Water Year 2021 – 2026 Major Planned Deviation to the Coyote Valley Dam-Lake Mendocino Water Control Manual

Draft Environmental Assessment

OCTOBER 2020

Prepared for: **DEPARTMENT OF THE ARMY**
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
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DRAFT
FINDING OF NO SIGNIFICANT IMPACT

WATER YEAR 2021 – 2026 MAJOR PLANNED DEVIATION TO THE COYOTE VALLEY DAM-LAKE MENDOCINO WATER CONTROL MANUAL
MENDOCINO COUNTY, CALIFORNIA

The U.S. Army Corps of Engineers, San Francisco District (Corps) has conducted an environmental analysis in accordance with the National Environmental Policy Act of 1969, as amended. The final Environmental Assessment (EA) dated_____, for the Water Year 2021 – 2026 Major Planned Deviation to the Coyote Valley Dam - Lake Mendocino Water Control Manual addresses a major deviation that would allow the Corps to store an additional 11,650 acre-feet of water above the existing guide curve, stipulated in the Coyote Valley Dam - Lake Mendocino Water Control Manual, for Water Year (WY) 2021 through WY 2026 between November 1 and February 28 in each year, with an option to begin the increase in spring storage on February 15, to restore some of the diminished water supply reliability without reducing the existing flood protection capacity of Lake Mendocino in the County of Mendocino, California.

The Final EA, incorporated herein by reference, evaluated alternatives that would improve water supply reliability without reducing the existing flood protection capacity of Lake Mendocino in the study area. The Proposed Action includes:

- A major deviation that would allow the Corps to store an additional 11,650 acre-feet of water above the existing guide curve, stipulated in the Coyote Valley Dam - Lake Mendocino Water Control Manual, for WY 2021 through WY 2026 between November 1 and February 28 in each year, with an option to begin the increase in spring storage on February 15, to restore some of the diminished water supply reliability without reducing the existing flood protection capacity of Lake Mendocino.

In addition to a “no action” plan, three alternatives were evaluated. The alternatives included Proposed Action (Hybrid and Modified Hybrid operations), Ensemble Forecast Operations (EFO) and the 5-day Deterministic Forecast, which were considered in the Final Viability Assessment (FVA), but eliminated from further consideration. Please see Chapter 2, Alternatives, in the EA for full discussion.

For all alternatives, the potential effects were evaluated, as appropriate. A summary assessment of the potential effects of the Propsed Action are listed in Table 1:

Table 1: Summary of Potential Effects of the Proposed Action

	Insignificant effects	Insignificant effects as a result of mitigation*	Resource unaffected by action
Air quality/Climate change	☐	☐	☒
Invasive species	☐	☐	☒
Fisheries	☐	☐	☒
Threatened/Endangered species/critical habitat	☐	☐	☒
Historic properties	☐	☐	☒
Cultural resources	☐	☐	☒
Recreation	☒	☐	☐
Land use	☐	☐	☒
Traffic	☐	☐	☒
Noise levels	☐	☐	☒
Socio-economics	☐	☐	☒
Vegetation/Wildlife	☐	☐	☒
Visual Resources	☐	☐	☒
Water quality	☐	☐	☒

All practicable and appropriate means to avoid or minimize adverse environmental effects were analyzed and incorporated into the recommended plan.

No compensatory mitigation is required as part of the recommended plan.

Public review of the draft EA and FONSI was completed on _____ and FONSI review period ended_____. All comments submitted during the public review period were responded to in the Final EA and FONSI.

Pursuant to section 7 of the Endangered Species Act of 1973, as amended, the U.S. Army Corps of Engineers determined that the recommended plan will have no effect on federally listed species or their designated critical habitat. National Marine Fisheries Service (NMFS) issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River Watershed* (Russian River Biological Opinion) on September 24, 2008 (NMFS 2008). The Russian River Biological Opinion is a culmination of more than a decade of consultation among the Corps, Sonoma Water, the Mendocino County Water Conservation and Flood Control Improvement District, and NMFS regarding the impacts of the USACE and Sonoma Water flood control and water supply activities on three fish species listed under the federal Endangered Species Act: Central California Coast steelhead; Central California Coast coho salmon; and California Coastal Chinook salmon.

Given the presence of critical habitat and potential for presence of listed salmonid species downstream of Lake Mendocino, coordination with NMFS was conducted. Appendix C of the EA provides a summary of coordination with NMFS regarding the major deviation request (Proposed Action). The Proposed Action does not include operations beyond the scope of conditions evaluated and considered under the Russian River Biological Opinion. No significant effects to Federally listed, proposed, or candidate species or critical habitat are anticipated from the Proposed Action. No potential for significant effects to Federally listed, proposed, or candidate species or critical habitat under the jurisdiction of the USFWS is anticipated.

Pursuant to Section 106 of the National Historic Preservation Act of 1966, as amended, the U.S. Army Corps of Engineers determined that the recommended plan has no effect on historic properties. There are no resources found in the area of potential effect.

All applicable environmental laws have been considered and coordination with appropriate agencies and officials has been completed. Chapter 4 of the EA provides discussion of compliance with environmental laws and regulations.

Technical, environmental,cultural, engineering feasibility, and and cost effectiveness criteria used in the formulation of alternative plans were those specified in the Water Resources Council's 1983 Economic and Environmental Principles and Guidelines for Water and Related Land Resources Implementation Studies. All applicable laws, executive orders, regulations, and local government plans were considered in evaluation of alternatives. Based on this report, the reviews by other Federal, State and local agencies, Tribes, input of the public, and the review by my staff, it is my determination that the recommended plan would not cause significant adverse effects on the quality of the human environment; therefore, preparation of an Environmental Impact Statement is not required.

_____ _____

Date

John D. Cunningham
Lieutenant Colonel, U.S. Army
District Commander and Engineer

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TABLE OF CONTENTS

ACRONYMS

AF	acre-feet
APE	area of potential effect
Basin Plan	Water Quality Control Plan for the North Coast Region
CA DWR	California Department of Water Resources
CDEC	California Data Exchange Center
CDFW	California Department of Fish and Wildlife
CEQ	Council on Environmental Quality
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
C.F.R.	Code of Federal Regulations
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CNRFC	California Nevada River Forecast Center
CW3E	Scripps Center for Western Weather and Water Extremes
CWA	Clean Water Act
CWMS	Corps Water Management System
DO	dissolved oxygen
DSM	decision support model
DWR	Department of Water Resources
EA	Environmental Assessment
EFH	essential fish habitat
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESRL	NOAA Earth System Research Laboratory
FCO	Forecast Coordinated Operations
FEMA	Federal Emergency Management Administration
FERC	Federal Energy Regulatory Commission
FIRO	Forecast Informed Reservoir Operations
Fish Flow Project	Fish Habitat Flows and Water Rights Project
FONSI	finding of no significant impact
HEC	Hydrologic Engineering Center
IP	Individual Permits
IPaC	Information for Planning and Consultation
ITS	Incidental Take Statement
MCWFCID	Mendocino County Water Conservation and Flood Control Improvement District
msl	mean sea level
MWh	megawatt hours

NAHC	Native American Heritage Commission
NCPA	Northern California Power Association
NCRWQCB	North Coast Regional Water Quality Control Board
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NRHP	National Register of Historic Places
NWIC	Northwest Information Center, Sonoma State University
NWS	National Weather Service
PG&E	Pacific Gas and Electric
PVA	Preliminary Viability Assessment
PVP	Potter Valley Project
RPA	Reasonable and Prudent Alternative
RPM	Reasonable and Prudent Measure
RPS	Renewable Portfolio Standard
RR-DSS	Russian River Decision Support System
Scripps	Scripps Institute of Oceanography
Sonoma Water	Sonoma County Water Agency
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UVAP	Ukiah Valley Area Plan
WCM	Water Control Manual

CHAPTER 1.0 Introduction

1.1 Proposed Action

Members of the Lake Mendocino Forecast Informed Reservoir Operations (FIRO) Steering Committee have requested a major planned deviation to the Coyote Valley Dam – Lake Mendocino Water Control Manual (WCM), as amended in 2011 (USACE, 1986a). The purpose of this request is to improve water supply reliability, flood risk management, and environmental conditions of Lake Mendocino and the upper Russian River. Lake Mendocino has experienced significantly reduced water supply reliability over the past several years due to a significant reduction of trans-basin transfers into the facility from the Eel River. The goal of FIRO is to help restore some of the diminished water supply reliability without reducing the existing flood protection capacity of Lake Mendocino.

The FIRO effort is led by a steering committee formed in 2014 comprised of representatives from the Sonoma County Water Agency (Sonoma Water), Scripps Institute of Oceanography (Scripps), U.S. Army Corps of Engineers (USACE), National Oceanic and Atmospheric Administration (NOAA), U.S. Geological Survey (USGS), U.S. Bureau of Reclamation, and the California Department of Water Resources (DWR). This deviation request is being submitted on behalf of steering committee members representing the following organizations: Sonoma Water, Scripps, USACE, NOAA, and California Department of Water Resources.

Members of the FIRO Steering Committee are requesting USACE approval of a multi-year planned major deviation to store additional water above the existing guide curve for the Coyote Valley Dam Lake Mendocino WCM for Water Year (WY) 2021 through WY 2026. A WY is defined as the 12-month period starting October1 for any given year through September 30 of the following year. If approved, this would result in a maximum additional storage of 11,650 acre-feet between November 1 and February 28 in each year, with an option to begin the increase in spring storage on February 15, which the USACE can exercise at their discretion if conditions allow (Figure 1). The requested major deviation to the WCM is essentially the same and follows the successful implementation of major deviations granted by the USACE for WY 2019 and WY 2020, with the addition that (1) pre-releases by USACE in advance of storm events into the water conservation pool would be allowed under certain conditions (as was provided for in the WY 2020 major deviation) and (2) the aforementioned option for USACE to begin the increase in spring storage on February 15. Such pre-releases would be allowed if: (1) such a release is recommended by the FIRO decision support tools (described below); and (2) Sonoma Water is consulted about the pre-releases and approves of the action in coordination with advice from FIRO Steering Committee member, the National Marine Fisheries Service (NMFS). The decision to repeat the WY 2020 major deviation for the upcoming five year period was based on a collaborative process between members of the Steering Committee and the USACE reservoir operators in which the results of the prior two years of operations were evaluated relative to options for different potential deviations. It is important to emphasize that if water levels are within the storage space allowed by this deviation, the USACE will have the discretion to utilize the additional information provided to inform (but not control) reservoir

operations. As part of the planned major deviation, members of the FIRO Steering Committee are also requesting USACE include and leverage the Russian River Decision Support System (RR-DSS) developed by Sonoma Water as part of the tools and protocols USACE uses to manage reservoir operations at Lake Mendocino. USACE reservoir operators will retain full operational control and authority, with the RR-DSS providing an additional tool for operators.

Based on operational hydrologic ensemble of streamflow forecasts provided by the National Weather Service (NWS) California-Nevada River Forecast Center (CNRFC), current reservoir storage, and current and anticipated downstream conditions, the RR-DSS provides a recommended release to help inform operational decisions. Details regarding the RR-DSS are provided in Section 2.3, Proposed Action.

The FIRO Steering Committee is seeking a multi-year planned major deviation to provide effective operations until the WCM is formally updated with an approved FIRO approach. During this multi-year period it is expected that streamflow forecasts provided by the CNRFC will undergo periodic updating with associated skill improvement. When significant updates occur, the Steering Committee will reprocess the CNRFC-provided streamflow hindcasts through the Lake Mendocino ensemble forecasts operation (EFO) model for the period of record to ensure that reservoir management outcomes are not negatively impacted.

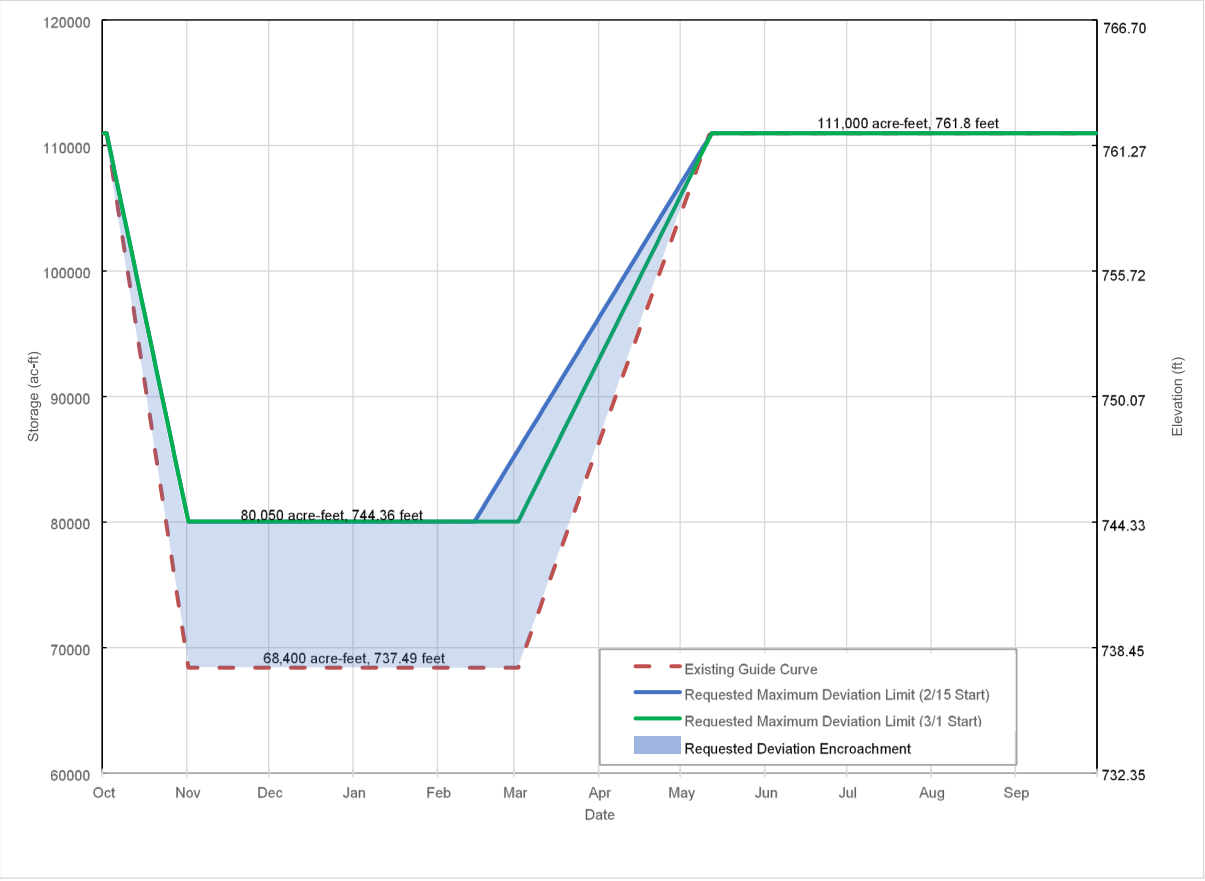


Figure 1. Existing Water Control Manual Guide Curve and Proposed Maximum Deviation Limits beginning on February 15 and March 1.

1.2 Location of the Project

Lake Mendocino is located approximately 4 miles northeast of the City of Ukiah on the East Fork Russian River in Mendocino County and is created by Coyote Valley Dam (Figure 2). The watershed contributing to Lake Mendocino encompasses an area of 105 square miles, which is approximately 7 percent of the Russian River watershed. The Russian River watershed drains an area of 1,485 square miles that includes substantial portions of Sonoma and Mendocino counties. The headwaters of the West Fork Russian River are located in central Mendocino County, approximately 15 miles north of Ukiah. The Russian River is approximately 110 miles long and runs generally southward to Forestville, where the channel's direction changes westward to the Pacific Ocean near Jenner, approximately 20 miles west of Santa Rosa.

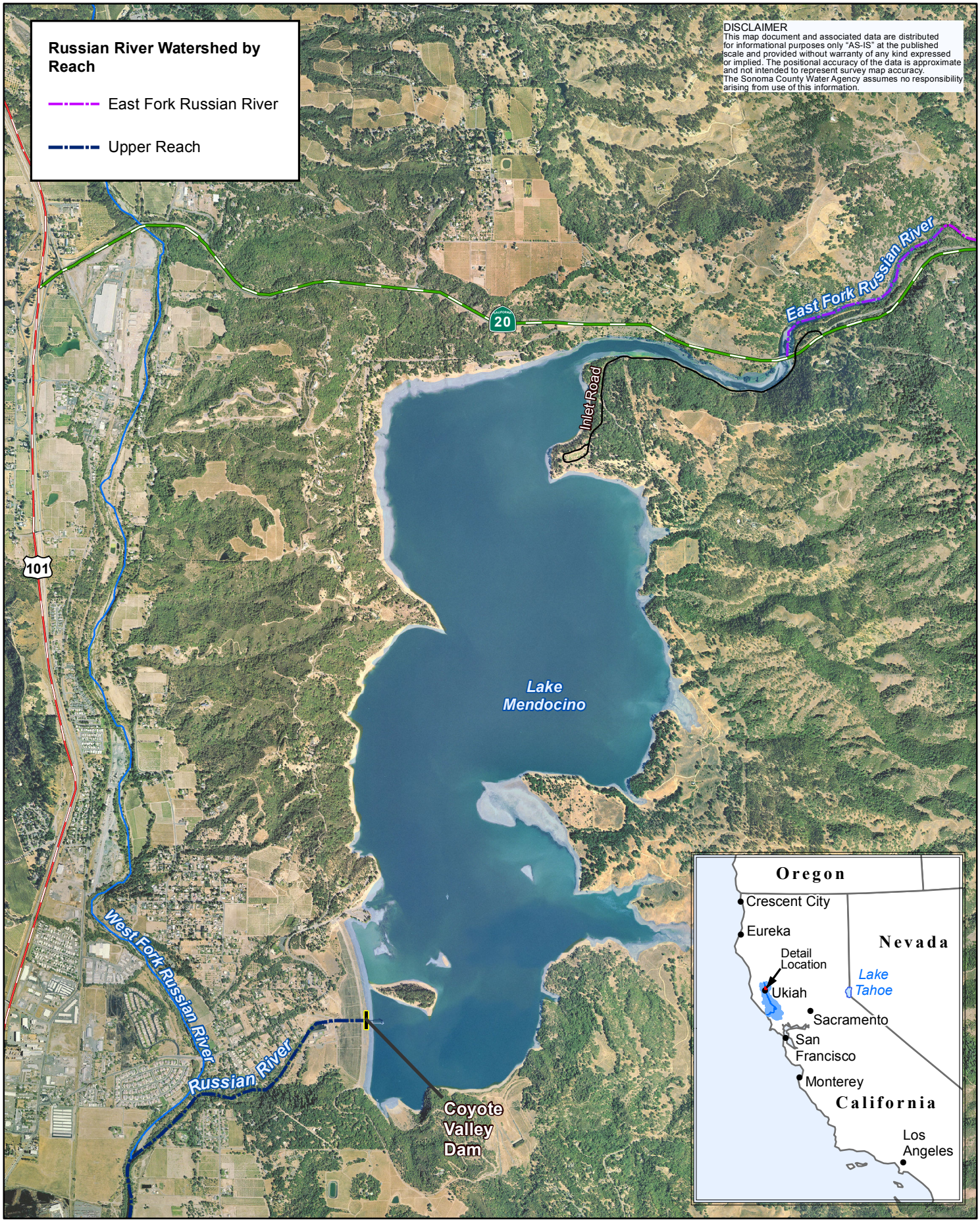
1.3 Background and Need for Action

The USACE's construction of Coyote Valley Dam and Lake Mendocino was completed in 1959. Coyote Valley Dam is an earth embankment dam, approximately 160 feet high with a crest 3,500 feet long. The invert of the controlled outlet at the dam is at an elevation of 637 feet above mean sea level (MSL); the dam crest elevation is at 784 feet above MSL (USACE, 1986a). Lake Mendocino's total current storage capacity is 116,500 acre-feet, with a water supply pool between 68,400 acre-feet and 111,000 acre-feet, depending on time of year (Figure 3).

The watershed contributing to Lake Mendocino encompasses an area of 105 square miles, which is approximately 7 percent of the Russian River watershed. The average annual inflow into Lake Mendocino is approximately 235,000 acre-feet per year, with a peak annual inflow of 443,000 acre-feet in 1983 and a minimum annual inflow of 60,000 acre-feet in 1977. Inflow into the reservoir consists of unimpaired flows[1] from the contributing watershed and water imported from the Eel River by Pacific Gas and Electric's (PG&E) Potter Valley Project (PVP). Unimpaired stream flows create most of the Russian River flows downstream of Coyote Valley Dam to the Russian River's confluence with Dry Creek during the rainy season (November through April). During the drier months of May through October, water released from Lake Mendocino storage creates most of the flows in the Russian River upstream of Dry Creek.

The USACE operates Lake Mendocino recreational facilities, which include hiking trails, picnic areas, campgrounds, boat launches, and a disc golf course. These facilities also provide opportunities for boating, swimming, and hunting.

[1] Unimpaired flows are the "natural" flows, unaffected by man-made influences like water diversions and reservoir operations.



US Army Corps of Engineers
San Francisco District

Lake Mendocino Major Deviation Request

N

0 0.25 0.5 Miles

Figure 2

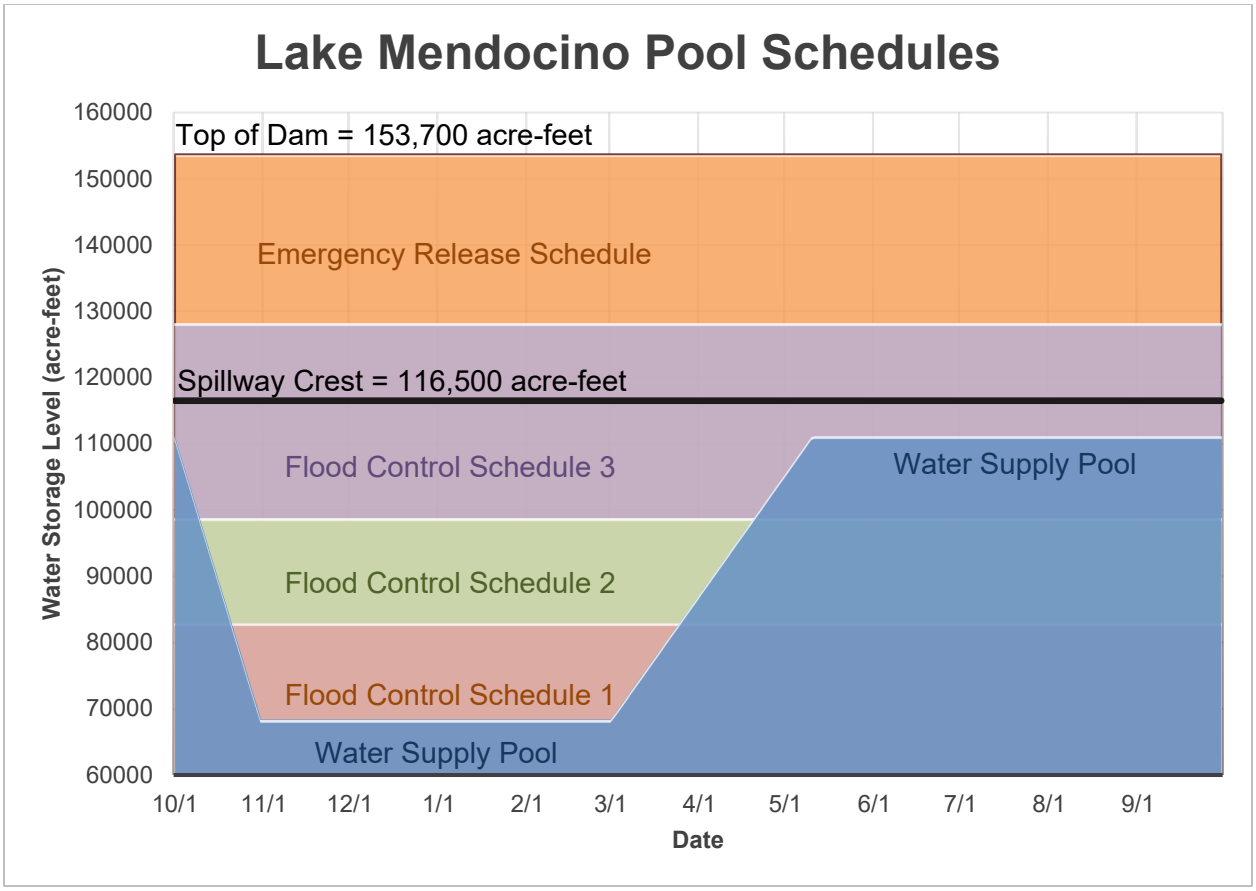


Figure 3. Lake Mendocino Flood Control and Water Supply Pool Schedules Defined in the 2004 U.S. Army Corps of Engineers Coyote Valley Dam and Lake Mendocino, Russian River, California, Exhibit A, Chart A-10 to Master Water Control Manual, Water Control Diagram.

1.3.1 Basis for Requested Deviation

Coyote Valley Dam and Lake Mendocino are operated in accordance with the terms of the facility's WCM developed in 1958. The most recent revision of the manual was released in August 1986, with periodic additions and updates in 1993 (Exhibit D. Drought Contingency Plan), 2003 (Exhibit A, Standing Instructions to Damtenders), and 2011 (Exhibit E, Operational Requirements for Pre-Flood and Periodic Inspections and Maintenance Activities). Since the preparation of the WCM, significant changes have occurred throughout the Russian River system. These changes include the listing of Central California coast steelhead (Oncorhynchus mykiss), Central California Coast coho salmon (O. kisutch), and California Coastal Chinook salmon (O. tshawytscha) as threatened or endangered under the Endangered Species Act (ESA); and most importantly, significant reductions of inflow to Lake Mendocino due to lower diversions from the Eel River through PVP.

Recent reductions in releases from PVP are the result of an Order issued by the Federal Energy Regulatory Commission (FERC) in January 2004 that amended PG&E's operating license. Since 2006, when PG&E began operating under the amended license, there has been an approximately 57 percent reduction in the annual transfer of Eel River water into the Russian River Watershed. As shown in Figure 4 below, the average annual transfer through PVP

between 1922 and 2006 was approximately 150,000 acre-feet. The average annual transfer through PVP between 2007 and 2019 was approximately 64,000 acre-feet.

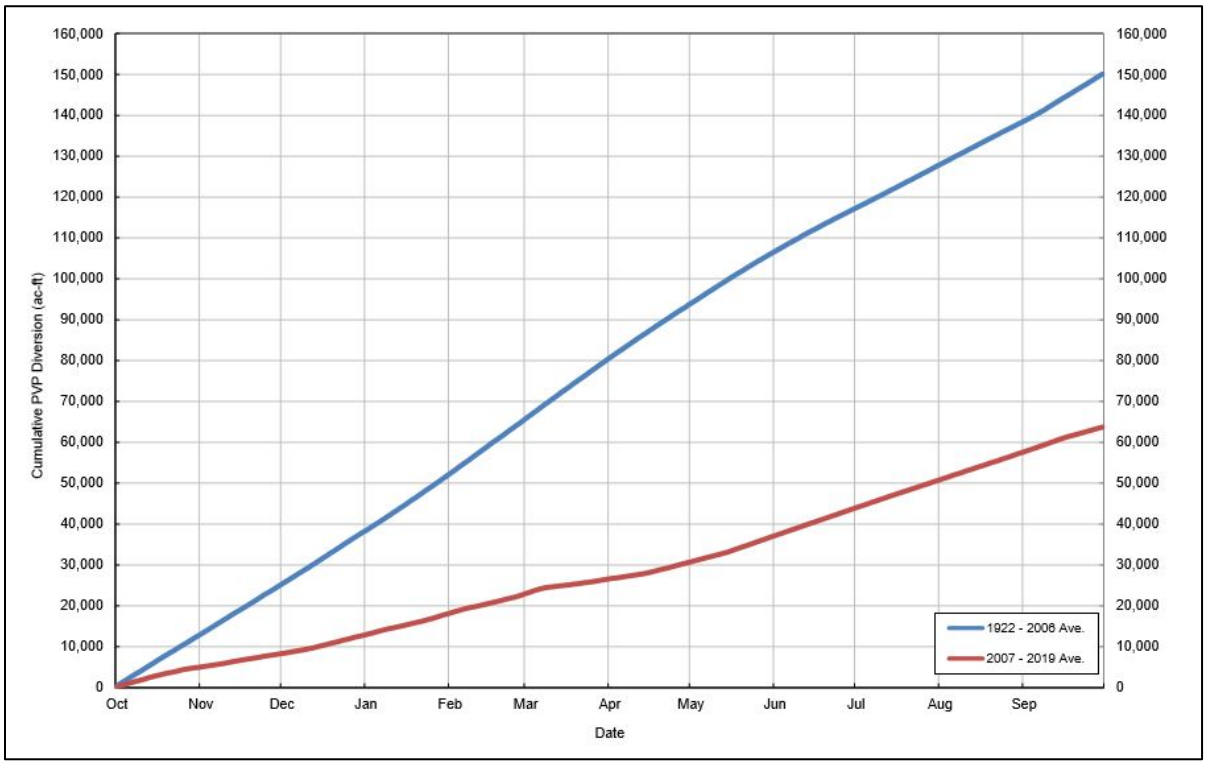


Figure 4. Cumulative Diversions of Eel River Water Through the Potter Valley Project by Water Year.

More importantly, a considerable portion of the reduced transfer occurs between March 1st and June 1st. As shown in Figure 5 below, the average transfer through PVP betweent February 15th and June 1st from 1922 through 2006 was approximately 40,000 acre-feet. From 2007 through 2019, the average transfer between March 1st and June 1st was slightly less than 14,000 acre-feet, a decrease of 65 percent.

This coincides with the time period that the water conservation pool begins increasing by 600 acre-feet per day, raising the water conservation pool from 68,400 acre-feet to 111,000 acre-feet. Consequently, Lake Mendocino has become reliant on late spring storm events to adequately fill in order to meet minimum instream flow requirements, downstream demands and maintain a cold-water pool for summer rearing juvenile steelhead trout and the migration of fall-run adult Chinook salmon.

Because late spring storm events do not reliably occur, there have been a number of years since 2006 that Lake Mendocino has not had sufficient storage to meet water supply needs without risking draining the reservoir. As a result, Sonoma Water has needed to file Temporary Urgency Change Petitions with the State Water Resources Control Board in 2007, 2009, 2013, 2014, 2015 and 2020 to reduce minimum instream flow requirements in order to prevent draining Lake Mendocino.

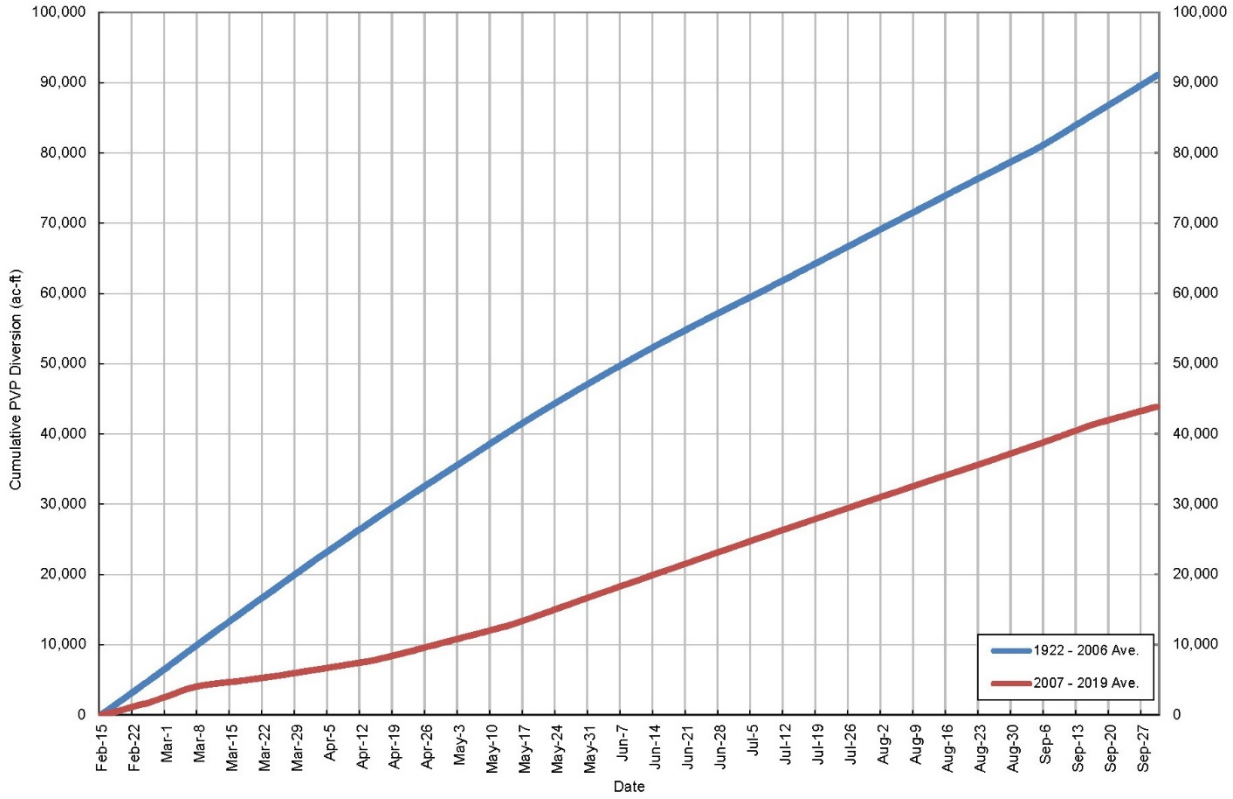


Figure 5. Cumulative Diversions of Eel River Water Through the Potter Valley Project February 15 Through September 30.

PVP's FERC license expires in 2022 and PG&E has decided not to seek a new license for the project. On March 1, 2019, FERC issued a solicitation for any parties interested in filing a license application to file a Notice of Intent by July 1, 2019. On June 28, 2019, a partnership made up of Mendocino Inland Water and Power Commission, Sonoma Water, California Trout, the Round Valley Indian Tribes, and the County of Humboldt (Parties) filed a joint Notice of Intent with FERC to investigate the feasibility of relicensing the project. Accordingly, if the Parties are successful and FERC issues a new operating license for the project, it would likely contain terms that further reduces the transfer of Eel River water to the Russian River Watershed, resulting in even greater loss of water supply reliability of Lake Mendocino for the region. With the significant loss of water supply reliability, there is an urgent need to evaluate the operation of Lake Mendocino to determine if improvements can be implemented to offset reductions of Eel River transfers to the Russian River Watershed. This major deviation request is targeting the recovery of the compromised water supply reliability resulting from the changes to the PVP transfers from the Eel River. It is also requesting that tools developed as part of the Lake Mendocino FIRO project be included to inform USACE flood managers along with the protocols available to USACE for managing reservoir operations at Lake Mendocino.

In the summer of 2017, the FIRO Steering Committee completed the *Preliminary Viability Assessment of Lake Mendocino Forecast Informed Reservoir Operations* (Jasperse, et al.,

2017) (PVA), which represents a major effort to develop the Lake Mendocino FIRO project.[2] This major body of work demonstrates that there is significant evidence that weather and water forecasts can be used to improve the operation of Lake Mendocino to recover water supply reliability without compromising flood management capacity. In addition, significant environmental benefits are achievable by improving fishery habitat for flows and water temperatures. These conclusions were reached through three independent studies conducted by the USACE's Hydrologic Engineering Center (HEC), Scripps Center for Western Weather and Water Extremes (CW3E), and Sonoma Water. The FIRO Steering Committee is currently working on a Final Viability Assessment (FVA). Draft documents on the FVA evaluation have been reviewed by the FIRO Steering Committee, are available online and will be published by the end of 2020. The FVA will detail the technical analysis for selecting a recommended FIRO strategy for consideration in a future update of the Coyote Valley Dam – Lake Mendocino WCM. The FVA will utilize the comprehensive technical studies, models, and empirical data developed by the major deviations for WY 2019 and 2020. Future update of the Coyote Valley Dame – Lake Mendocino WCM would require additional evaluation of potential for environmental effects under NEPA.

1.3.2 Water Years 2019 and 2020 Major Deviations

The FIRO Steering Committee previously submitted requests to the USACE for one-year major deviations for WYs 2019 and 2020. Both were approved by the USACE.

Summary of WY 2019 Planned Major Deviation Reservoir Operations

A plot of Lake Mendocino storage and downstream flows in the Russian River at Hopland from January through April 2019 is shown in Figure 6 below. The figure includes results of both observed conditions and simulated (virtual) existing operations, which approximates outcomes for Lake Mendocino and the Russian River if the WY 2019 Major Deviation was not implemented and provides a useful basis of comparison. In general, WY 2019 was a very wet year and utilization of FIRO strategies was not necessary from an end-of-year water supply storage perspective. However, the experience highlighted how forecasts and the decision tools aided reservoir operations during several storm events. Figure 6 includes callouts of certain periods of interest that are explained below:

1. After the first significant storm of the season, storage levels are encroached into the reservoir flood pool, and virtual existing operations (solid red line) increased releases to return storage levels to the existing guide curve (dashed red line). In contrast through the use of the RR-DSS and other forecast products provided by CW3E, USACE operators safely retained the storage gains within the flood pool, as shown with the solid blue observed storage line.
2. If precipitation had ceased or decreased for the remainder of the year (e.g., drought conditions), the retained early season storage would have resulted in a significant water supply benefit.
3. Due to forecasted storm events predicted with the RR-DSS and other forecast products, USACE operators increased releases to reduce storage levels in advance of the storms.

[2] Available at http://cw3e.ucsd.edu/firo-preliminary-viability-assessment-for-lake-mendocino/

4. The pre-storm storage management actions explained in period 3 resulted in post-storm storage levels well below the emergency spillway.
5. Forecast informed operations did not result in any increases in flows above nuisance flood stage (8,000 cfs) at Hopland when compared to virtual existing operation.
6. Forecast informed operations did not result in loss of water supply storage at the end of the storm season when compared to virtual existing operations.

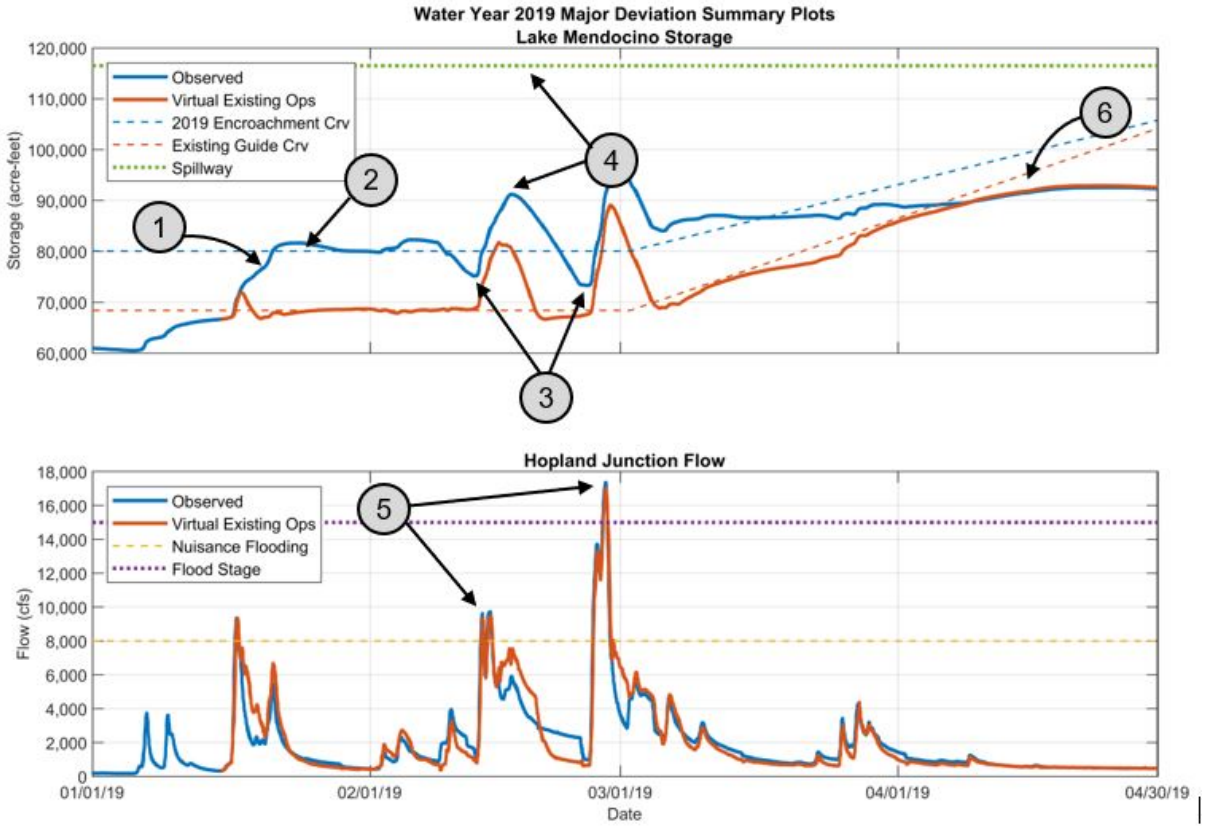


Figure 6. Plots of Lake Mendocino storage and Russian River flows at Hopland from January 1 to April 30, 2019. Callouts 1-6 depict points of interest described above.

Summary of WY 2020 Planned Major Deviation Reservoir Operations

WY 2020 was very dry compared to WY 2019, and to date Ukiah has receive received 14.7" of rain, which is approximately 40% of normal and 34% of WY 2019 and the 3rd driest year out of 127 year record. A plot of Lake Mendocino storage and downstream flows in the Russian River at Hopland from January through May 2020 is shown in Figure 7 below. As in Figure 6, Figure 7 also includes results for both observed conditions and simulated (virtual) existing operations, which approximates outcomes for Lake Mendocino and the Russian River if the WY 2020 Planned Major Deviation was not implemented. It can be seen in Figure 7 that some small storms in December increased storage levels (solid blue line) above the existing guide curve (red dashed line) where virtual existing operations began simulating operations to maintain level at or below the guide curve. Larger storm events in mid to late January, as well as increased diversions from PVP in February, further increased storage levels to the top of the encroachment curve (blue dashed line). In contrast, the storage levels under virtual existing operations were maintained at the existing guide curve from mid-December through mid-

February. Comparing current storage levels to virtual existing operations shows significant benefits to water supply from FIRO of approximately 11,000 acre-feet, which is an 18% increase over existing operations.

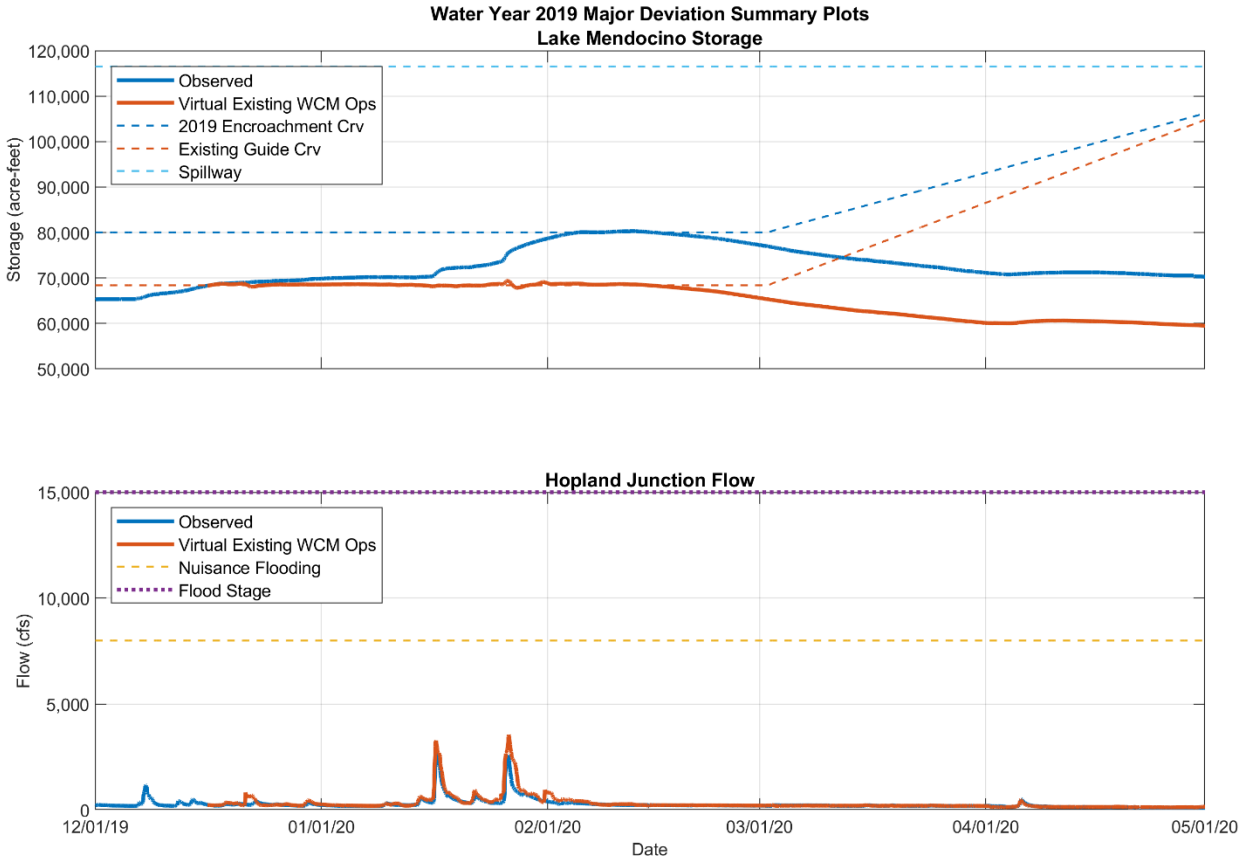


Figure 7. Plots of Lake Mendocino storage and Russian River flows at Hopland from January 1 to May 1, 2020.

1.4 Authority

The USACE's construction of Coyote Valley Dam and Lake Mendocino was authorized by section 204 of the Flood Control Act of 1950, Publ L. No. 81-516, in accordance with the Chief of Engineers' Report dated November 15, 1949, House Doc. Number 518 (Oct. 10, 1966), for the purposes of flood control, water supply, recreation, and streamflow regulation.

1.5 Purpose of the Environmental Assessment

This Environmental Assessment (EA) assesses the effects of the proposed water control manual deviation on the environment to determine whether an Environmental Impact Statement (EIS) or a Finding Of No Significant Impact (FONSI) should be prepared. This EA has been prepared in accordance with the National Environmental Policy Act (NEPA) (42 USC § 4321 *et seq*), as amended, and the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of the NEPA (40 C.F.R. pts. 1500-1508), which

requires full disclosure of the environmental effects, alternatives, potential mitigation, and environmental compliance procedures of the proposed action through an EA. This EA describes the need for the proposed action, a discussion of alternatives considered, including the No Action alternative, and the potential environmental effects associated with the proposed action.

1.6 Decision Needed

The District Engineer, commander of the San Francisco District of the USACE, will decide whether or not the proposed water control manual deviation qualifies for a finding of no significant impact (FONSI) or whether an EIS must be prepared. The decision on whether to allow the deviation to proceed will be made by USACE's South Pacific Division in San Francisco, California.

CHAPTER 2.0 Alternatives

2.1 Alternatives Eliminated from Further Consideration

The FIRO Steering Committee considered five alternatives for FIRO as described in the FVA (in prep.). The No Action (existing water control plan operations) and Proposed Action (Hybrid and Modified Hybrid operations) alternatives are described in this chapter. Two other alternatives, Ensemble Forecast Operations (EFO) and the 5-day Deterministic Forecast, were also considered in the FVA, but eliminated from further consideration. The EFO alternative performed well in improving water supply reliability related to storage and available water for release to support salmonid habitat in the Russian River and the 5-day Deterministic Forecast was comparable to the Proposed Action, neither alternative improved potential for recreation impacts (the number of days during the recreation season during which access to Bushay Campground may be limited), power production impacts, nor improved flood risk management over the Proposed Action. The EFO and 5-day Deterministic Forecast alternatives are not considered further in this EA.

2.2 No Action

The USACE would not approve the requested major water control manual deviation under the No Action Alternative. As a result, the flood control releases from Lake Mendocino would continue to be made in accordance with the existing tools and protocols available to inform USACE flood managers for managing reservoir operations at Lake Mendocino. Drawdown to the winter top of conservation pool (TOC) begins October 1 and is to be complete by November 1. The increase in spring storage can begin March 1 and can be complete on May 10. No forecasts are utilized. Storage above the rule curve is always evacuated as quickly as feasible. FIRO's goal to help restore some of the diminished water supply reliability without reducing the existing flood protection capacity of Lake Mendocino would not be met and a maximum additional storage of 11,650 acre-feet between November 1 and February 28 would not be achieved.

2.3 Proposed Action

Members of the FIRO Steering Committee are requesting USACE approval of a multi-year planned major deviation to store additional water above the existing guide curve for the Coyote Valley Dam - Lake Mendocino WCM for WY 2021 through WY 2026 within the shaded region shown in Figure 1. If approved, this would result in an additional storage of 11,650 acre-feet between November 1 and February 28 in each year (consistent with the Hybrid alternative of the FVA), with an option to begin the increase in spring storage on February 15 (consistent with the Modified Hybrid alternative). This would bring the retention of storage up to 80,050 acre-feet at mid-winter. Above this storage level, excess water would be released according to the release constraints defined in the WCM. Figure 1 shows the existing guide curve for the Coyote Valley

Dam - Lake Mendocino WCM and the proposed encroachment curves with the requested changes. Tables A-1 and A-2 provided in Appendix A summarizes the daily maximum deviation limit values under the Hybrid (begin spring increase in storage on March 1) and Modified Hybrid (begin spring increase in storage on February 15) options. The Proposed Action is very similar to, and an expected progression of, the approved major deviations of WY 2019 and 2020, with the addition of an early, February 15, increase in spring storage option, which the USACE could exercise at their discretion if conditions allow.

In WY 2019, the Hybrid model was used without the option to draft into the water conservation space. In WY 2020 the Hybrid model was used with the option to conditionally draft into the water conservation space. The Proposed Action again includes the option to conditionally draft into the water conservation space in advance of significant storm events. Such pre-releases would be allowed if: (1) such a release is recommended by the FIRO decision support tools; and (2) Sonoma Water is consulted about the pre-releases and approves of the action in coordination with the National Marine Fisheries Service. If water levels are within the storage space allowed by this deviation, the USACE will have the discretion to utilize the additional information provided to inform reservoir operations.

As part of the planned major deviation under the Proposed Action, members of the FIRO Steering Committee are also requesting that the USACE include and leverage the Russian River Decision Support System (RR-DSS), developed by Sonoma Water as part of the tools and protocols the USACE uses to manage reservoir operations at Lake Mendocino. The RR-DSS was developed to support the reservoir operations during the WY 2019 and WY 2020 major deviations to supplement USACE's current suite of tools to support reservoir management. The RR-DSS provided USACE operators with real time modeling and analysis to assist with managing water retained in the flood control pool as requested by the major deviations. A flowchart depicting the major components and primary process steps of the RR-DSS is provided in Figure 8 below. The RR-DSS was modeled after the highly successful Yuba-Feather Forecast Coordinated Operations (FCO) interface that resides on California Data Exchange Center (CDEC) and is operationally supported by DWR. The Yuba-Feather FCO program is a 10-year collaboration between Yuba County Water Agency, DWR's State Water Project, and USACE's Sacramento District with support from NOAA that provides a common operating picture of the current and forecast weather and streamflow conditions from which improved reservoir regulation decisions can be made to better meet all partners' objectives.

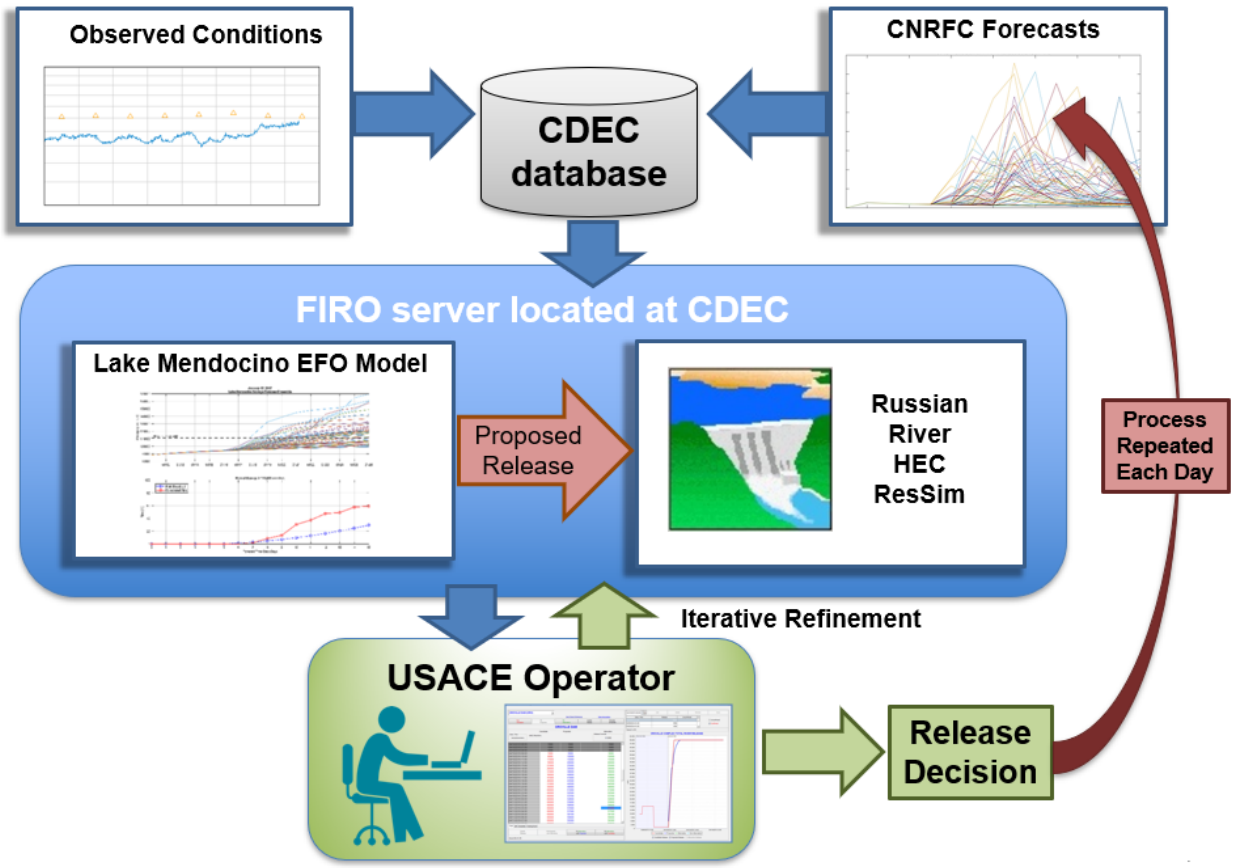


Figure 8. RR-DSS process flowchart for FIRO Implementation at Lake Mendocino.

The RR-DSS includes an HEC-ResSim implementation as well as the Sonoma Water Lake Mendocino EFO Model, which utilizes an ensemble of streamflow predictions provided by the CNRFC and current and anticipated reservoir storage and downstream conditions to formulate forecast-based release recommendations. The RR-DSS is described as “Hybrid Operations” in the PVA (Jasperse, et al., 2017) and further detailed in a report prepared by Sonoma Water (Sonoma Water, 2016).

USACE reservoir operators will retain full authority for flood control, with the RR-DSS providing an additional tool for operators. Consistent with FIRO project goals, the RR-DSS is available to the project team to aid in identifying opportunities for refinement and improvement. As with all Lake Mendocino FIRO components, the RR-DSS is being designed, developed and deployed by the interagency FIRO team. A schematic of the RR-DSS is shown in Figure 8. The system was successfully used by USACE San Francisco District operators and Sonoma Water during WYs 2019 and 2020.

The incremental difference between the WY 2020 planned major deviation and the Proposed Action is fully captured in the difference between the Hybrid model and the Modified Hybrid model. In the extensive evaluation performed in support of the FVA, the Modified Hybrid model provided the highest level of benefits by virtue of both objective and expert-elicitation evaluation of multi-purpose sixteen metrics.

CHAPTER 3.0 Affected Environment and Environmental Consequences

This section describes the environmental resources in the project area as well as any effects of the alternatives on those resources. When necessary, mitigation measures are also proposed to avoid, reduce, minimize, or compensate for any significant effects.

3.1 Environmental Resources Not Considered in Detail

Initial evaluation of the effects of the project indicated that there would likely be little to no effect on several resources. These resources are discussed below to add to the overall understanding of the project area.

3.1.1 Air Quality and Climate Change

Mendocino County is located within the North Coast Air Basin. The North Coast Air Basin is comprised of the counties of Del Norte, Trinity, Humboldt, Mendocino, and that region of Sonoma County designated as the Northern Sonoma County Air Pollution Control District. For the purposes of regulating and monitoring air quality, Lake Mendocino and Mendocino County are under the jurisdiction of the Mendocino County Air Quality Management District, whose boundaries are coterminous with the existing boundaries of Mendocino County.

The proposed major deviation would not result in direct emissions of criteria pollutants or greenhouse gases from equipment, processes, or vehicles either on- or off-site. Therefore, no Federal air quality standards would be violated and the project would not hinder the attainment of air quality objectives in the North Coast Air Basin.

The Lake Mendocino Hydroelectric Plant at Coyote Valley Dam is operated and maintained by the City of Ukiah Electric Utility Department. The facility has a capacity of 3.5 MW (City of Ukiah, 2014) and an annual production of 3,000 to 10,000 megawatt hours (MWh) per year, depending on the water year (Grandi, 2016). These estimates translate to approximately 2.8 to 9.2 percent of the City's electrical energy needs, which totaled 108,335 MWh in 2018 (California Energy Commission, 2019). The remaining electricity demand is met through the Northern California Power Association (NCPA). During the most recent three years for which data is available, 2016 through 2018, from 40 to 66 percent of the City's electricity came from renewables and large hydroelectric sources (City of Ukiah, n.d.).

While the timing of power production could shift as a result of the Proposed Action, the total amount of power produced annually is anticipated to increase slightly over baseline conditions. Improved forecasting would allow dam operators to make moderate, sustained releases for longer time periods ahead of incoming storms rather than large releases immediately ahead of incoming storms. This may increase the length of time that the releases produce power and reduce the peak power production rate, but would slightly increase the total amount of power produced by those releases. When no precipitation is forecasted, releases may be reduced

during the winter but water held in the reservoir would be released the following summer and fall, thus shifting the timing of power production.

These changes in timing would not impact the City of Ukiah's ability to meet the 33 percent Renewable Portfolio Standard (RPS) for 2020. Therefore, no affect to climate change is anticipated and the Proposed Action would not hinder the attainment of climate change objectives in the North Coast Air Basin.

The Proposed Action could enable operators to adapt dam operations to an increasingly variable climate. By making improved forecasting data available to dam operators, the FIRO effort would allow operators to prepare for large precipitation events by releasing water to prevent downstream flooding or, conversely, to retain water longer when no precipitation is forecasted. The Proposed Action, therefore, would be beneficial with regard to climate change adaptation.

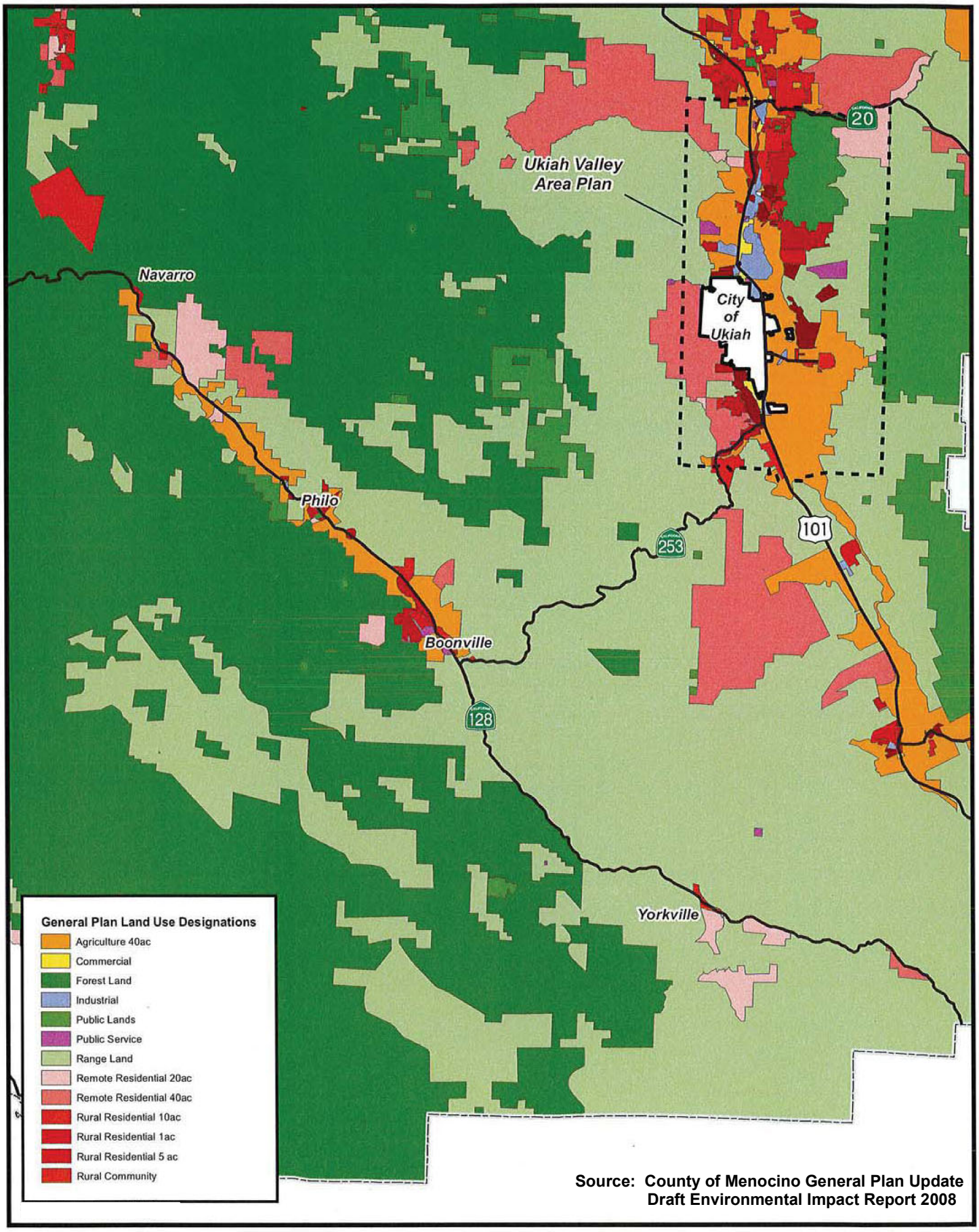
3.1.2 Land Use and Socioeconomics

Lake Mendocino falls within the *Ukiah Valley Area Plan (2011)* (UVAP) for Mendocino County, California. The UVAP is an element in the Mendocino County General Plan governing land use and development on the unincorporated lands in the Ukiah Valley. However, this portion of the county is not subject to Mendocino County's government land use planning authority. Figure 9 identifies the non-jurisdictional landholders in the county.

The UVAP focuses on issues and elements of importance to the growth and development of the Ukiah Valley. Figure 10 identifies Lake Mendocino as Public Lands in the Ukiah Valley planning area. A large portion of land surrounding Lake Mendocino is designated as Remote Residential and Range Lands. Other areas include Agricultural, Rural Residential with 1, 2, 5, and 10 acre minimums and very limited areas of Suburban Residential (Figure 9).

The UVAP goals and policies guide development of higher density residential uses generally be located within the City of Ukiah's sphere of influence and the City itself in order to concentrate development in areas with adequate services and access and limit impacts to resource lands. These policies maintain a well-balanced land use pattern, ensuring compatibility among adjacent uses and satisfying the economic, social, and environmental requirements of the community. The project is located on Federally-owned land. The Proposed Action would have no effects on or changes to land use plans.

Ukiah is the largest city in the UVAP and encompasses an area of 4.7 square miles and has an estimated 2016 population of 15,882 people (U.S. Census, 2016). Mendocino County has a population of 86.4 percent white, 25 percent Hispanic or Latino, 1 percent African American, 6.3 percent American Indian and Alaska Native, 2.1 percent Asian and 0.2 percent Native Hawaiian and other Pacific Islander and 4.0 percent of two or more races with 19 percent of the population below the poverty level (U.S. Census, 2016). No relocations would occur as a result of the water control manual deviation, and no populations would be displaced as a result of approving the temporary change in operation.



Source: County of Menocino General Plan Update Draft Environmental Impact Report 2008

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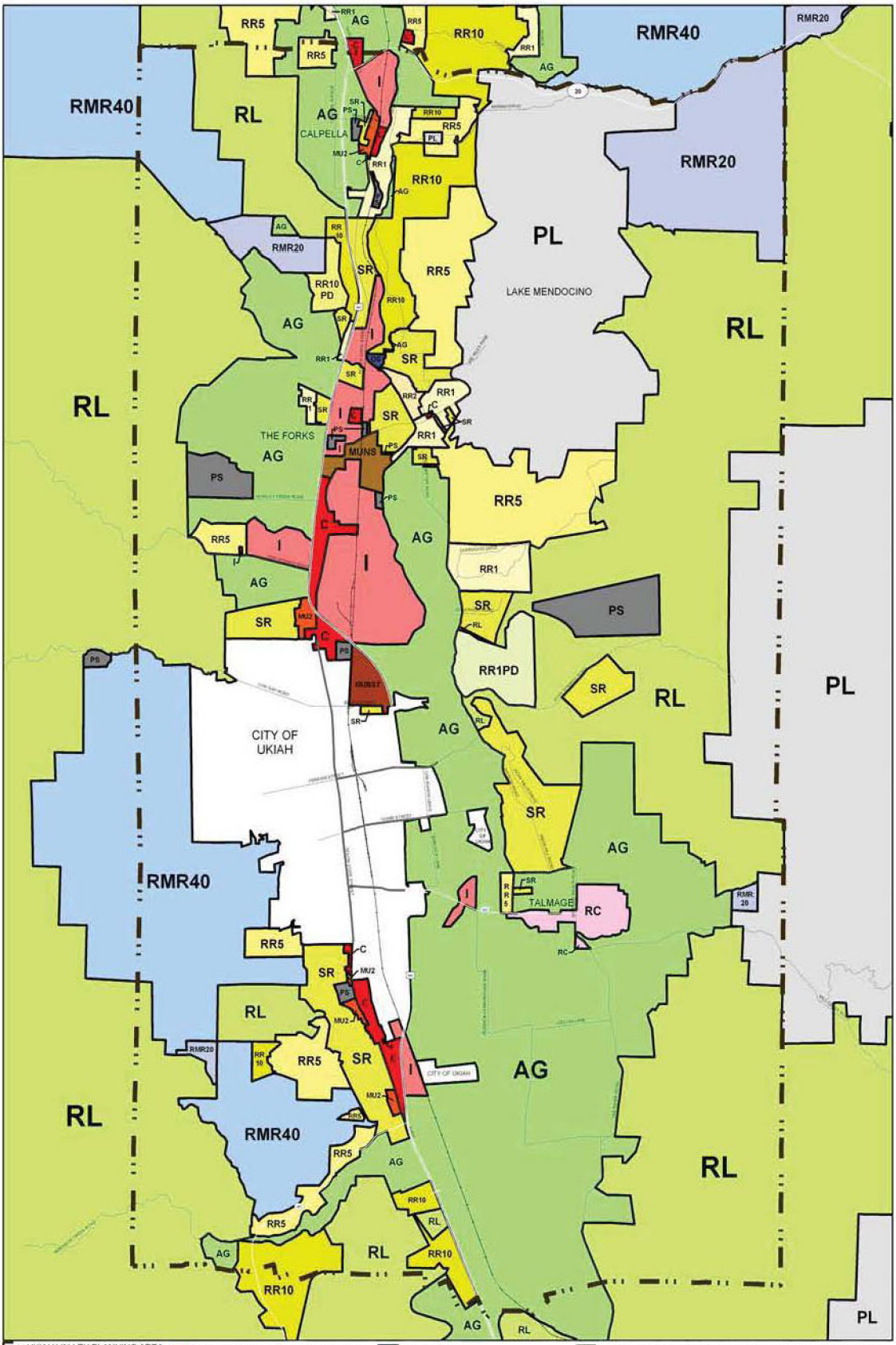
US Army Corps of Engineers ®
San Francisco District

Lake Mendocino Major Deviation Request

Mendocino County General Plan Land Use Designations

2 0 2 Miles

Figure 9



Source: Mendocino County Planning & Building Services

This map is provided as a visual display of county information.
Reasonable effort has been made to ensure the accuracy of the map and data provided, nevertheless som information may not be accurate.

August 2011

T:\water transmission\Water_Supply\W0045C018-MendocinoRes-FIRO\Fig_3.2_2-2.mxd 1/10/2018

US Army Corps of Engineers ®
San Francisco District

Lake Mendocino Major Deviation Request
Land Use and Public Land

N

0.5 0 0.5 Miles

Figure 10

In compliance with Executive Order (EO) 12898, Environmental Justice, the USACE evaluated the potential effects of the Proposed Action on low-income and minority population. The Proposed Action does not have the potential to cause disproportionately high and adverse impacts on low-income and minority populations. No relocations would occur as a result of the water control manual deviation, and no populations would be displaced as a result of approving the temporary change in operation.

3.1.3 Noise

The proposed major deviation request would not expose persons to or generate noise levels in excess of standards established in county or city plans, ordinances, or applicable standards of other agencies. In addition, it would not expose persons to or generate ground-borne vibration or ground noise levels, or substantially increase ambient noise levels. Modifying the reservoir storage curve and using the RR-DSS would not impact noise levels in the Lake Mendocino area. The proposed water control manual deviation would have little to no effect on noise.

3.1.4 Traffic

Highway access to Lake Mendocino is provided by State Highway 101 to the west and State Highway 20 to the north. The major deviation request would not involve any new construction and would not result in an increase in traffic that is substantial in relation to existing traffic load or capacity of the street system. Thus, there would be no changes to traffic or transportation associated with modifying the reservoir storage curve and using the RR-DSS. The proposed water control manual deviation would have little to no effect on traffic.

3.1.5 Fisheries

The fish community in Lake Mendocino is dominated by non-native warm water species such as largemouth bass (*Micropterus salmoides*) and redear sunfish (*Lepomis microlophus*), with lesser numbers of smallmouth bass (*Morone saxatilis*), green sunfish (*Lepomis cyanellus*), bluegill (*Lepomis macrochirus*), and channel catfish (*Ictalurus punctatus*) being caught. A few native species inhabit the lake, including Sacramento sucker (*Catostomus occidentalis*) and Sacramento pikeminnow (*Ptychocheilus grandis*). Lake Mendocino supports recreational fishing. Implementation of the Proposed Action could increase the size of the reservoir pool on a temporary basis in each year over a period of up to five years and would not impact the fisheries resources in Lake Mendocino. Warm water fish species such as sunfish spawn in Lake Mendocino during the spring months (typically beginning in late March). Sunfish species spawn in relatively shallow water depths (approximately 0.5 to 6 feet, depending on species). During the spring months, water surface elevation in the reservoir would rise or fall depending on the amount of inflow or outflow (releases from the reservoir). As shown in Figures C-11-C-14 in Appendix C, reservoir storage and releases during the spring spawning period are not anticipated to fluctuate more than the No Action alternative (existing operations) and would not result in impacts to fish spawning in the reservoir. Beginning the spring fill on February 15 or March 1, as described in the Proposed Action, would precede the spawning season for sunfish in the reservoir and operations during the spawning season would be similar to the No Action alternative.

There are no anadromous fish species in Lake Mendocino. The Russian River downstream of the Lake Mendocino supports special-status anadromous salmon that rely on releases from the reservoir. These species are discussed further under Section 3.5, Special-status Species.

The Proposed Action is not associated with river flows on the West Fork of the Russian River, therefore no impacts to fisheries resources would occur.

Coyote Valley Dam impounds the East Fork of the Russian River (Figure 1). There are no anadromous fish species in the reaches of the East Fork Russian River upstream of Lake Mendocino; however, there are warm water species present. The Proposed Action would not alter flows from the East Fork to Lake Mendocino and would not impound additional reaches of the East Fork, therefore, no impacts to fisheries resources would occur upstream of Lake Mendocino.

3.1.6 Visual Resources

Lake Mendocino is located on the East Fork Russian River near the City of Ukiah. Water-based boating, swimming, fishing, and camping are popular at Lake Mendocino. The reservoir is surrounded by views of oak woodland hills. A 15-mile network of trails can be used to hike, bike, or horse ride, and provides access to a 689-acre Wildlife Management Area. Fishing is popular at Lake Mendocino (U.S. Army Corps of Engineers, 2015). The public can view the reservoir from multiple view points from the trail network near the reservoir, as well as from boats on the reservoir.

Currently, the conservation space elevation fluctuates seasonally, with corresponding change in the viewshed at the lake. The proposed water control manual deviation and increased reservoir pool size would have a temporary effect on visual resources from the increased reservoir level. However, this temporary effect would be minor and conditions would return to normal following the deviation. The proposed water control manual deviation would have little to no effect on visual resources.

3.1.7 Safeguarding the Nation from the Impacts of Invasive Species

Invasive species have negative impacts on the environment and natural resources. Every year, invasive species cost the United States billions of dollars in economic losses and other damages (E.O. 13751). Since their initial discovery in 1989, zebra and quagga mussels have had dramatic impacts on ecosystems and economy, including changes to the food web, degrading fish habitat, interfering with drinking water systems and damaging tourism and recreation economies. Year-round watercraft inspections occur at Lake Mendocino to help prevent the introduction of mussels and to safeguard the water supply. The increase in reservoir pool size would not result in an increase in introduction, establishment, and spread of invasive species.

3.2 Cultural Resources

3.2.1 Existing Conditions

Prehistoric Context

The earliest archaeological evidence indicates that human occupation of California began at least 12,000 years ago (Erlandson, et al., 2007). Early occupants appear to have had an economy based largely on hunting and foraging, with limited exchange, and nomadic social structures based on the extended family unit. Later, milling technology and an inferred acorn economy were introduced. This diversification of economy appears to have arisen along with the development of sedentism and population growth and expansion. Sociopolitical complexity and status distinctions based on wealth are also observable in the archaeological record, as evidenced by an increased range and distribution of trade goods (e.g., shell beads, obsidian tool stone), which are possible indicators of both status and increasingly complex exchange systems (Barrow & Caskey, 2015).

In the regions north of the San Francisco Bay that became Sonoma, Marin, and Mendocino counties, Pomo, Wappo, and Coast Miwok (California Indian Library Collections, 2015) settled in village communities. Members of these nations lived in tribal groups made up of numerous autonomous village communities or tribelets. Within these tribelets were one or two central villages that were surrounded by up to a dozen smaller outlying villages. The tribelet occupied a specific tract of land and often spoke a distinct dialect. North San Francisco Bay tribelets followed a hunting and gathering subsistence pattern, with acorns providing a year-round food staple. They maintained permanent winter villages and set up temporary outlying camps during the summer to gather seasonal resources.

Pomo

The Pomo are one of the best-known aboriginal groups in California. Pomo settlements were distributed throughout nearly the entire Russian River watershed, but were most concentrated in the Russian River valley. Among the California Indians, the Pomo are noted for their great variety in basketry woven from tough pliable fibers of sedge roots, rye grass, and other plant species (Barrett, 1908). Pomo basketry serves a multitude of purposes ranging from cooking, storing food, religious ceremonies, trapping, and baby baskets. The craftsmanship of Pomo basketry is often admired for its rich traditional design and ornamentation.

Northern Pomos inhabited present-day Mendocino County, extending from Cleone on the coast, east across the Coast Range to the Laytonville area, and south to Ukiah and the valley in which Lake Mendocino is now located. Their territory included the upper reaches of the Russian River watershed. The valleys and foothills they inhabited contained abundant resources and had a mild climate.

The Central Pomo occupied the area from the mouth of the Navarro River, south to Gualala, west to Cloverdale and north to Ukiah.

The Kashaya Pomo (Southwestern Pomo) occupied most of Sonoma County. The Kashaya territory consisted primarily of rocky coastline and redwood forest from Stewarts Point south to Jenner. Their territory included the mouth of the Russian River and the Austin Creek drainage area. Shellfish, sea mammals, and salmon were major resources. Village sites were situated along the coast and on inland ridges.

The Southern Pomo occupied the Russian River drainage south of the Mendocino-Sonoma county line near Cloverdale south to Santa Rosa and Cotati (Kroeber, 1970).

Records and Literature Search

This entire area was subject to a record search in 2020 at the California Historical Resources Information System's Northwest Information Center located at Sonoma State University. The record search area includes the Lake Mendocino boundary and a 0.5 mile buffer around the lake. Documentation for this records search is on file under NWIC File No. 19-1990. A Sacred Lands File Search was also completed through the Native American Heritage Commission (NAHC) to determine if the NAHC had any knowledge of Native American cultural resources (e.g. traditional use or gathering areas, places of religious or sacred activity, traditional cultural properties). The results of the Sacred Lands File Search concluded there are resources present within the records search area.

Previously identified sites were evaluated for their eligibility for listing in the National Register of Historic Places (NRHP). NRHP recommendations were also completed for newly documented sites. As a result of the records search, it was determined that 35 cultural resources have been recorded within the record search area. Of these resources recorded within the record search area, 32 are either inundated or have been recommended ineligible for NRHP listing (Cox et al. 1977a; Fenenga 1947b, 1947c, 1947d, 1948b; Fredrickson and Origer 1977; Lake Mendocino Cultural Resources Study Personnel 1976; Minor 2010a, 2010b, 2010c,2010d, 2010e, 2010f, 2010g, 2010h, 2010i, 2010j, 2010k, 2010l, 2010m, 2010n; Newland 1997;Stoddard 1977a, 1977b, 1977c, 1978; Treganza 1957a, 1957b, 1957c, 1957d, 1957e, 1957f, 1957g,1957h, 1957i, 1957j, 1957k). There are two resources that are both potentially eligible for inclusion on the NRHP. However, these two resources are found at elevations higher than the area of potential effects (APE) where water levels are expected to increase and would not be affected by the Proposed Action. The third resource within the records search area is downstream of Coyote Valley Dam and will not be affected by proposed changes in water levels.

3.2.2 Environmental Effects

Basis of Significance

Any adverse effects on cultural resources that are listed or eligible for listing in the NRHP (i.e., historic properties) are considered to be significant. Effects are considered to be adverse if they:

- Alter, directly or indirectly, any of the characteristics of a cultural resource that qualify that resource for the NRHP so that the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association is diminished.

No Action

Under the No Action alternative, the USACE would not approve the requested major water control manual deviation. As a result, the flood control releases from Lake Mendocino would continue to be made in accordance with the existing tools and protocols available to inform USACE flood managers for managing reservoir operations at Lake Mendocino. There would be no effect on cultural resources existing in the area of potential effect because current conditions would remain unaltered.

Proposed Action

Effects to cultural resources would be from water inundation through the raising of the water level along the project APE, which is a narrow strip of Lake Mendocino's shoreline between the reservoir's gross pool level of 734 feet and the proposed increased level up to 750 feet mean sea level (msl). The three sites that are potentially eligible for listing in the NRHP within the APE are located at elevations that surpass the proposed increased water levels or are downstream from the Coyote Valley Dam. Therefore, pursuant to 36 C.F.R. § 800.4(d)(1), the USACE determined that the Proposed Action will not affect historic properties.

Cultural resources would be vulnerable to damage by inundation of areas not previously subject to inundation; however, because the range of water surface elevations in Lake Mendocino would remain within reservoir's existing operational levels, no new areas would be inundated as a result of the Proposed Action and no impact is anticipated.

Certain plant species located in the vicinity of Lake Mendocino serve an ethnobotanical purpose for the Pomo tribal bands today, primarily for basket weaving. Vegetation along the shore of Lake Mendocino has been determined by seasonal fluctuations in reservoir elevation that occur under existing operations. The maximum water surface elevation at the reservoir would remain the same as existing operations under the Proposed Action. The maximum water surface elevation determines the transition location from upper shoreline to upland vegetation. Annual plant species may seasonally colonize exposed shoreline areas. Because there would be no change in maximum water surface elevation, upland vegetation beyond the shoreline is not anticipated to change and there would be no impact to culturally significant plants. The proposed water control manual deviation would have little to no effect on cultural resources.

3.2.3 Mitigation

No impact to cultural resources would result from implementation of the Proposed Action and no mitigation is needed or proposed.

3.3 Recreation

3.3.1 Existing Conditions

The Lake Mendocino Recreation Area offers a variety of recreational activities, including boating, water skiing, swimming, camping, fishing, hunting, picnicking, mountain biking, horseback riding, and sightseeing. Lake Mendocino recreation facilities are open year round; however, the summer months of June through August are the most popular months for boating

activities on the reservoir. Lake Mendocino offers four large day-use areas with covered picnic shelters and barbeques (Figure 11). Lake Mendocino provides boating, swimming, water skiing, and fishing opportunities. Fishing for large and small mouth bass, striped bass, crappie, blue gill and catfish are popular sport fish at Lake Mendocino. There is a 700-acre wilderness area where native wildlife can be viewed on the east side of the reservoir, which is accessible by boat or by driving or walking down Inlet Road. Camping at Lake Mendocino is available at Kyen Campground, Bushay Recreation Area, and Chekaka Recreation Area. Kyen Campground offers 102 campsites, Bushay Recreation Area offers over 100 campsites, and Chekaka Recreation Area offers 17 campsites. There are approximately 15 miles of trails around Lake Mendocino that are accessible to mountain bikers and hikers. Horseback riders are allowed on designated trails. Lake Mendocino provides 1,750 surface acres of water that are accessible by canoe, sailboat, motorboats, or other water vessels. Boat launching is provided at public boat ramps located at the northern end of Lake Mendocino off of Marina Drive (North Boat Ramp) and at the southern end of Lake Mendocino near Coyote Valley Dam (South Boat Ramp).

Many of the recreation facilities are built at or slightly above 748 feet mean sea level (msl). Inlet Road is built at approximately 750 feet msl. Under the No Action baseline conditions, approximately 30 percent of the time, during winter months, Inlet Road floods and Bushay Recreation Area is closed due to inaccessibility. High lake levels can continue into late spring and early summer prolonging inaccessibility to these areas.

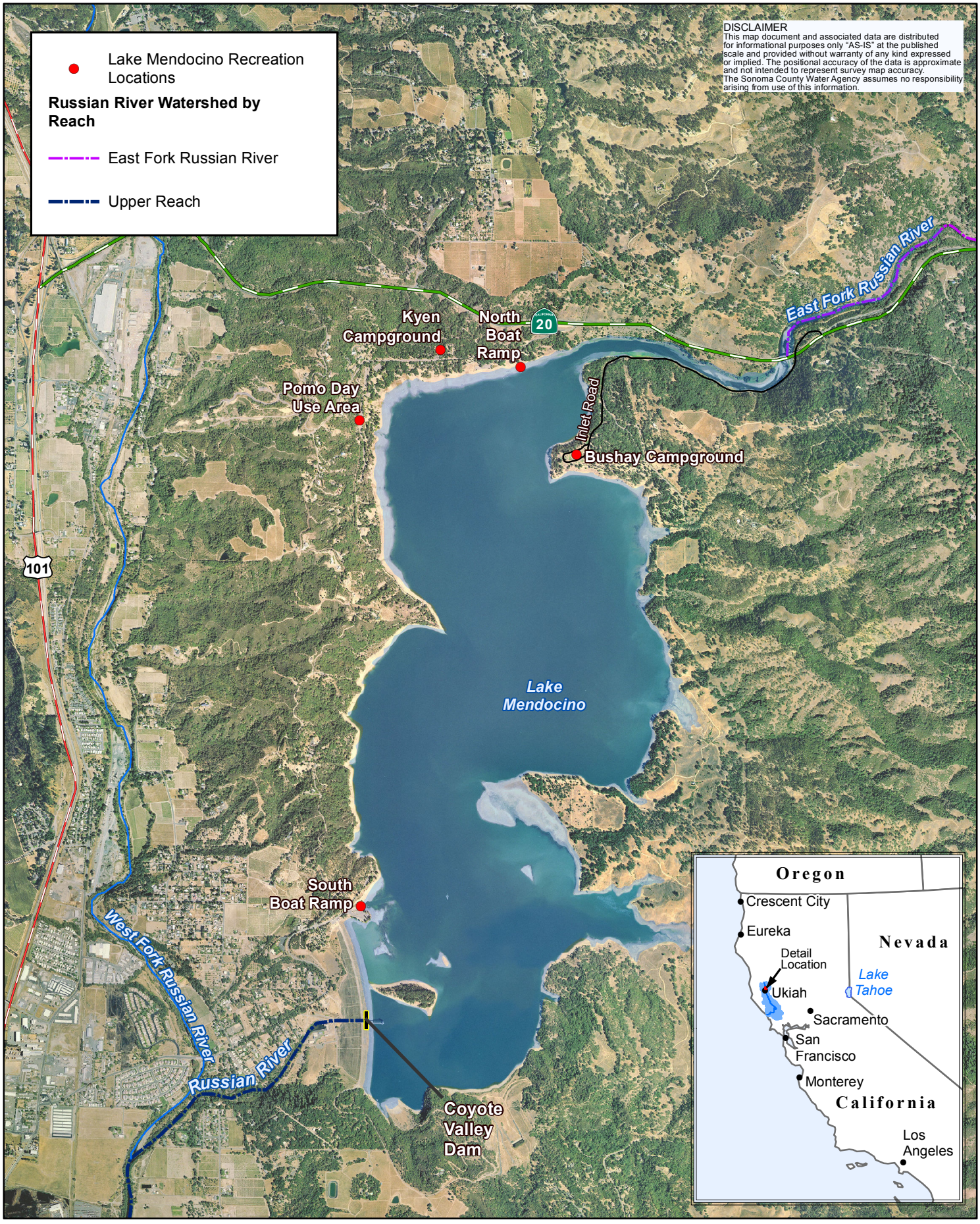
3.3.2 Environmental Effects

Basis of Significance

An alternative would be considered to have a significant effect on recreation if it would result in loss of recreational facilities, cause a substantial disruption in a recreational activity or opportunity, or substantially diminish the quality of the recreational experience. Since recreation occurs primarily from June through September, a seasonal component to potential impacts to recreation is considered. However, since recreation facilities are open year round, impacts to recreation during the year as a whole (October through September) are often presented as well.

No Action

Under the No Action alternative, the USACE would not approve the requested major water control manual deviation. As a result, the flood control releases from Lake Mendocino would continue to be made in accordance with the existing tools and protocols available to inform USACE flood managers for managing reservoir operations at Lake Mendocino. Temporary closures would occur to Inlet Road and Bushay Recreation Area when reservoir levels reach above 750 feet msl. These occurrances are in compliance with the water control manual and would be considered part of the standard reservoir operations. The associated impacts would not be subject to any mitigation, as a result, these impacts would be considered less than significant.



US Army Corps of Engineers
San Francisco District

Lake Mendocino Major Deviation Request

Lake Mendocino Recreation Locations

N

0 0.25 0.5 Miles

Figure 11

Proposed Action

Modifying the reservoir storage curve and utilizing the RR-DSS would allow for additional recreational opportunities with increased water elevations throughout the year. Higher lake levels increases visitors numbers and provides picnic areas and campgrounds with enhanced access to the lake making them closer to the water.

Under the Proposed Action, the frequency of higher water elevations that would extend longer into the recreational season could increase to approximately 50 percent of the time (FIRO Final Viability Assessment, in prep.). The quality of the recreational experience would be slightly diminished by the Proposed Action due to the inaccessibility of Inlet Road and Bushay Recreation Area due to temporary inundation of a portion of the road. Even though the closure of the Bushay Recreation Area may cause a short term disturbance to a limited number of recreationists, the additional storage of water will ensure a longer recreation season with more water in the lake for the 4th of July and Labor Day holidays, providing enhanced recreational opportunities for the larger recreating public. As a result, the temporary effects to recreation would be considered less than significant. The range of water surface elevations at Lake Mendocino would remain within the reservoir's existing operational levels. No recreational facilities would be permanently lost as a result of the proposed water control manual deviation.

3.3.3 Mitigation

Modifying the reservoir storage curve and utilizing the RR-DSS would increase the frequency of inaccessibility of Inlet Road and Bushay Recreation Area due to temporary inundation of a portion of the road. Since the disruption in access to the Bushay Recreation Area is temporary in nature, and other recreation areas around the reservoir will be accessible and available to recreationists to provide the same recreational opportunities, this effect is considered less than significant, and no mitigation is proposed.

3.4 Special-status Species

For the purpose of this section, special-status species are wildlife species that meet one or more of the following definitions: species listed or proposed for listing as threatened or endangered under the federal Endangered Species Act (ESA) (50 C.F.R. § 17.11); or species that are candidates for possible future listing as threatened or endangered under the federal ESA (84 FR 54732).

3.4.1 Existing Conditions

The federal Endangered Species Act (ESA) of 1973 (16 U.S.C. §§ 1531 – 1599) provides legal protection for plant and animal species in danger of extinction (50 C.F.R. pt. 17). This act is administered by the U.S. Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service.

A list of Federally listed, proposed, and candidate species that may occur in the project area was obtained on June 5, 2020, via the USFWS Information for Planning and Consultation (IPaC) website (United States Fish and Wildlife Service, 2020), the species by county reports for Sonoma and Mendocino counties (Service, Species by County Report, 2020), and the NMFS

lists of protected species and essential fish habitat (EFH) in the West Coast Region (NOAA, 2020). Anadromous species and their critical habitats are under the responsibility of NMFS. These information sources were used to generate a master list of species and habitats potentially present in the project area. The lists are provided in Appendix B.

In Mendocino and Sonoma counties, there are designated critical habitats for three protected salmonids (Chinook salmon, coho salmon, and steelhead) that inhabit the Russian River. Although these species do not occur in Lake Mendocino, a brief discussion of their life history is included since their critical habitats are near the project area. Additionally, a search of the California Natural Diversity Database (CNDDB) conducted on June 19, 2020, indicated that there are reported occurrences of Federally listed species near the project area. Species' known ranges and habitat constraints were evaluated and those determined to have the potential to occur in the project area at Lake Mendocino are discussed below.

The area of potential effect consists of Lake Mendocino and its shoreline. For the purposes of describing biological resources that may be affected by the Proposed Action, the lateral extent of the project area consists of the shoreline and adjacent vegetation that is dependent on the river or lake for water. The Lake Mendocino project area boundary extends along the upper shoreline. Regulated water levels in these reservoirs create an abrupt change between barren shoreline and upland vegetation with no extensive riparian zone present

Special-status Plants

Based on review of the databases and other information sources, 29 special-status plant species have been identified as occurring in Sonoma and Mendocino counties (Appendix B-1 of Appendix B). For project-level evaluation, an official species list was requested via the IPaC website. The list identified three occurring or potentially occurring federally protected flowering plants in the vicinity of the project area (Appendix B-2 of Appendix B). However, two of these plants are considered unlikely to occur within the project area for reasons such as absence of essential habitat requirements for the species, or the distance to known occurrences and/or the species distributional range. These species are listed in Appendix B-3 of Appendix B and not discussed further in this section. The remaining plant is considered to have moderate potential to occur within the project area, based on known occurrences and availability of suitable habitat.

Burke's Goldfields

Burke's goldfields *(Lasthenia burkei)* is state- and federally-listed as endangered. It is an annual herb in the Aster family (Asteraceae) with a blooming period that extends from April to June. This plant grows in meadows, seeps vernal pools, and swales and occurs in Mendocino, Sonoma, Lake, and Napa counties.

The margins of the Russian River may contain seasonal wetlands, which may provide suitable habitat for Burke's goldfields. The project area contains sparse patches of marsh and grassland, which are potential habitat for the Burke's goldfields but likely experience inundation and flow velocities that would preclude its presence. The closest known occurrence was reported in 2010 near Coyote Valley Dam. Given the potential presence of suitable habitat and proximity to an

occurrence record near Coyote Valley Dam, this species has a moderate likelihood of occurring in the project area.

Special-status Wildlife

Based on review of databases and other information sources, 28 special-status animal species have been identified as occurring in Sonoma and Mendocino counties (Appendix B-1 of Appendix B). For project-level evaluation, an official species list was requested via the IPaC website. The list identified five wildlife species occurring or potentially occurring in the vicinity of the project area (Appendix B-2 of Appendix B). However, two of these species are considered unlikely to occur and two have a low potential to visit in the project area for reasons such as absence of essential habitat required for the species or the distance to known occurrences and/or the species distributional range. These species are listed on Appendix B-3 of Appendix B and are not discussed further in this section. The remaining special-status animal species, tricolored blackbird, is considered to have moderate to high potential to occur within the project area based on occurrences, known range, or availability of suitable habitat. While the tricolored blackbird is not listed on the IPaC species list, as a candidate species, it has moderate potential to occur within the project area. Therefore, a discussion of its nesting and foraging habitats and behavior are included. All species identified as occurring or potentially occurring in the vicinity of the project area are summarized in Appendix B-3 of Appendix B.

Amphibians

California Red-legged Frog

The California red-legged frog (*Rana draytonii*) is federally listed as threatened and is a California species of special concern (CDFW, 2016b). The USFWS released a recovery plan in 2002 (USFWS, 2002), and critical habitat for the California red-legged frog was designated in 2010 after several legal and regulatory actions (USFWS, 2010). There is no critical habitat for the California red-legged frog within the Russian River watershed.

The California red-legged frog ranges from coastal mountains from southern Mendocino County southward to northern Baja California, and inland to the Sierra Nevada foothills (Jennings & Hayes, 1994) (Shaffer, Fellers, Voss, Olivers, & Pauly, 2004). The frog has been apparently extirpated from approximately 70 percent of its historic range (USFWS, 2002). California red-legged frogs are usually confined to aquatic habitats such as creeks, streams, and ponds, and occur primarily in areas that have pools about 2 to 3 feet deep, with adjacent dense emergent or riparian vegetation (Jennings & Hayes, 1988) (Cook & Jennings, 2007). Adult frogs move seasonally between their egg-laying sites and foraging habitat, but they rarely move long distances from their aquatic habitat. Long-distance movement of more than two miles between aquatic sites has been reported (Bulger, Scott, & Seymour, 2003), but is likely a relatively rare event. California red-legged frogs breed from November to March. Egg masses are attached to emergent vegetation (Jennings & Hayes, 1994) and hatch within about two weeks. Metamorphosis generally occurs between July and September. This frog prefers freshwater and avoids brackish water greater than 4-9 parts per thousand (Jennings & Hayes, 1990).

California red-legged frog is known from several locations within the vicinity of the Russian River project area, including two tributaries of the Russian River. Aquatic habitats along Russian River and Lake Mendocino are not characteristic for this species and are likely unsuitable habitat due to an abundance predatory fish, crayfish, and bullfrogs.

Special-status Fish

There are three fish species in the Russian River watershed listed under the federal Endangered Species Act (ESA): Central California Coast steelhead (*Oncorhynchus mykiss*); Central California Coast coho salmon (*O. kisutch*); and California Coastal Chinook salmon (*O. tshawytscha*). Coho salmon are also listed under the California Endangered Species Act (CESA). These species do not occur in Lake Mendocino. Critical habitats for these species occur in the mainstem Russian River downstream of Lake Mendocino, but are not found in the reservoir or upstream in the East Fork Russian River.

Generalized Salmonid Life History

All three salmonids (Chinook salmon, coho salmon, and steelhead) inhabiting the Russian River exhibit a similar life history strategy known as anadromy. With an anadromous life style, juveniles rear in freshwater before migrating to the ocean where they grow and mature; finally returning as adults to freshwater to lay their eggs and begin the lifecycle anew. Although there are specific differences between salmonids, they all share several life history traits. After growing and maturing in the ocean, the adults of all three species return (generally) to the stream where they were born. The eggs are laid in a nest, called a redd. The freshwater residency is highly variable between the three species, but is marked by rapid growth followed by a physiological change known as smoltification. A salmonid undergoing this change is called a smolt. The smoltification process is necessary for salmon to convert from a physiology adapted to living in freshwater to one adapted to living in salt water.

Chinook salmon

Based on run timing, Chinook salmon inhabiting the Russian River are considered “fall-run.” Chinook salmon occupy the Upper and Lower Russian River seasonally from the estuary upstream into the West Fork Russian River. Chinook salmon have been documented to spawn in some tributaries to the Russian River, but usage of tributaries appears to be limited. Chinook salmon primarily spawn in the Russian River, upstream of Healdsburg.

Adult Chinook salmon have been observed at the Mirabel fish counting station as early as the last week in August through at least early February; however, the adult upstream migration consistently peaks in October and November (Chase et al. 2007; Martini-Lamb and Manning 2014). Chinook salmon are limited naturally in the basin to waters with sufficient flow to allow upstream migration and spawning during the fall/early winter timeframe. Spawning typically begins in November (Cook 2008), and often continues through at least early February. Juvenile Chinook emigrate through the Russian River from approximately late-February through July, with peak emigration from mid-April through mid-May.

Coho Salmon

Coho salmon primarily occupy streams in the lower Russian River watershed, primarily from the Maacama Creek sub watershed downstream. Coho salmon do not spawn or rear in the mainstem Russian River, but use it seasonally as a migration corridor.

Coho salmon have the most restricted habitat requirements of the three salmonid species inhabiting the Russian River. Coho salmon prefer cold (≤61° F); low gradient stream reaches that typically include dense riparian canopy.

Coho salmon have a fairly rigid life history, where they spend approximately one year in freshwater and two years in the ocean, although juveniles occasionally spend two years in freshwater, and a few adults return after one year in the ocean (mostly male fish). In other streams in California, coho migrate upstream in November and December, and spawning occurs primarily between December and January (Shapovalov and Taft 1954), (UCCE, n.d.). Since coho spawn in relatively small tributaries, they are dependent on rain to provide sufficient streamflow to allow for passage and spawning. Smolts emigrate March through May, with the peak occurring during the first two weeks of May.

Steelhead

Based on run timing, steelhead in the Russian River are considered “winter run.” Steelhead are the most widely distributed salmonid in the Russian River watershed, inhabiting most permanent tributary streams. Steelhead also utilize the mainstem Russian River as spawning and rearing habitat. Spawning habitat overlaps with Chinook salmon (mainly above Cloverdale). Limited steelhead rearing occurs in the mainstem Russian River with peak abundances recorded in the Canyon Reach located between Cloverdale and Hopland and near Ukiah (Cook 2003). Although steelhead are widely distributed in the basin, the overall population is likely depressed compared to historical levels.

Steelhead are flexible in their life history strategies and habitat requirements. Adult steelhead migrate primarily during the winter (December through March). Adult steelhead enter the Russian River from at least November through May, although based on hatchery returns peak migration occurs in January through March. Steelhead spawn in the upper mainstem river as well as most tributaries throughout the basin. Steelhead smolt primarily as two year old fish (Chase et al. 2005) although one-year-old smolts are observed in Dry Creek (Sonoma Water unpublished data). Steelhead smolts emigrate primarily during the spring (March through early June), as well as post-spawn adult steelhead (kelts).

3.4.2 Environmental Effects

Basis of Significance

Adverse effects on Federally listed, proposed, and candidate species were considered significant if an alternative would result in any of the following:

- Direct or indirect reduction in the growth, survival, or reproductive success of species listed or proposed for listing as threatened or endangered under the ESA.

- Direct mortality, long-term habitat loss, survival, or reproductive success of Federally-listed threatened or endangered animal or plant species.
- Have an adverse effect on a species' designated critical habitat.

No significant effects to Federally listed, proposed, or candidate species or critical habitat are anticipated from the Proposed Action. No potential for significant effects to Federally listed, proposed, or candidate species or critical habitat under the jurisdiction of the USFWS is anticipated. Given the presence of critical habitat and potential for presence of listed salmonid species downstream of Lake Mendocino, coordination with NMFS was conducted. A summary of the coordination is provided in Appendix C.

No Action

Under the No Action alternative, the USACE would not approve the requested major water control manual deviation. As a result, the flood control releases from Lake Mendocino would continue to be made in accordance with the existing tools and protocols available to inform USACE flood managers for managing reservoir operations at Lake Mendocino. There would be no effect on special-status plant, wildlife, and fish species existing in the area of potential effect because current conditions would remain unaltered.

Proposed Action

The plant communities along the Lake Mendocino shoreline have been exposed to historically large changes in water surface elevation that occur as part of reservoir operations. The Lake Mendocino maximum water level would remain unchanged. This maximum water level determines the edge of the upper shoreline and upland vegetation. Because this maximum water level would remain the same under the Proposed Action, no direct or indirect impacts to the growth, survival, or reproductive success of special-status species is anticipated. Similarly, no direct mortality, long-term habitat loss, or impacts to survival or reproductive success of Federally-listed wildlife, fish, or plant species are anticipated. No critical wildlife or fish habitat has been designated in the Lake Mendocino area. Beginning the spring fill as early as February 15 instead of March 1, as described in the Proposed Action, would result in reaching peak water surface elevations in the reservoir sooner in some years, but operations would be similar to the No Action alternative.

Downstream of Lake Mendocino, flows in the East Fork Russian River and mainstem Russian River would remain within the range of existing baseline levels with extreme high winter flows being slightly moderated and a reduction in drier, low summer flows due to improved reservoir storage and reliability. Because the range of flows downstream of the reservoir would remain the same as under baseline conditions or improved over baseline related to drier low summer flows, the Proposed Action would have no direct or indirect impacts to the growth, survival, or reproductive success of special-status species; no direct mortality, long-term habitat loss, or impacts to survival or reproductive success of Federally-listed wildlife, fish, or plant species; and no impact to critical habitat downstream of Lake Mendocino.

National Marine Fisheries Service issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the*

Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River Watershed (Russian River Biological Opinion) on September 24, 2008 (NMFS 2008). The Russian River Biological Opinion is a culmination of more than a decade of consultation among the USACE, Sonoma Water, the Mendocino County Water Conservation and Flood Control Improvement District (MCWFCID), and NMFS regarding the impacts of the USACE and Sonoma Water flood control and water supply activities on three fish species listed under the federal Endangered Species Act: Central California Coast steelhead; Central California Coast coho salmon; and California Coastal Chinook salmon.

The ESA prohibits the "take" (which include killing, harassing or harming) of threatened and endangered species. Agencies may be authorized to take actions that cause incidental take liability by the regulating agency (in this case NMFS) if species will be harmed only incidentally as unintentional results of lawful operations. The Russian River Biological Opinion includes an Incidental Take Statement (ITS) with a term of 15 years that authorizes the USACE and the Water Agency to conduct specified lawful operations and make specified changes in operations as a result of the Russian River Biological Opinion so long as the terms and conditions of the Incidental Take Statement are met, even if incidental take may result from such operations. The Incidental Take Statement includes Reasonable and Prudent Measures (RPMs) that the USACE and Sonoma Water must implement to minimize and monitor the impacts of the incidental take of listed species due to implementation of the Sonoma Water and USACE's water supply and flood control activities and Reasonable and Prudent Alternatives (RPAs) (NMFS 2008).

The 15-year term of the Russian River Biological Opinion and its ITS concludes in September 2023. The USACE, NMFS, and Sonoma Water will engage in a Section 7 consultation under the ESA to prepare the next biological opinion for USACE and Sonoma Water flood control and water supply activities and their potential effects on the three fish species listed under the federal ESA (Central California Coast steelhead; Central California Coast coho salmon; and California Coastal Chinook salmon). It is anticipated that the consultation will be concluded and the next biological opinion issued by September 2023. If additional time is needed to conclude consultation USACE can mutually agree with NMFS on an extension and a time that the biological opinion will be delivered. If initiation of consultation for the next biological opinion for USACE operations has not occurred by September of 2023, the USACE will request technical assistance from NMFS to aid in the consultation process prior to submission of a biological assessment for their ongoing activities.

Appendix C provides a summary of coordination with NMFS regarding the major deviation request (Proposed Action). The Proposed Action does not include operations beyond the scope of conditions evaluated and considered under the Russian River Biological Opinion. The Proposed Action as proposed would comply with existing operations, including Decision 1610 minimum instream flow requirements and the Russian River Biological Opinion, flood release requirements including that there would be no flood releases when Russian River flows at Hopland are greater than 8,000 cubic feet per second and in compliance with ramping rates recommended by the NMFS (NMFS, 2016). As discussed in Appendix C, one observation

raised by NMFS was related to model results, such as in 1996 (Figure C-18) when the Proposed Action (both Hybrid and Modified Hybrid) show reduced fall flood control releases relative to existing operations. Due to the potential additional storage afforded by the flood pool encroachment under the Proposed Action, certain years could delay fall flood control releases due to additional time that the reservoir takes to reach capacity from early season storms. NMFS also observed that under existing operations, early season flood releases (prior to mid-November) made under dry season flow conditions, with no incoming precipitation events, may raise concerns regarding adult Chinook salmon migration in the fall. The proposed major deviation would reduce the frequency of early season flood releases (prior to mid-November) that would result in artificial pulse flows that could cue premature adult Chinook salmon migration. If flood releases are needed in the fall, NMFS recommends that they be coupled with the onset of precipitation events and/or made during the later fall period. NMFS requested an advanced opportunity to provide technical assistance to the USACE for the timing of such fall releases in order to determine the appropriate release strategy for spawning and migrating salmonids. Additionally, NMFS requested an advance opportunity to provide technical assistance to the USACE for increases in spring storage beginning February 15 to ensure upper Russian River conditions remain adequate for adult steelhead. Sonoma Water requests to be part of the coordination discussions as well. The USACE will provide notifications of proposed release changes electronically on the internet and by electronic mail to NMFS and Sonoma Water and will continue to make these notifications during implementation of the Proposed Action.

3.4.3 Mitigation

No adverse impact to Federally-listed special-status species would result from implementation of the Proposed Action and no mitigation is needed or proposed.

3.5 Vegetation and Wildlife

3.5.1 Existing Conditions

For the purposes of describing vegetation and wildlife, the project area includes one large reservoir on the East Fork Russian River, Lake Mendocino, as well as the mainstem Russian River downstream of its confluence with the East Fork.

Lake Mendocino

The project area includes Lake Mendocino, located 32 miles inland where summer temperatures are much higher than along the coast. Riparian and marsh habitat is generally absent from the shoreline of the lake due to managed, fluctuating water levels. The shoreline is typically barren with an upland plant community at the high water line. The USACE owns Lake Mendocino, including the surrounding uplands at a total of approximately 3,500 acres. Mountainous north-facing slopes contain hardwood and coniferous forests, and on foothills oak woodlands and grasslands are common. Chaparral and grassland exists on shallow soils of south-facing slopes.

Russian River

The Russian River below the confluence of the East and West Forks flows from Ukiah Valley to the Pacific Ocean. Cool coastal conditions moderate temperatures year-round in the lower river. In contrast, the inland Russian River mainstem has hot, dry summers. Bank vegetation ranges from sparse to dense riparian forest. Some river banks are armored with rock riprap, and in a few places even automobile bodies. Adjacent to the river, habitats vary from urban, ruderal, agricultural, woodland, to forest. Largely, scouring during winter high flows provides the dominant force that dictates where vegetation can establish and persist. In the Ukiah, Hopland, and Alexander valleys most lands are agricultural, typically vineyard. The Lower Russian River is primarily forested lands, with interspersed vineyards, and development associated with communities in the Healdsburg, Forestville, Guerneville and Monte Rio areas.

The lower portion of the Russian River is a tidal estuary (Estuary) that extends from the Pacific Ocean upstream approximately seven miles to the Duncans Mills area. The Estuary can be characterized as a submerged or “drowned” river at the ocean with an open or closed sandbar barrier beach at the river mouth. The terrain adjacent to the Estuary is mountainous forest, woodland, and grassland habitats. Estuary bank vegetation consists of riparian forest, grazed grassland, sparse marshlands, and exposed gravel bars.

The following section describes the biological resources in the vicinity of the Proposed Action. Please refer to the Special-status Species section above for additional information.

Plant Community and Wildlife Habitat

North Coastal Forest

North coastal forest occurs over much of the North Coast Ranges in Sonoma and Mendocino counties. North coastal forest generally occurs on north and west facing slopes and in steeper canyons and ravines. In the wetter regions and along the coastline, north coastal forest is typically dominated by one or more coniferous trees including coast redwood and Douglas fir, and may include hardwoods such as big-leaf maple and tan oak. On the dryer, inland slopes of the North Coast Ranges, conifers can be found with hardwoods such as California black oak (*Quercus kelloggii*), coast live oak (*Quercus agrifolia*), California bay laurel, and Pacific madrone (*Arbutus menziesii*). The north coast forest habitat provides important foraging and nesting habitat for several wildlife species. Berries, forbs, conifer seeds, and oak acorns provide important food sources for species including western gray squirrel (*Sciurus griseus*), dusky-footed woodrat (*Neotoma fuscipes*), mule deer (*Odocoileus hemionus columbianus*), various species of woodpecker, and Stellar’s jay (*Cyanocitta stelleri*). Avian predators such as Cooper’s hawk (*Accipiter cooperii*) and great horned owl (*Bubo virginianus*) prey upon rodents and small birds in this habitat. In addition, north coastal forest provides shelter and breeding habitat for wildlife species such as nesting raptors; cavity nesters such as woodpeckers, western screech-owl (*Otus kennicottii*), and pygmy nuthatch (*Sitta pygmaea*); mammals including ringtail (*Bassariscus astutus*) and long-tailed weasel (*Mustela frenata*); and reptile and amphibians such as northern alligator lizard (*Elgaria coerulea*), ring-necked snake (*Diadophis punctatus*), and California giant salamander (*Dicamptodon ensatus*).

Within the project vicinity, valley and foothill woodland is dominated by oak species with varying degrees of canopy cover, and with grasses and scattered low shrubs between trees. Oak woodlands, while common in California, are considered in decline due to seedling predation and loss due to development. This habitat provides important foraging for numerous wildlife species. Oak acorns provide an important food source for species including western gray squirrel, California ground squirrel, mule deer, various species of woodpecker, and western scrub jay (*Aphelocoma californica*). Avian predators such as golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), and Cooper's hawk, prey upon rodents and small birds in this habitat. In addition, oak woodlands and savannahs provide shelter and breeding habitat for wildlife species such as nesting raptors; cavity nesters such as woodpeckers, house wrens (*Troglodytes aedon*), and western bluebirds (*Sialia mexicana*); mammals including mule deer, raccoon (*Procyon lotor*), brush rabbit (*Sylvilagus bachmani)*, and feral pig (*Sus scrofa)*; and reptile and amphibians such as western fence lizard (*Sceloporus occidentalis*), common gopher snake (*Pituophis melanoleucus*), arboreal salamander (*Aneides lugubris*) and Pacific treefrog/chorus frog *Pseudacris regilla* (*seirrae*).

Valley and Foothill Woodland (Oak Savannah)

Within the project vicinity, valley and foothill woodland is dominated by oak species with varying degrees of canopy cover, and with grasses and scattered low shrubs between trees. Oak savannah typically occurs on dry and/or fine-textured soils. Savannahs are dominated by valley oak and coast live oak where they occur in open stands. Valley grassland is found between trees and herbaceous species grow in shaded areas within tree driplines. Oak woodlands, while common in California, are considered in decline due to seedling predation and loss due to development.

This habitat provides important foraging for numerous wildlife species. Oak acorns provide an important food source for species including western gray squirrel, California ground squirrel, mule deer, various species of woodpecker, and western scrub jay (*Aphelocoma californica*). Avian predators such as golden eagle (*Aquila chrysaetos*), red-tailed hawk (*Buteo jamaicensis*), and Cooper's hawk, prey upon rodents and small birds in this habitat. In addition, oak woodlands and savannahs provide shelter and breeding habitat for wildlife species such as nesting raptors; cavity nesters such as woodpeckers, house wrens (*Troglodytes aedon*), and western bluebirds (*Sialia mexicana*); mammals including mule deer, raccoon (*Procyon lotor*), brush rabbit (*Sylvilagus bachmani)*, and feral pig (*Sus scrofa)*; and reptile and amphibians such as western fence lizard (*Sceloporus occidentalis*), common gopher snake (*Pituophis melanoleucus*), arboreal salamander (*Aneides lugubris*) and Pacific treefrog/chorus frog *Pseudacris regilla* (*seirrae*).

Chaparral

Chaparral is one of the most characteristic plant communities of California, and occurs only in California. It is characterized by hard-leaved low-growing shrubs, and is typically devoid of tree and herbaceous plant species. This is in part attributable to shading and competition from the dense growing brush. Characteristic plant species include manzanita, chamise (*Adenostoma fasciulatum*), toyon (*Heteromeles arbutifolia*), and California lilac (*Ceanothus* sp.). Chaparral occurs in the project vicinity on hot, dry southern slopes. Wildlife species that occur within

chaparral are those that inhabit drier, more arid regions of the county and include western fence lizard, California ground squirrel, and brush rabbit. Birds such as common bushtit, California quail, and wrentit are commonly occurring species that use chaparral for foraging, cover, and nesting. Predators include coyote (*Canis latrans*) and American badger (*Taxidea taxus*) that utilize open areas in chaparral for hunting prey.

Valley Grassland

Valley grassland occurs most extensively in the Central Valley of California, but also is present in some of the low valleys or gentle slopes of the Coast Ranges, including the project vicinity. Non-native grassland habitat is commonly distributed in valley and foothills of most of California, except for the north coastal and desert regions. Valley grassland (native and non-native) occurs in the open areas adjacent to or within woodland and forest habitats. Within the project area valley grassland may fringe the riparian zone along the Russian River. This habitat typically occurs on fine-textured soils, usually clay, moist, or even waterlogged during the winter rainy season, and very dry during the summer and fall. European settlement of the area introduced non-native annual grasses, which have, for the most part, replaced the native perennial grasses that used to dominate this biotic community. Plant species characteristic of valley grassland in the project area include Harding grass (*Phalaris aquatica*), soft chess (*Bromus mollis*), slender oats (*Avena barbata*), clover (*Trifolium* spp.), lotus (*Lotus* spp.), California burclover (*Medicago polymorpha*), and vetch (*Vicia* spp.). Wildlife species typically observed foraging in valley grasslands include song sparrow (*Melospiza melodia*), red-winged blackbird (*Agelaius phoenicus*), and American pipit (*Anthus rubescens*). Valley grasslands provide cover and foraging habitat for small mammals, reptiles, and avian species, including Botta's pocket gopher (*Thomomys bottae*), common gopher snake, common kingsnake (*Lampropeltis getulus*), and raptors such as red-tailed hawk. This habitat is also important for common ground nesting birds such as western meadowlark (*Sturnella neglecta*) and mourning dove (*Zenaida macroura*). Grasslands provide open foraging habitat for wildlife species such as white-tailed kite (*Elanus leucurus*) and mule deer that seek cover in adjacent woodland.

Riparian Woodland

Riparian vegetation, or the plants associated with a stream environment, once covered much of the Russian River floodplain and tributaries. Generally, riparian areas are associated with and/or encompass elevations adjacent to streams up to the floodplain elevation that matches the 100 to 500 year storm event. These large intense events along a river system are the primary driver for mobilizing sediments, scouring vegetation, and creating new places for vegetation to colonize. Historically, riparian vegetation along the Russian River was removed for agriculture, gravel mining, logging, flood control, and urbanization. Today, riparian vegetation along the Russian River and numerous tributaries exists in thin and in some places discontinuous strips. Riparian plant communities often show abrupt changes in species composition along stream banks due to differing preferences of seasonal water levels and tolerance to scouring during winter floods.

With close proximity to water and a multi-story canopy, riparian habitats provide important breeding, foraging, migration, dispersal, and cover habitat for numerous wildlife species. Riparian habitats benefit fish and other aquatic organisms through nutrients provided in the form

of leaf litter and insects; shelter provided by scour pools, woody debris, and root masses; and cool water temperatures maintained by shading of all or parts of streams. Trees in riparian areas provide stabilization of banks and erosion control and prevent woody debris from entering agricultural lands during peak flood flows. Riparian areas also link fragmented upland habitats together. Because of its importance to terrestrial and aquatic wildlife species, riparian habitat has been afforded special regulatory protection, namely from the CDFW.

Wildlife species commonly found in riparian habitats include mule deer, dusky-footed woodrat, gray fox (*Urocyon cinereoargenteus*), raccoon, downy woodpecker (*Picoides pubescens*), belted kingfisher (*Ceryle alcyon*), northern oriole (*Icterus galbula*), brown towhee (*Pipilo fuscus*), common bushtit (*Psaltriparus minimus*), song sparrow, and common kingsnake. Neotropical migrant songbirds use these habitats as movement corridors and nesting habitat. Raptors often nest in riparian areas and forage in adjacent grasslands and agricultural fields. Characteristic riverine species that also use riparian habitats include river otter (*Lutra canadensis*), Pacific treefrog, and western pond turtle (*Actinemys marmorata)*.

3.5.2 Environmental Effects

Basis of Significance

An alternative would be considered to have a significant effect on vegetation and wildlife if it would permanently remove or disturb sensitive native communities, or significantly reduce the amount of native vegetation and wildlife habitat in the project area.

No Action

Under the No Action alternative, the USACE would not approve the requested major water control manual deviation. As a result, the flood control releases from Lake Mendocino would continue to be made in accordance with the existing tools and protocols available to inform USACE flood managers for managing reservoir operations at Lake Mendocino. There would be no effect on vegetion and wildlife species existing in the area of potential effect because current conditions would remain unaltered.

Proposed Action

At Lake Mendocino, riparian and marsh habitat is generally absent from the shoreline due to managed, fluctuating water levels. The shoreline is typically barren with an upland plant community at the high water line. Changes in water releases from Coyote Valley Dam would affect water levels in Lake Mendocino, however the maximum water level would remain unchanged. This maximum water level determines the transition of the upper shoreline to upland vegetation. Because this maximum water level would remain the same as currently exists under existing conditions, the Proposed Action would not permanently remove or disturb sensitive native communities, nor would it significantly reduce the amount of native vegetation and wildlife habitat in the area.

Downstream of Lake Mendocino, flows in the East Fork Russian River and mainstem Russian River would remain within the range of existing levels with extreme high winter flows and low summer flows potentially slightly moderated. Because the range of flows downstream of the

reservoir would remain the same as existing conditions, the Proposed Action would not permanently remove or disturb sensitive native communities, nor would it significantly reduce the amount of native vegetation and wildlife habitat in downstream areas.

3.5.3 Mitigation

No impact to vegetation and wildlife would result from implementation of the Proposed Action and no mitigation is needed or proposed.

3.6 Water Quality

3.6.1 Existing Conditions

Mendocino County and Lake Mendocino are located within the jurisdiction of the North Coast Regional Water Quality Control Board (Regional Board). Water quality objectives for the Russian River and its tributaries are specified in the *Water Quality Control Plan for the North Coast Region* (Basin Plan) prepared in compliance with the federal Clean Water Act (CWA) and the State Porter-Cologne Act (NCRWQCB 2011). The Basin Plan identifies the existing and potential beneficial uses of water within the North Coast Region and the water quality objectives necessary to protect those uses. Section 401 of the Clean Water Act also gives the Regional Board the authority to review any proposed federally permitted or federally licensed activity that may impact water quality and to certify, condition, or deny the activity if it does not comply with State water quality standards.

The Regional Board listed the entire Russian River on the 2010 Clean Water Act (CWA) Section 303(d) List of Water Quality Limited Segments (NCRWQCB, 2011) for sedimentation/siltation and temperature impairments. Lake Mendocino is also on the 303(d) List for mercury impairments in fish tissue. Mercury, also called quicksilver, is a heavy metal and potent neurotoxin that is harmful to humans and wildlife (NCRWQCB 2016a). Mercury builds up in the bodies of fish and also in people who eat contaminated fish. There is a statewide effort currently in development for a control program for reservoirs, including Lake Mendocino, that will address controlling sources of mercury and water quality objectives for mercury.

Reservoir stratification

Reservoirs such as Lake Mendocino can undergo “thermal stratification” within the lake, which can affect water temperature and dissolved oxygen (DO) levels in the water releases from the reservoir storage. As water cools, its density increases. This relationship continues until water cools to about 39° F at which point the density of water decreases with further cooling (this explains why ice floats). Solar radiation disproportionately warms water near the surface of a lake. As the surface water warms, it becomes less dense and “floats” on top of the colder, denser layer below. With just a few degrees of warming, the density difference can become strong enough to prevent mixing between the surface and bottom layers. In essence, lakes stratify into three layers: a warm surface layer (called the epilimnion), a narrow middle layer where the temperature rapidly declines, called the metalimnion (sometimes referred to as the thermocline); and a cold bottom layer (called the hypolimnion, which is commonly referred to in reservoirs as the “coldwater pool”). During the fall, atmospheric temperatures decline, cooling

the surface waters of the reservoirs. The decrease in temperature in the surface waters reduces the density gradient between the epilimnion and hypolimnion, allowing the two layers to mix (often referred to as the lake “turning over”). During the mixing of the upper and lower layers, the bottom layer becomes re-oxygenated, and the overall temperature of the lake decreases, depending on the size of the remaining coldwater pool.

The density barrier that restricts mixing between the upper and lower layers affects water quality. The epilimnion remains in contact with the atmosphere and remains well oxygenated. However, the hypolimnion is isolated, and overtime, biological and chemical processes slowly deplete the oxygen within this layer. Thus, the reservoirs stratify into a warm, oxygenated surface layer and a cold bottom layer where the DO declines over time, potentially becoming anoxic. Depending on the depth of the release outlet in relation to the “coldwater pool,” water released from a reservoir may range from warm to cold and oxygenated to anoxic.

The size of the reservoir significantly affects downstream water quality as well. Larger reservoirs, such as Lake Sonoma, support a large coldwater pool. The available cold water is substantially less in smaller reservoirs such as Lake Mendocino and can be depleted on a regular basis.

During the late fall, winter, and early spring, water stored in Lake Mendocino remains well mixed, and water released from the reservoir is well oxygenated. In addition, atmospheric conditions and tributary input help to maintain DO levels at or near saturation. However, beginning in May of most years, DO levels in the water released below the reservoir begins to decrease. This continues through the summer and early fall until the lake “turns over” and the process starts anew. The general pattern follows the development and depletion of the coldwater pool in Lake Mendocino. Lake Mendocino has one release point at the bottom of the lake where the water typically remains colder than surface temperatures until mixing of the stratified water layers occurs in late summer/early fall.

Figures 12 and 13 show Lake Mendocino water temperature data collected by the Sonoma Water in 2013, 2015, 2016, 2018, and 2019 at differing reservoir storage levels. The data demonstrates benefits of higher reservoir storages levels to maintaining cooler water temperatures into the late summer/early fall.

3.6.2 Environmental Effects

Basis of Significance

An alternative would be considered to have a significant effect on water quality if it would violate water quality standards or waste discharge requirements, result in the loss of surface or groundwater sources, or interfere with existing beneficial uses or water rights.

No Action

Under the No Action alternative, the USACE would not approve the requested major water control manual deviation. As a result, the flood control releases from Lake Mendocino would continue to be made in accordance with the existing tools and protocols available to inform

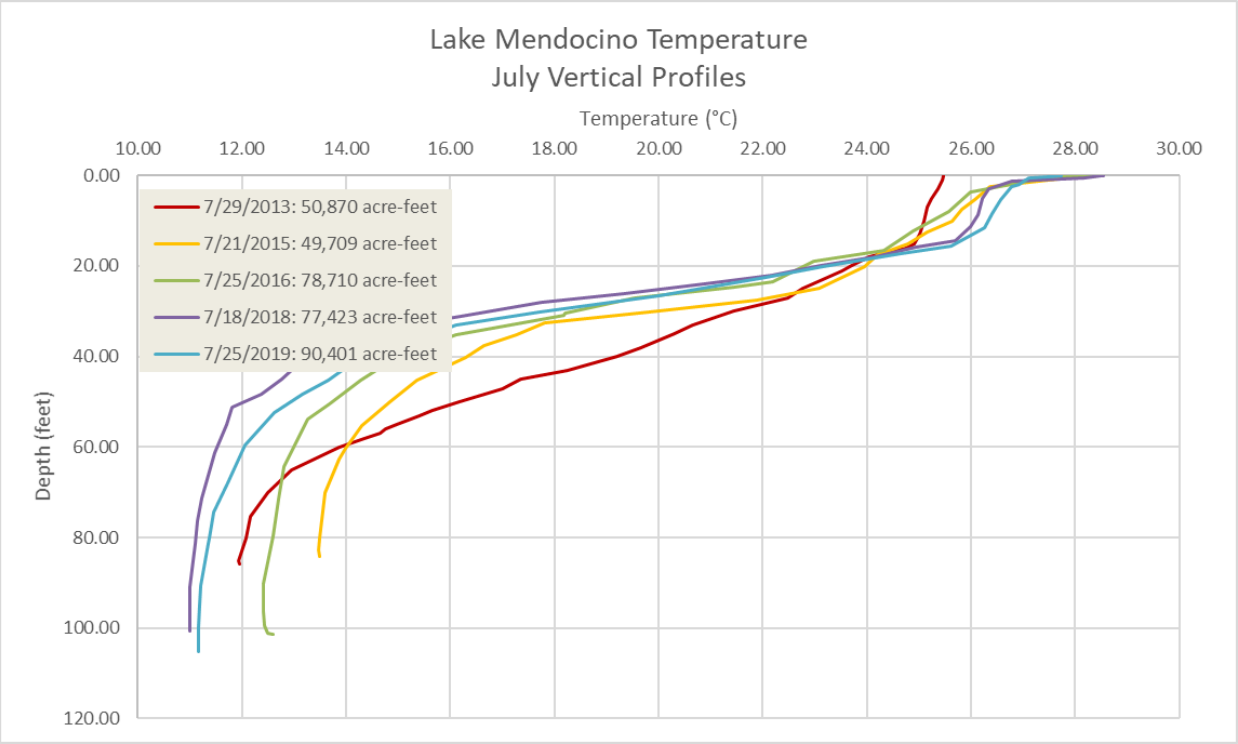


Figure 12. Lake Mendocino Water Temperatures in July 2013, 2015, 2016, 2018, and 2019.

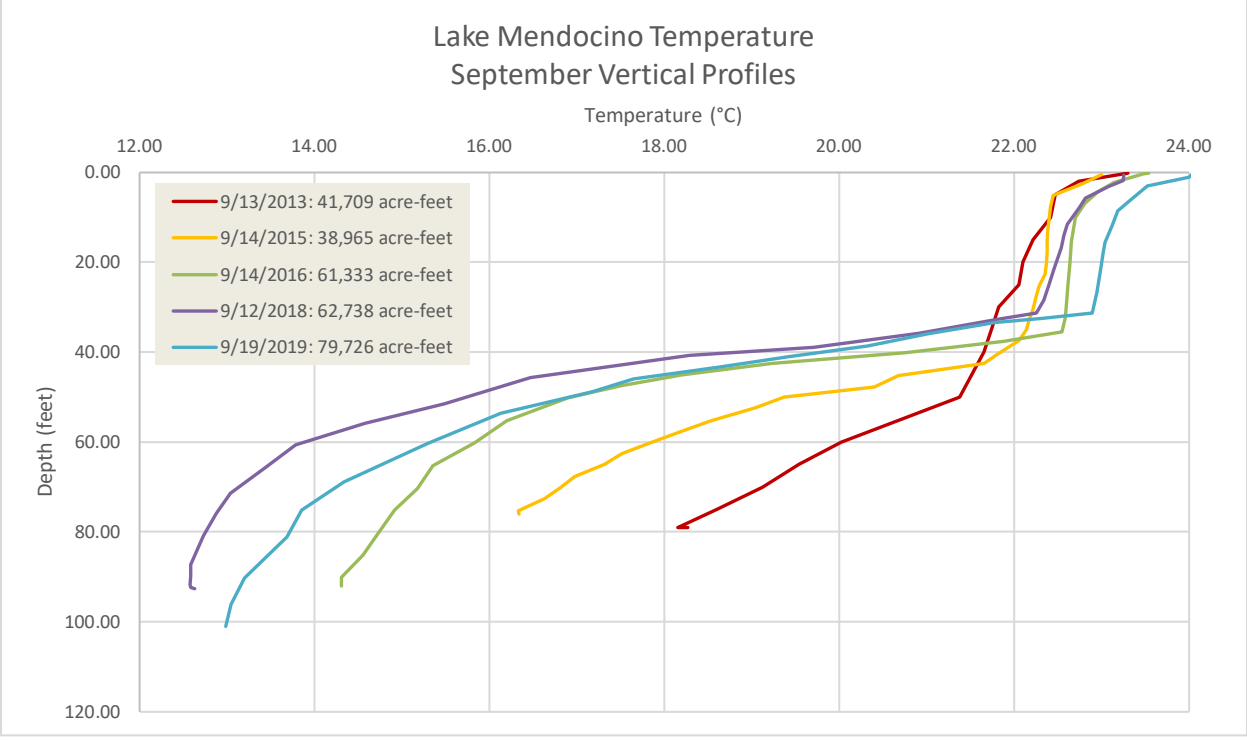


Figure 13. Lake Mendocino Water Temperatures in September 2013, 2015, 2016, 2018, and 2019.

USACE flood managers for managing reservoir operations at Lake Mendocino. There would be no effect on water quality in Lake Mendocino because current conditions would remain unaltered.

Proposed Action

Implementation of the Proposed Action would not negatively impact Lake Mendocino's water quality. The Proposed Action would include modifying the reservoir storage curve. The range of water surface elevations in Lake Mendocino would remain within the reservoir's existing operational levels and no new areas would be inundated or subject to shoreline erosion as a result of the Proposed Action; therefore, no water quality impact is anticipated. Beginning the spring fill as early as February 15 instead of March 1, as described in the Proposed Action, would result in reaching peak water surface elevations in the reservoir sooner in some years, but operations would be similar to the No Action alternative.

The Proposed Action would provide benefits to Lake Mendocino water quality by providing greater spring reservoir storage volumes (Jasperse, et al., 2017), improving the ability to maintain a "cold water pool" in the reservoir, and to release cooler water in late summer into the East Fork and mainstem Russian River.

3.6.3 Mitigation

No impact to water quality would result from implementation of the Proposed Action and no mitigation is needed or proposed.

3.7 Cumulative Effects

NEPA requires the consideration of cumulative effects of the Proposed Action combined with the effects of other projects. NEPA defines a cumulative effect as the effect on the environment that results from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions (C.F.R. 40 pt. 1508.7). NEPA requires a discussion of cumulative impacts when they are significant. The discussion should reflect the severity of impacts and their likelihood of occurrence and should be guided by the standards of practicability and reasonableness. The Proposed Action would not have any significant adverse effects on any of the discussed resources. The Proposed Action's potential to incrementally contribute to significant cumulative effects on specific resources is discussed below.

3.7.1 Past, Present, and Reasonably Foreseeable Future Projects

This section describes implemented, developed, or planned projects that may result in environmental effects similar to those of the proposed action, such that these effects, when combined, constitute cumulative impacts. Section 1.3 provides a description of the development of Coyote Valley Dam and Lake Mendocino and the USACE operation of Lake Mendocino recreational facilities. Section 3.4 describes the listing of Central California coast steelhead, Central California Coast coho salmon, and California Coastal Chinook salmon as threatened or endangered under the ESA. The Basis for Requested Deviation discussion, included in Section

1.3, describes the significant reductions of inflow to Lake Mendocino due to lower diversions from the Eel River through Pacific Gas & Electric's Potter Valley Project.

Local Projects

Fish Habitat Flows and Water Rights Project

Sonoma Water is the local sponsor for Lake Mendocino (the USACE is the federal sponsor) and manages water supply releases from the conservation pool. Sonoma Water is proposing the Fish Habitat Flows and Water Rights Project (Fish Flow Project). A California Environmental Quality Act (CEQA) Draft Environmental Impact Report (EIR) was released by Sonoma Water for public review on August 19, 2016. The public review period concluded on March 10, 2017. Sonoma Water is currently preparing a revised Draft EIR for recirculation. The objectives of the Fish Flow Project are to manage Lake Mendocino and Lake Sonoma water supply releases to provide instream flows that will improve habitat for threatened and endangered fish species, and to update Sonoma Water's existing water rights to reflect current conditions. The Fish Flow Project proposes to change minimum instream flow requirements in the Russian River downstream of Lake Mendocino and in Dry Creek (a tributary to the Russian River and downstream of Lake Sonoma); to change the hydrologic index that determines the minimum instream flow schedules; to extend the time to 2040 to fully utilize existing water rights; and to add existing points of diversion for the Occidental Community Service District and the Town of Windsor as authorized points of diversion in the Water Agency's water right permits. The proposed changes to minimum instream flow requirements are in response to the Russian River Biological Opinion's Reasonable and Prudent Alternatives to avoid jeopardizing listed salmonids. Sonoma Water would implement the proposed Fish Flow Project if the water-right modifications are made by the SWRCB.

Two-Basin Solution

In June of 2020, Sonoma Water partnered with California Trout, Mendocino County Inland Water and Power Commission, and the County of Humboldt (Partners) to submit a Notice of Intent with the Federal Energy Regulatory Commission (FERC) stating that they plan to file an application to relicense the Potter Valley Project. Subsequent to filing the Notice of Intent, the Round Valley Indian Tribes joined the Partners. The purpose of this collaboration, called the Two-Basin Solution, is to set a path forward to meet the needs of water users in the region while also improving conditions for native fish species in the Eel River watershed. The Potter Valley Project is a hydroelectric facility that, in addition to generating a small amount of electricity, esults in a transfer of water from the Eel River basin into the Russian River basin. It is currently owned and operated by PG&E, which announced in January 2019 that it would not seek a new hydroelectric license from FERC for the Project. The main facilities are: (1) Scott Dam on the Eel River which impounds Lake Pillsbury; (2) Cape Horn Dam on the Eel River, which impounds Van Arsdale Reservoir; (3) a trans-basin diversion tunnel, along with wood stave conduits and steel penstocks; and (4) a powerhouse located in Potter Valley in the Russian River Watershed.

A Feasibility Study was filed by the Partners on May 13, 2020 to FERC, which evaluates continued power generation and water diversions, but shifts the timing and magnitude of diversions to winter and spring months to improve and protect fishery resources while

maintaining water supply reliability. The Feasibility Study evaluates the removal of Scott Dam while maintaining the Van Arsdale Diversion and other downstream infrastructure, as well as sediment management and re-vegetation within the Lake Pillsbury footprint. Additionally, the Feasibility Study includes modifications to Van Arsdale Diversion and Cape Horn Dam to improve power generation, water supply reliability, and upstream and downstream fish passage; and a new water supply pipeline from Lake Mendocino to Potter Valley Irrigation District. A regional entity would be created, which would ultimately become the license applicant. A Fisheries Restoration Plan would be completed with the intent to restore volitional anadromous fish access to the Eel River watershed upstream of Scott Dam and Lake Pillsbury.

3.7.2 Effects Analysis

In determining the past, present, and reasonably foreseeable actions with potential to contribute to cumulative effects, when combined with effects of the Proposed Action, the USACE considered other planning efforts (listed above) that would be likely to result in effects that could interact cumulatively with those from Proposed Action. Sections 3.2 to 3.6 identify potential direct and indirect environmental effects of the Proposed Action, including cultural resources, recreation, special-status species, vegetation and wildlife, and water quality. The Proposed Action would not have any significant and adverse effects on any of the discussed resources. These less than significant effects are assessed in the following analysis in terms of their potential to combine with similar environmental effects of the projects listed above, resulting in cumulative impacts. The analysis is focused on considering the potential for those impacts identified in Sections 3.2 to 3.6 to result in an incrementally significant effect.

The extent of the geographic area that may be affected with implementation of the alternatives varies depending on the resource under consideration. Therefore, for each discussion below, the past, present, and reasonably foreseeable future projects that are considered are limited to those having potential effects similar to those of the Proposed Action that could interact with impacts generated by the Proposed Action.

The Proposed Action would not have any significant adverse effects on any of the discussed resources. These resources are discussed below and the potential for the project to incrementally contribute to a significant cumulative effect to these resources.

Short-term and long-term effects

There are no temporary or minor adverse impacts associated with the Proposed Action. The Proposed Action would not have significant adverse indirect or cumulative impacts on the physical, biological, and human environment. The timing for the Proposed Action of a maximum additional storage of 11,650 acre-feet between November 1 and February 28 in each year with an option to begin the increase in spring storage on February 15, for a period of five consecutive years (WY 2021 through WY 2026) may coincide with the local projects listed above. The planned major deviation would allow the USACE to have the discretion to utilize the additional information provided to inform (but not control) reservoir operations. With the reduction in PVP transfers, Lake Mendocino has become dependent on late spring storm events to adequately fill in order to meet water demands. However, late spring storm events do not reliably occur which

creates a vulnerability in Lake Mendocino's water supply. The Proposed Action would help reservoir operators adapt to an increasingly variable environment.

Long-term effects of the Proposed Action would be beneficial in terms of improving water supply reliability, adapting to increasingly variable environmental conditions, and maintaining a cold-water pool in the reservoir for the fall Chinook salmon migration for a longer duration.

Resource effects

Cultural Resources

Potential for incremental effects to cultural resources would be from water inundation through the raising of the water level along the project APE. Cultural resources would be vulnerable to damage by inundation of areas not previously subject to inundation. Vegetation along the shore of Lake Mendocino has been determined by seasonal fluctuations in reservoir elevation that occur under existing operations. Because there would be no change in maximum water surface elevation, new areas of inundation are not expected and upland vegetation beyond the shoreline is not anticipated to change. No incremental effect to cultural resources is anticipated.

Recreation

The Fish Flow Project Draft EIR identified less than significant impacts to Lake Mendocino recreational facilities as a result of increased water storage during the recreational season. Many of the recreation facilities are built at or slightly above 748 feet msl and within the maximum pool of Lake Mendocino (764.8 feet msl). High water surface elevations can inundate low-lying parking lots, access roads, day use areas and campground sites. If the Proposed Action and the local project were implemented concurrently, the range of water surface elevations in Lake Mendocino would remain within below the modified storage curve and no incremental effects to recreation are anticipated.One of the objectives of the Two-Basin Solution is to minimize or avoid adverse impacts to water supply reliability, fisheries, water quality, and recreation in both the Eel and Russian river basins. The Two-Basin Solution includes a Fisheries Restoration Plan that, once implemented, would improve fishery populations within the Eel River watershed for the benefit of tribal, commercial, and recreational fisheries. A Recreation Facility Assessment would also be completed and the results would inform the actions taken as part of the Two-Basin Solution. Additionally, implementation of the Two-Basin Plan would include the continued diversion of Eel River water to the Russian River watershed and Lake Mendocino. Therefore, no incremental effects to recreation are anticipated.

Special-status Species

As discussed above in Section 3.4.2 and in detail in Appendix C, the Russian River Biological Opinion evaluated the USACE's flood control operations of Coyote Valley Dam/Lake Mendocino under the WCM, including the described releases from Flood Control Schedules 1, 2, and 3 used to empty the flood control pool following a storm (NMFS, 2008). The Proposed Action is consistent with the requirements of the Russian River Biological Opinion and therefore would not contribute to incremental effects to ESA-listed species. As discussed in Section 3.4.2, the 15-year term of the Russian River Biological Opinion and its ITS concludes in September 2023. It is anticipated that Section 7 consultation for the next biological opinion and ITS will be

completed by that time, but if additional time is needed, USACE can mutually agree with NMFS on an extension and a time that the biological opinion will be delivered. If initiation of consultation for the next biological opinion for USACE operations has not occurred by September of 2023, the USACE will request technical assistance from NMFS to aid in the consultation process prior to submission of a biological assessment for their ongoing activities.

The Proposed Action and the Fish Flow Project could benefit Lake Mendocino water storage reliability. The proposed action of a planned major deviation to store additional water above the existing guide curve for the Coyote Valley Dam Lake Mendocino WCM combined with the present, and reasonably forseeable future actions pertaining to the Fish Flow Project would maximize the conservation of the cold water pool in Lake Mendocino, which will increase the likelihood that water temperatures would remain suitably cool for rearing steelhead throughout the summer and help ensure that sufficient flow could be released to facilitate upstream migration of fall run Chinook salmon.

The Two-Basin Solution includes a Fisheries Restoration Plan, which describes improvements of riverine processes within the Lake Pillsbury footprint and downstream of Scott Dam. Modifications to Van Arsdale Diversion and Cape Horn Dam would improve upstream and downstream fish passage efficiency and survival. The objectives of the Two-Basin Solution include improving fish passage and habitat on the Eel River sufficient to support recovery of native anadromous fish populations, including passage at existing dam locations. Therefore, no incremental affect to special-status species is anticipated.

Vegetation and Wildlife

At Lake Mendocino, riparian and marsh habitat is generally absent from the shoreline due to managed, fluctuating water levels. The shoreline is typically barren with an upland plant community at the high water line. Changes in diversions from the Eel River or water releases from Coyote Valley Dam would affect water levels in Lake Mendocino, however the maximum water level would remain unchanged. Downstream of Lake Mendocino, flows in the East Fork Russian River and mainstem Russian River would remain within the range of existing levels with extreme high winter flows and low summer flows potentially slightly moderated. The Proposed Action would not permanently remove or disturb sensitive native communities, nor would it significantly reduce the amount of native vegetation and wildlife habitat in downstream areas. No incremental effect to vegetation and wildlife is anticipated.

Water Quality

Implementation of the Proposed Action would not would not negatively impact Lake Mendocino’s water quality. The range of water surface elevations in Lake Mendocino would remain within the reservoir’s existing operational levels and no new areas would be inundated or subject to shoreline erosion as a result of the Proposed Action; therefore, no water quality impact is anticipated.

The Proposed Action and the Fish Flow Project would provide benefits to Lake Mendocino water quality by providing greater reservoir storage reliability, improving the ability to maintain a "cold water pool" in the reservoir, and release cooler water in late summer into the East Fork and mainstem Russian River. No incremental significant effect to water quality is anticipated.

CHAPTER 4.0 Compliance with Environmental Laws and Regulations

- Clean Air Act of 1972, as amended, 42 U.S.C. § 7401, *et seq*. *Full Compliance*. The Proposed Action is not expected to violate any Federal air quality standards, exceed the U.S. EPA's general conformity de minimis threshold, or hinder the attainment of air quality objectives in the local air basin. The USACE has determined the Proposed Action would have no significant effects on the future air quality of the area.
- Clean Water Act of 1972, as amended, 33 U.S.C. § 1251, *et seq*. *Full Compliance*. The Proposed Action is not expected to adversely affect surface or ground water quality or deplete ground water supplies. No discharge of dredge or fill materials into navigable water or adjacent wetlands would occur under the project. The USACE has determined that the Proposed Action would have no significant effects on future water quality of the area.
- Endangered Species Act of 1973, as amended, 16 U.S.C. § 1531, *et seq*. *Full Compliance*. The USACE obtained a list from the USFWS of Federally listed and proposed species likely to occur in the project area. After reviewing the species list and conducting a desktop survey of the potential action area, the USACE determined that no listed species have the potential to be affected by the Proposed Action.

  The USACE, as the action agency, has made the determination that there would be "no effect" on any listed species under the jurisdiction of NMFS. No significant effects to Federally listed, proposed, or candidate species or critical habitat are anticipated from the Proposed Action. No potential for significant effects to Federally listed, proposed, or candidate species or critical habitat under the jurisdiction of the USFWS is anticipated. Given the presence of critical habitat and potential for presence of listed salmonid species downstream of Lake Mendocino, coordination with NMFS was conducted. A summary of the coordination is provided in Appendix C.
- Executive Order 11988, Floodplain Management. *Full Compliance.* Executive Order 11988 was signed into law on May 24, 1977, requiring that Federal agencies provide leadership and take action to restore and preserve the natural and beneficial values served by floodplains. Before proposing, conducting, supporting, or allowing an action in the floodplain, each Federal agency must determine if planned activities would affect the floodplain and evaluate the potential effects of the intended action on the floodplain's functions.
- Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. *Full Compliance*. This Executive Order states that Federal agencies are responsible for conducting their programs, policies, and activities that substantially affect human health of the environment in a manner that

ensures that such programs, policies, and activities do not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination under such programs, policies, and activities because of their race, color, or national origin. No relocations would occur as a result of the water control manual deviation, and no populations would be displaced as a result of approving the temporary change in operation.

- Executive Order 13751, Safeguarding the Nation from the Impacts from Invasive Species. *Full Compliance*. Executive Order 13751 was signed into law on December 5, 2016, to refrain from authorizing, funding, or implementing actions that are likely to cause or promote the introduction, establishment, or spread of invasive species in the United States unless, pursuant to guidelines that it has prescribed, the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize risk of harm will be taken in conjunction with the actions.

  The Proposed Action is not expected to cause or promote the introduction, establishment, or spread of invasive species. Vegetation along the shore of Lake Mendocino has been determined by seasonal fluctuations in reservoir elevation that occur under existing operations. The maximum water surface elevation at the reservoir would remain the same as existing operations under the Proposed Action. The maximum water surface elevation determines the transition location from upper shoreline to upland vegetation. Annual plant species may seasonally colonize exposed shoreline areas. Because there would be no change in maximum water surface elevation, upland vegetation beyond the shoreline is not anticipated to change and there would be no potential for the Proposed Action to cause or promote the introduction, establishment, or spread of invasive species.

  Upstream of Lake Mendocino, flows are regulated by a license issued to PG&E by FERC. The Proposed Action would not change flows in the East Fork Russian River and would remain within the range of existing baseline levels. The Proposed Action would not cause or promote the introduction, establishment, or spread of invasive species upstream of Lake Mendocino.

  Downstream of Lake Mendocino, flows in the East Fork Russian River and mainstem Russian River would remain within the range of existing baseline levels with extreme high winter flows and low summer flows potentially slightly moderated. Because the range of flows downstream of the reservoir would remain the same as under baseline conditions, the Proposed Action would not cause or promote the introduction, establishment, or spread of invasive species.
- Migratory Bird Treaty Act (15 U.S.C § 701-18h). *Full Compliance*. There would be no construction activities or vegetation removal as part of the Proposed Action and therefore, no impacts to nesting migratory birds are anticipated.
- National Environmental Policy Act of 1969, as amended, 42 U.S.C. § 4321, *et seq. Full Compliance. This EA is in compliance with this Act. Comments received during the*

public review period will be incorporated into the final EA, as appropriate, and a comments and responses appendix will be prepared. The final EA will be accompanied by a FONSI.

- National Historic Preservation Act of 1966, as amended, 16 U.S.C. § 470 *et seq*. *Full Compliance*. The project is in compliance with Section 106 of the National Historic Preservation Act (36 C.F.R. pt. 800). There are no resources found in the APE and therefore no impacts to cultural resources.

CHAPTER 5.0 Coordination and Review of the Draft Environmental Assessment

This draft report will be circulated for a 30-day public review period to Federal, State, and Local agencies, organizations, and individuals who have an interest in the project. Copies of the draft EA will be posted on the USACE website at https://www.spn.usace.army.mil/Missions/Projects-and-Programs/Projects-by-Category/Projects-for-Flood-Risk-Management/Coyote-Dam/ and Sonoma Water's website at https://www.sonomawater.org/environmental-documents

Copies of the draft EA can be viewed at Sonoma Water's administrative office at 404 Aviation Blvd., Santa Rosa, CA. 95403 or please call 707-547-1900 to request a copy of the draft EA by mail.

All comments received during the public review period will be considered and incorporated into the final report, as appropriate. Public comments and the USACE responses to those comments will be included with the final EA.

CHAPTER 6.0 Findings

6.1 Draft Finding #1

This EA evaluated the environmental effects of the proposed Coyote Valley Dam – Lake Mendocino Major Deviation Request. Potential adverse effects to the following resources were evaluated in detail: cultural resources, recreation, special-status species, vegetation and wildlife, and water quality.

Results of the draft EA and coordination with other agencies indicated that the Proposed Action does not have the potential to cause significant environmental effects.

Based on this evaluation, the Proposed Action meets the definition of a FONSI as described in 40 C.F.R. § 1508.13. A FONSI may be prepared when an action would not have a significant effect on the human environment and for which an environmental impact statement would not be prepared. Therefore, a FONSI will be prepared and will accompany the final EA.

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Appendix A

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Appendix A

Table A-1. Coyote Valley Dam - Lake Mendocino Maximum Daily Deviation Limit Values for Hybrid, increase in spring storage beginning on March 1 (acre-feet).

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	111,000	80,050	80,050	80,050	80,050	80,050	93,127	106,205	111,000	111,000	111,000	111,000
2	111,000	80,050	80,050	80,050	80,050	80,050	93,563	106,641	111,000	111,000	111,000	111,000
3	109,968	80,050	80,050	80,050	80,050	80,486	93,999	107,077	111,000	111,000	111,000	111,000
4	108,937	80,050	80,050	80,050	80,050	80,922	94,435	107,513	111,000	111,000	111,000	111,000
5	107,905	80,050	80,050	80,050	80,050	81,358	94,871	107,949	111,000	111,000	111,000	111,000
6	106,873	80,050	80,050	80,050	80,050	81,794	95,307	108,385	111,000	111,000	111,000	111,000
7	105,842	80,050	80,050	80,050	80,050	82,230	95,743	108,820	111,000	111,000	111,000	111,000
8	104,810	80,050	80,050	80,050	80,050	82,665	96,179	109,256	111,000	111,000	111,000	111,000
9	103,778	80,050	80,050	80,050	80,050	83,101	96,615	109,692	111,000	111,000	111,000	111,000
10	102,747	80,050	80,050	80,050	80,050	83,537	97,051	110,128	111,000	111,000	111,000	111,000
11	101,715	80,050	80,050	80,050	80,050	83,973	97,487	110,564	111,000	111,000	111,000	111,000
12	100,683	80,050	80,050	80,050	80,050	84,409	97,923	111,000	111,000	111,000	111,000	111,000
13	99,652	80,050	80,050	80,050	80,050	84,845	98,358	111,000	111,000	111,000	111,000	111,000
14	98,620	80,050	80,050	80,050	80,050	85,281	98,794	111,000	111,000	111,000	111,000	111,000
15	97,588	80,050	80,050	80,050	80,050	85,717	99,230	111,000	111,000	111,000	111,000	111,000
16	96,557	80,050	80,050	80,050	80,050	86,153	99,666	111,000	111,000	111,000	111,000	111,000
17	95,525	80,050	80,050	80,050	80,050	86,589	100,102	111,000	111,000	111,000	111,000	111,000
18	94,493	80,050	80,050	80,050	80,050	87,025	100,538	111,000	111,000	111,000	111,000	111,000
19	93,462	80,050	80,050	80,050	80,050	87,461	100,974	111,000	111,000	111,000	111,000	111,000
20	92,430	80,050	80,050	80,050	80,050	87,896	101,410	111,000	111,000	111,000	111,000	111,000
21	91,398	80,050	80,050	80,050	80,050	88,332	101,846	111,000	111,000	111,000	111,000	111,000
22	90,367	80,050	80,050	80,050	80,050	88,768	102,282	111,000	111,000	111,000	111,000	111,000
23	89,335	80,050	80,050	80,050	80,050	89,204	102,718	111,000	111,000	111,000	111,000	111,000
24	88,303	80,050	80,050	80,050	80,050	89,640	103,154	111,000	111,000	111,000	111,000	111,000
25	87,272	80,050	80,050	80,050	80,050	90,076	103,589	111,000	111,000	111,000	111,000	111,000
26	86,240	80,050	80,050	80,050	80,050	90,512	104,025	111,000	111,000	111,000	111,000	111,000
27	85,208	80,050	80,050	80,050	80,050	90,948	104,461	111,000	111,000	111,000	111,000	111,000
28	84,177	80,050	80,050	80,050	80,050	91,384	104,897	111,000	111,000	111,000	111,000	111,000
29	83,145	80,050	80,050	80,050		91,820	105,333	111,000	111,000	111,000	111,000	111,000
30	82,113	80,050	80,050	80,050		92,256	105,769	111,000	111,000	111,000	111,000	111,000
31	81,082		80,050	80,050		92,692		111,000		111,000	111,000	

Table A-2. Coyote Valley Dam - Lake Mendocino Maximum Daily Deviation Limit Values for Modified Hybrid, increase in spring storage beginning on February 15 (acre-feet). The gray shading indicates days where limits differ from the Hybrid (Table A-1).

Day	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
1	111000	80050	80050	80050	80050	85386	96414	107087	111000	111000	111000	111000
2	110002	80050	80050	80050	80050	85742	96770	107443	111000	111000	111000	111000
3	109003	80050	80050	80050	80050	86098	97126	107798	111000	111000	111000	111000
4	108005	80050	80050	80050	80050	86453	97482	108154	111000	111000	111000	111000
5	107006	80050	80050	80050	80050	86809	97837	108510	111000	111000	111000	111000
6	106008	80050	80050	80050	80050	87165	98193	108866	111000	111000	111000	111000
7	105010	80050	80050	80050	80050	87521	98549	109221	111000	111000	111000	111000
8	104011	80050	80050	80050	80050	87876	98905	109577	111000	111000	111000	111000
9	103013	80050	80050	80050	80050	88232	99260	109933	111000	111000	111000	111000
10	102015	80050	80050	80050	80050	88588	99616	110289	111000	111000	111000	111000
11	101016	80050	80050	80050	80050	88944	99972	110644	111000	111000	111000	111000
12	100018	80050	80050	80050	80050	89299	100328	111000	111000	111000	111000	111000
13	99019	80050	80050	80050	80050	89655	100683	111000	111000	111000	111000	111000
14	98021	80050	80050	80050	80050	90011	101039	111000	111000	111000	111000	111000
15	97023	80050	80050	80050	80406	90367	101395	111000	111000	111000	111000	111000
16	96024	80050	80050	80050	80761	90722	101751	111000	111000	111000	111000	111000
17	95026	80050	80050	80050	81117	91078	102106	111000	111000	111000	111000	111000
18	94027	80050	80050	80050	81473	91434	102462	111000	111000	111000	111000	111000
19	93029	80050	80050	80050	81829	91790	102818	111000	111000	111000	111000	111000
20	92031	80050	80050	80050	82184	92145	103174	111000	111000	111000	111000	111000
21	91032	80050	80050	80050	82540	92501	103529	111000	111000	111000	111000	111000
22	90034	80050	80050	80050	82896	92857	103885	111000	111000	111000	111000	111000
23	89035	80050	80050	80050	83252	93213	104241	111000	111000	111000	111000	111000
24	88037	80050	80050	80050	83607	93568	104597	111000	111000	111000	111000	111000
25	87039	80050	80050	80050	83963	93924	104952	111000	111000	111000	111000	111000
26	86040	80050	80050	80050	84319	94280	105308	111000	111000	111000	111000	111000
27	85042	80050	80050	80050	84675	94636	105664	111000	111000	111000	111000	111000
28	84044	80050	80050	80050	85030	94991	106020	111000	111000	111000	111000	111000
29	83045	80050	80050	80050		95347	106375	111000	111000	111000	111000	111000
30	82047	80050	80050	80050		95703	106731	111000	111000	111000	111000	111000
31	81048		80050	80050		96059		111000		111000	111000	

Appendix B

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Appendix B-1. Special Status Plant Species with Potential to Occur in the Vicinity of the Proposed Action (USGS Quads Ukiah (3912322), Hopland (3812381), Asti (3812278), Geyserville (3812268), Jimtown (3812267), Healdsburg (3812257))

Scientific Name **Common Name**	**Status*** **Federal, State CA Rank, CNPS**	**Phenology[a]**	**Flowering Period**	**Habitat**	**Potential to Occur**
Alopecurus aequalis var. *sonomensis* Sonoma Alopecurus	FE, CNPS 1B.1	Perennial herb	May – Jul	Freshwater marshes and swamps and riparian scrub. Elevation 15 to 1,200 feet.	Low. Present in Duncans Mills and Guerneville areas near or adjacent to the Russian River. Suitable habitat in region but not within affected area.
Blennosperma bakeri Sonoma Sunshine	FE,SE S1, 1B.1	Annual herb	Mar – May	Wetlands. Vernal pools and swales in valley and foothill grassland. Elevation range: 30 – 350 feet.	Low. Suitable habitat in region but not within affected area.
Cordylanthus tenuis ssp. capillaris Pennell's Bird's-beak	FE, Rare S1, 1B.2	Annual herb	Jun – Sept	Open or disturbed areas in closed-cone coniferous forest, chaparral. Serpentine substrate. Elevation range: 145 – 995 feet.	None. Serpentine soils not present within affected areas.
Lasthenia burkei Burke's Goldfields	FE, CE, CNPS 1B.1	Annual herb	April-June	Vernal pools, swales in valley and foothill grassland and cismontane woodland. Elevation range: 45 – 1000 feet.	Moderate. Reported in depressions within grassland west of Coyote Valley Dam.
Lasthenia conjugens Contra Cost Goldfields	FE	Annual herb	Mar – Jun	Wetlands, especially vernal pools, occasionally in non wetlands. Elevation range: 6 - 400 feet.	Low. Suitable habitat in region but not within affected area.

Scientific Name **Common Name**	**Status*** **Federal, State CA Rank, CNPS**	**Phenology[a]**	**Flowering Period**	**Habitat**	**Potential to Occur**
Limnanthes vinculans Sebastopol Meadowfoam	FE	Annual herb	Apr – May	Vernal pools, swales, wet meadows in valley and foothill grassland, valley oak woodland. Poorly drained soils of clay and sandy loam. Elevation range: 35 - 950 feet..	Low. Suitable habitat in region but not within affected area.
Navarretia leucocephala ssp. plieantha Many-flowered Navarretia	FE, SE S1, 1B.2	Annual herb	May – June	Vernal pools. Volcanic ash flows and volcanic substrates. Elevation range: 95 – 3090 feet.	Low. Habitat present in region but not within affected area.
Trifolium amoenum Showy Indian Clover	FE, CNPS 1B.1	Annual herb	Apr – Jun	Coastal bluff scrub and valley and foothill grassland. Sometimes on serpentine soil. Elevation 20 - 1,360 feet.	Low. Reported from the Freestone and Bodega Bay areas. Suitable soils and habitat not generally present in the project area.

CODES:

FE: Federally listed as Endangered
FT: Federally listed as Threatened
CE: State of California listed as Endangered
CT: State of California listed as Threatened
CR: State of California listed as Rare
CNPS = California Native Plant Society
1A: Presumed extinct in California
1B: Rare, Threatened, or Endangered in California and elsewhere
2: Rare, Threatened, or Endangered in California, but more common elsewhere

POTENTIAL TO OCCUR:

Unlikely = Habitat not present in the Lake Mendocino Study Area and/or species is not known to occur in the Lake Mendocino Study Area based on CNDDB occurrences, recent field surveys or species distribution information.
Low = Habitat not present in the Lake Mendocino Study Area and/or few occurrence in the region.
Moderate = Marginal habitat present in the Lake Mendocino Study Area and/or some occurrences in the region.
High = Good habitat present in the Lake Mendocino Study Area and nearby occurrences or species is known to occur in the Study Area based on CNDDB occurrences or recent field surveys.

SOURCES:

California Native Plant Society, Rare Plant Program. 2020. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 22 July 2020].

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USFWS. 2020. ECOS FWS-Listed U.S. Species by Taxonomic Group - Flowering Plants. Accessed June 22, 2020. Available at: https://ecos.fws.gov/ecp/listedSpecies/speciesListingsByTaxGroupPage?statusCategory=Listed&groupName=Flowering%20Plants&total=891

Appendix B-2. Special Status Animal Species with Potential to Occur in the Vicinity of the Proposed Action (USGS Quads Ukiah (3912322), Hopland (3812381), Asti (3812278), Geyserville (3812268), Jimtown (3812267), Healdsburg (3812257))

Scientific Name Common Name	Legal Status[1]	Habitat	Nearest Documented Occurrence and Potential Presence in Project Area[2]
Invertebrates			
Syncaris pacifica California freshwater shrimp	FE, SE	Perennial creeks with slow flows and developed bank vegetation. Needs deep undercut banks with exposed roots for winter refugia.	Unlikely. Several occurrences in tributaries of the Russian River, including Green Valley, Austin, and Blucher creeks. Not known to occur in larger streams including the Russian River. No suitable habitat in Lake Mendocino. Species unlikely to occur in project area.
Amphibians			
Ambystoma californiense California tiger salamander, Sonoma County	FT, ST	Grasslands and valley foothill woodland habitats with appropriate subterranean refuge sites (burrows). Breeds in fishless vernal pools and seasonal ponds.	Unlikely. Project area does not include vernal pools and is located outside designated critical habitat.
Rana draytonii California red-legged frog	FT, CSC	Creeks, ponds, and marshes with permanent or temporary water bordered by emergent or riparian vegetation. Requires 4-6 months of permanent water for larval development.	Moderate. Reported occurrences from tributaries and ponds in the lower Russian River area. No reports from the Russian River mainstem or Lake Mendocino. Project area is located outside critical habitat.
Birds			
Brachyramphus marmoratus Marbled murrelet	FT, SE	This coastal seabird from the North Pacific nests in old-growth coniferous forests. Foraging occurs in open ocean for small fish.	Unlikely. No old-growth forest or Critical Habitat within the Project area. Unlikely to nest or forage in the project area.
Charadrius alexandrinus nivosus Western Snowy Plover, Pacific Coast population	FT	This species breeds on sandy coasts and brackish inland lakes, and is uncommon in freshwater.	Unlikely. No records within the Project Area. No suitable nesting habitat and unlikely to occur in the Project Area. Project Area is located outside critical habitat.
Coccyzus americanus occidentalis Western Yellow-billed Cuckoo	FT, SE	Requires patches of at least 25 acres of dense riparian forest with a canopy cover of at least 50 percent in both the understory and overstory; nests typically in mature willows.	Low. A single cuckoo was observed in Bodega Head in 2014, located 9 miles south of the Estuary. The project area is located outside the normal breeding range for this species; may occur as an infrequent transient.
Strix occidentalis caurina Northern spotted owl	FT	Old growth forests or mixed stands of old growth and mature trees. High, multistory canopy dominated by big trees, many trees w/cavities or broken tops, woody debris, and space under canopy.	Low. No reports from the project area, but likely uses mature forests in the vicinity. May be infrequent visitor to the project area.

[1]Legal Status:
FE: Listed as endangered under the FESA.
FT: Listed as threatened under the FESA.
FC: A candidate for listing under the FESA.
FSC: USFWS Species of Concern.
SE: Listed as endangered under the California Endangered Species Act (CESA).
ST: Listed as threatened under the CESA.
SC: Candidate for listing under the CESA.
SA: CDFW Special Animal.
CSC: A CDFW Species of Special Concern.

FP: Fully protected under California Fish and Game Code (Birds §3511; Mammals §4700; Reptiles and Amphibians §5050; Fish §5515).
PN: Protected native amphibian or reptile under California Fish and Game Code Chapter 5, §41 and §42, respectively.
MMA: protected by the federal Marine Mammal Act
[2]Source of Nearest Documented Occurrences: (CDFW, 2020) and (USGS, 2016).

Sources:

CDFW. (2020). Occurrence Report. *California Natural Diversity Database*. Sacramento: California Department of Fish and Wildlife.

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Appendix B-3.

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United States Department of the Interior

FISH AND WILDLIFE SERVICE
Arcata Fish And Wildlife Office
1655 Heindon Road
Arcata, CA 95521-4573
Phone: (707) 822-7201 Fax: (707) 822-8411

In Reply Refer To: June 05, 2020
Consultation Code: 08EACT00-2018-SLI-0090
Event Code: 08EACT00-2020-E-00620
Project Name: Coyote Valley Dam - Lake Mendocino Major Deviation Request Project, WY 2021-2026

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Arcata Fish And Wildlife Office
1655 Heindon Road
Arcata, CA 95521-4573
(707) 822-7201

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08EACT00-2018-SLI-0090

Event Code: 08EACT00-2020-E-00620

Project Name: Coyote Valley Dam - Lake Mendocino Major Deviation Request Project, WY 2021-2026

Project Type: WATER SUPPLY / DELIVERY

Project Description: Project includes the optional use of newly-developed precipitation forecasting tools to inform the USACE's application of its flood control manual for reservoir releases.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.91217613391816N123.06159132310098W

Counties: Mendocino, CA | Sonoma, CA

Endangered Species Act Species

There is a total of 11 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Fisher *Pekania pennanti* Population: West coast DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3651	Threatened

Birds

NAME	STATUS
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened
Western Snowy Plover *Charadrius nivosus nivosus* Population: Pacific Coast population DPS-U.S.A. (CA, OR, WA), Mexico (within 50 miles of Pacific coast) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/8035	Threatened
Yellow-billed Cuckoo *Coccyzus americanus* Population: Western U.S. DPS There is **proposed** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/3911	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Tidewater Goby *Eucyclogobius newberryi* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/57	Endangered

Crustaceans

NAME	STATUS
California Freshwater Shrimp *Syncaris pacifica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/7903	Endangered

Flowering Plants

NAME	STATUS
Burke's Goldfields *Lasthenia burkei* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4338	Endangered
Contra Costa Goldfields *Lasthenia conjugens* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/7058	Endangered
Showy Indian Clover *Trifolium amoenum* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6459	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Appendix B-4

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: June 05, 2020
Consultation Code: 08ESMF00-2018-SLI-0869
Event Code: 08ESMF00-2020-E-06495
Project Name: Coyote Valley Dam - Lake Mendocino Major Deviation Request Project, WY 2021-2026

Subject: Updated list of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

This project's location is within the jurisdiction of multiple offices. Expect additional species list documents from the following office, and expect that the species and critical habitats in each document reflect only those that fall in the office's jurisdiction:

Arcata Fish And Wildlife Office
1655 Heindon Road
Arcata, CA 95521-4573
(707) 822-7201

Project Summary

Consultation Code: 08ESMF00-2018-SLI-0869

Event Code: 08ESMF00-2020-E-06495

Project Name: Coyote Valley Dam - Lake Mendocino Major Deviation Request Project, WY 2021-2026

Project Type: WATER SUPPLY / DELIVERY

Project Description: Project includes the optional use of newly-developed precipitation forecasting tools to inform the USACE's application of its flood control manual for reservoir releases.

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/38.91217613391816N123.06159132310098W

Counties: Mendocino, CA | Sonoma, CA

Endangered Species Act Species

There is a total of 13 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Marbled Murrelet *Brachyramphus marmoratus* Population: U.S.A. (CA, OR, WA) There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/4467	Threatened
Northern Spotted Owl *Strix occidentalis caurina* There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/1123	Threatened

Reptiles

NAME	STATUS
Green Sea Turtle *Chelonia mydas* Population: East Pacific DPS No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/6199	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2891
Species survey guidelines:
https://ecos.fws.gov/ipac/guideline/survey/population/205/office/11420.pdf

California Tiger Salamander *Ambystoma californiense*	Endangered

Population: U.S.A. (CA - Sonoma County)
There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/2076

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus*	Threatened

There is **final** critical habitat for this species. Your location is outside the critical habitat.
Species profile: https://ecos.fws.gov/ecp/species/321

Crustaceans

NAME	STATUS
California Freshwater Shrimp *Syncaris pacifica*	Endangered

No critical habitat has been designated for this species.
Species profile: https://ecos.fws.gov/ecp/species/7903

Flowering Plants

NAME	STATUS
Burke's Goldfields *Lasthenia burkei* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4338	Endangered
Many-flowered Navarretia *Navarretia leucocephala ssp. plieantha* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2491	Endangered
Pennell's Bird's-beak *Cordylanthus tenuis ssp. capillaris* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/3175	Endangered
Sebastopol Meadowfoam *Limnanthes vinculans* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/404	Endangered
Sonoma Alopecurus *Alopecurus aequalis var. sonomensis* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/557	Endangered
Sonoma Sunshine *Blennosperma bakeri* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1260	Endangered

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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Appendix C

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Summary of Coordination with National Marine Fisheries Service regarding Lake Mendocino Forecast Informed Reservoir Operations (FIRO) Steering Committee Major Deviation Request from the Coyote Valley Dam – Lake Mendocino Water Control Manual

Members of the Lake Mendocino Forecast Informed Reservoir Operations (FIRO) Steering Committee requested a third consecutive planned major deviation to the Coyote Valley Dam – Lake Mendocino Water Control Manual (WCM) (USACE, 1986a), which follows the major deviations implemented for WY 2019 and WY 2020. The purpose of this request is to improve water supply reliability, flood risk management, and environmental conditions of Lake Mendocino and the upper Russian River. Staff from U.S. Army Corps of Engineers (USACE), National Marine Fisheries Service (NMFS), and the Sonoma County Water Agency (Sonoma Water) coordinated to ensure avoidance of potential effects to listed salmonid species downstream of Lake Mendocino in the Russian River.

Background on Major Deviation Request and Lake Mendocino Operations

The FIRO effort is led by a steering committee formed in 2014 consisting of representatives from the USACE, Sonoma Water, Scripps Institute of Oceanography (Scripps), National Oceanic and Atmospheric Administration (NOAA), U.S. Geologic Survey (USGS), U.S. Bureau of Reclamation and the California Department of Water Resources. NOAA staff that participate in the FIRO effort include technical staff from the NOAA Restoration Center and National Marine Fisheries Service, National Weather Service (NWS), California Nevada River Forecast Center (CNRFC), and NOAA Earth System Research Laboratory (ESRL).

The purpose of this request is to improve water supply reliability, flood risk management, and environmental conditions of Lake Mendocino and the upper Russian River. Lake Mendocino has experienced significantly reduced water supply reliability over the past several years due to a significant reduction of trans-basin transfers from the Eel River. The goal of FIRO is to help restore some of the diminished water supply reliability without reducing the existing flood protection capacity of Lake Mendocino. FIRO is a water management program that uses data from watershed monitoring networks and improved weather and hydrologic forecasting to help water managers selectively retain or release water from reservoirs in a flexible manner that more accurately reflects and leverages the natural variability and predictability of meteorology and hydrology. Potential ecosystems benefits include increased flexibility in reservoir storage that can improve the timing and volume of releases to improve water quality conditions and provide reliable flow for federal listed salmonids.

Operation of Lake Mendocino is governed by WCM rules that allocate storage to flood management and conservation (water supply) purposes in a seasonally varying manner and specify how water may be stored in the flood pool and conservation pool. The WCM rules allocate the 122,400 acre-feet (AF) of storage in Lake Mendocino to storage for flood management and storage for conservation purposes. The seasonally varying flood storage pool varies from a maximum of 54,000 AF in the winter rainy season to 11,400 AF in the drier summer season. Rules require the flood pool to be empty except briefly in periods of greatest inflow. Then flood runoff is stored and released at a rate that avoids or minimizes exceedance of

downstream flow targets at Hopland (a key stream gage downstream from the reservoir), Healdsburg, Guerneville, and elsewhere (Jasperse, et al., 2017).

The conservation storage, used for water management objectives and meeting minimum instream flow requirements, is filled as water is available to do so. However, operation following the WCM rules strictly does not permit storage in the flood pool for conservation purposes. These rules apply even if inflow forecasts do not indicate an immediate need for empty space to manage flood water (Jasperse, et al., 2017).

Members of the FIRO Steering Committee are requesting USACE approval of a planned major deviation to store additional water above the existing guide curve for the Coyote Valley Dam Lake Mendocino WCM. If approved, this would result in an additional storage of 11,650 acre-feet between November 1 and February 28 in each year, with an option to begin the increase in spring storage as early as February 15 (Modified Hybrid alternative), if conditions allow, or on March 1 (Hybrid alternative). This request for a planned major deviation to the WCM for WY 2021 through WY 2026 follows the successful implementation of major deviations granted by the USACE for WY 2019 (Figure C-1) and WY 2020 (Figure C-2); and is essentially the same as and follows the successful implementation of those previous major deviations, with the addition of an option to begin the increase in spring storage as early as February 15, which the USACE can exercise at their discretion. NMFS is requesting an advance opportunity to provide technical assistance to the USACE for increases in spring storage beginning February 15 to ensure upper Russian River conditions remain adequate for adult steelhead. Similar to the WY 2020 approved planned major deviation, the WY 2021 through WY 2026 request would allow USACE to pre-release in advance of a storm event into the water conservation pool if: (1) such a release is recommended by the FIRO decision support tools and (2) Sonoma Water is consulted about the pre-release and approves of the action in coordination with the National Marine Fisheries Service.

In the summer of 2017, the FIRO Steering Committee completed the *Preliminary Viability Assessment of Lake Mendocino Forecast Informed Reservoir Operations* (PVA; (Jasperse et al., 2017), which represents a major effort to develop the Lake Mendocino FIRO project, http://cw3e.ucsd.edu/firo-preliminary-viability-assessment-for-lake-mendocino/). This major body of work demonstrates that there is significant evidence that weather and water forecasts can be used to improve the operation of Lake Mendocino to recover lost water supply reliability without compromising flood management capacity. In addition, significant environmental benefits are achievable by improving fishery habitat for minimum flows and lower water temperatures. These conclusions were reached through three independent studies conducted by the USACE's Hydrologic Engineering Center (HEC, 2017), Scripps Center for Western Weather and Water Extremes (CW3E) (CW3E, 2017), Sonoma Water (Sonoma Water, 2017), and the National Marine Fisheries Service (NMFS, 2019)). As mentioned above, the FIRO Steering Committee is currently working on a Final Viability Assessment. In the extensive evaluation performed in support of the FVA, the Modified Hybrid model provided the highest level of benefits by virtue of both objective and expert-elicitation evaluation of 16 multi-purpose metrics. Draft documents on the FVA evaluation have been reviewed by the FIRO Steering Committee, are available online and upon request, and will be published by the end of 2020.

The decision to repeat the WY 2020 major deviation for the upcoming five-year period was based on a collaborative process between members of the Steering Committee and USACE reservoir operators in which the results of the prior two years of operations were evaluated relative to options for different potential deviations. It is important to emphasize that if water levels are within the storage space allowed by this deviation, the USACE will have the discretion to utilize the additional information provided to inform reservoir operations. USACE reservoir operators will retain full operational control and authority, with the Russian River Decision Support System (RR-DSS) providing an additional tool for dam operators to make flood operation decisions.

Coyote Valley Dam/Lake Mendocino Flood Operations and Russian River Biological Opinion

The NMFS issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River Watershed* (Russian River Biological Opinion) on September 24, 2008 (NMFS, 2008). The Russian River Biological Opinion is a culmination of more than a decade of consultation among the USACE, the Sonoma Water, the Mendocino County Water Conservation and Flood Control Improvement District (MCDWFCID), and NMFS regarding the impacts of the USACE and Sonoma Water flood control and water supply activities on three fish species listed under the federal Endangered Species Act: Central California Coast steelhead (*Oncorhynchus mykiss*); Central California Coast coho salmon (*O. kisutch*); and California Coastal Chinook salmon (*O. tshawytscha*). Coho salmon are also listed under the California Endangered Species Act (CESA).

The Russian River Biological Opinion includes an Incidental Take Statement with a term of 15 years that authorizes the USACE and the Sonoma Water to conduct specified lawful operations and make specified changes in operations as a result of the Russian River Biological Opinion so long as the terms and conditions of the Incidental Take Statement are met, even if incidental take may result from such operations. The Incidental Take Statement includes Reasonable and Prudent Measures (RPMs) that the USACE and Sonoma Water must implement to minimize and monitor the impacts of the incidental take of listed species due to implementation of the Sonoma Water and USACE's water supply and flood control activities and Reasonable and Prudent Alternatives (RPAs) (NMFS, 2008).

The Russian River Biological Opinion evaluated the USACE's flood control operations of Coyote Valley Dam/Lake Mendocino under the WCM, including the described releases from Flood Control Schedules 1, 2, and 3 used to empty the flood control pool following a storm (NMFS, 2008). The Biological Opinion identified Coyote Valley Dam flood operations as including both water storage and water releases. Water storage reduces the magnitude of flood peaks, while flood releases have the potential to scour the streambed, erode banks, increase turbidity, and may create dewatered channel conditions during ramp downs of flood releases. NMFS' analysis found potential adverse impacts to Chinook salmon spawning habitat from scour and bank erosion, and potential impacts to Chinook and steelhead spawning and rearing habitat from the

release of turbid waters. Ramping of flows was found to create intermittent flow and/or dewatered conditions in rearing habitat used by both Chinook salmon and steelhead fry and juveniles during the winter and spring. Pre-flood and periodic inspections during the fall (September) are likely to cause dewatered channel conditions, adversely affecting rearing habitat for juvenile steelhead.

The Russian River Biological Opinion includes an Incidental Take Statement. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2) of the Endangered Species Act, taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of an incidental take statement. Incidental take measures related to flood control activities at Coyote Valley Dam and Lake Mendocino are identified beginning on page 304 of the Russian River Biological Opinion (NMFS, 2008).

Discussion of Viability Assessment Results

In an extensive evaluation performed in support of the FVA, the Modified Hybrid alternative provided the highest level of benefits by virtue of both objective and expert-elicitation evaluation of 16 multi-purpose metrics. Flood control operations would continue to be implemented in light of the Incidental Take Statement issued by NMFS under the Russian River Biological Opinion (see below).

The 5-year major deviation request, if approved by the USACE, would allow conditional encroachment of water into the flood control pool by 11,650 acre-feet; and potentially increasing stored water from November 1 to February 14 to 80,050 acre-feet (Figure C-3). From October 1 to 31, the Proposed Action would decrease the conservation pool by 1,030 acre-feet per day if storage is above 80,050 acre-feet. The Proposed Action would provide an option to begin the increase in spring storage as soon as February 15 (Modified Hybrid) or March 1 (Hybrid). Beginning the spring refill on February 15 would increase the conservation pool from February 15 to May 10 by 356 acre-feet per day. Beginning the spring refill on March 1 would increase the conservation pool from March 1 to May 10 by 436 acre-feet per day. The proposed encroachment into the flood control pool is within the flood control pool schedules (see Figure 2 in EA) identified in the WCM and evaluated in the Russian River Biological Opinion. The RR-DSS is designed to inform operations when storage levels are within the proposed encroachment space. If reservoir storage is above the maximum encroachment limit (as previously defined), then water will be released as quickly as feasible, while considering all release constraints and downstream flow requirements, to return storage to a level that is at or below the proposed maximum encroachment limit.

The Proposed Action as proposed would comply with existing operations, including Decision 1610 minimum instream flow requirements and the Russian River Biological Opinion, flood release requirements including that there would be no flood releases when Russian River flows at Hopland are greater than 8,000 cubic feet per second, and in compliance with new ramping

schedule criteria identified by the NMFS and USACE (NMFS, 2016).[3] Modeling of historical hydrology (1985-2017) demonstrated that the Proposed Action helps support improvements in reliable reservoir storage at the beginning (Figure C-4) of the steelhead rearing season and at the end of the water year (Figure C-5), helping to meet recommended Russian River Biological Opinion juvenile steelhead rearing minimum instream flows (Figure C-6), provide improved (cooler) water temperatures for releases out of Lake Mendocino, and reliable releases at the end of the water year to support adult Chinook salmon migration and spawning. Model results demonstrate that these improvements would not increase flood or spill risk (Figures C-7 and C-8).

These results were evaluated to ensure that the major deviation request and the RR-DSS, if used by the USACE for flood control operations, would not increase potential flood control operations impacts to salmonid migration and spawning. Figures C-9 (1986) and C-10 (1997) demonstrate implementation of the FIRO decision tool in years of atmospheric rivers with associated flood events, with a storm event preceded by a flood control release in advance of the storm and reduced flows after the storm event in comparison to existing operations. The Proposed Action includes an option to begin the spring refill as soon as February 15 (Modified Hybrid) or March 1 (Hybrid). Beginning the spring fill as early as February 15 as described in the Proposed Action, would result in reaching peak water surface elevations in the reservoir sooner in some years, but reservoir operations would be similar to the No Action alternative. Beginning the spring refill on February 15 versus March 1 would result in similar reservoir releases across the years evaluated, including in dry years (examples years provided: 1986, Figure C-11; 1997, Figure C-12; 2017, Figure C-13; dry years - 2009, Figure C-14; 2013, Figure C-15; 2014, Figure C-16; 2015, Figure C-17).

One observation previously raised by NMFS was related to model results, such as in 1996 (Figure C-18), when the Hybrid and Modified Hybrid alternatives show reduced fall flood control releases relative to existing operations. Due to the potential additional storage afforded by the flood pool encroachment under the proposed action, certain years could delay fall flood control releases due to additional time that the reservoir takes to reach capacity from early season storms. NMFS also observed that under existing operations, early season flood releases (prior to mid-November) made under dry season flow conditions, with no incoming precipitation events, may raise concerns regarding adult Chinook salmon migration in the fall. The proposed major deviation would reduce the frequency of early season flood releases (prior to mid-November) that would result in artificial pulse flows that could cue premature adult Chinook salmon migrations. If flood releases are needed in the fall, NMFS recommends that they should be coupled with the onset of precipitation events and/or made during the later fall period. NMFS requests an advanced opportunity to provide technical assistance to the USACE for the timing of such fall releases in order to determine the appropriate release strategy for spawning and migrating salmonids. Additionally, NMFS requests an advance opportunity to provide technical assistance to the USACE for increases in spring storage beginning February 15 to ensure upper Russian River conditions remain adequate for adult steelhead. Sonoma Water requests to be

[3] Development of the new ramping schedule criteria was in response to the Russian River Biological Opinion Reasonable and Prudent Measure 3 to minimize and avoid adverse impacts to listed salmonids.

part of the coordination discussions as well. The USACE will provide notifications of proposed release changes electronically on the internet and by electronic mail to NMFS and Sonoma Water and will continue to make these notifications during implementation of the major deviation request.

Figure C-1. Water Year 2019 Major Deviation Summary of Lake Mendocino storage, releases, and flow at Hopland, including observed conditions and modified hybrid alternative model results.

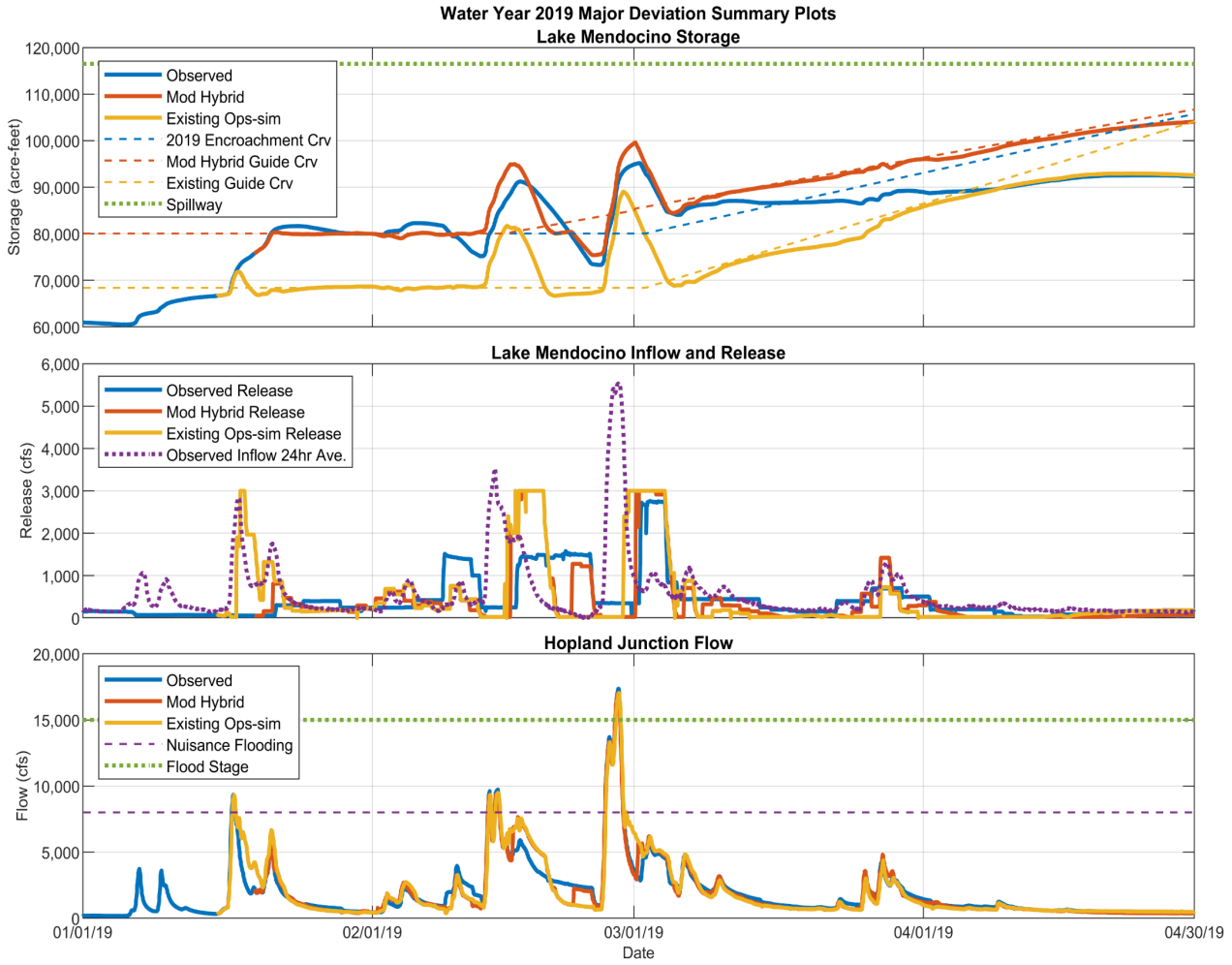


Figure C-2. Water Year 2020 Major Deviation Summary of Lake Mendocino storage, releases, and flow at Hopland, including observed conditions and virtual existing water control manual operations results.

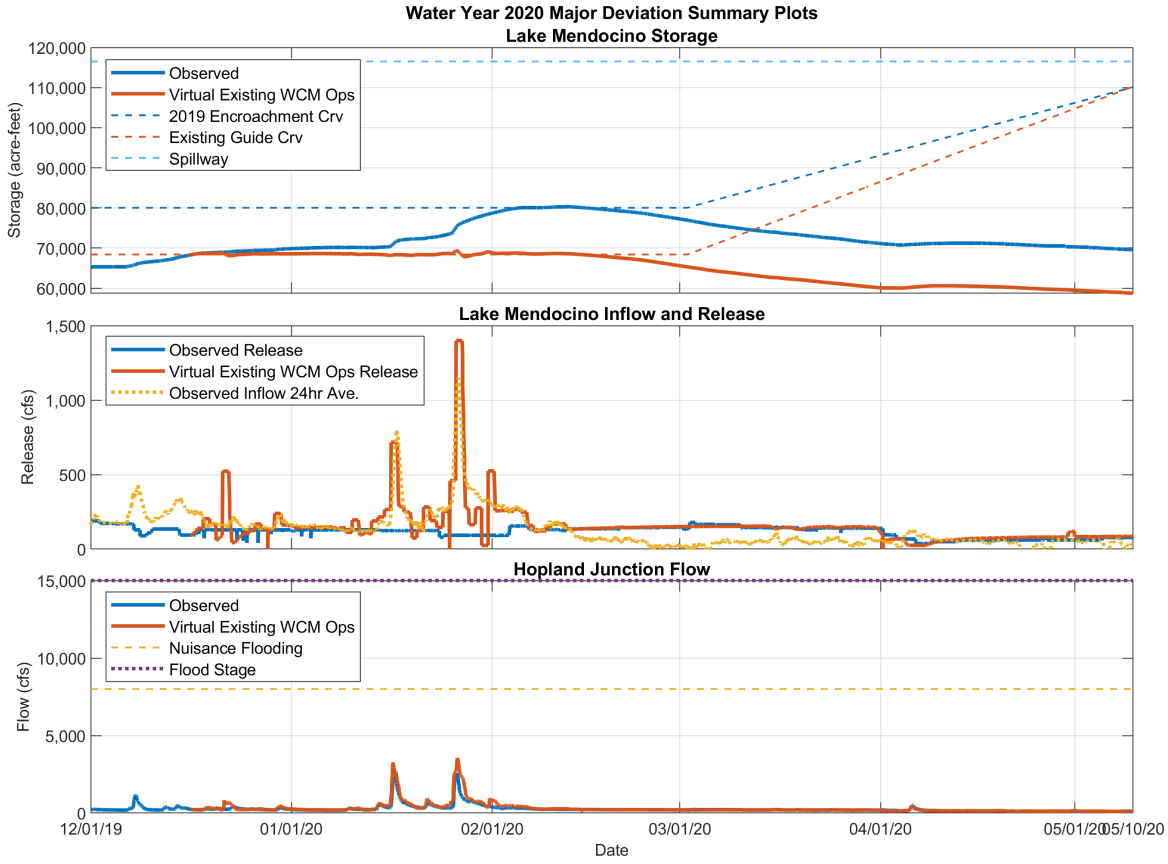


Figure C-3. Existing Guide Curve from Coyote Valley Dam – Lake Mendocino Water Control Manual (USACE 1986a) and Proposed Maximum Deviation Limit Major Deviation Request beginning on February 15 and March 1.

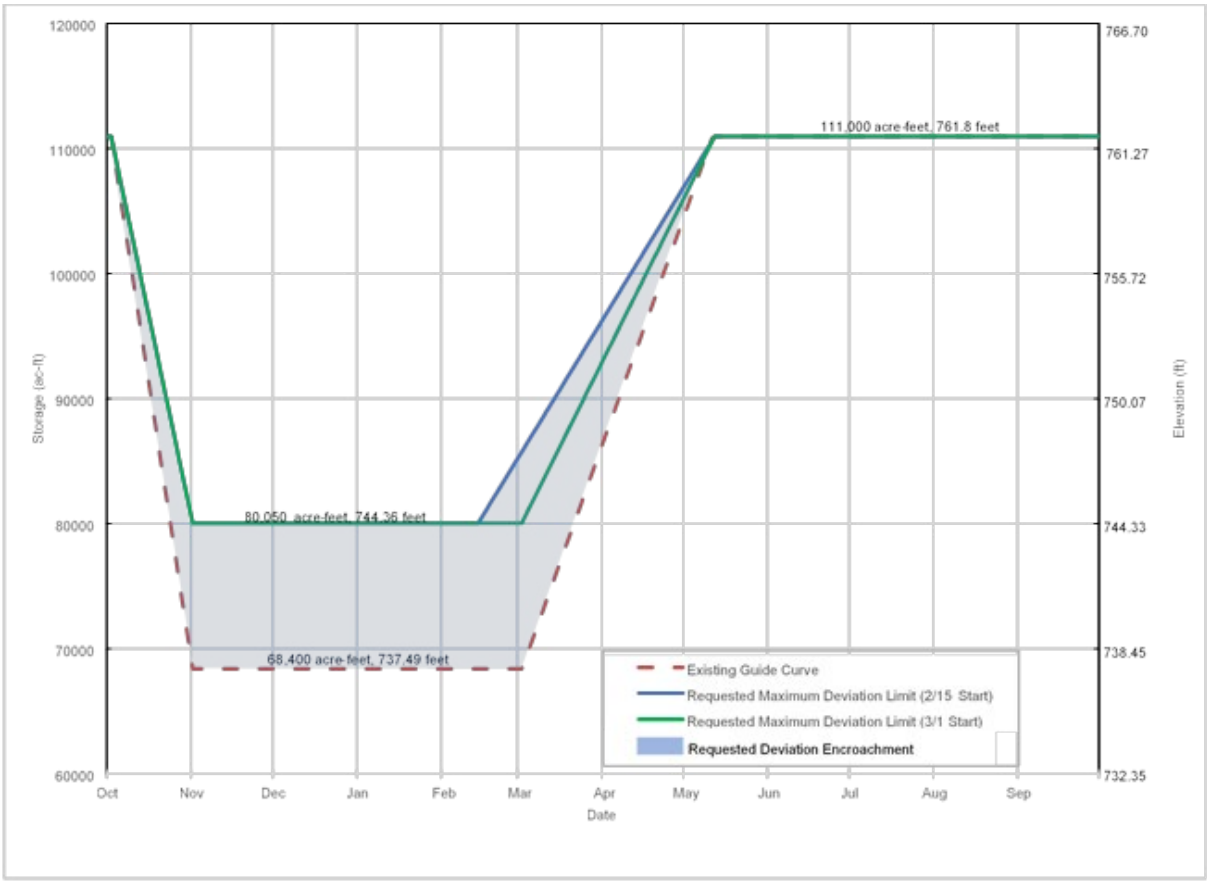


Figure C-4. Lake Mendocino reservoir storage at early steelhead rearing season (May 10) for existing operations and with Modified Hybrid (February 15 spring refill start) and Hybrid (March 1 spring refill start) alternatives.

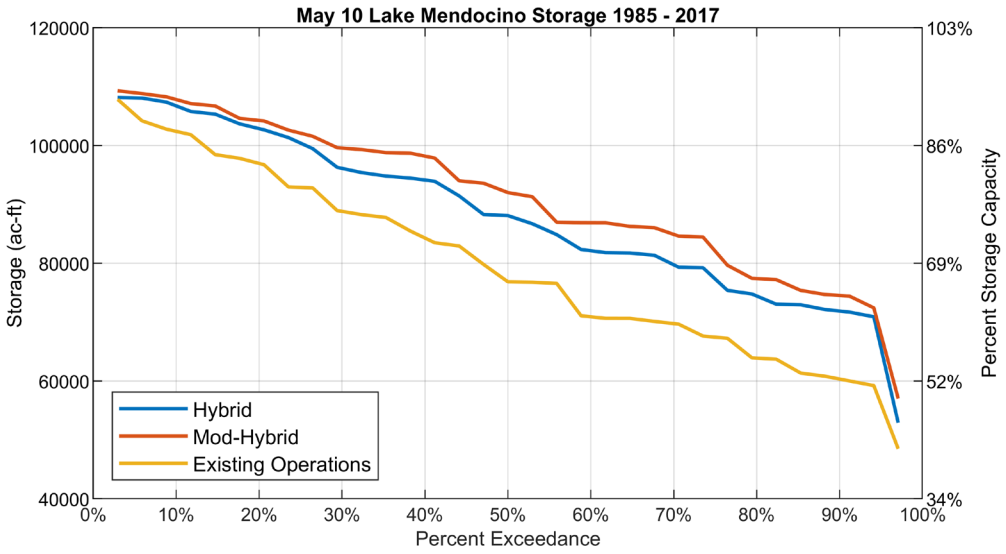


Figure C-5. Lake Mendocino reservoir storage at end of water year for existing operations and with modified hybrid (February 15 spring refill start) and hybrid (March 1 spring refill start) alternatives.

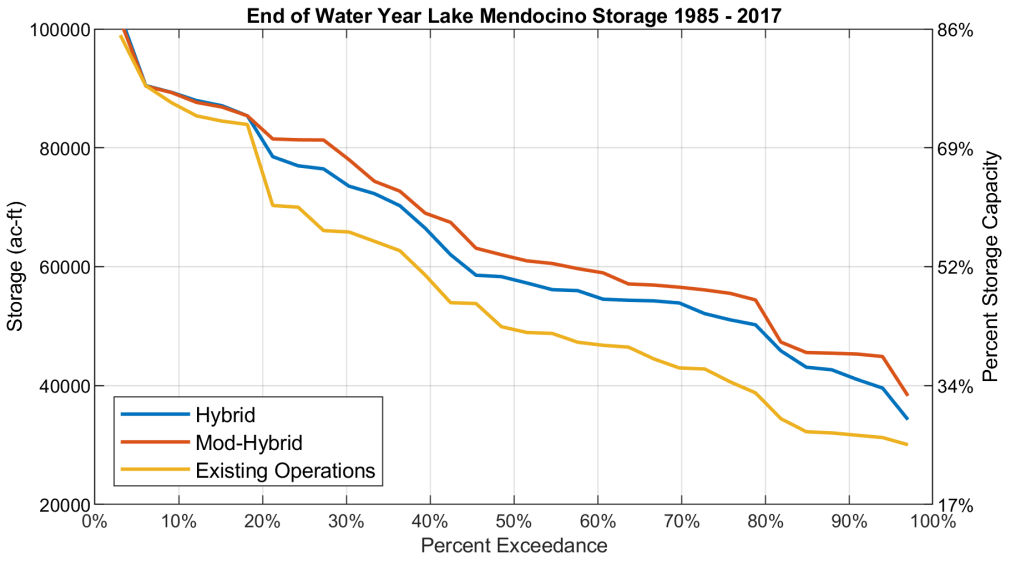


Figure C-6. Percent of days per season, June through September, in which flows satisfy 125 cubic feet per second (cfs) at Cloverdale for alternatives considered in FIRO Final Viablity Assessment (in prep.).

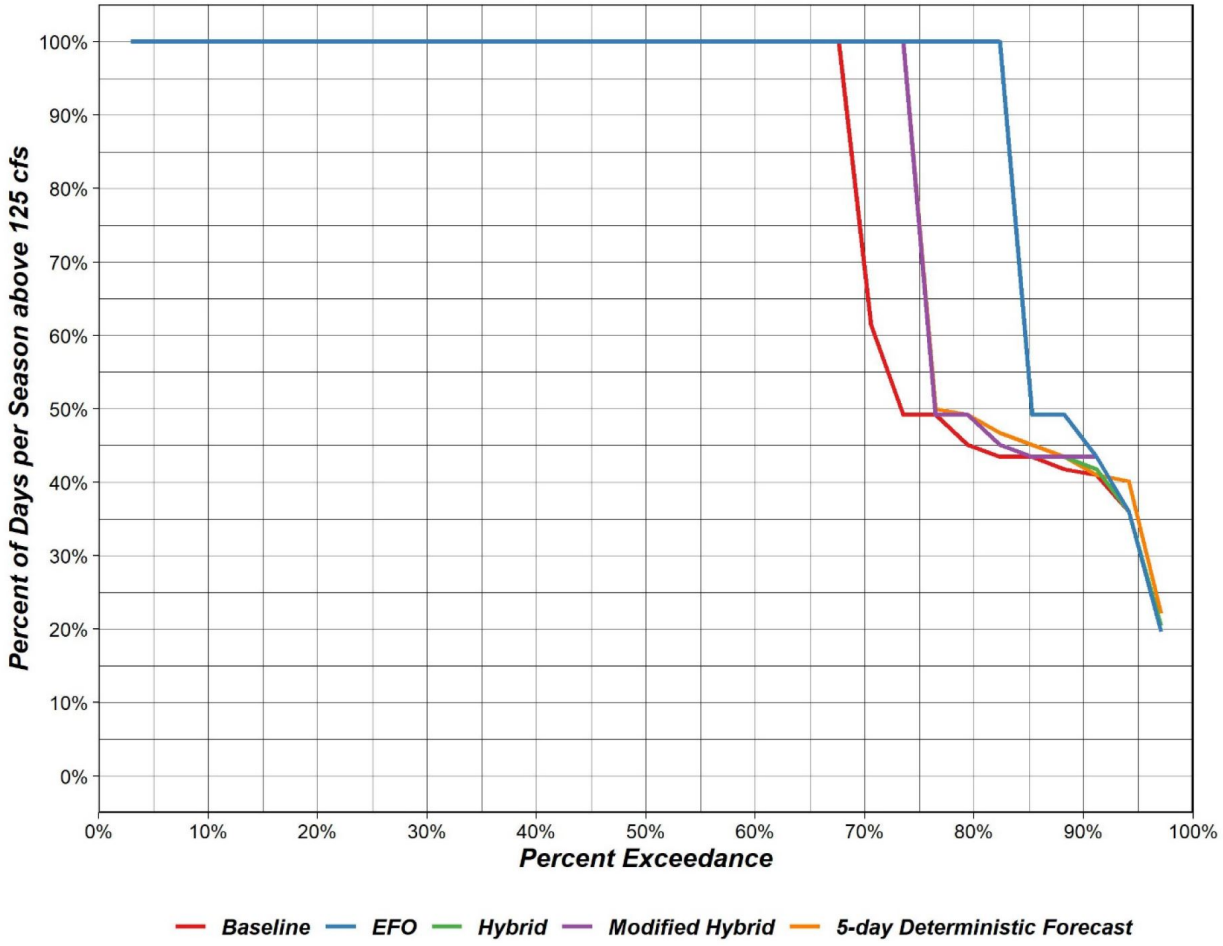


Figure C-7. Annual maximum flow exceedance probability at Hopland for alternatives considered in FIRO Final Viablity Assessment (in prep.).

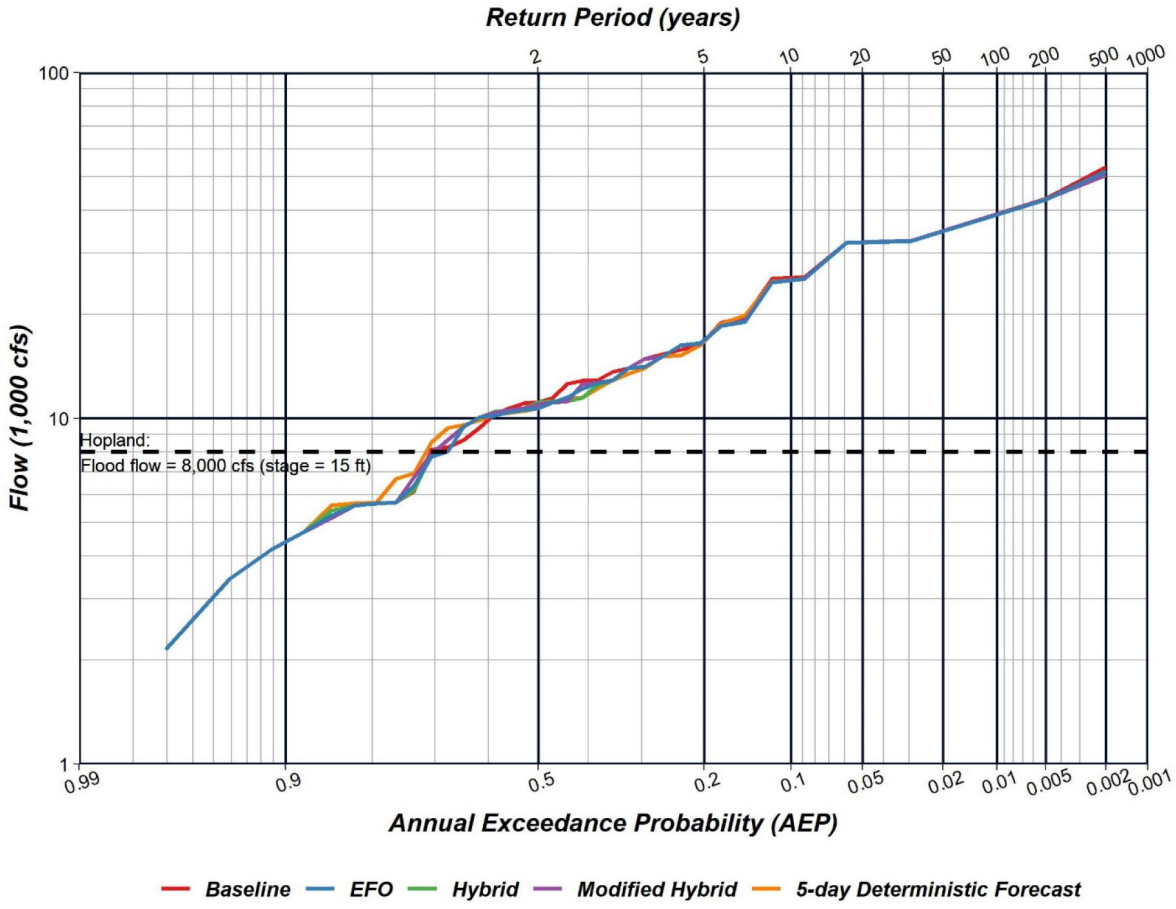


Figure C-8. Annual maximum uncontrolled spill-frequency in Lake Mendocino for alternatives considered in FIRO Final Viablity Assessment (in prep.).

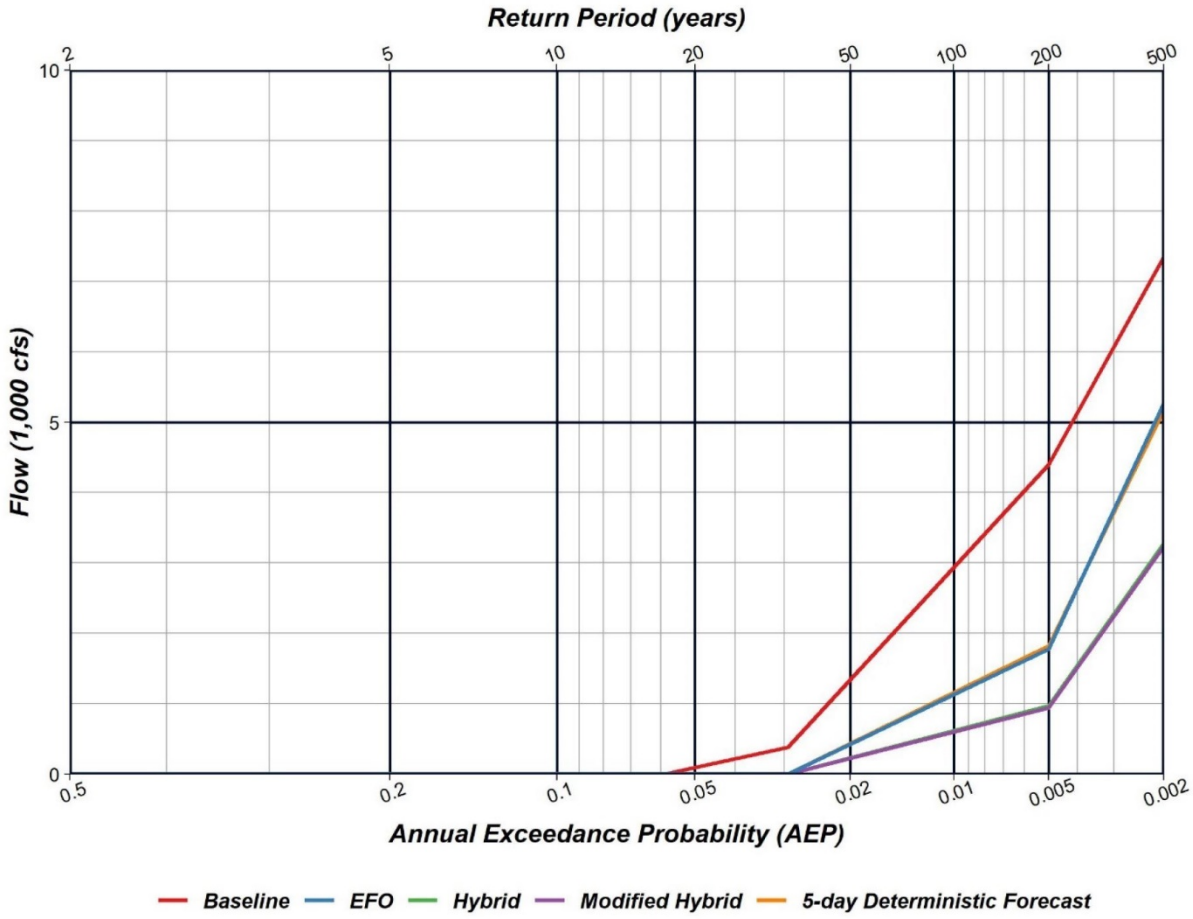


Figure C-9. Water Year 1986 FIRO operations (hybrid and modified hybrid alternatives) simulation results. Water Year 1986 included a mid-winter atmospheric river event.

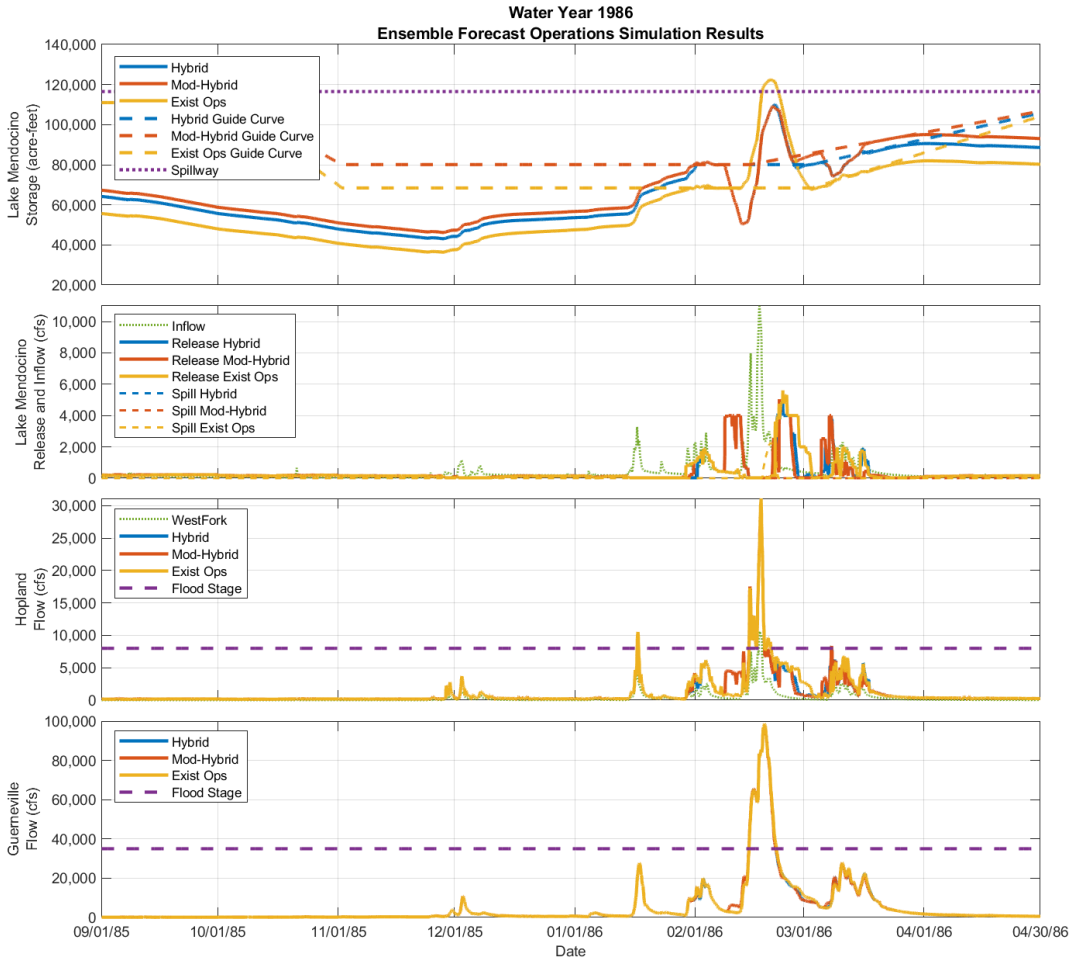


Figure C-10. Water Year 1997 FIRO operations (hybrid and modified hybrid alternatives) simulation results. Water Year 1997 included an early-winter atmospheric river event.

Figure C-11. Simulated comparison of spring refill on beginning February 15 (modified hybrid alternative) versus March 1 (hybrid alternative) Lake Mendocino storage, releases, and flow at Hopland and Guerneville, including observed conditions and virtual existing water control manual operations results from February to April 1986.

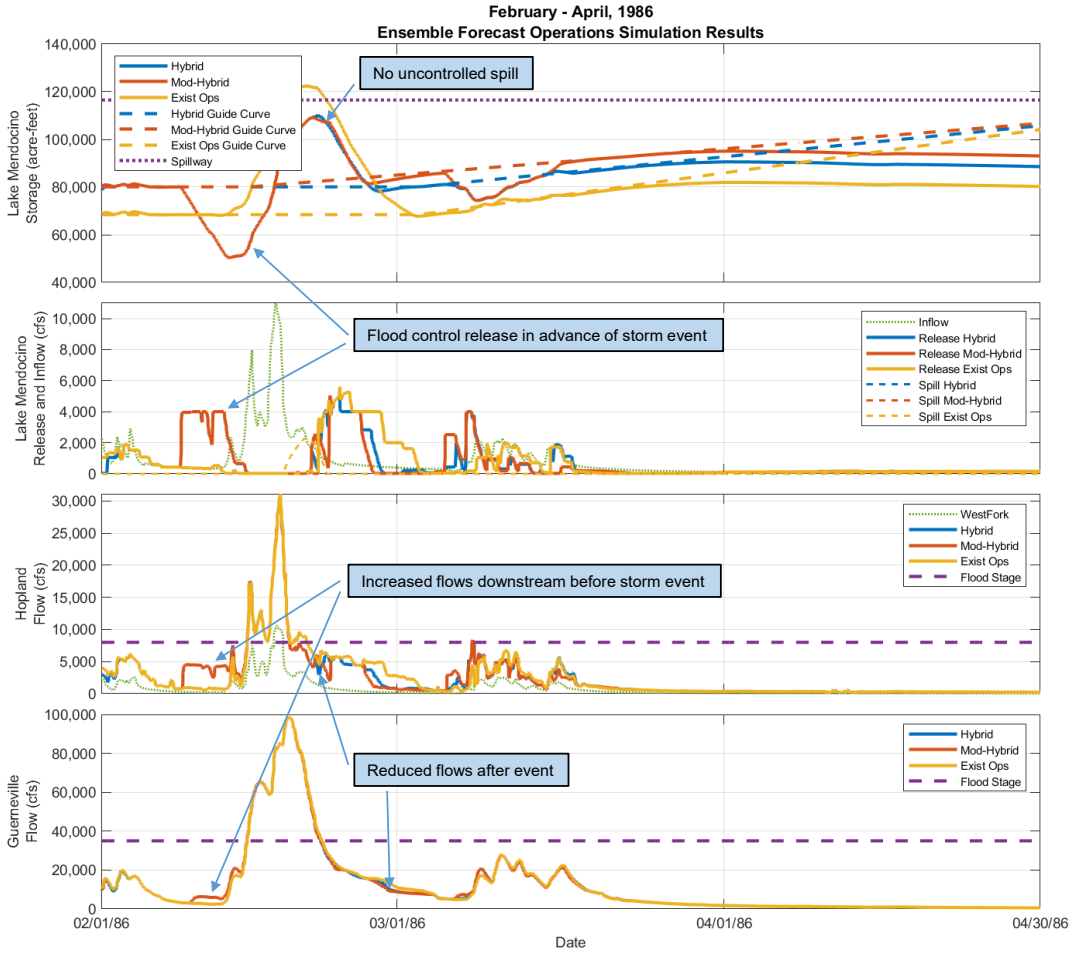


Figure C-12. Simulated comparison of spring refill on beginning February 15 (modified hybrid alternative) versus March 1 (hybrid alternative) Lake Mendocino storage, releases, and flow at Hopland and Guerneville, including observed conditions and virtual existing water control manual operations results from February to April 1997.

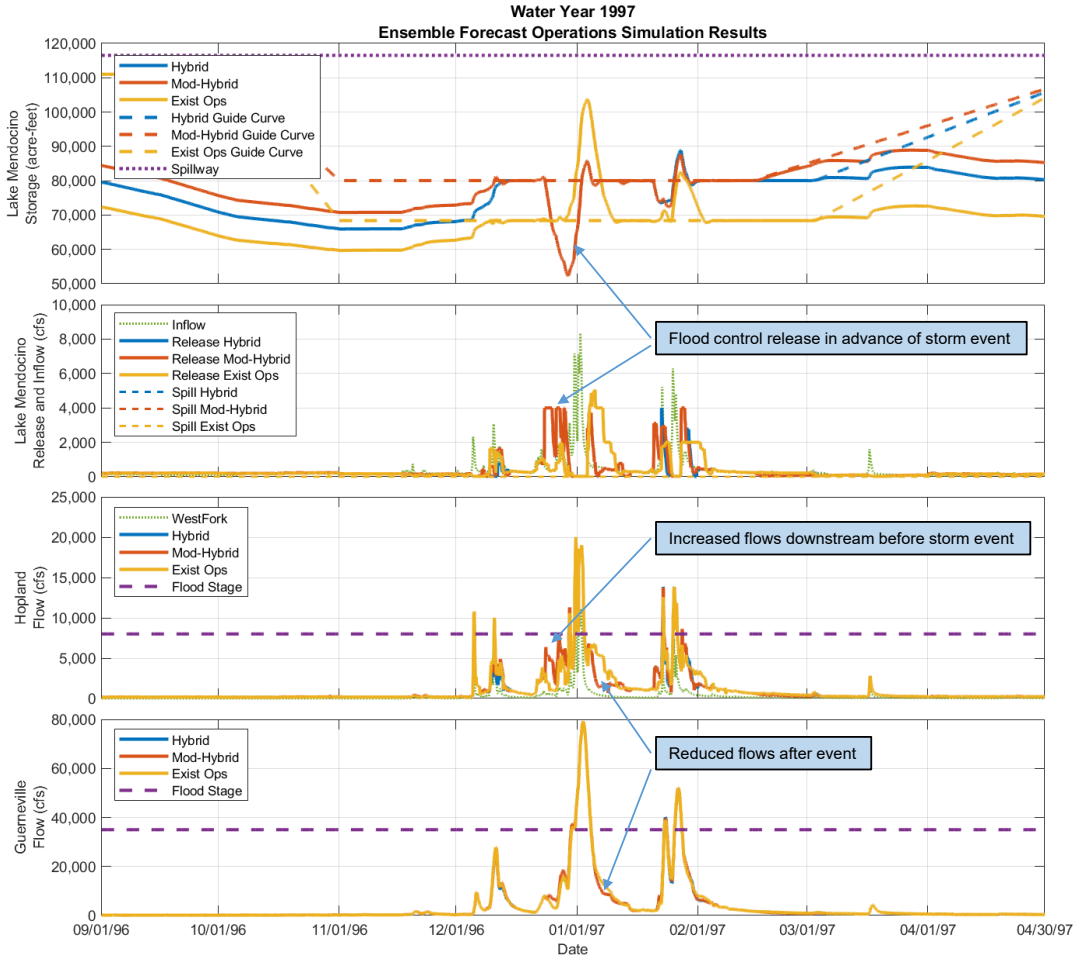


Figure C-13. Simulated comparison of spring refill on beginning February 15 (modified hybrid alternative) versus March 1 (hybrid alternative) Lake Mendocino storage, releases, and flow at Hopland and Guerneville, including observed conditions and virtual existing water control manual operations results from February to April 2017.

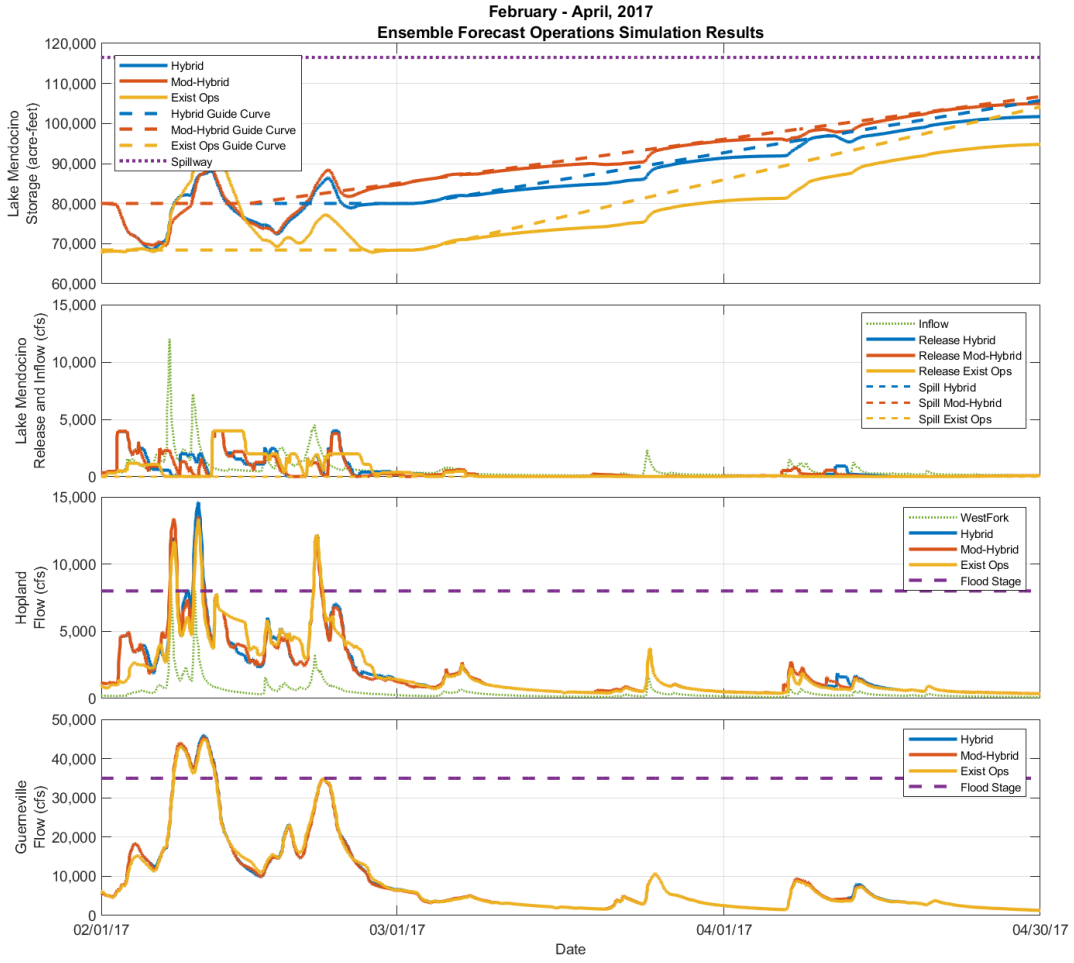


Figure C-14. Simulated comparison of spring refill on beginning February 15 (modified hybrid alternative) versus March 1 (hybrid alternative) Lake Mendocino storage, releases, and flow at Hopland and Guerneville, including observed conditions and virtual existing water control manual operations results from February to April 2009.

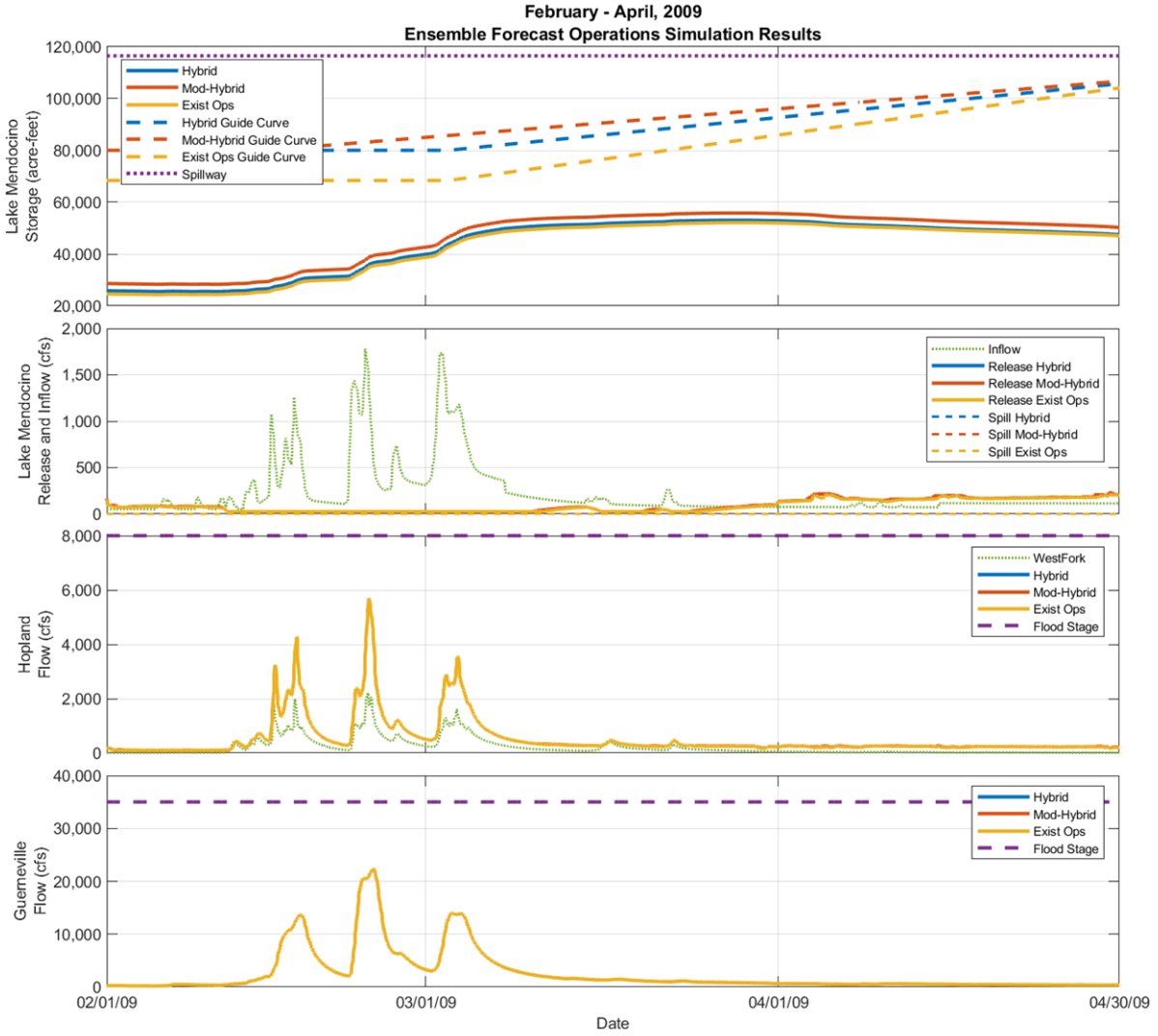


Figure C-15. Simulated comparison of spring refill on beginning February 15 (modified hybrid alternative) versus March 1 (hybrid alternative) Lake Mendocino storage, releases, and flow at Hopland and Guerneville, including observed conditions and virtual existing water control manual operations results from February to April 2013.

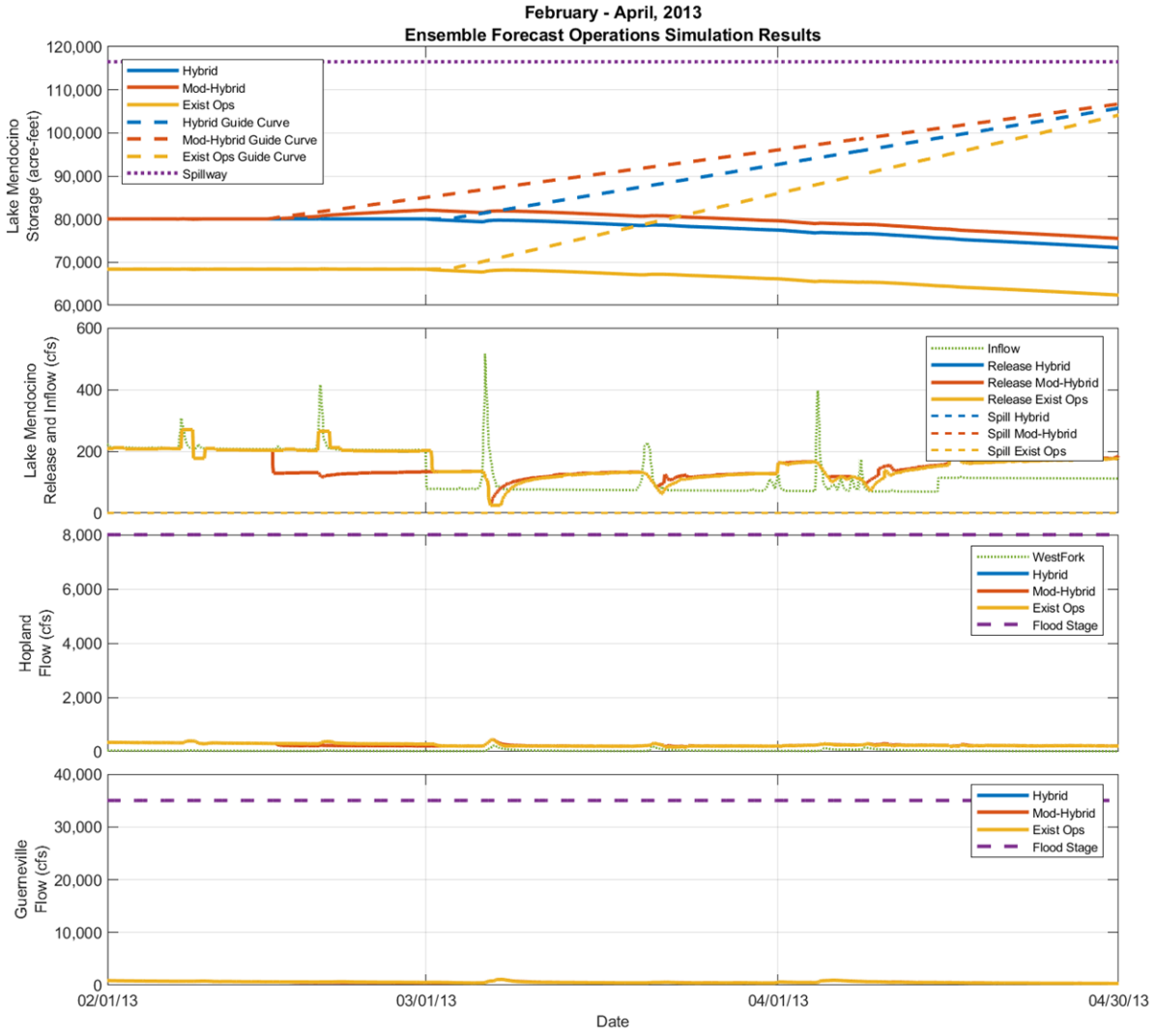


Figure C-16. Simulated comparison of spring refill on beginning February 15 (modified hybrid alternative) versus March 1 (hybrid alternative) Lake Mendocino storage, releases, and flow at Hopland and Guerneville, including observed conditions and virtual existing water control manual operations results from February to April 2014.

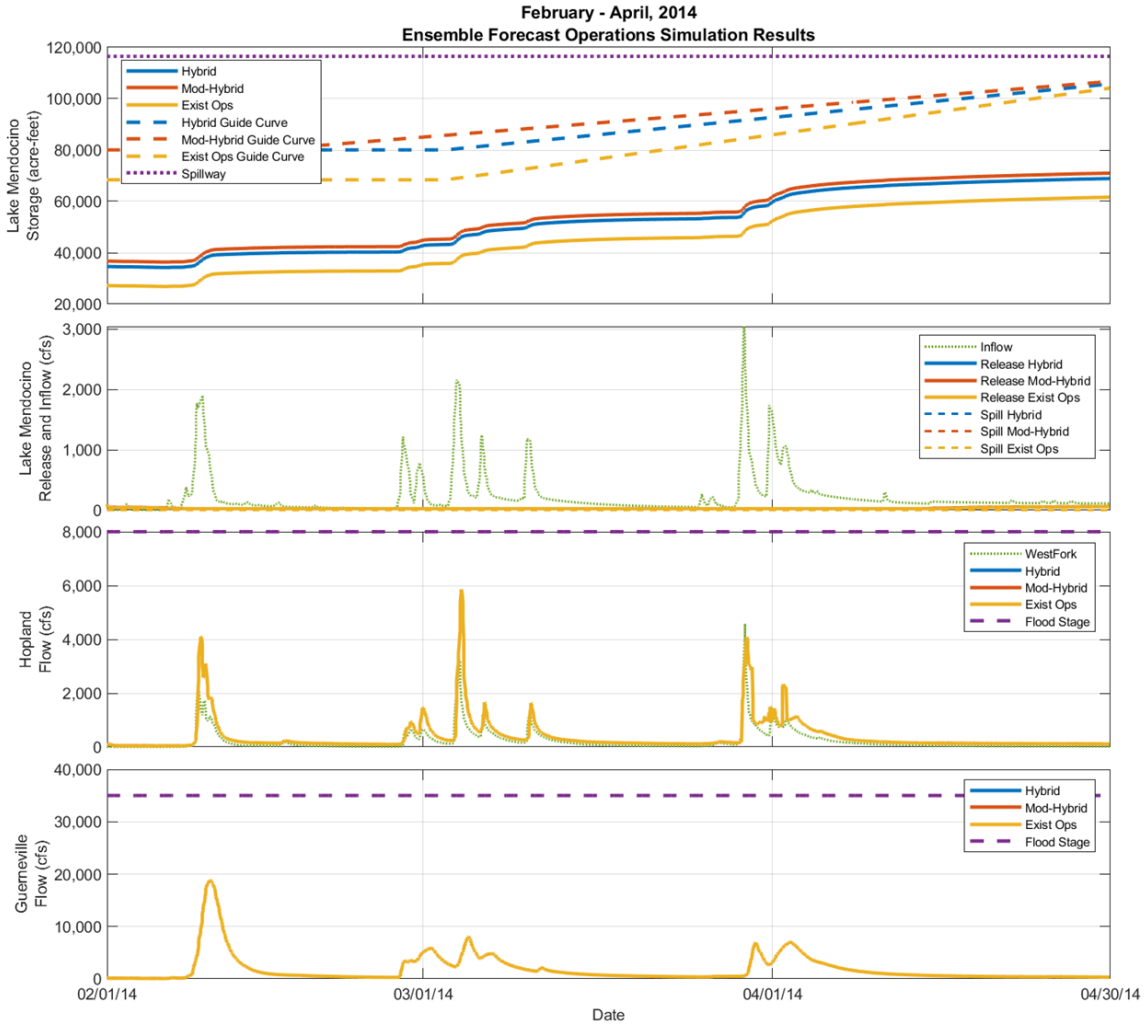


Figure C-17. Simulated comparison of spring refill on beginning February 15 (modified hybrid alternative) versus March 1 (hybrid alternative) Lake Mendocino storage, releases, and flow at Hopland and Guerneville, including observed conditions and virtual existing water control manual operations results from February to April 2015.

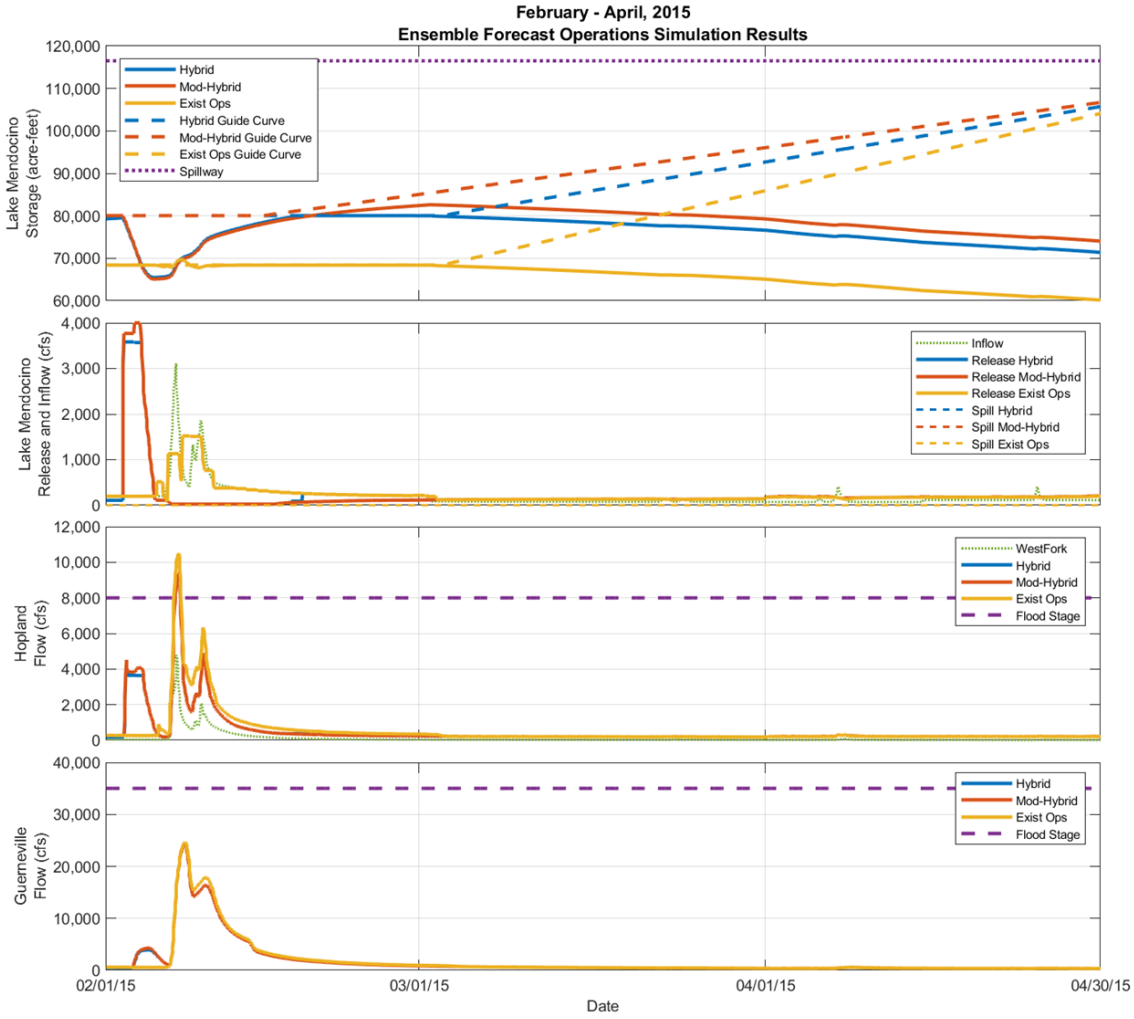
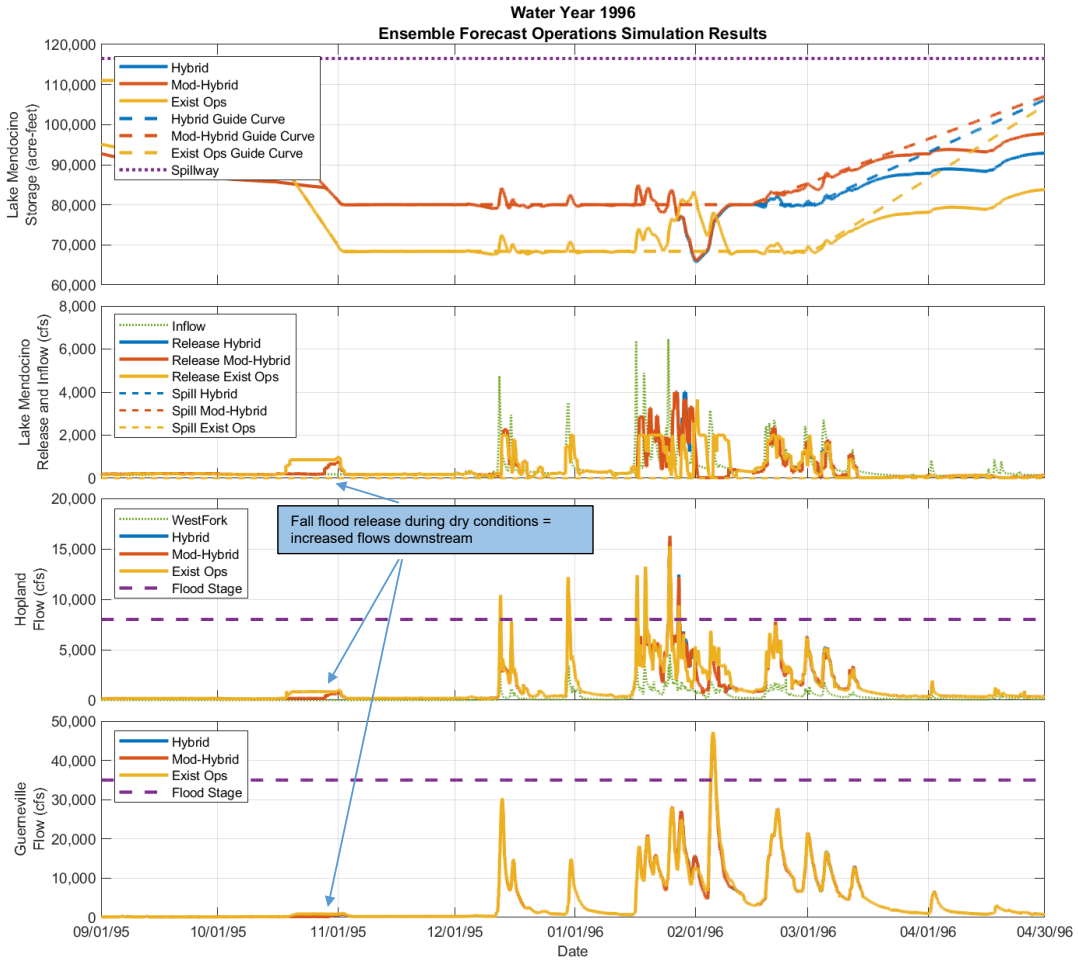


Figure C-18. Simulated comparison of fall flood releases during dry conditions, including Lake Mendocino storage, releases, and flow at Hopland and Guerneville for Water Year 1996.



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