5/31 185 CFS

If Combined Storage in Lake Pillsbury and Lake Mendocino on May 31 is

Normal	Normal - Dry Spring 1	Normal - Dry Spring 2
150,000 AF or >90% of Total Storage 6/1 - 8/31 185 CFS 9/1 - 12/31 150 CFS	130,000 - 150,000 AF or 80-90% of Total Storage whichever is less 6/1 - 12/31 150 CFS	<130,000 AF or <80% of Total Storage 6/1 - 12/31 75 CFS

If Lake Mendocino <30,000 AF Storage
10/1 - 12/31 75 CFS

DRY

75 CFS

CRITICAL

25 CFS

Dry Creek

NORMAL

1/1 - 4/30 75 CFS
5/1 - 10/31 80 CFS
11/1 - 12/31 105 CFS

DRY

4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS

CRITICAL

4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS

Mouth of Dry Creek

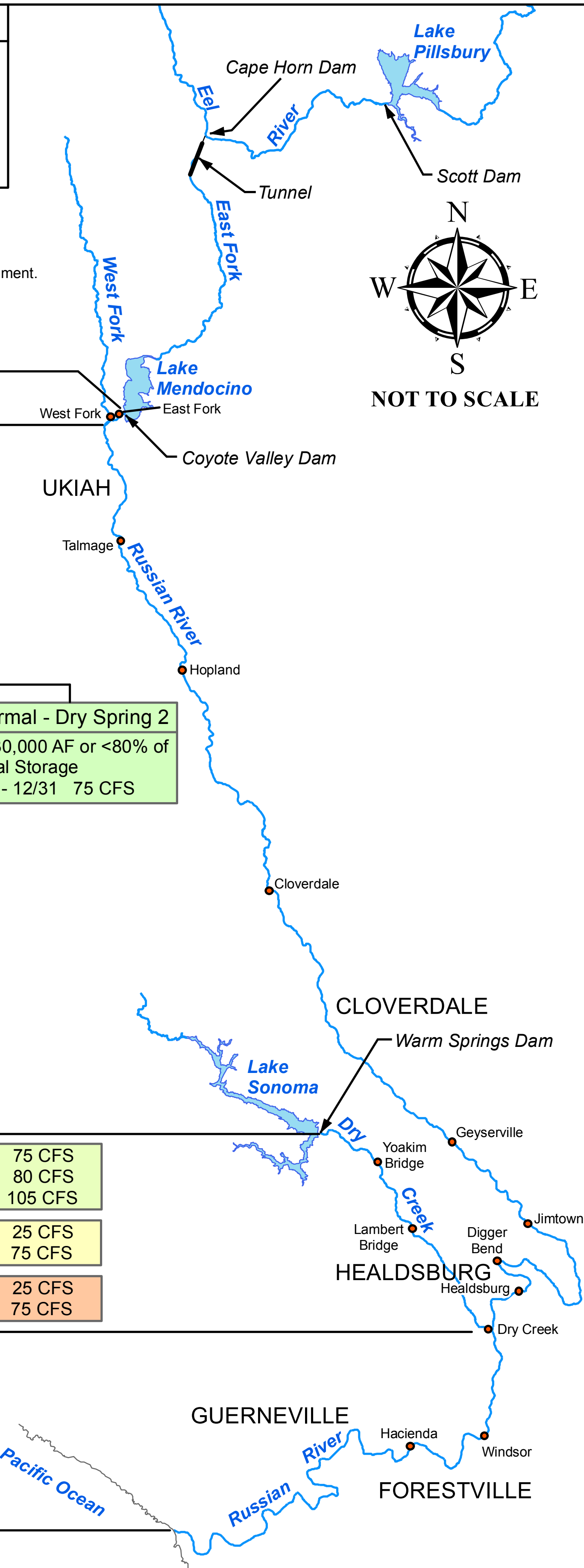
Russian River

NORMAL 125 CFS*

DRY 85 CFS*

CRITICAL 35 CFS*

Mouth of Russian River

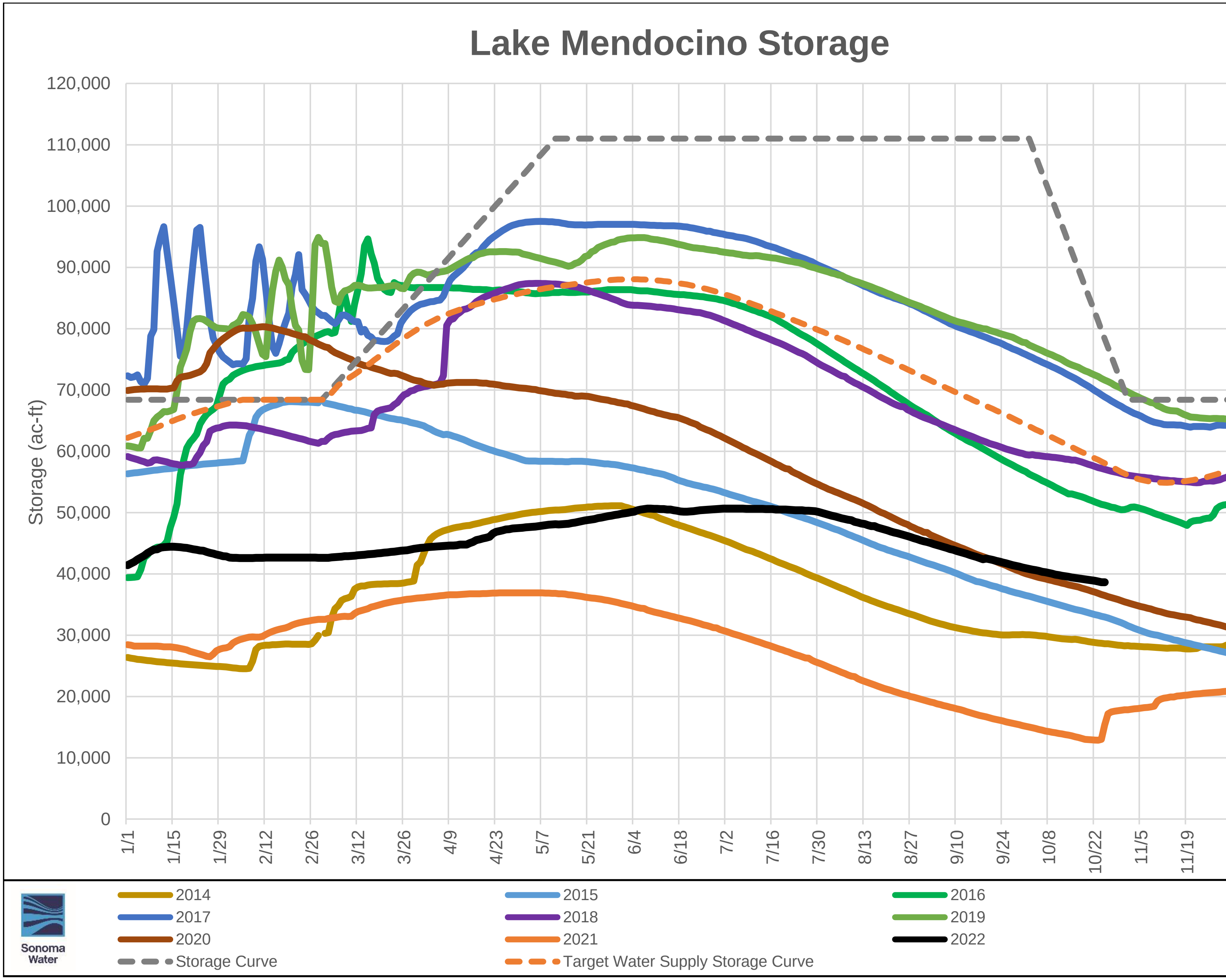


Sonoma Water

Russian River Basin
Streamflow Requirements

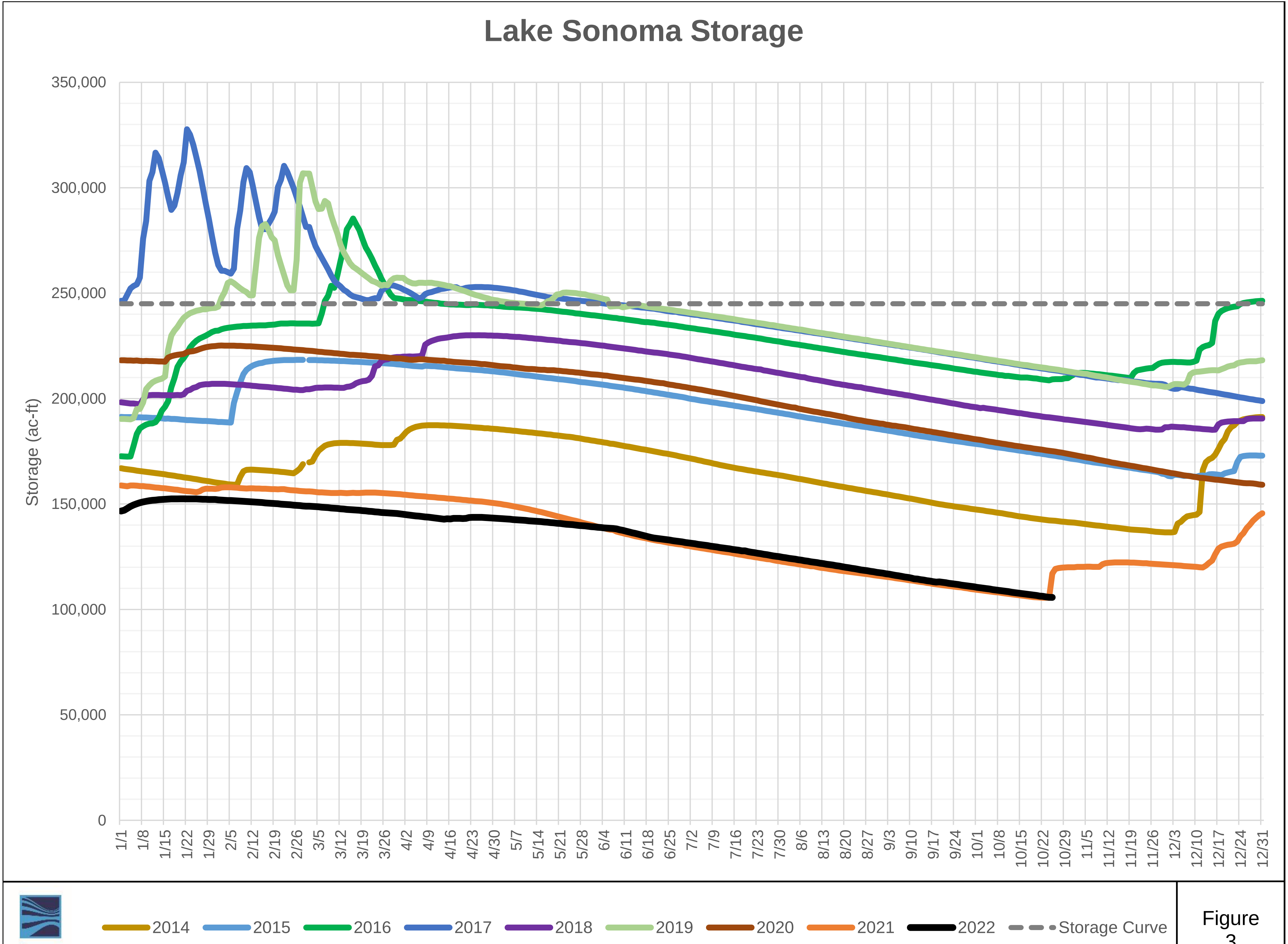
Per State Water Resources Control Board Decision 1610, April 1986

Figure 1



Lake Mendocino Storage
Storage (ac-ft)
120,000
110,000
100,000
90,000
80,000
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1/1
1/15
1/29
2/12
2/26
3/12
3/26
4/9
4/23
5/7
5/21
6/4
6/18
7/2
7/16
7/30
8/13
8/27
9/10
9/24
10/8
10/22
11/5
11/19
12/3
12/17
12/31
2014
2015
2016
2017
2018
2019
2020
2021
2022
Storage Curve
Target Water Supply Storage Curve
Sonoma Water

Figure 2



Sonoma Water

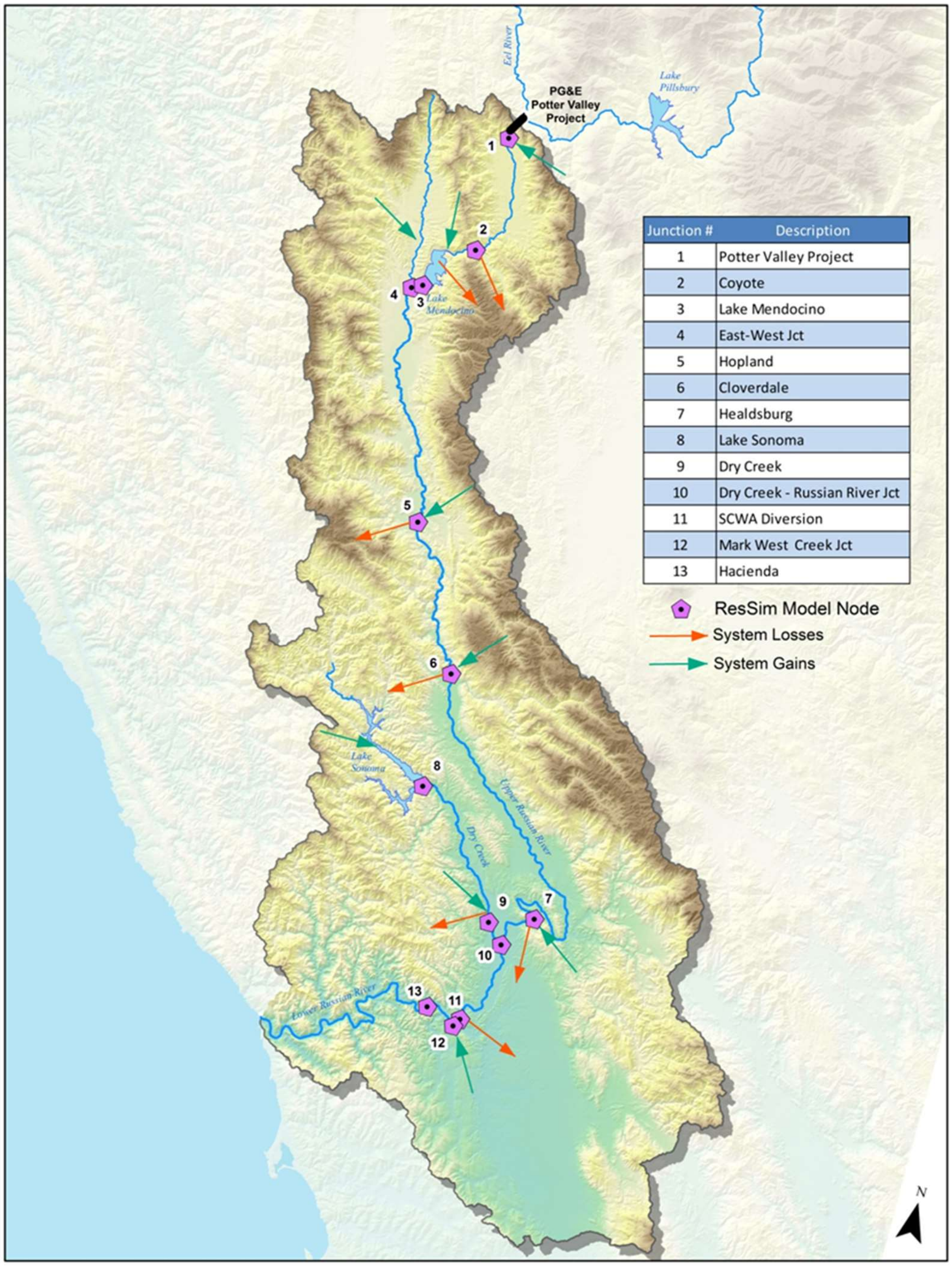
Figure 3

Lake Mendocino Storage Thresholds

The Lake Mendocino storage thresholds were developed using Sonoma Water's Russian River System Model (RR ResSim). This model was developed using the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center (HEC) ResSim code and is used as a planning tool by Sonoma Water to simulate the effects of various climatic conditions, levels of demand and operational criteria on the water supply available to meet minimum instream flow requirements and demands by downstream users. RR ResSim calculates what releases must be made from Lake Mendocino and Lake Sonoma, taking into account USACE flood control operations criteria, minimum instream flow requirements and/or proposed alternatives to system operations.

The model incorporates 107 water years of hydrologic data (Water Years 1910 - 2017), represented as daily unimpaired tributary flows into the Russian River and Dry Creek. Unimpaired flows are the "natural" flows, unaffected by man-made influences, such as water demands, or reservoir operations. These unimpaired flows, which form the basis of the hydrology in the model, were synthetically derived by the U.S. Geological Survey using their Basin Characterization Model (BCM) using historical weather, climate and hydrologic data.

The RR ResSim model divides the Russian River and Dry Creek into 13 primary model junctions as presented in Figure 1. Model junctions correspond with important system features such as transfers from PVP, reservoir releases, major system tributaries and existing stream gage locations. Model reaches are defined as the length of river between each model junction. Gains associated with unimpaired flows and losses associated with municipal and industrial (M&I) diversions and/or other distributed demands are accounted for within each reach.



Junction #	Description
1	Potter Valley Project
2	Coyote
3	Lake Mendocino
4	East-West Jct
5	Hopland
6	Cloverdale
7	Healdsburg
8	Lake Sonoma
9	Dry Creek
10	Dry Creek - Russian River Jct
11	SCWA Diversion
12	Mark West Creek Jct
13	Hacienda

Figure 1: Russian River ResSim Model Schematic

The RR ResSim accounts for losses in the Russian River system that include Sonoma Water's diversions, as well as all other depletions from the watershed including: evapotranspiration by riparian vegetation, aquifer recharge, agricultural diversions and other M&I diversions. The model aggregates system losses by reach between each junction. Sonoma Water's model demands were estimated based on historical river diversions from 2005 to 2012, with an annual diversion of approximately 58,000 acre-feet per year. System losses not associated with the Sonoma Water's diversions were estimated through an analysis of historical M&I data, flow gage data, unimpaired flow data and climate data from 2002 to 2013. Because the model calculates the reservoir releases necessary to meet minimum instream flow requirements, all water uses in the watershed are satisfied by simulated reservoir releases.

PVP diversions were simulated using the PVP ResSim model. The PVP ResSim model was developed by the Water Supply Working Group as part of Congressman Jared Huffman's PVP Ad Hoc group to develop operational alternatives to PVP that met the Ad Hoc's Two Basin objectives. The model encompasses the Lake Pillsbury watershed down to the outlet of Cape Horn Dam (Van Arsdale Reservoir) along the Eel River (Figure 2). The model simulates operations of Scott Dam and Cape Horn Dam, as well as the hydroelectric diversion given a set of physical and operational constraints. Just like the RR ResSim model, it incorporates daily hydrology from 1910 – 2017. The input hydrology was developed by Western Hydrologics using observed gage records at the reservoir outlets and the change in storage of the reservoirs.

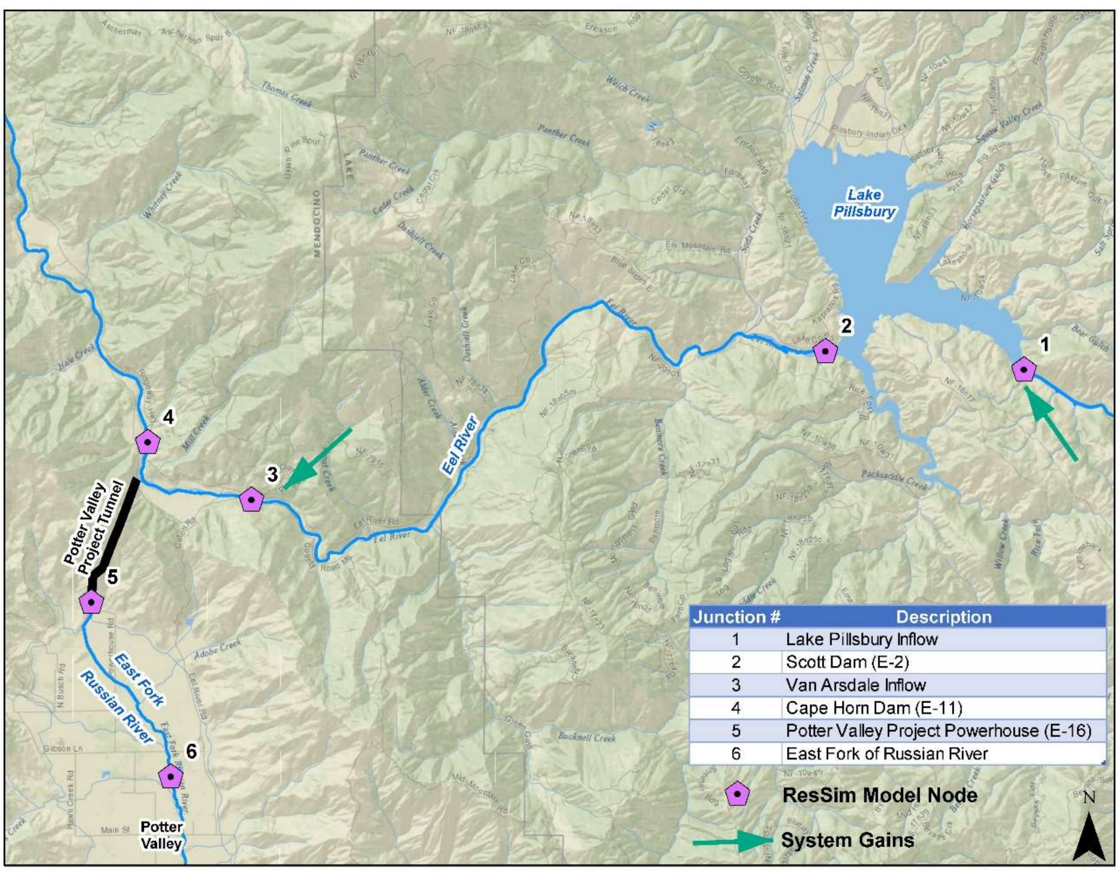


Figure 2: Potter Valley Project ResSim Model Schematic

Simulation of PVP operations included modified operations of the project due to out of service transformer banks. The modified operation removes discretionary PVP transfers used for increased power production while Lake Pillsbury storage is high during late fall through early spring, which can reduce peak wet season PVP transfers by as much as 195 cfs.

Based on a historical analysis of cumulative inflow into Lake Pillsbury from 1910 through 2017, the average occurrence frequency of *Normal* water supply conditions is 86%, of *Dry* water supply conditions is 11% and of *Critical* water supply conditions is 4%. Sonoma Water used full period of record simulations (1910 – 2017) with the RR ResSim model to develop storage thresholds for Lake Mendocino to set the water supply condition and associated minimum instream flow requirements for the Russian River that are proposed for use from January through June 2023. These storage thresholds were designed to approximate the statistical occurrence of *Normal*, *Dry* and *Critical* water supply conditions defined in Decision 1610 from January to June. The percent occurrence of *Normal*, *Dry* and *Critical* water defined by Decision 1610 and the requested storage thresholds are shown in Table 1 below.

	D1610 LP[1] Cumulative Inflow			LM[2] Storage Thresholds		
Date	**Normal**	**Dry**	**Critical**	**Normal**	**Dry**	**Critical**
1-Jan	86.9	9.3	3.7	82.2	11.3	6.5
1-Feb	78.4	13.1	8.4	79.4	15.0	5.6
1-Mar	86.0	9.3	4.7	84.3	10.6	5.1
1-Apr	86.9	10.3	2.8	84.6	11.7	3.7
1-May	86.9	11.2	1.9	84.5	13.2	2.3
1-Jun	87.9	10.3	1.9	85.0	13.1	1.9
Average	**85.5**	**10.6**	**3.9**	**84.2**	**12.8**	**3.0**

Table 1: Percent Occurrence of Water Supply Conditions by Month for D1610 and the Proposed Lake Mendocino Storage Index
[1] Lake Pillsbury [2] Lake Mendocino

These storage thresholds were updated from the November 2021 Temporary Urgency Change Petitions to incorporate operational settings of the Russian River that are reflective of current conditions. These updates include: (1) flood operations at Lake Mendocino in accordance with the *Planned Major Deviation (Deviation) of the Coyote Valley Dam/Lake Mendocino Water Control Manual* approved by USACE in February 2021; and (2) PVP modified operations as described above. The Major Deviation allows the USACE to consider meteorological and hydrological forecasts when determining Lake Mendocino flood releases when storage is below 80,050 ac-ft. This could lead to an increase in diversions to storage as high as 11,650 ac-ft. Combined, these modified operations affect the water balance at Lake Mendocino and necessitated changes to the previous storage thresholds.

Sonoma Water proposes that the monthly storage values listed below be used, in lieu of cumulative Lake Pillsbury inflow, to determine the water supply condition that sets which minimum instream flow requirements in Term 20 of Permit 12947A, Term 17 of Permit 12949, Term 17 of Permit 12950, and Term 13 of Permit 16596 will apply in the Russian River:

a. Dry water supply conditions will exist when storage in Lake Mendocino is less than:

   45,000 acre-feet as of January 1
   60,000 acre-feet as of February 1
   71,000 acre-feet as of March 1
   75,000 acre-feet as of March 16
   77,000 acre-feet as of April 1
   76,500 acre-feet as of April 16
   76,000 acre-feet as of May 1
   75,500 acre-feet as of May 16
   75,000 acre-feet as of June 1

b. Critical water supply conditions exist when storage in Lake Mendocino is less than:

   31,000 acre-feet as of January 1
   41,000 acre-feet as of February 1
   53,500 acre-feet as of March 1
   56,000 acre-feet as of March 16
   56,500 acre-feet as of April 1
   56,000 acre-feet as of April 16
   55,000 acre-feet as of May 1

54,000 acre-feet as of May 16
53,500 acre-feet as of June 1

c. Normal water supply conditions exist in the absence of defined Dry or Critical water supply conditions.

Appendix A-10

STATE OF CALIFORNIA
CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY
STATE WATER RESOURCES CONTROL BOARD

DIVISION OF WATER RIGHTS

In the Matter of Permits 12947A, 12949, 12950, and 16596
(Applications 12919A, 15736, 15737, 19351)

Sonoma County Water Agency

ORDER APPROVING TEMPORARY URGENCY CHANGE

SOURCE: Dry Creek, Russian River, and East Fork Russian River

COUNTIES: Sonoma and Mendocino Counties

BY THE DEPUTY DIRECTOR FOR WATER RIGHTS:

1.0 SUBSTANCE OF TEMPORARY URGENCY CHANGE PETITION

On October 31, 2022, Sonoma County Water Agency (Sonoma Water) filed Temporary Urgency Change Petitions (TUCPs) with the State Water Resources Control Board (State Water Board), Division of Water Rights (Division) requesting approval of changes to the subject permits pursuant to California Water Code section 1435. The TUCPs request implementation of an alternative hydrologic index based on Lake Mendocino storage values starting December 14, 2022 (proposed hydrologic index). The proposed hydrologic index is requested in lieu of the hydrologic index contained in the subject permits that is based on cumulative Lake Pillsbury inflow (current hydrologic index). The hydrologic index is used to determine the applicable minimum instream flow requirements in Term 20 of Permit 12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596. Sonoma Water's proposed hydrologic index, for up to 180 days beginning December 14, 2022, is as follows:

a. Dry water supply conditions will exist when storage in Lake Mendocino is less than:

45,000 acre-feet as of January 1
60,000 acre-feet as of February 1
71,000 acre-feet as of March 1
75,000 acre-feet as of March 16

77,000 acre-feet as of April 1
76,500 acre-feet as of April 16
76,000 acre-feet as of May 1
75,500 acre-feet as of May 16
75,000 acre-feet as of June 1

b. Critical water supply conditions exist when storage in Lake Mendocino is less than:

31,000 acre-feet as of January 1
41,000 acre-feet as of February 1
53,500 acre-feet as of March 1
56,000 acre-feet as of March 16
56,500 acre-feet as of April 1
56,000 acre-feet as of April 16
55,000 acre-feet as of May 1
54,000 acre-feet as of May 16
53,500 acre-feet as of June 1

c. Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

This temporary change is requested in response to the current extremely dry conditions, severely low storage levels in Lake Mendocino and Lake Sonoma, and the current hydrologic index not aligning with observed hydrologic conditions in the Russian River Watershed. The proposed change is also requested in response to the reported failure of the transformer bank of the Potter Valley Project (PVP) hydroelectric plant in October 2021 that will likely continue to result in a significant reduction in the inter-basin transfers of Eel River water into the Russian River Watershed.

2.0 BACKGROUND

Sonoma Water controls and coordinates water supply releases from Lake Mendocino and Lake Sonoma to implement the minimum instream flow requirements in accordance with its water rights, including permit terms implemented pursuant to Decision 1610, which the State Water Board adopted on April 17, 1986. Decision 1610 specifies minimum instream flow requirements for the Upper Russian River[1], Dry Creek, and the Lower Russian River[2]. These minimum instream flow requirements vary based on water supply conditions specified in Decision 1610 and are contained in Term 20 of Permit

[1] For purposes of this Order, Upper Russian River refers to the mainstem Russian River from its confluence with the East Fork Russian River to its confluence with Dry Creek.
[2] For purposes of this Order, the Lower Russian River refers to the mainstem Russian River from its confluence with Dry Creek to the Pacific Ocean.

12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596. Sonoma Water's operations are also subject to the National Marine Fisheries Service (NMFS) Russian River Biological Opinion issued in 2008.

2.1 Sonoma Water's Water Right Permits

The TUCPs involve the following water right permits held by Sonoma Water:

- Permit 12947A (Application 12919A), which authorizes direct diversion of 92 cubic feet per second (cfs) from the East Fork Russian River and storage of 122,500 acre-feet (AF or af) per year in Lake Mendocino from January 1 through December 31 of each year;
- Permit 12949 (Application 15736), which authorizes direct diversion of 20 cfs from the Russian River from January 1 through December 31 of each year;
- Permit 12950 (Application 15737), which authorizes direct diversion of 60 cfs from the Russian River from April 1 through September 30 of each year; and
- Permit 16596 (Application 19351), which authorizes direct diversion of 180 cfs from the Russian River from January 1 to December 31 of each year and storage of 245,000 AF in Lake Sonoma from October 1 of each year to May 1 of the succeeding year.

Term 20 of Sonoma Water's Permit 12947A states the following:

For the protection of fish and wildlife, and for the maintenance of recreation in the Russian River, permittee shall pass through or release from storage at Lake Mendocino sufficient water to maintain:

A. A continuous streamflow in the [East Fork Russian River] from Coyote Dam to its confluence with the Russian River of 25 cfs at all times.

B. The following minimum flows in the Russian River between the [East Fork Russian River] and Dry Creek:

1. During normal water supply conditions when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year exceeds 150,000 af or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:

From June 1 through August 31	*185 cfs*
From September 1 through March 31	*150 cfs*
From April 1 through May 31	*185 cfs*

2. *During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is between 150,000 af or 90 percent of the estimated water supply storage capacity of the reservoirs, whichever is less, and 130,000 af or 80 percent of the estimated water supply storage capacity of the reservoirs, whichever is less:*

From June 1 through March 31	*150 cfs*
From April 1 through May 31	*185 cfs*
If from October 1 through December 31, storage in Lake Mendocino is less than 30,000 acre-feet	*75 cfs*

3. *During normal water supply conditions and when the combined water in storage, including dead storage, in Lake Pillsbury and Lake Mendocino on May 31 of any year is less than 130,000 af or 80 percent of the estimated water supply storage capacity of [the] reservoirs, whichever is less:*

From June 1 through December 31	*75 cfs*
From January 1 through March 31	*150 cfs*
From April 1 through May 31	*185 cfs*

4. *During dry water supply conditions* — *75 cfs*

5. *During critical water supply conditions* — *25 cfs*

C. *The following minimum flows in the Russian River between its confluence with Dry Creek and the Pacific Ocean to the extent that such flows cannot be met by releases from storage at Lake Sonoma under Permit 16596 issued on Application 19351:*

1. *During normal water supply conditions* — *125 cfs*

2. *During dry water supply conditions* — *85 cfs*

3. *During critical water supply conditions* — *35 cfs*

Term 13 of Permit 16596 states the following:

For the protection of fish and wildlife in Dry Creek and the Russian River and for the maintenance of recreation in the Russian River, permittee shall pass through or release from storage at Lake Sonoma sufficient water to maintain:

A) The following minimum flows in Dry Creek between Warm Springs Dam and its confluence with the Russian River:

1) During normal water supply conditions:

75 cfs from January 1 through April 30
80 cfs from May 1 through October 31
105 cfs from November 1 through December 30

2) During dry or critical water supply conditions:

25 cfs from April 1 through October 31
75 cfs from November 1 through March 31

B) The following minimum flows in the Russian River between its confluence with Dry Creek and the Pacific Ocean, unless the water level in Lake Sonoma is below elevation 292.0 feet with reference to the National Geodetic Vertical Datum of 1929, or unless prohibited by the United States Government:

1) During normal water supply conditions - 125 cfs

2) During dry water supply conditions - 85 cfs

3) During critical water supply conditions - 35 [cfs]

Term 17 of Permit 12949 and Term 17 of Permit 12950 both state the following:

For the protection of fish and wildlife, and the maintenance of recreation in the Russian River, permittee shall allow sufficient water to bypass the points of diversion to maintain the following minimum flows to the Pacific Ocean:

(1) During normal water supply conditions: 125 cfs. . .

(2) During dry water supply conditions: 85 cfs

(3) During critical water supply conditions: 35 cfs

Water supply conditions established for the above flow requirements as required in Decision 1610 are defined in Term 20 of Permit 12947A, Term 17 of Permits 12949 and 12950, and Term 13 of Permit 16596 as follows:

1. Dry water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:

8,000 acre-feet as of January 1

39,200 acre-feet as of February 1
65,700 acre-feet as of March 1
114,500 acre-feet as of April 1
145,600 acre-feet as of May 1
160,000 acre-feet as of June 1

2. *Critical water supply conditions exist when cumulative inflow to Lake Pillsbury beginning on October 1 of each year is less than:*

4,000 acre-feet as of January 1
20,000 acre-feet as of February 1
45,000 acre-feet as of March 1
50,000 acre-feet as of April 1
70,000 acre-feet as of May 1
75,000 acre-feet as of June 1

3. *Normal water supply conditions exist in the absence of defined dry or critical water supply conditions. . .*

4. *The water supply condition designation for the months of July through December [shall] be the same as the designation for the previous June. Water supply conditions for January through June [shall] be redetermined monthly.*

5. *Cumulative inflow to Lake Pillsbury is the calculated algebraic sum of releases from Lake Pillsbury, increases in storage in Lake Pillsbury, and evaporation from Lake Pillsbury.*

Term 20 of Permit 12947A includes an additional provision:

6. *Estimated water supply storage space is the calculated reservoir volume below elevation 1,828.3 feet . . . in Lake Pillsbury and below elevation 749.0 [feet] in Lake Mendocino. Both elevations refer to the National Geodetic Vertical Datum . . . of 1929. The calculation shall use the most recent two reservoir volume surveys made by the U.S. Geological Survey (USGS), U.S. Army Corps of Engineers, or other responsible agency to determine the rate of sedimentation to be assumed from the date of the most recent reservoir volume survey.*

2.2 Current Drought Conditions and Response

The Russian River Watershed has experienced extremely dry conditions since 2020, with Water Year 2021 being the second driest year in the Ukiah Valley, and Water Year 2020 being the fourth driest, during the period of record. Lake Mendocino and Lake Sonoma are at or near their lowest levels since they began storing water in 1959 and 1984, respectively. As of November 24, 2022, the water supply storage level was 37,067 AF in Lake Mendocino, the twelfth lowest storage level for this time of the year since Lake Mendocino was filled in 1959. Similarly, the water supply storage level was 98,764 AF in Lake Sonoma on November 24, 2022, which is the lowest storage level for this time of the year since Lake Sonoma was filled in 1986.

In addition to the extremely dry conditions in the past two years, the Russian River Watershed is expecting significantly less transfer water from the Eel River due to the PVP powerhouse failure. On October 7, 2021, Pacific Gas & Electric (PG&E) informed Sonoma Water that the transformer bank at the PVP powerhouse had failed and would need to be replaced to operate the powerhouse for power generation. Currently, the PVP is operating under a Federal Energy Regulatory Commission (FERC) order that approved a temporary variance on the license flow requirements on July 27, 2022. The order effectively reduced the minimum instream releases into the East Fork of the Russian River from 75 cfs to 5 cfs. PG&E's current transfer obligation under the FERC variance and a water supply contract with the Potter Valley Irrigation District (PVID) from now until April 14, 2023, is 10 cfs. The variance is expected to be terminated after Lake Pillsbury storage reaches 36,000 acre-feet. Upon termination, PG&E's transfer obligations will total 45 cfs until April 14, 2023. On April 15, 2023, the transfer requirement to the East Fork of the Russian River will be reassessed under the FERC license based on water supply conditions. PG&E has indicated that without the ability to generate hydropower, PG&E will not likely make discretionary transfers through the PVP above its FERC license and contract obligations. Ordinarily, discretionary transfers to generate hydropower can occur up until early April if hydrologic conditions on the Eel River and at Lake Pillsbury are met. Without the discretionary transfer of Eel River water to generate hydropower, the total transfer through the PVP will be reduced by up to 456 acre-feet per day.

The risks of low storage are of particular concern should drought conditions persist into 2023; if the winter of 2022 and early 2023 is similar to last winter, there is significant risk to the quality and availability of stored water for meeting human health and safety and listed and threatened species needs in the summer of 2023. Sonoma Water states that under the current operating conditions of the PVP, the influence of the Eel River water imports on Lake Mendocino water storage and downstream hydrologic conditions in the Russian River will be greatly diminished. Therefore, there will be little to no correlation between cumulative inflow into Lake Pillsbury and the hydrologic conditions in the Russian River Watershed. The TUCPs request that storage thresholds in Lake Mendocino be used directly as the hydrologic index to determine the water supply condition in the Russian River Watershed.

California is experiencing severe to exceptional drought conditions across the state. Water Year 2020-2021 was a second consecutive dry year with record-breaking high temperatures. In response, Governor Gavin Newsom proclaimed a regional drought emergency on April 21, 2021, for the Russian River Watershed in Mendocino and Sonoma counties. The Governor has continued the drought emergency proclamation for Sonoma and Mendocino counties through further drought proclamations on May 10, July 8, and October 19, 2021. A March 28, 2022 executive order signed by Governor Newsom reiterated past drought proclamations and directed further drought response actions.

On April 20, 2021, Mendocino County declared a local emergency and imminent threat of disaster in Mendocino County due to drought conditions. On April 27, 2021, Sonoma County also adopted a resolution proclaiming a local drought emergency due to drought conditions in Sonoma County. On June 15, 2021, the State Water Board adopted an emergency regulation for the Curtailment of Diversions to Protect Water Supplies and Threatened and Endangered Fish in the Russian River Watershed (Cal. Code Regs., tit. 23, §§ 877-879.2). Consequently, on August 2, 2021, the State Water Board issued curtailment orders to Upper Russian River Watershed diverters. On August 10, 2021, the State Water Board issued curtailment orders to Lower Russian River Watershed diverters. Since then, the curtailment status of diverters' water rights and claims have been updated periodically based on changing hydrologic conditions. Currently, there are no curtailments or riparian shortages through December 31, 2022 due to forecasted precipitation in the watershed. Curtailments may resume in January 2023 unless additional precipitation beyond what is currently forecasted occurs.

Sonoma Water has filed five previous sets of TUCPs beginning in June 2020 to address the current drought. On July 28, 2020, the State Water Board approved Sonoma Water's TUCPs to temporarily reduce the minimum instream flow requirements in the Russian River. After the 2020 TUCP order expired on December 27, 2020, Sonoma Water filed another TUCP for Permit 12947A in January 2021 to request an alternative hydrologic index be used for the Upper Russian River. The State Water Board issued an order approving the TUCP on February 4, 2021, and approved clarifying amendments to the order on February 11, 2021. Sonoma Water filed the third set of TUCPs in May 2021 to address the critical drought conditions in the whole Russian River Watershed. The TUCPs were approved on June 14, 2021, and amended on October 22, 2021. A November 2021 TUCP request, approved on December 10, 2021, temporarily changed the hydrologic index. A May 26, 2022 TUCP request, approved on June 17, 2022, and later amended on October 11, 2022, approved a temporary change in minimum instream flows.

Decision 1610 established the current hydrologic index, in which water supply conditions are classified as "*Normal*," "*Dry*," or "*Critical*" based on cumulative inflow into Lake Pillsbury (in the adjacent Eel River Watershed) beginning October 1 of each year. The cumulative inflow into Lake Pillsbury through from October 2021 through June 1, 2022 was 228,109 AF, with the combined storage in Lake Mendocino and Lake Pillsbury being 106,803 acre-feet. Consequently, the water supply conditions from June 1, 2022 through remainder of the year is *Normal Dry Spring II.* Sonoma Water is currently managing the Russian River instream flows based on a *Critical* water supply condition as authorized by the June 2022 TUCP order. The State Water Board's June 2022 TUCP order expires after December 13, 2022, at which point, under the current hydrologic index, the water supply condition would change back to *Normal Dry Spring II* for the remainder of the calendar year. The corresponding minimum instream flow requirements would become 75 cfs in Dry Creek and the Upper Russian River and 125 cfs in the Lower Russian River.

Pursuant to the current hydrologic index under Decision 1610, the water supply condition would be categorized as *Normal* for at least from January 1 through February 1, 2023 due to a cumulative inflow of 11,186 AF into Lake Pillsbury as of December 13, 2022. The corresponding minimum instream flow requirements would become 150 cfs on the Upper Russian River, 75 cfs on Dry Creek and 125 cfs on the Lower Russian River. Without an additional temporary urgency change order approving the requested changes, Sonoma Water would be required to potentially increase releases from Lake Mendocino and Lake Sonoma, despite their current low storage levels.

The water supply conditions designated by the current hydrologic index were premised on the PVP’s substantial transfers of water from the Eel River to the East Fork Russian River (see, e.g., Decision 1610, p. 5) and do not accurately reflect the present severe drought conditions in the Upper Russian River despite Lake Pillsbury cumulative inflows. Sonoma Water’s proposed temporary urgency change would use Lake Mendocino storage, rather than cumulative inflow into Lake Pillsbury, as the basis for defining the applicable hydrologic condition. This proposed temporary urgency change would implement minimum instream flow requirements under Decision 1610 that would adjust to changes in the Upper Russian River Watershed hydrologic conditions. Streamflow requirements would increase if additional seasonal rainfall results in Lake Mendocino storage increasing or remaining above the volumes specified in the proposed hydrologic index.

3.0 COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT

Ordinarily, the State Water Board must comply with applicable requirements of the California Environmental Quality Act (Pub. Resources Code, § 21000 et seq.) (CEQA) prior to issuance of any order approving a TUCP. (Cal. Code Regs., tit. 23, § 805.) However, the Governor’s April 21, 2021 Drought Emergency Proclamation, ordering paragraph 7, suspended CEQA and regulations adopted pursuant to CEQA in Mendocino and Sonoma Counties to the extent necessary for the State Water Board to address drought-related impacts through “[m]odifying requirements for reservoir releases or diversion limitations” in the Russian River Watershed “to ensure adequate, minimal water supplies for critical purposes.” Sonoma Water’s requests to temporarily modify the hydrologic index in its water rights permits—and thereby temporarily modify reservoir release and instream flow requirements in the Russian River—due to historically dry conditions qualify for this suspension under the Governor’s April 21, 2021 Drought Emergency Proclamation. In conjunction with approving this

Order, the State Water Board will add the activities approved under this Order to its list of suspended projects on its website.

In addition to the Governor's suspension of CEQA covering the activities proposed and approved under this Order, Sonoma Water determined that the requested water right changes are categorically exempt under CEQA's emergency statutory exemption and Class 7 and 8 categorical exemptions. Sonoma Water filed a Notice of Exemption on October 27, 2022. The State Water Board has reviewed the information submitted by Sonoma Water and has made its own independent finding that the requested changes are statutorily and categorically exempt from CEQA. The changes sought by the TUCPs are consistent with the following statutory and categorical CEQA exemptions for the following reasons:

1) As mentioned above, on April 21, 2021, the Governor proclaimed a drought emergency in Mendocino and Sonoma counties due to drought conditions in the Russian River Watershed. The Governor's Drought Emergency Proclamation ordered the State Water Board to consider specific actions to "ensure adequate, minimal water supplies for critical purposes." Information provided by Sonoma Water demonstrates that continued releases of water to maintain minimum instream flows required by Sonoma Water's current water right permit terms could contribute to storage levels in Lake Mendocino and Lake Sonoma declining to unsafe levels. As discussed in this Order, if storage in Lake Mendocino and Lake Sonoma are depleted, there will be serious water supply impacts to human health and safety, and water will not be available to protect aquatic life, including threatened and endangered species in the Russian River. Approval of the TUCPs is therefore necessary to prevent and mitigate loss of, or damage to, the environment, fishery resources, property, public health and safety, and essential public services. Accordingly, the project is statutorily exempt from CEQA because it is necessary to prevent or mitigate an emergency—in this case, a proclaimed drought emergency—that poses a clear and imminent danger. (Pub. Resources Code, §§ 21060.3 & 21080, subd. (b)(4); Cal. Code Regs., tit. 14, § 15269, subd. (c).)

2) A Class 7 categorical exemption "consists of actions taken by regulatory agencies as authorized by state law or local ordinance to assure the maintenance, restoration, or enhancement of a natural resource where the regulatory process involves procedures for protection of the environment." (Cal. Code Regs., tit. 14, § 15307.) The proposed action is necessary for maintenance of viable operations to support municipal use and protect listed salmonid species in the Russian River by preventing Lake Mendocino from declining to a storage level at which the reservoir may no longer be operational in light of the extremely dry condition the region has been experiencing. Accordingly, these changes are categorically exempt from CEQA pursuant to a Class 7 exemption.

3) A Class 8 categorical exemption “consists of actions taken by regulatory agencies, as authorized by state or local ordinance, to assure the maintenance, restoration, enhancement, or protection of the environment where the regulatory process involves procedures for protection of the environment.” (*Id*., § 15308.) The proposed action will assure the maintenance of the environment (i.e., the instream environment of the Russian River) in the same way as stated for the Class 7 categorical exemption, and the proposed temporary changes are also therefore categorically exempt under Class 8.

4.0 PROCEDURAL REQUIREMENTS CONCERNING THE TEMPORARY URGENCY CHANGE PETITION

On November 10, 2022, the State Water Board issued and delivered to Sonoma Water a notice of the temporary urgency change order pursuant to Water Code section 1438, subdivision (a). Pursuant to Water Code section 1438, subdivision (b)(1), Sonoma Water is required to publish the notice in a newspaper having a general circulation, and that is published within the counties where the points of diversion lie within 20 days from the date of issuance of the notice by the State Water Board. Sonoma Water published the notice in *Ukiah Daily Journal* and *The Press Democrat* on November 23, 2022, and November 20, 2022, respectively. In addition, the State Water Board posted the notice of the temporary urgency change order on its website and distributed the notice through its electronic notification system.

Any interested person may file an objection to a temporary urgency change. (*Id.*, subd. (d).) The State Water Board must promptly consider the objection and may hold a hearing on any objection. *(Id.*, subd. (e).) The State Water Board exercises continuing supervision over temporary urgency change orders and may modify or revoke temporary urgency change orders at any time. (Wat. Code, §§ 1439, 1440.) Temporary urgency change orders automatically expire 180 days after issuance, unless they are revoked, an earlier expiration date is specified, or they are renewed. (*Id*., §§ 1440, 1441.)

Objections to Sonoma Water’s TUCPs were due by November 28, 2022. The State Water Board received three letters in support of the TUCPs from 1) Mendocino County Russian River Flood Control and Water Conservation Improvement District (Mendocino County RRFC), 2) NMFS, and 3) the California Department of Fish and Wildlife (CDFW).

NMFS and CDFW urged the State Water Board to conditionally approve Sonoma Water’s TUCPs as early as possible to preserve water stored in Lake Mendocino and Lake Sonoma to meet the needs of federal and state listed salmonids in the Russian River. NMFS and CDFW also proposed terms and conditions when water supply conditions are classified as *Dry* or *Critical* that would require Sonoma Water to: 1) conduct continuous water quality and fisheries monitoring in the Russian River;

2) adhere to ramping requirements for reservoir release rates; 3) conduct ongoing consultation with NMFS, CDFW, and the North Coast Water Board; and 4) conduct ongoing reporting of monitoring measurements to assist NMFS, CDFW, the North Coast Water Board, and the State Water Board in overseeing the effects of the TUCPs on conditions in the Russian River and determining if additional actions are required. The State Water Board has considered and incorporated the terms and conditions from the support letters of NMFS and CDFW into Conditions 2-6 of this Order.

The State Water Board received two comments on Sonoma Water's TUCPs from Mr. Richard Morat and Russian River Keeper (RRK).

Mr. Morat states that reservoirs are operated at too low of storage levels and dry conditions exhaust remaining storage at the expense of aquatic habitat. Mr. Morat asserts that PG&E should be more willing to provide discretionary flows into the Russian River to alleviate the need to reduce flows and impact instream uses.

RRK stated that it supports "the need for temporary modification of flows within the Russian River so that water storage supplies are protected." RRK recommended the State Water Board take additional actions to manage water diversion and use within the Russian River Watershed, including the recommendation for stricter (25-40 percent) water use reductions and increased enforcement of required water reductions and curtailments. RRK also recommended various measures for intra-watershed management such as the requirement for water users to report daily projections of water use to aid in real-time flow management, as well as use of the Voluntary Sharing Agreement to more accurately determine end-of-season values.

RRK also expressed support for long-term changes to the hydrologic index in Decision 1610 to more accurately reflect hydrologic conditions in the Russian River watershed. RRK requested that the State Water Board add requirements to ensure Sonoma Water continues to diligently pursue its obligations under its pending change petition to modify the hydrologic index and minimum instream flows under its Russian River water rights. RRK requested further that the 5-day running average flow requirement used in the minimum instream flow permit terms be modified to allow no less than 5 cfs below the required minimum flow.

5.0 CRITERIA FOR APPROVING THE PROPOSED TEMPORARY URGENCY CHANGE

Water Code section 1435 provides that a right holder who has an urgent need to change the point of diversion, place of use, or purpose of use from that specified in the water right may petition for a conditional temporary change order. The State Water Board's regulations set forth the filing and other procedural requirements applicable to TUCPs. (Cal. Code Regs., tit. 23, §§ 805, 806.) The State Water Board's regulations also clarify that requests for changes to permits or licenses other than changes in point of diversion, place of use, or purpose of use may be filed, subject to the same filing and procedural requirements that apply to changes in point of diversion, place of use, or purpose of use. (*Id*., § 791, subd. (e).)

Before approving a TUCP, the State Water Board must make the following findings: (1) the right holder has an urgent need to make the proposed change; (2) the proposed change may be made without injury to any other lawful user of water; (3) the proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses; and (4) the proposed change is in the public interest. (Wat. Code, § 1435, subd. (b)(1-4).)

A temporary change order does not result in the creation of a vested right, even of a temporary nature, but shall be subject at all times to modification or revocation in the discretion of the State Water Board. (Wat. Code, § 1440.)

5.1 Urgency of the Proposed Change

Under Water Code section 1435, subdivision (c), an "urgent need" means "the existence of circumstances from which the [State Water Board] may in its judgment conclude that the proposed temporary change is necessary to further the constitutional policy that the water resources of the state be put to beneficial use to the fullest extent of which they are capable and that waste of water be prevented........ "

In this case, an urgent need exists for the proposed change in the hydrologic index for determining minimum instream flow requirements in the Russian River. The hydrologic index in Decision 1610 is based on cumulative inflow to Lake Pillsbury, however given the reduction in water transfers from the Eel River system, there will be little to no correlation between cumulative inflow into Lake Pillsbury and the hydrologic conditions in the Russian River watershed. As described in the TUCPs, cumulative inflow into Lake Pillsbury does not reflect hydrologic or water supply conditions in the Russian River Watershed; storage levels in Lake Mendocino and Lake Sonoma are currently at or near the lowest levels for this time of the year since they were filled, but the current hydrologic index per Decision 1610 indicates conditions are *Normal Dry Spring II* for the remainder of this year and *Normal* starting in January 2023. Furthermore, the Russian River Watershed is experiencing significant reductions of Eel River transfers through the PVP due to inoperability of the powerhouse for the foreseeable future. The current hydrologic index under Decision 1610, which is based on cumulative inflow into Lake Pillsbury, is not applicable to water supply conditions in the Russian River due to the changes in PVP operations. Pursuant to the State Water Board's June 17, 2022 approval of a TUCP, the instream flow requirements for the Upper Russian River were temporarily reduced to 25 cfs, consistent with Decision 1610 requirements for *Critical* water supply conditions. That temporary urgency change expires after December 13, 2022. With this Order, the year type for the remainder of 2022 would remain *Critical* based on the modified hydrologic index and would be reassessed on January 1, 2023.

Without the proposed change, Decision 1610's applicable minimum instream flow requirements may require releases of water from Lake Mendocino and Lake Sonoma at levels that would contribute to significant depletions of reservoir storage and potential elimination of water supplies for water users in Mendocino, Sonoma, and Marin Counties if the current drought continues into 2023. Such depletion or possible elimination of stored water supplies would risk serious impacts to human health and safety and fishery protection. Extremely low storage levels may result in loss of the cold-water pool in Lake Mendocino that is needed to support listed Russian River salmonid fishery species in the fall, and may cause increased total dissolved solid or mercury concentrations if lake-bottom sediments become displaced due to reservoir operation at low storage levels.

Water Code section 1435, subdivision (c) also states that the State Water Board shall not find a petitioner's need to be urgent if it concludes that the petitioner has not exercised due diligence either in petitioning for a change pursuant to provisions other than a TUCP or in pursuing that petition for change. As noted in the State Water Board's February 2021 order approving Sonoma Water's TUCP for Permit 12947A, a number of factors have hindered progress on Sonoma Water's long-term change petitions to modify Decision 1610 and Permits 12947A, 12949, 12950, and 16596. As required as a condition of the February 2021 order, Sonoma Water has provided a schedule of milestones and completion dates for further actions necessary to pursue its long-term change petitions. Since submittal of that schedule, progress has been hindered by two additional significant issues: 1) the severity of the ongoing drought since February 2021 and 2) the ongoing uncertainty regarding the future of transfers of water from the Eel River watershed through the PVP. Sonoma Water has been meeting with the State Water Board staff regularly to discuss progress on its long-term petitions while it continues to work on the Fish Habitat Flows and Water Rights Project Draft EIR. However, Sonoma Water has stated that the long-term petitions and draft EIR have been delayed due to the dire ongoing drought and changes in the PVP. Until the nature and duration of the surrender and decommissioning process proposed by PG&E and approved by FERC is known, progress on the long-term petitions and the related supporting environmental analyses will be hindered. In light of these circumstances and representations, the State Water Board finds that Sonoma Water has exercised due diligence. Sonoma Water must continue to diligently pursue its long-term petitions, but there is also an urgent need now, during the current critical water conditions and ongoing drought emergency, to grant Sonoma Water's TUCPs.

5.2 No Injury to Any Other Lawful User of Water

Under Decision 1610 and the terms and conditions of its associated water rights permits, Sonoma Water is required to maintain specified flows in the Russian River from Lake Mendocino to the Russian River's confluence with the Pacific Ocean and in Dry Creek from Warm Springs Dam to the confluence with the Russian River. This Order retains these existing minimum instream flow requirements but temporarily changes the circumstances under which "*Normal*," "*Dry*," or "*Critical*" water supply conditions will apply. Minimum instream flows will continue to be maintained under this Order consistent with hydrologic conditions within the Russian River Watershed. It is anticipated that all other lawful users of water will be able to divert and use the amounts of water to which they are legally entitled during the period specified in this Order. Other legal users of water will not be injured by reduction in releases of previously stored water because water released from storage is not available for diversion by downstream users with an independent basis of right. (See, e.g., *North Kern Water Storage Dist. v. Kern Delta Water Dist.* (2007) 147 Cal.App.4th 555, 570 [when the stored water is released for use, it is not part of the river's natural flow and rediversion of this water does not count toward the appropriator's current allocation of river water]; *State Water Resources Control Bd. Cases* (2006) 136 Cal.App.4th 674, 737-745 [a riparian or appropriator has no legally protected interest in other appropriators' stored water or in the continuation of releases of stored water].)

In conjunction with other actions in response to the current drought state of emergency within the Russian River Watershed, the State Water Board will supervise diversion and use of water under this Order for the protection of all other lawful users of water pursuant to Water Code section 1439.

5.3 No Unreasonable Effect upon Fish, Wildlife, or Other Instream Beneficial Uses

Prior to approval of a TUCP, the State Water Board must find that the proposed change may be made without unreasonable effect upon fish, wildlife, or other instream beneficial uses. In addition, the State Water Board has an independent obligation to consider the effect of approval of Sonoma Water's petitions on public trust resources and to protect those resources to the extent feasible and in the public interest. (*National Audubon Society v. Superior Court* (1983) 33 Cal.3d 419.) Public trust resources may include, but are not limited to, wildlife, fish, aquatic habitat, and recreation in navigable waterways, as well as fisheries located in non-navigable waterways. It is also the policy of this state that all state agencies, boards, and commissions shall seek to conserve endangered species and threatened species and shall use their authority in furtherance of the purposes of the California Endangered Species Act (Fish & G. Code, § 2050 et seq.). State agencies should not approve projects that would jeopardize the continued existence of any endangered species or threatened species if there are reasonable and prudent alternatives available consistent with conserving the species or its habitat that would prevent jeopardy. (Fish & G. Code, §§ 2053 & 2055.)

Although relying on Lake Mendocino storage thresholds to define the water supply conditions may result in lower instream flows in the Russian River than would ordinarily be required under Sonoma Water's permits, maintenance of stored water in Lake Mendocino and Lake Sonoma for subsequent release is crucial for ensuring sufficient water supplies for human health and safety use and maintaining habitat for threatened and endangered fish species during the critical life stages that occur during the fall and spring. With the conditions imposed by this Order, including ongoing efforts to support water conservation and regular monitoring and reporting of conditions by Sonoma Water, the State Water Board finds that granting the proposed temporary changes will not have an unreasonable effect on fish, wildlife, or other instream beneficial uses and public trust resources will be protected to the extent feasible and in the public interest. The State Water Board will continue to evaluate conditions in the watershed throughout the duration of this Order and consider other actions that may further the protection of fish, wildlife, and other instream beneficial uses.

5.3.1 Consultation with Other Agencies

Sonoma Water has consulted with CDFW, NMFS, and North Coast Regional Water Quality Control Board (North Coast Water Board) regarding the TUCPs and the effects of the proposed changes.

NMFS submitted a letter on November 23, 2022 in support of Sonoma Water's TUCPs to ensure that the water supply condition and corresponding minimum instream flow requirements in the Russian River Watershed are aligned with actual watershed hydrologic conditions. NMFS's 2008 Biological Opinion addresses the need for modifying minimum instream flow requirements to: 1) protect salmonid species listed under the federal Endangered Species Act, including threatened California Coastal (CC) Chinook salmon (*Onchorynchus [O.] tshawyscha*), endangered Central California Coast (CCC) coho salmon (*O. kisutch*), and threatened CCC steelhead trout (*O. mykiss*), residing in the Russian River; and 2) address water supply conditions at Lake Mendocino and Lake Sonoma to maintain viable operations that support municipal water distribution. The November 23, 2022 letter indicates that the proposed TUCPs meet both objectives towards preventing Lake Mendocino from declining to a storage level at which the reservoir may no longer be operational. NMFS has requested additional terms and conditions be included to any order issued by the State Water Board to provide water needed to protect listed salmonids in the Russian River. NMFS's requested terms and conditions in the November 23, 2022 letter are included in this Order to prevent unreasonable effects on fish and wildlife in the near term while preserving water needed for protecting salmonid species in the Russian River in the longer term.

CDFW also submitted a letter on November 22, 2022 in support of Sonoma Water's TUCPs. The letter of support encouraged immediate implementation of the TUCP and proposed terms and conditions similar to those proposed by NMFS.

This Order requires Sonoma Water to consult biweekly with CDFW, NMFS, and the North Coast Water Board regarding the current hydrologic and water quality conditions for the Russian River when water supply conditions are classified as *Dry* or *Critical*. This information will assist the State Water Board in determining whether additional actions or modifications to this Order are necessary.

5.3.2 Conservation

Sonoma Water is actively engaged in water conservation to reduce demands on water stored in Lake Mendocino and Lake Sonoma for municipal supply. Sonoma Water and its water contractors have implemented water use efficiency programs to comply with the California Water Conservation Act since the establishment of the Sonoma-Marin Water Saving Partnership (Partnership) in 2010. The Partnership represents twelve North Bay water utilities in Sonoma and Marin counties that have joined to provide a regional solution for water use efficiency.

As stated in the TUCPs, Sonoma Water, its water contractors, and other members of the Partnership have continued implementing an aggressive water saving outreach campaign since winter 2020. Sonoma Water, its contractors, and the other member agencies of the Partnership continue to run a multimedia drought outreach campaign to maintain customer awareness of low reservoir levels and the need for continued water savings due to a third consecutive dry year. The campaign emphasizes reducing water waste by adhering to statewide water waste prohibitions and local restrictions on irrigation and other non-essential uses of water. The June 17, 2022 Order approving Sonoma Water's TUCP required a 20 percent reduction in total diversions as compared to 2020 for the period of July 1, 2022 through October 31, 2022. During that period, Sonoma Water achieved a diversion reduction of over 30 percent as compared to the same time period in 2020.

In addition, on May 24, 2022, the State Water Board adopted a new emergency regulation for urban water conservation. The regulation required urban water suppliers to submit preliminary supply and demand assessments to the Department of Water Resources by June 10, 2022. Urban water suppliers also were required to implement all conservation actions in their locally adopted plans meant to address at least a water shortage level of 10 to 20 percent (Level 2) by June 10, 2022, and owners and managers of commercial, industrial, and institutional properties were prohibited from using potable water for irrigating non-functional turf. The regulation will remain in effect for one year unless the State Water Board determines that it is no longer necessary due to changed conditions or unless the State Water Board renews the regulation due to continued drought conditions.

With the conditions imposed by this Order, including ongoing efforts to support water conservation and regular monitoring and reporting by Sonoma Water, the State Water Board finds that granting the proposed temporary changes will not have an unreasonable effect on fish, wildlife, or other instream beneficial uses and protects public trust resources to the extent feasible and in the public interest. The State Water Board will continue to evaluate conditions in the watershed throughout the duration of this Order and consider other actions that may further the protection of fish, wildlife, and other instream beneficial uses. The State Water Board will continue to evaluate whether additional conservation measures are necessary to respond to dry conditions in the Russian River Watershed and/or low storage in Lake Mendocino and Lake Sonoma.

5.4 The Proposed Change is in the Public Interest

Approval of the TUCPs to temporarily change the hydrologic index will help conserve stored water in Lake Mendocino and Lake Sonoma to meet human health and safety needs, and to protect endangered and threatened species in the Russian River. Without the proposed changes, the resulting depletion of stored water in Lake Mendocino and Lake Sonoma to unsafe levels will put residents in the counties of Mendocino, Sonoma, and Marin at risk should dry conditions persist into 2023. It is in the public interest to preserve water supplies for these beneficial uses given the extreme hydrologic circumstances and reduced water supplies.

Should the conditions that support the approval of this Order change, whether in alterations to water supply or identification of additional impacts to aquatic habitat, water quality, or other matters within the public interest, the State Water Board has the authority to revoke this Order or modify its terms and conditions as necessary to promote the interests of the public.

6.0 CONCLUSIONS

The State Water Board has adequate information in its files to make the evaluation required by Water Code section 1435. The findings of this Order are based on unique circumstances created by drought and are independent from any findings to be made in connection with the related change petitions filed by Sonoma Water in 2009 and revised in 2016 pursuant to Chapter 10 of Division 2 of Part 2 of the Water Code.

I conclude that, based on the available evidence:

1. The right holder, Sonoma Water, has an urgent need to make the proposed changes;

2. The proposed changes will not operate to the injury of any other lawful user of water;

3. The proposed changes will not have an unreasonable effect upon fish, wildlife, or other instream beneficial uses; and

4. The proposed changes are in the public interest.

ORDER

NOW, THEREFORE, IT IS ORDERED THAT: the petitions filed by Sonoma Water for a temporary urgency change in Permits 12947A, 12949, 12950, and 16596 are approved and effective from December 14, 2022, through a period of 180 days.

All existing terms and conditions of the subject permits remain in effect, except as temporarily amended by the following terms:

1. The minimum instream flow requirements for the Upper Russian River, the Lower Russian River, and Dry Creek will be established using a hydrologic index based on water storage in Lake Mendocino. For the purposes of the requirements in Term 20 of Permit 12947A, Term 17 of Permit 12949, Term 17 of Permit 12950, and Term 13 of Permit 16596, the following definitions shall apply:

    a. Dry water supply conditions exist when storage in Lake Mendocino is less than:

        45,000 acre-feet as of January 1
        60,000 acre-feet as of February 1
        71,000 acre-feet as of March 1
        75,000 acre-feet as of March 16
        77,000 acre-feet as of April 1
        76,500 acre-feet as of April 16
        76,000 acre-feet as of May 1
        75,500 acre-feet as of May 16
        75,000 acre-feet as of June 1

    b. Critical water supply conditions exist when storage in Lake Mendocino is less than:

        31,000 acre-feet as of January 1
        41,000 acre-feet as of February 1
        53,500 acre-feet as of March 1
        56,000 acre-feet as of March 16
        56,500 acre-feet as of April 1
        56,000 acre-feet as of April 16
        55,000 acre-feet as of May 1
        54,000 acre-feet as of May 16
        53,500 acre-feet as of June 1

    c. Normal water supply conditions exist in the absence of defined dry or critical water supply conditions.

2. From December 14, 2022, through April 15, 2023, and as water clarity and safety considerations allow, Sonoma Water shall conduct monitoring to evaluate accessibility to spawning habitat by adult salmonids in the following manner at the following locations:

   a. <u>Upper Russian River Habitat:</u>

      If water supply conditions are classified as *Dry* or *Critical* and flow at the USGS Hopland gage (station number 11462500) falls below 100 cubic feet per second (cfs), Sonoma Water shall conduct on a biweekly basis, visual (walking) surveys of riffles in reaches between the confluence of the East Fork Russian River and West Fork Russian River (the Forks) and the confluence of Dry Creek and Russian River in Healdsburg. Proposed reaches include below the Forks, Leaping Lady Rock, Commisky Station Road, downstream of Crocker Road, downstream of Washington School Road, and Alexander Valley. A count of salmonid redds, live adult salmonids, and adult salmonid carcasses shall be documented for each riffle surveyed. In reaches with major tributaries, tributary connectivity to the mainstem shall be assessed with photo documentation and a written description of prevailing conditions as they relate to tributary access by adult salmonids. If tributary stream gage information is available, tributary stage and/or flow at the time of documentation shall also be noted. Proposed tributary confluences include West Fork Russian River, Pieta Creek, Cummiskey Creek, and Big Sulphur Creek.

   b. <u>Lower Russian River Habitat:</u>

      If flow at the USGS Hacienda gage (station number 11467000) falls below 125 cfs, Sonoma Water shall conduct on a biweekly basis, visual (walking) surveys of likely holding pools located near riffle sites to document whether adult salmonids are congregating in pools, spawning in the lower river, and general health. Proposed reaches include Monte Rio, Vacation Beach, Hulbert Creek, and Steelhead Beach.

      If flow at the USGS Hacienda gage (station number 11467000) falls below 125 cfs, Sonoma Water shall conduct a biweekly basis, walking surveys of riffles to visually evaluate access to spawning habitat by adult salmonids between the Mirabel dam and the upstream end of the Russian River estuary in Duncans Mills. Proposed reaches include Monte Rio, Vacation Beach, Hulbert Creek, and Steelhead Beach. During one of these surveys, if flows are between 50-90 cfs, Sonoma Water shall measure riffle length, width, depth, and document the site with photographs.

c. Dry Creek:

If flow at the USGS Dry Creek near Geyserville (Yoakim Bridge) gage (station number 11462500) falls below 75 cfs, Sonoma Water will conduct biweekly walking surveys of riffles in Dry Creek between Warm Springs Dam and Lambert Bridge. Proposed reaches include upstream of Yoakim Bridge and at Board Bridge. A count of salmonid redds, live adult salmonids, and adult salmonid carcasses will be documented for each riffle surveyed.

3. Ramping

a. To protect against stranding of fish when releases from Lake Mendocino are reduced to *Dry* or *Critical* levels under this Order, flow in the East Fork Russian River immediately below Coyote Valley Dam shall not be reduced by more than 12 cfs per hour, with a minimum of 4 hours between the end of each flow reduction. Flow reduction shall not exceed 24 cfs per day. The NMFS Santa Rosa Office and CDFW shall be notified by email 48 hours in advance of ramping events that will reach 24 cfs per day. Ramping rates specified in this term may be revised upon consultation with NMFS and CDFW and notification to the Deputy Director of the Division of Water Rights (Deputy Director). Sonoma Water shall submit a summary report of consultation details to the Deputy Director within one week of each consultation meeting.

b. If flow reductions of 12 cfs per hour or 24 cfs per day are made, Sonoma Water shall conduct an in-stream survey on the East Fork Russian River below the fish ladder to the Coyote Valley Fish Facility downstream to the confluence of the Mainstem Russian River and note any regions of the stream that are disconnected or any areas of isolated pools. Sonoma Water shall provide locations of disconnection and isolated pools to CDFW and NMFS no later than the following business day.

4. Water Operations

a. To assist hatchery steelhead smolt releases from Coyote Valley Fish Facility, Sonoma Water shall consult with CDFW on the timing and level of temporary and periodic flow increases from Lake Mendocino to be made between March 1 and the expiration of this Order, for the purpose of encouraging hatchery smolt outmigration from the East Fork Russian River and Upper Russian River.

b. From January 1 through the end of steelhead spawning season in the hatchery, Sonoma Water shall consult with CDFW to determine the appropriate and periodic flow increases from Lake Mendocino and

Lake Sonoma to ensure successful adult returns to both Coyote Valley Fish Facility and Warm Springs Hatchery for production needs.

c. To ensure that smolts reared in the wild from the juvenile stage are able to exit the watershed, if a rain event has not occurred by April 1, 2023, Sonoma Water will consult with CDFW, NMFS, and the State Water Board to discuss providing a pulse of water to promote outmigration of juvenile salmonids and steelhead from the watershed.

5. Reporting

   a. If water supply conditions are classified as *Dry* or *Critical*, Sonoma Water shall continue to consult with NMFS, CDFW, and the North Coast Water Board on a biweekly basis until July 1, 2023 to discuss fishery and hydrologic condition updates and any concerns relative to water quality and the hydrologic condition of the Russian River. Sonoma Water shall provide materials to be discussed during these meetings, including proposed flow changes and water storage levels, to the resource agencies by 1:00 p.m. of the day prior to the meeting. Sonoma Water shall send notes of those meetings to the resource agencies and State Board within one week after their occurrence. Sonoma Water shall submit a summary report of consultation details to the Deputy Director upon request.

   b. Sonoma Water shall submit a summary report of fisheries monitoring activities associated with the Order to the resource agencies following the expiration of the Order.

6. Sonoma Water shall continue ongoing monitoring in coordination with the USGS at the existing multi-parameter water quality sonde sites on the Russian River. By April 21, 2023, Sonoma Water shall consult with the North Coast Water Board to discuss possible water quality impacts if *Critical* or *Dry* water supply conditions occur and whether additional water quality monitoring activities should be required to document water quality conditions in the Russian River. If any water quality issues of concern are observed from the continuous monitoring or water sampling required by this Order, Sonoma Water shall initiate earlier or additional consultation with the North Coast Water Board. The North Coast Water Board may also initiate additional consultation to discuss concerns based on available water quality information. Sonoma Water shall submit a summary report of consultation details and a description of proposed monitoring activities to the Deputy Director within one week of each consultation. Any necessary revisions to this Condition may be made following consultation with the North Coast Water Board and approval by the Deputy Director.

7. Based upon the methodology for characterizing Lake Mendocino and Lake Sonoma water inflows, releases, and rediversions developed pursuant to Condition 11 of the State Water Board's TUCP order dated February 4, 2021, and Condition 12 of the State Water Board's TUCP order dated June 14, 2021, Sonoma Water shall maintain a spreadsheet of daily average release rates and characterization of those releases. Sonoma Water shall make the spreadsheet available to State Water Board staff within five days of being requested and shall include the spreadsheet as an attachment to Sonoma Water's annual Reports of Permittee for Permits 12947A, 12949, 12950 and 16596. Sonoma Water shall implement any amendments to either methodology requested by the Deputy Director within 15 days of the request.

8. This Order does not authorize any act that results in the taking of a candidate, threatened, or endangered species, or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish & G. Code, § 2050 et seq.) or the federal Endangered Species Act (16 U.S.C. § 1531 et seq.). If a "take" will result from any act authorized under this Order, Sonoma Water shall obtain authorization for an incidental take permit prior to operation of the project. Sonoma Water shall be responsible for meeting all requirements of the applicable Endangered Species Act for the temporary urgency changes authorized under this Order.

9. The State Water Board reserves jurisdiction to supervise the temporary urgency changes under this Order, and to coordinate or modify terms and conditions, for the protection of vested rights, fish, wildlife, instream beneficial uses and the public interest as future conditions may warrant.

10. Sonoma Water shall immediately notify the Deputy Director if any significant change in storage conditions in Lake Mendocino or Lake Sonoma occurs that warrants reconsideration of this Order.

11. Within 30 days of the issuance of this Order, Sonoma Water shall report on the status of implementation of its WSCP and the WSCPs of its contractors and other wholesale customers and the extent to which shortage levels comply with urban conservation regulations.

12. Sonoma Water shall continue to conduct the activities described in Planning and Management Terms of the March 21, 2022 Memorandum of Understanding Concerning Lake Mendocino Storage Planning and Russian River Management (MOU). Projections of Lake Mendocino storage and the extent to which storage will be available for the uses described in items (A) through (D) shall be provided to the Deputy Director for Water Rights by March 1, 2023.

STATE WATER RESOURCES CONTROL BOARD

ORIGINAL SIGNED BY

Erik Ekdahl, Deputy Director
Division of Water Rights

Dated: DEC 14, 2022