CHAPTER 5 Cumulative Impacts

5.1 Introduction

The purpose of this chapter is to provide an analysis of the cumulative impacts that may result from the implementation of the Fish Habitat Flows and Water Rights Project (Proposed Project) in combination with the effects of other past, present, and reasonably foreseeable future projects (related projects) and to determine if additional mitigation measures are necessary and feasible to reduce the incremental contributions of the Proposed Project to significant cumulative impacts.

This chapter begins with a description of the California Environmental Quality Act (CEQA) analysis requirements, then discusses the approach to identifying related projects, followed by a description of related projects and their relationships to the Proposed Project. The chapter then describes the cumulative impact analysis methodology, which uses both quantitative tools (e.g., hydrologic modeling) and qualitative analyses, and defines the standards of significance used to determine the potential cumulative impacts of the Proposed Project and related projects. The chapter ends with the Impacts and Mitigation Measures section, which summarizes the cumulative impacts in each resource-specific area, and recommends feasible mitigation measures that may reduce, eliminate or avoid such impacts.

5.2 CEQA Analysis Requirements

The CEQA Guidelines require that environmental impact reports (EIRs) discuss the cumulative impacts of a project when the project's incremental effects are considerable when viewed in combination with the effects of past, current, and probable future projects. The purpose of the analysis is to disclose significant cumulative impacts resulting from the Proposed Project in combination with other projects or conditions, and to indicate the severity of the impacts and the likelihood of occurrence. CEQA Guidelines Sections 15130 (a) and (b) provided:

(a) An EIR shall discuss cumulative impacts of a project when the project's incremental effects are "cumulatively considerable" (i.e., the incremental effects of an individual project are considerable when viewed in combination with the effects of past, current, and probable future projects, including those outside the control of the agency, if necessary). Where a lead agency is examining a project with an incremental effect that is not "cumulatively considerable," a lead agency need not consider that effect significant, but shall briefly describe its basis for concluding that the incremental effect is not cumulatively considerable.

> (1) As defined in Section 15355, a cumulative impact consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from implementation of the project being evaluated in the EIR.

(2) When the combined cumulative impact associated with the project's incremental effect and the effects of other projects is not significant, the EIR shall briefly indicate why the cumulative impact is not significant and is not discussed in further detail in the EIR. A lead agency shall identify facts and analysis supporting the lead agency's conclusion that the cumulative impact is less than significant.

(3) An EIR may determine that a project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. The lead agency shall identify facts and analysis supporting its conclusion that the contribution will be rendered less than cumulatively considerable.

(b) The discussion of cumulative impacts shall reflect the severity of the impacts and their likelihood of occurrence, but the discussion need not provide as great detail as is provided for the effects attributable to the project alone. The discussion should be guided by the standards of practicality and reasonableness, and should focus on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact. The following elements are necessary to an adequate discussion of significant cumulative impacts:

(1) Either:

(A) A list of past, present, and probable future projects producing related or cumulative impacts; or

(B) A summary of projections contained in an adopted general plan or similar document, or in an adopted or certified environmental document, which described or evaluated conditions contributing to a cumulative impact;

(2) A discussion of the geographic scope of the area affected by the cumulative effect;

(3) A summary of expected environmental effects to be produced by these projects, with specific references to additional information stating where that information is available; and

(4) Examine reasonable, feasible options for mitigating or avoiding the project’s contribution to any significant cumulative effects.

5.3 Approach to Identifying Related Projects

The analysis in this chapter uses the “list” approach described in the State CEQA Guidelines (14 CCR 15130(b)(1)(A)) for identifying and evaluating potential cumulative impacts. As recommended in the CEQA Guidelines Section 15130(b)(2), the factors considered in determining whether to include a related project included the nature of each environmental

resource being examined (i.e., whether the project has the potential to affect the same resources as the Proposed Project), the location of the project and its type. Additionally, the list of projects considers the timing and duration of project implementation and resulting impacts.

Geographic Scope

The potential for project-generated impacts to contribute to a cumulative impact would arise if the impacts are located within the same geographic area. This geographic area may vary, depending upon the environmental resource discussed and the geographic extent of the potential cumulative impact. For example the geographic area associated with potential energy resources cumulative impacts would be limited to hydroelectric facilities at Lake Mendocino and Lake Sonoma whereas the geographic area that could be affected by potential hydrologic cumulative impacts may include a larger area (i.e., Russian River watershed). Thus, when considered cumulatively with other projects that may occur in the same geographic vicinity, the scope of analysis is defined by the natural boundaries and physical conditions relevant to each environmental factor. The geographic scope for each environmental factor is described in Section 5.7, “Cumulative Impacts and Mitigation Measures.”

Project Timing

In addition to the geographic scope, cumulative impacts are determined by timing of the other projects relative to the Proposed Project. Schedule is important for short-term construction-related impacts; for example, for a group of projects to generate cumulative impacts (e.g. temporary and/or intermittent noise), they must occur close together in time as well as location. Implementation of the Proposed Project would not include new construction of water facilities, infrastructure, or any other type of construction or land disturbance. As a result, the Proposed Project would not contribute to cumulative short and long-term impacts associated with construction activities and therefore are not cumulatively considerable and will not be addressed in this cumulative analysis. Potential long-term impacts (e.g. permanent changes to stream flows) associated with the implementation of the Proposed Project are considered in the cumulative impacts analysis if they could combine in both location and time with similar impacts of related projects. Potential related projects described below may or may not occur simultaneously with the Proposed Project, depending on the schedule of each individual project. Although timing of the potential related projects are likely to fluctuate due to schedule changes or other unknown factors, this analysis assumes that these related projects would be implemented concurrently with implementation of the Proposed Project.

Using these factors, and as discussed below in detail, the following projects were identified as projects with potentially cumulative impacts.

5.4 Potential Related Projects

Past, present, and reasonably foreseeable future projects that may have the potential to combine with the impacts of the Proposed Project are described below. As discussed above, this analysis uses the “list” approach for identifying and evaluating potential cumulative impacts.

The following criteria were used to determine whether a past, present, or foreseeable future project would be included in this cumulative impact analysis. Potential related projects are:

(a) Located within the vicinity of the Proposed Project and in combination with the Proposed Project may affect the same environmental resources;

(b) In operation or completed within the same timeframe of the Proposed Project;

(c) Under active consideration; or

(d) Associated with the Proposed Project through the Russian River Instream Flow and Restoration (RRIFR) Program (described below), and therefore intended to beneficially affect the same resources.

The identified potential related projects are in various stages of planning and development and include projects that have been constructed, are currently being constructed, have been recently approved, or are pending approval as of the publication of this Draft EIR. The analysis focuses on those projects that, when combined with the Proposed Project, could contribute to cumulative impacts. Scoping for the EIR and other recent documents was used to identify projects considered in the cumulative impacts analysis.

A brief overview of the related, reasonably foreseeable, relevant programs, projects and water management actions in the Proposed Project area is provided below.

A. Russian River Instream Flow and Restoration Program (RRIFR)
    1. Russian River Coho Salmon Captive Broodstock Program
    2. Water Diversion Infrastructure Improvement Projects
    3. Flood Control: Stream Maintenance Program
    4. Dry Creek Habitat Enhancement Projects
    5. Russian River Estuary Management Project
B. North Coast Resource Partnership
C. Potter Valley Project
D. No Potter Valley Project Diversions
E. Gravel Mining
    1. Sonoma County Gravel Mining and Aggregate Resource Mining Plan
    2. Syar Alexander Valley Instream Mining Project and Sonoma County ARM Plan Amendments Draft Environmental Impact Report
    3. Mendocino County Gravel Mining and the Upper Russian River Aggregate Resources Management Plan
    4. Kunzler Terrace Mine Project Environmental Impact Report
F. Amendment of City of Ukiah Water Right Permit 12952 (Application 15704) Draft Program Environmental Impact Report

G. 2015 Urban Water Management Plan – Future Water Rights Application with the SWRCB

A. Russian River Instream Flow and Restoration Program (RRIFR)

Over the last 20 years, the Sonoma County Water Agency (Water Agency) has been working with regulatory agencies, primarily the National Marine Fisheries Service (NMFS) to address fisheries issues in the Russian River watershed. Two salmonid species inhabiting the Russian River watershed, Chinook salmon (*Oncorhynchus tshawytscha*) and steelhead (*Oncorhynchus mykiss*), have been listed as threatened under the federal Endangered Species Act (ESA), and one species, coho salmon, has been listed as endangered under the federal ESA and California ESA[1].

Because the Water Agency's water supply facilities and operations have the potential to adversely affect the three listed species, the Water Agency entered into a Memorandum of Understanding (MOU) in December 1997 to participate in a consultation under Section 7 of the federal ESA. The other signatories of the MOU include the United States Army Corps of Engineers (USACE), NMFS, and Mendocino County Russian River Flood Control and Water Conservation Improvement District. In September 2008, NMFS issued a Biological Opinion (Russian River Biological Opinion) evaluating the impact of the Water Agency's and the USACE's operations on the listed species and identifying Reasonable and Prudent Alternatives (RPAs) and Recommended and Prudent Measures (RPMs) to be implemented by the Water Agency and USACE to address impacts and potential impacts on listed salmonids. The Russian River Biological Opinion concluded that some elements of the USACE and Water Agency's activities in the Russian River watershed could result in an adverse modification of critical habitat and jeopardize the continued existence of coho salmon and steelhead in this evolutionary significant unit (National Marine Fisheries Service 2008).

The Russian River Biological Opinion involves both immediate and long-term actions to improve habitat and fish populations that will guide operations to protect threatened or endangered salmonids in the Russian River watershed through the year 2023. The Water Agency has developed the Russian River Instream Flow and Restoration (RRFIR) Program to implement the mandates under the Russian River Biological Opinion. In addition to the Proposed Project, the following actions are mandated by the Russian River Biological Opinion:

- Continue support of the Russian River Coho Salmon Captive Broodstock Program[2];
- Water Diversion Infrastructure Improvement Projects;
- Flood Control: Stream Maintenance Program;

[1] Protective regulations of the ESA prohibit the "take" of these species. "Take" is broadly defined in the ESA and its implementing regulations; it includes not only intentionally killing a protected species, but also actions that unintentionally result in actual harm to an individual of a protected species, including adverse modification of habitat.
[2] Note that the Water Agency assists with funding of this program; however, it is administered and implemented by the U.S. Army Corps of Engineers.

- Dry Creek Habitat Enhancement Projects; and
- Russian River Estuary Management Project.

Relationship to Proposed Project

As presented above, the RRIFR Program has been developed pursuant to the Biological Opinion. Many of the actions mandated by the Russian River Biological Opinion require additional review under CEQA, as well as compliance with other state and federal regulations. The Russian River Biological Opinion and the corresponding RRIFR Program include a series of actions to be taken by the Water Agency, in coordination with NMFS and California Department of Fish and Wildlife (CDFW), formerly known as California Department of Fish and Game, to provide benefit to listed salmonids. The Proposed Project is one of a series of actions to be undertaken by the Water Agency to meet the requirements of the Russian River Biological Opinion. The effects of the Proposed Project must be considered in conjunction with impacts associated with other RRIFR Program elements in a cumulative analysis. The RRIFR Program elements are described in more detail below.

The objectives of the Proposed Project are identified in Chapter 3.0, “Project Description and Background.” The Proposed Project would manage Russian River Project releases to provide instream flows that improve habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead, while updating the Water Agency’s existing water rights to reflect current conditions. The Proposed Project provides independent utility (i.e. must be implemented to achieve a purpose irrespective of other RRIFR elements) in achieving these goals and necessitates implementation separately from other RRIFR Program elements in order to meet the objectives and schedule in the Russian River Biological Opinion. As identified in the Russian River Biological Opinion, the Water Agency has prepared a separate CEQA analysis for potential enhancements to Dry Creek and a separate CEQA analysis for the Estuary Management Project (see below). The Proposed Project will function under a range of flow conditions, irrespective of the other elements identified in the Russian River Biological Opinion, and is federally mandated to be implemented to avoid jeopardizing steel and coho salmon. The Proposed Project’s potential contribution to these cumulative impacts is further discussed below.

1. Russian River Coho Salmon Captive Broodstock Program

To aid in the recovery effort for state-and federally-endangered Central Coast coho salmon, CDFW, NMFS, and the USACE initiated the Russian River Coho Salmon Captive Broodstock Program (RRCSCBP) in 2001 with the goal of reestablishing self-sustaining runs of coho salmon in tributary streams within the Russian River basin. The program will continue through 2020. Under this program, offspring of wild, captive-reared coho salmon from within their historic range are released during spring and fall into multiple tributaries in the Russian River watershed. Private landowners, government agencies such as Resource Conservation Districts, and other organizations have responded to a decline in coho salmon by conserving and restoring critical habitat within the Russian River Watershed. CDFW, NMFS, and USACE have partnered with University of California Cooperative Extension/California Sea Grant Extension Programs, Water Agency, Trout Unlimited, and Bodega Marine Lab, to carefully capture, rear,

and spawn coho salmon broodstock at the Don Clausen Warm Springs Hatchery, located at Warms Springs Dam, Lake Sonoma. They then release the off-spring as young fish in select tributary streams and monitor their growth and survival until the migration downstream and into the Pacific Ocean. This cycle will be repeated annually, along with the monitoring of adult coho salmon returning three years after their release to tributary streams (Russian River Coho Salmon Recovery Program 2016).

The University of California Cooperative Extension (UCCE) and California Sea Grant Extension Program have worked with agency partners to develop and implement a monitoring and evaluation component for the RRCSCBP. The overall monitoring goal is to evaluate the effectiveness of the RRCSCBP by documenting whether released program fish return to their streams of release as adults and successfully complete their life cycles. Different hatchery release protocols and stocking environments are assessed to determine the optimal stocking strategies for successfully restoring coho salmon to the Russian River system. Specific monitoring objectives for each release stream include: estimating seasonal instream abundance, comparing seasonal survival rates of spring and fall-released coho salmon, estimating the number of returning adults, estimating juvenile to adult survival rates, measuring coho salmon size and condition, estimating food availability, and documenting baseline flow and temperature regimes. All of these biotic and abiotic metrics are compared among the different program streams. This information will allow agencies to make informed decisions about the future direction of the program and adaptively manage release strategies for optimal survival. Population estimates are determined through habitat surveys (counts of pools and riffles), snorkel counts, and electrofishing surveys (Obedzinski, et al. 2009).

Impacts Identified

The RRCSCBP establishes a baseline data set and records results of fish releases. In addition to the RRCSCBP, coho salmon young of the year, other fish and non-fish species are captured during the electrofishing portion of the surveys. The intent of the RRCSCBP is enhancement of the fishery populations and developing an understanding of trends and fish population dynamics. Overall, this is considered a beneficial project for fisheries restoration.

Relationship to Proposed Project

The continued participation in the RRCSCBP is one of the series of actions to be taken by the Water Agency and USACE as part of the RRIFR Program in order to maintain compliance with the Russian River Biological Opinion. Both the RRCSCBP and the Proposed Project are components of the RRIFR Program, located in the Russian River watershed, and would be implemented pursuant to objectives that focus on fisheries enhancement.

Potential for Contribution to Cumulative Impacts

The RRCSCBP would continue the current coho salmon broodstock program to aid in the recovery effort for state- and federally-endangered Central California Coast coho salmon. One of the primary goals of the Proposed Project is to manage Russian River Project releases to provide instream flows that improve habitat for endangered Central California Coast coho

salmon and threatened Central California Coast steelhead. As such, it would have a beneficial effect by providing instream flows that would improve habitat for fish, which, considered concurrently with the beneficial effects to fisheries provided by the RRCSCBP, would be cumulatively beneficial. The cumulative impact analysis focuses on adverse environmental impacts; since this is a cumulative beneficial impact it will not be analyzed in Section 5.7, "Cumulative Impacts and Mitigation Measures" of this chapter.

2. Water Diversion Infrastructure Improvement Projects

The Water Agency diverts water from the Russian River to meet its customers' demands. Water diverted from the underground aquifer is a combination of releases from upstream storage reservoirs and instream flow. The Water Agency's water diversion facilities are located adjacent to the Russian River near the community of Forestville. To provide the primary water supply for its transmission system, the Water Agency operates six collector wells and seven vertical wells which extract water from the aquifer beneath, and adjacent to, the streambed. Projects implemented or being implemented in the area near the Water Agency's water diversion infrastructure include replacement of the fish screen at the Mirabel Inflatable Dam (Mirabel Inflatable Dam) and decommissioning the infiltration ponds on the east side of the Russian River at the Wohler facility. The fish screen and infiltration ponds are discussed below.

The ability of the Russian River aquifer to produce water is generally limited by the rate of recharge to the aquifer through the streambed. To augment this rate of recharge, the Water Agency utilizes a series of infiltration ponds and its inflatable dam. The inflatable dam, located in the Mirabel area, raises the water level and submerges the intakes to a series of canals that feed infiltration ponds located at Mirabel. The backwater created by the Mirabel Inflatable Dam also raises the upstream water level and submerges a larger streambed area along the Russian River. This increased depth and wetted surface of the submerged area significantly increases infiltration to the aquifer.

The Lower Russian River in the vicinity of Mirabel serves primarily as a migration corridor for adult and juvenile salmon and steelhead. Thus, the inflatable dam has the potential to impact salmon and steelhead primarily during their upstream and downstream migrations through: 1) altering habitat composition, 2) altering water temperature and water quality in the lower river, 3) impeding downstream migration of juveniles, 4) impeding upstream migration of adults, and 5) altering habitat to favor predatory fish (Sonoma County Water Agency 2000). The Mirabel Inflatable Dam impounds water over an approximate 3.0 mile (4.8-kilometer) reach of the river. Within the impounded reach, riverine habitat is altered from its natural composition of pool/riffle/run habitats to solely pool habitat (the pool formed behind the Mirabel Inflatable Dam is referred to as the Wohler Pool). Impounding water behind a dam can lead to an increase in water temperature (Sonoma County Water Agency 2000). Additionally, emigrating smolts drift downstream with the current. A decrease in stream current within the impounded reach may adversely delay smolts emigrating from the river (Sonoma County Water Agency 2000).

Mirabel Fish Ladder and Fish Screen Replacement Project

The purpose of the existing fish screen is to ensure the safety of the fish in the river and permanent fish ladders provide fish passage when the dam is raised. However, NMFS

determined that the existing fish screening facilities performed less than adequately for full protection of fish and downstream migration. Pursuant to the Russian River Biological Opinion, the Water Agency completed a design of a new fish screen in 2013 and construction began in 2014 to replace the rotary drum fish screens at Mirabel. The new fish screens are in place and operating as of July of 2016. Although not a requirement of the Russian River Biological Opinion, grant funding was obtained to replace one of the existing fish ladders with a vertical-slot fish ladder. The new fish ladder also includes a viewing gallery to enhance educational opportunities.[3] The new fish ladder and viewing facility were designed to complement and enhance the fish screen project.

On November 12, 2012, the Water Agency released an Initial Study/Mitigated Negative Declaration (ISMND) for the Mirabel Fish Ladder and Fish Screen Replacement Project. The objective of the project was to provide a fish screen that meets hydraulic design criteria to avoid impacts to threatened and endangered fish, maintain or improve fish passage through the fish ladder, and improve monitoring and educational opportunities at the Mirabel Dam and diversion facilities. The project was approved and certified by the Water Agency's Board of Director's on January 29, 2013.

Decommissioning of the Wohler Infiltration Ponds

The Wohler Infiltration Ponds 1 and 2 (originally built to assist with water supply operations) were located on the east side of the Russian River at the Water Agency's Wohler facility. Decommissioning these ponds is part of the Reasonable and Prudent Measure (RPM) 6 Terms and Conditions (Item C) in the Russian River Biological Opinion. The Water Agency was required to decommission or modify Infiltration Ponds 1 and 2 to prevent fish entrapment in the ponds during flood events. During 2010, the Water Agency received all necessary state and federal agency permits to allow construction during the low-flow season when the infiltration ponds are dry. Construction commenced in July 2011 and was completed in October 2011.

Impacts Identified

Mirabel Fish Ladder and Fish Screen Replacement Project: Impacts identified in the Mirabel Fish Ladder and Fish Screen Replacement Project ISMND consisted of potential construction-related impacts that would be short term in nature and cease to occur upon completion of construction activities. Identified construction activities related to the project included short-term less than significant impacts to the following resources: aesthetics, air quality, biological and fisheries resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, mineral resources, noise, and traffic. Construction activities related to the project identified included in a longer-term impact that extends beyond the construction, such as the removal of vegetation during construction or the placement of new facilities within a scenic area. The ISMND identified mitigation measures to be implemented that would reduce potential significant construction-related impacts on biological resources to a less than

[3] Although not a mandated requirement, the design includes a fish viewing gallery with seven general viewing windows for education and outreach opportunities and an eighth window dedicated for fisheries monitoring.

significant level. (Sonoma County Water Agency 2012). Construction activities occurred from 2014 to 2016. Modification of fish screens and providing an improved fish ladder design at Mirabel is intended to minimize or remove one potential limiting factor impacting the life histories of listed salmonid species in the region. Please refer to the Mirabel Fish Ladder and Fish Screen Replacement Project ISMND for a detailed description of all impacts and mitigation measures.

Decommissioning of the Wohler Infiltration Ponds: As directed in the Russian River Biological Opinion, decommissioning of the Wohler infiltration ponds was completed in 2011. No fueling or equipment service was performed within the active floodplain. After grading operations were completed, ponds were contoured to at least a two percent grade to reduce the potential for stranding fish.

Relationship to Proposed Project

The Water Diversion Infrastructure Improvement Projects are a series of actions taken by the Water Agency as part of the RRIFR Program in order to maintain compliance with the Russian River Biological Opinion. Both the Water Diversion Infrastructure Improvement and the Proposed Project are components of the RRIFR Program, located in the Russian River watershed, and would be implemented pursuant to objectives that focus on fisheries enhancement.

Potential for Contribution to Cumulative Impacts

Construction activities for the Mirabel Fish Ladder and Fish Screen Replacement Project began in 2014 and are anticipated to be complete in the fall of 2016. Implementation of the Proposed Project would not include new construction of water facilities, infrastructure, or any other type of construction or land disturbance, and, as a result, would not contribute to cumulative short and long-term impacts associated with construction activities and therefore are not cumulatively considerable with the Water Diversion Infrastructure Improvement Projects and will not be analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

Implementation of Water Diversion Improvement Projects are intended to minimize adverse impacts to designated critical habitat and is intended to minimize or remove one potential limiting factor impacting the life histories of listed salmonid species in the region; similarly, the Proposed Project would manage Coyote Valley Dam and Warm Springs Dam releases to provide instream flows that would improve threatened and endangered fish habitat in the region. Therefore, the long-term benefit to fisheries associated with the Proposed Project considered concurrently with the long-term benefit to fisheries associated with the Water Diversion Infrastructure Improvements, would be cumulatively beneficial to fisheries. The cumulative impact analysis focuses on adverse environmental impacts; since this is a cumulative beneficial impact it will not be analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

3. Flood Control: Stream Maintenance Program

A Draft EIR for the SMP was released in January 2009, and the Final EIR was approved and certified by the Water Agency's Board of Directors on June 2009. The primary impacts of SMP activities identified in the SMP EIR are short-term, occurring during maintenance activities and the period immediately following maintenance activities; however, maintenance impacts vary in levels of significance. Maintenance activities related to the SMP may result in short-term less than significant impacts to the following resources: air quality; geology, soils, and seismicity; hazards and hazardous materials; land use; and public services and utilities. Maintenance activities related to the SMP may result in potential short-term significant impacts, but would be mitigated to a less than significant level through implementation of mitigation in the form of Best Management Practices (BMPs) to the following resources: aesthetics; air quality; biological resources; cultural resources; geology, soils, and seismicity; hazards and hazardous materials; hydrology, geomorphology and water quality; noise; public serves and utilities; recreation; and traffic. Maintenance activities related to the SMP may result in short-term significant and unavoidable impacts to the following resources: aesthetics (temporary alteration of visual character or quality from maintenance activities; and alteration to visual character or quality from sediment disposal); noise (exposure of the public to noise levels in excess of city or county standards); and cumulative air quality (emissions of PM10 and ozone precursors), given the non-attainment status for these pollutants in the San Francisco Bay Air Basin. Over the long term, SMP activities would involve channel maintenance and establishment of a riparian corridor along the maintained channels, which will result in enhanced habitat values, improved water quality, and better aesthetic quality and recreational value (Sonoma County Water Agency 2009). Please refer to the SMP EIR for a detailed description of all impacts and mitigation measures.

Impacts Identified

A Draft EIR for the SMP was released in January 2009, and the Final EIR was approved and certified by the Water Agency's Board of Directors on June 2009. The primary impacts of SMP activities identified in the SMP EIR are short-term, occurring during maintenance activities and the period immediately following maintenance activities; however, maintenance impacts vary in levels of significance. Maintenance activities related to the SMP may result in short-term less than significant impacts to the following resources: air quality; geology, soils, and seismicity; hazards and hazardous materials; land use; and public services and utilities. Maintenance activities related to the SMP may result in potential short-term significant impacts, but would be mitigated to a less than significant level through implementation of mitigation in the form of Best Management Practices (BMPs) to the following resources: aesthetics; air quality; biological resources; cultural resources; geology, soils, and seismicity; hazards and hazardous materials; hydrology, geomorphology and water quality; noise; public serves and utilities; recreation; and traffic. Maintenance activities related to the SMP may result in short-term significant and unavoidable impacts to the following resources: aesthetics (temporary alteration of visual character or quality from maintenance activities; and alteration to visual character or quality from sediment disposal); noise (exposure of the public to noise levels in excess of city or county standards); and cumulative air quality (emissions of PM10 and ozone precursors), given the non-attainment status for these pollutants in the San Francisco Bay Air Basin. Over the long

term, SMP activities would involve channel maintenance and establishment of a riparian corridor along the maintained channels, which will result in enhanced habitat values, improved water quality, and better aesthetic quality and recreational value (Sonoma County Water Agency 2009). Please refer to the SMP EIR for a detailed description of all impacts and mitigation measures.

Relationship to Proposed Project

The SMP is one of the series of actions to be taken by the Water Agency as part of the RRIFR Program in order to maintain compliance with the Russian River Biological Opinion. Both the SMP and the Proposed Project are components of the RRIFR Program, located in the Russian River watershed, and would be implemented pursuant to objectives that focus on fisheries enhancement.

Potential for Contribution to Cumulative Impacts

Implementation of the Proposed Project would not include new construction of water facilities, infrastructure, or any other type of construction or land disturbance, and, as a result, would not contribute to cumulative short and long-term impacts associated with construction activities in the environmental resource categories of aesthetics; air quality, biological resources; cultural resources; geology, soils, and seismicity; hazards and hazardous materials; hydrology, geomorphology and water quality; land use, noise; recreation; and traffic and transportation, public services and utilities. Therefore concurrent implementation of the Proposed Project and the SMP would not contribute to cumulative short and long-term impacts associated with construction activities and therefore are not cumulatively considerable. The cumulative impact analysis focuses on adverse environmental impacts; since this is not cumulative considerable it will not be analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

Ongoing maintenance efforts under the SMP would occur within flood control zones throughout Sonoma County. The only SMP work that may occur concurrently with the Proposed Project and in the vicinity of the Proposed Project area is debris removal, therefore, concurrent implementation of the Proposed Project would not result in cumulatively considerable short-term or long-term adverse impacts. The Proposed Project would have a long-term beneficial effect by managing Russian River Project releases, in turn providing instream flows that improve threatened and endangered fish habitat, which, considered concurrently with the beneficial effects to fisheries provided by the SMP, would be cumulatively beneficial. The cumulative impact analysis focuses on adverse environmental impacts; since this is a cumulative beneficial impact it will not be analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

4. Dry Creek Habitat Enhancement Projects

Dry Creek Habitat Enhancement Demonstration Project

The Russian River Biological Opinion have determined that cold water released from Lake Sonoma into Dry Creek is ideal for coho salmon and steelhead, but the current flow velocities of

the water released from Lake Sonoma, which range from 110 to 175 cubic feet per second (cfs), are not optimal for young coho and steelhead survival (National Marine Fisheries Service 2008). The Russian River Biological Opinion addresses this problem by mandating the creation of high quality habitat on six miles of the 14-mile Dry Creek over a 12-year period.

The Russian River Biological Opinion contains an explicit timeline that prescribes a series of projects to improve summer and winter rearing habitat for juvenile coho salmon and steelhead in Dry Creek. During the initial three years of implementation, 2008 to 2011, the Water Agency was charged with improving fish passage and habitat in selected tributaries to Dry Creek (discussed below under Dry Creek Tributary Enhancement) and in Willow Creek. For the mainstem of Dry Creek, the Water Agency performed fisheries monitoring, developed a detailed adaptive management plan, and conducted feasibility studies for large-scale habitat enhancement and a potential water supply bypass pipeline. The pipeline feasibility study was completed in 2011.

The Water Agency and the USACEs have completed the first mile of habitat enhancement work, through completion of the Water Agency's Dry Creek Habitat Enhancement Demonstration Project (completed between 2012 and 2014) near Lambert Bridge and the Corps' Dry Creek Reach 15 Habitat Enhancement Project (constructed in 2013) constructed just downstream of Warm Springs Dam. A CEQA Initial Study and Mitigated Negative Declaration for the Dry Creek Habitat Enhancement Demonstration Project was approved by the Water Agency's Board of Directors on November 15, 2011.

Dry Creek Habitat Enhancement Project, Miles 2-6

The Water Agency has developed the Dry Creek Habitat Enhancement Project, Miles 2-6. The Water Agency released a CEQA Environmental Impact Report for the Dry Creek Habitat Enhancement Project, Miles 2-6, which was approved by the Water Agency's Board of Directors on November 17, 2015 The Miles 2-6 Project includes the creation or enhancement of off-channel backwaters, alcoves, and side channel habitat features adjacent to Dry Creek, and the creation or enhancement of pools, riffles, instream habitat features, and bank stabilization within Dry Creek.

Miles 2-3

Construction of habitat enhancement projects designated as part of the Miles 2-3 habitat work began in the summer of 2016 and is anticipated to continue through at least the summer of 2017.

Miles 4-6

Any areas within the 14-mile length of Dry Creek from below Warm Springs Dam to the confluence of the Russian River that are not already enhanced or providing high quality habitat would be under consideration for Miles 4-6 of habitat work in Dry Creek. Miles 4-6 construction would likely occur between 2018 and 2020.

Dry Creek Tributary Habitat Enhancement Projects

As discussed above, the Russian River Biological Opinion prescribes a series of tributary projects outside of the mainstem of Dry Creek to improve summer and winter rearing habitat for

juvenile coho salmon and steelhead. Completion of five tributary enhancement projects were required by the Russian River Biological Opinion (summarized below in Table 5.4-1) with the requirement that the Water Agency implement at least five of these projects. The five projects that the Water Agency completed are 1) Grape Creek Habitat Improvement Project (constructed 2009-2010); 2) Willow Creek Road 2nd Bridge Area Fish Passage Project (funding of $100,000 provided by Water Agency towards cost of construction, project was constructed in 2011); 3) Grape Creek Fish Passage Project (constructed in 2012); 4) Mill Creek Fish Passage Project (funding of $200,000 provided by the Water Agency towards cost of construction, project being constructed summer of 2016); and 5) Crane Creek Fish Passage Access Project (constructed 2011).

Impacts Identified

Willow Creek Road 2nd Bridge Area Fish Passage Project: An ISMND for the Willow Creek Road 2nd Bridge Area Fish Passage Project was released on February 13, 2010 and adopted on September 3, 2010 by the State of California Department of Parks and Recreation, Russian River District. Impacts identified in the Willow Creek Road 2nd Bridge Area Fish Passage Project ISMND consisted of potential construction-related impacts that would be short term in nature and cease to occur upon completion of construction activities. Less than significant impacts to the following resources included: aesthetics and global climate change. Significant impacts, to be mitigated to a less than significant level through implementation of mitigation and minimization measures to the following resources included: air quality; biological resources; cultural; geology, soils, and hazards; hazardous materials; hydrology and water quality; noise; and transportation and traffic. The project resulted in improvement of the local environment by creating fish passage, restoring the natural hydrologic and geomorphic processes of Willow Creek, and improving aquatic and floodplain habitat. The project will not restrict the range of any species. While narrow slices of wetland habitat were eliminated along the edge of the road at the bridge approach, it is an insignificant portion of the total wetland in the area. Further, it will not reduce the number or restrict the range of any rare or endangered plants or animals (State of California Department of Parks and Recreation 2010). Please refer to the Initial Study and Mitigated Negative Declaration for the Willow Creek Fish Passage Restoration Project for a detailed description of all impacts and mitigation measures.

Dry Creek Habitat Enhancement Demonstration Project: An Initial Study and Mitigated Negative Declaration (ISMND) for Dry Creek Habitat Enhancement Demonstration Project was released in May 2011 and was approved by the Water Agency's Board of Directors on November 15, 2011. Impacts identified in the ISMND consisted of potential construction-related impacts that would be short term in nature and cease to occur upon completion of construction activities. The ISMND identified impacts as less than significant to the following: aesthetics, agriculture and forestry resources, air quality, geology/soils, hazards and hazardous materials, hydrology and water quality, mineral resources, noise, and transportation/traffic. The ISMND identified minimization and mitigation measures to be implemented, that would reduce potential significant impacts on biological and cultural resources, to a less than significant level. Over the long-term, Dry Creek Habitat Enhancement Demonstration Project is expected to provide benefits to fisheries, riparian corridors, and water quality (Sonoma County Water Agency 2011).

Table 5.4-1. Dry Creek Tributary Habitat Enhancement Projects Completed Under the Russian River Biological Opinion.

Project Name	Impacts	Restoration Action	Increased Area of Fish Production	Status
Crane Creek Fish Passage Access Project	Impacted by previous gravel mining and channelization; severe downcutting obstructs salmonid passage	Removal of barrier	5,021 m2	Completed in 2011
Grape Creek Fish Passage Enhancement Project	Artificial structures, grade control structures, culverts during certain flow levels at West Dry Creek Road stream crossing is passage barrier	Modify hydraulics through culverts; arched culvert with natural channel bottom	1,977 m2	Completed in 2012
Grape Creek Instream Habitat Improvement Project	Low pool shelter	Installation of cover structures in existing pools; bio-engineered bank stabilization, increased riparian setbacks, streambed toe stabilization; large woody debris/ boulder structures (plunge weir, boulder/log weirs, digger logs, covers); native revegetation	730 m2	Completed 2009-2010
Wallace Creek Fish Passage Enhancement Project	Passage barrier at Wallace Creek/ Mill Creek Road stream crossing	Modify hydraulics within culvert at certain flow levels to prolong amount of time culvert it passable; arched culvert with natural channel bottom	5,990 m2	Pending Right-of-Way
Willow Creek Road 2nd Bridge Area Fish Passage Project	Spawning and rearing habitat blocked by road culverts and shallow braided channel in forested wetland.	CDFG funding for road projects to reduce non-point source sedimentation; California State Parks projects	9,580 m2	Completed in 2011

Please refer to the Initial Study and Mitigated Negative Declaration for the Dry Creek Habitat Enhancement Demonstration Project for a detailed description of all impacts and mitigation measures.

Dry Creek Habitat Enhancements Miles 2-6 Project: Water Agency staff released a Draft EIR for the Dry Creek Habitat Enhancements Miles 2-6 Project in July 2015. The Final EIR was approved and certified on November 17, 2015 by the Water Agency Board of Directors. Habitat enhancements included as part of Miles 2-3 are described at the project-level CEQA analysis because detailed information for specific sites and proposed designs is available in order to determine potential environmental impacts. Because more than two miles of habitat enhancements are included in the Miles 2-3 project-level analysis, those projects not constructed as part of Miles 2-3 could be included in subsequent work for Miles 4-6. Additional habitat enhancements to be included in Miles 4-6 are described in the EIR at the program-level and will be subject to further environmental review once locations are determined and site-specific designs are underway.

The EIR evaluates the potential impacts associated with implementing the proposed Dry Creek Project. The EIR also includes an analysis of potential cumulative impacts associated with the project and potential alternatives to the proposed Dry Creek Project. Potential short-term impacts described in the EIR are related to construction activities. Long-term effects of the project are related to maintenance activities and operation of the project. Many of those long-term effects of the project are beneficial to the riparian system and the threatened and endangered fish living within it. Mitigation measures are proposed to avoid or reduce identified potential impacts, where feasible.

The EIR identified impacts as less than significant to the following resources: aesthetics; air quality, greenhouse gas emissions, energy, and sustainability; biological resources; fisheries resources; geology, soils, and mineral resources; hazards and hazardous materials; hydrology and water quality; land use, planning, and agricultural resources; noise; recreation; and cumulative. The EIR identified impacts as less than significant with mitigation to the following resources: aesthetics; biological resources; fisheries resources; cultural resources; geology, soils, and mineral resources; hazards and hazardous materials; hydrology and water quality; land use, planning, and agricultural resources; noise; and traffic and transportation.

The EIR identified impacts that may result in significant effect which cannot be avoided to the following resources: noise (noise levels during some types of construction activities could remain temporarily significant for brief periods of time; and cumulatively, construction noise combined with other noise sources, such as possible maintenance activities or construction of other unrelated projects in the Dry Creek Valley could also reach significant levels temporarily and for brief periods of time); traffic (traffic generated by construction activities alone would not result in significant impacts but, when considered cumulatively alongside possible maintenance activities or the construction of other reasonably foreseeable projects in the valley by other entities, there remains a possibility that a significant temporary cumulative impact related to traffic could occur) (Sonoma County Water Agency 2015). Please refer to the Dry Creek Habitat

Enhancements Miles 2-6 Project Draft for a detailed description of all impacts and mitigation measures.

Relationship to Proposed Project

The Dry Creek Habitat Enhancement Projects are a series of actions to be taken by the Water Agency as part of the RRIFR Program in order to maintain compliance with the Russian River Biological Opinion. Both the Dry Creek Habitat Enhancement Projects and the Proposed Project are components of the RRIFR Program, located in the Russian River watershed, and have been and will be implemented pursuant to objectives that focus on fisheries enhancement.

Potential for Contribution to Cumulative Impacts

Implementation of the Proposed Project would not include new construction of water facilities, infrastructure, or any other type of construction or land disturbance, and, as a result, would not contribute to cumulative short and long-term impacts associated with construction activities. Therefore, concurrent implementation of the Proposed Project and the Dry Creek Habitat Enhancement Projects would not contribute to cumulative short and long-term impacts associated with construction activities and therefore are not cumulatively considerable. The cumulative impact analysis focuses on adverse environmental impacts; since this is not cumulatively considerable it will not be analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

The Proposed Project would have a long-term beneficial effect by releases, in turn providing instream flows that improve habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead, which, considered concurrently with the beneficial effects to fisheries provided by the habitat enhancements along Dry Creek, would be cumulatively beneficial. The cumulative impact analysis focuses on adverse environmental impacts; since this is a cumulative beneficial impact it will not be analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

5. Russian River Estuary Management Project

The Russian River estuary (Estuary) is located approximately 60 miles (97 kilometers, km) northwest of San Francisco in Jenner, Sonoma County, California. The Estuary extends from the mouth of the Russian River upstream approximately 6 to 7 miles (10 to 11 km) between Austin Creek and the community of Duncans Mills (Heckel 1994).

The Estuary may close throughout the year as a result of a barrier beach forming across the mouth of the Russian River. The mouth is located at Goat Rock State Beach (California Department of Parks and Recreation). Although closures may occur at any time of the year, the mouth usually closes during the spring, summer, and fall (Heckel 1994). Closures result in ponding of the Russian River behind the barrier beach and, as water surface levels rise in the Estuary, flooding may occur. The barrier beach has been artificially breached for decades; first by local citizens, then the County of Sonoma Public Works Department, and, since 1995, by the Water Agency. The Water Agency’s artificial breaching activities are conducted in accordance with the Russian River Estuary Management Project recommended in the Heckel (1994) study

(Heckel 1994). The purpose of artificially breaching the barrier beach is to alleviate potential flooding of low-lying properties along the Estuary.

The Russian River Biological Opinion (National Marine Fisheries Service 2008) found that artificially elevated inflows to the Russian River estuary during the low flow season (May through October) and historic artificial breaching practices have significant adverse effects on the Russian River's estuarine rearing habitat for steelhead. The Russian River Biological Opinion states that the historical method of artificial sandbar breaching, which is done in response to rising water levels behind the barrier beach, adversely affects the estuary's water quality and freshwater depths. The historical artificial breaching practices create a tidal marine environment with shallow depths and high salinity. Salinity stratification contributes to low dissolved oxygen at the bottom in some areas. The Russian River Biological Opinion concluded that the combination of high inflows and breaching practices impact rearing habitat because they interfere with natural processes that cause a freshwater lagoon to form behind the barrier beach. Fresh or brackish water lagoons at the mouths of many streams in central and southern California often provide depths and water quality that are highly favorable to the survival of rearing salmon and steelhead.

The Russian River Biological Opinion's RPA 2, Alterations to Estuary Management (National Marine Fisheries Service 2008) requires the Water Agency to collaborate with NMFS and to modify estuary water level management in order to reduce marine influence (high salinity and tidal inflow) and promote a higher water surface elevation in the estuary (formation of a fresh or brackish lagoon) for purposes of enhancing the quality of rearing habitat for young-of-year and age 1+ juvenile (age 0+ and 1+) steelhead from May 15 to October 15 (referred to hereafter as the "lagoon management period"). A program of potential, incremental steps are prescribed to accomplish this, including adaptive management of a lagoon outlet channel on the barrier beach to promote higher water surface elevations in the Estuary to enhance habitat for juvenile steelhead rearing habitat.

The Water Agency completed a CEQA process to evaluate the potential impacts associated with implementing the Russian River Estuary Management Project (Estuary Management Project), which would allow for implementation of an outlet channel following natural river mouth closures from May 15 to October 15 (lagoon management season) to enhance habitat for juvenile rearing while maintaining water surface elevations to minimize flood risk, and allowing for artificial breaching practices during the remainder of the year. On December 15, 2010, the Water Agency released the Estuary Management Project Draft EIR for public review. The Final EIR was certified by the Water Agency's Board of Director's on August 16, 2011. A lawsuit was subsequently filed by the Russian River Watershed Protection Committee under CEQA. The litigation was settled in 2012 through entry of a stipulated judgment. The stipulated judgment requires the Water Agency to prepare an evaluation of the joint water quality impacts of the Estuary Management Project and the Fish Flow Project in a discrete special section of, or an appendix to, the "cumulative impact analysis" of the Fish Flow Project Draft EIR. Please refer to Appendix F, "Russian River Estuary Management Project Stipulated Judgment," for this special section.

Impacts Identified

The Estuary Management Project EIR identified less than significant impacts to the following resources: aesthetics; air quality; biological resources: waters and wetlands; wildlife movement and nursery sites; sensitive natural communities; special-status plant and animal species; and fisheries; geology; hazards and hazardous materials; hydrology and flooding; water quality; land use and agriculture; public services and utilities and public safety; recreation; transportation and traffic; and local policies and ordinances.

The EIR identified impacts as less than significant with mitigation to the following resources: biological resources; cultural; hazards and hazardous materials; and noise.

The EIR identified the significant and unavoidable impacts that could not be mitigated, to the following resources:

- Hydrology (some low-lying wetlands, beaches and boat docks near the estuary that are currently inundated by high water levels during the summer months could be inundated for longer periods of time; maintenance of water surface elevations of 7 to 9 feet would inundate the shoreline portions of properties adjacent to the Estuary for a longer duration, depending upon outlet channel performance; and in the rare very unlikely event of a tsunami of sufficient magnitude, the project may result in increased risk of structural damage or loss for properties just outside of the areas that would currently be inundated by tsunami-related flooding. Water levels in the estuary are likely to be higher for longer periods of time between May 15 and October 15. The risk of damage from a tsunami would remain the same the rest of the year);

- Water quality (because water will stay in a closed estuary for a longer time, there may be an increase in the amount of time that water quality in the estuary is potentially degraded due to high bacteria or nutrient levels; and some groundwater wells near the estuary currently experience seasonal saline water intrusion. When the estuary closes, the salt and fresh waters stratify, and the heavier saltwater could concentrate near the bottom of the Estuary, potentially extending the time period of salinity problems in some wells. It is also possible, however, that the project might improve well conditions by reducing seawater intrusion into the Estuary);

- Biological resources (seals, sea lions and other marine mammals that currently “haulout” on rocks and logs in the Estuary could be impacted by longer Estuary closures and higher water levels. (Seals and sea lions currently leave the haulout site whenever the Estuary closes); and

- Recreation (implementation of the project would reduce the occurrence of tidal channel conditions during summer months, thereby reducing the occurrence of resulting sandbar conditions desirable for surfing. Additionally, inundation would seasonally reduce recreational beach area within the Estuary) (Sonoma County Water Agency 2010).

Please refer to the Estuary Management Project EIR for a detailed description of all impacts and mitigation measures.

The EIR also identified environmental impacts which would be beneficial to biological resources (increasing potential habitat availability for juvenile salmonids). Please refer to the Estuary Management Project EIR for a detailed description of all impacts and mitigation measures.

The Estuary Management Project is a past, present, and ongoing related project, the past and ongoing effects of which are included in the Proposed Project environmental setting and baseline operational conditions. Please refer to Chapter 4, “Environmental Setting, Impacts, and Mitigation Measures” for a discussion of Proposed Project’s environmental setting and baseline.

This EIR’s analysis of the Proposed Project assumes the continued operation of the Estuary Management Project. The Baseline Condition assumes continuation of the Estuary Management Project. Accordingly, Baseline Condition represents the most accurate estimate of near-term future Estuary Management Project operations.

Relationship to Proposed Project

The geographic area affected by the Russian River Estuary Management Project overlaps with the area affected by the Proposed Project in the Russian River watershed.

The Estuary Management Project is one of a series of actions to be taken by the Water Agency as part of the RRIFR Program in order to maintain compliance with the Russian River Biological Opinion. Both the Estuary Management Project and the Proposed Project are components of the RRIFR Program, located in the Russian River watershed, and would be implemented pursuant to objectives that focus on fisheries enhancement. As described in Chapter 3, “Background and Project Description,” the Proposed Project would alter minimum instream flows within the Russian River and Dry Creek.

The Estuary Management Project governs the Water Agency’s breaching of the Estuary under all foreseeable instream flow conditions, with or without the instream flow levels proposed by the Fish Habitat Flow and Water Rights Project. The Water Agency has been managing water levels in the Estuary through breaching since 1995. At the times the Water Agency has breached the Estuary to prevent flooding, instream flows in the Russian River have ranged from 77 cubic feet per second (cfs) to 1,250 cfs. Although the Water Agency is required by the State Water Resources Control Board to maintain minimum instream flows in the Russian River, flows often greatly exceed the prescribed minimums due to natural flow from unmanaged tributaries on the river. Thus, depending on the year type and season, instream flows into the Estuary are, and will continue to be, a combination of natural runoff and releases from storage. The Estuary Management Project was developed to govern the Water Agency’s breaching activities under all flow conditions, regardless of the level of instream flows, and does not require or make more likely any changes to the existing minimum instream flows. The Proposed Project, on the other hand, proposes to reduce the level of flows in the Russian River and Dry Creek. Under the Proposed Project, flows into the Estuary could be lower in some years, particularly during the dry season, depending upon the extent of natural runoff and tributary flows. Reduced minimum

flows in the Russian River, and the resultant possible reduced flows into the Estuary, if approved by the State Water Resources Control Board, may make it easier for the Water Agency to maintain the water levels identified in the Russian River Biological Opinion as beneficial in some years. However, these lower flows are not required in order for the Estuary Management Project to be carried out. The Water Agency must carry out the Estuary Management Project regardless of whether lower minimum Russian River flows are ever approved by the State Water Resources Control Board. The Estuary Management Project, as designed and as evaluated in the Russian River Estuary Management Project Draft EIR, is feasible with or without the reduced minimum flows proposed by the Proposed Project.

When the effects of another project like the Estuary Management Project are reflected in an EIR's description of existing environmental conditions, and, as a result, also included in the cumulative impact analysis, a separate analysis of the effects of that project is not required.[4]

B. North Coast Resource Partnership

The North Coast Resource Partnership (NCRP) initially known as the North Coast Integrated Regional Water Management Plan is a collaboration among local government, Tribes, watershed groups, and interested partners working on integrated regional planning and project in the North Coast region of California. The North Coast comprises seven counties (which include Mendocino and Sonoma counties), Tribal lands, major watersheds, and a planning area of 19,390 square miles.

The NCRP focuses on projects related to clean and reliable drinking water supplies, watershed health, energy independence, climate adaptation and economic vitality, especially in economically disadvantaged communities. NCRP works collaboratively on water, natural resource, and energy challenges to reduce conflicts, integrate federal, state, regional and local priorities and identify and seek funding for the region's highest priority multi-benefit projects.

North Coast Implementation Projects

The passage of Propositions 50, 84, 1E and 1 has provided funding for North Coast Resource Partnership projects. NCRP is implementing or has completed the following Projects.

IRWM Proposition 1 Implementation Projects

- Water Use Efficiency Programs
    - Sonoma County Water Agency, Northern Sonoma County Water Conservation Program Turf & Toilet Rebates
    - Turf & Toilet Direct Installs

IRWM Proposition 50 Implementation Projects

- California Land Stewardship Institute - Fish Friendly Farming Environmental Certification Program (complete)
- City of Santa Rosa - Sonoma County Water Recycling and Habitat Preservation Project (Phase 2a) (complete)

[4] City of Long Beach v. Los Angeles Unified School Dist. (2009) 176 Cal.App.4th 889, 908-912.

- Mendocino Resource Conservation District - Forsythe Creek Upslope Road Sediment Reduction Project (ongoing)

IRWM Proposition 84 Implementation Projects

- California Land Stewardship Institute - Fish Friendly Farming & Ranching Environmental Certification in the Russian, Navarro, & Gualala River Watersheds (ongoing)
- California Land Stewardship Institute - Russian River Watershed Agricultural Water Conservation & Water Supply Reliability Program (complete)
- Russian River Watershed Agricultural Water Conservation and Water Supply Reliability Program (ongoing)
- Mendocino County Resource Conservation District - Mendocino County Working Landscapes Riparian Demonstration Project (upper main stem) (complete)
- Mendocino County Resource Conservation District - Mendocino Headwaters Integrated Water Quality Enhancement Project (ongoing)
- Mendocino County Resource Conservation District - Mendocino Jumpstart Integrated Water Plan (upper main stem) (ongoing)
- Copeland Creek Watershed Detention/Recharge, Habitat Restoration, and Steelhead Refugia Project (ongoing)
- Sonoma Resource Conservation District - Lower Russian River Water Quality Improvement Project (complete)
- Sonoma Resource Conservation District - Russian River *Arundo donax* Removal and Riparian Enhancement Program (ongoing until 2017)

Impacts Identified

Many of the NCRP projects listed above, are in various stages of completion; associated impacts include short-term construction activities impacts to local land uses, water quality, vegetation and sensitive species, and erosion. Over the long-term, the projects improve riparian areas and fisheries habitat.

Relationship to Proposed Project

The projects listed above are located within the Russian River Watershed. Some projects are within the upper reaches of the Russian River, and are not located within the geographic scope of the Proposed Project. Other projects have occurred within the geographic scope of the Proposed Project.

Potential for Contribution to Cumulative Impacts

A majority of the projects have been implemented and therefore short-term impacts to local land uses, water quality, vegetation and sensitive species, and erosion have already occurred and would not be cumulatively considerable. The Proposed Project would not include new construction of water facilities, infrastructure, or any other type of construction or land disturbance, as a result. As a result, concurrent implementation of the Proposed Project and the ongoing projects would not contribute to cumulative short-term adverse impacts associated with construction activities and therefore are not cumulatively considerable. The above-mentioned

projects include a variety of habitat enhancing techniques designed to improve the area and connectivity of fisheries habitat. One of the primary goals of the Proposed Project is to manage Russian River Project releases to provide instream flows that will improve habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead; therefore, the Proposed Project, when considered concurrently with the beneficial impact to fisheries under habitat restoration projects, would be considered cumulatively beneficial. The goals of IRWM are closely aligned with the habitat objective of the Proposed Project, and on the whole, contribute to cumulative improvements in habitat and water quality in the Russian River watershed. The cumulative impact analysis focuses on adverse environmental impacts; since this is a cumulative beneficial impact it will not be analyzed in Section 5.7, "Cumulative Impacts and Mitigation Measures" of this chapter.

C. Potter Valley Project

The Potter Valley Project (PVP) has diverted water from the Eel River to the East Fork of the Russian River for power generation purposes since 1908. The project consists of: Lake Pillsbury, an upstream regulating reservoir on the Eel River; Cape Horn Dam, a dam on the Eel River that creates Van Arsdale reservoir; a trans-basin tunnel; penstocks; and the Potter Valley Powerhouse, located in the Russian River watershed upstream of Lake Mendocino. The powerhouse has a maximum generation capacity of 9.4 megawatts. Between 1922 and 2006, diversions from the Eel River into the Russian River through the PVP averaged over 150,000 acre-feet a year. Since 2006, Eel River diversions have averaged 72,000 acre-feet a year (SCWA 2015).

The PVP is owned by Pacific Gas & Electric Company (PG&E) and operated under a license issued by the Federal Energy Regulatory Commission (FERC). Under the terms of its license, PG&E releases water from Lake Pillsbury to meet FERC-required minimum instream flow requirements in the Eel River and to provide water for diversions at Cape Horn Dam through the tunnel to the powerhouse. PG&E releases Eel River flows diverted through its powerhouse for power generation into the East Fork Russian River for diversion by the Potter Valley Irrigation District (PVID) under a PVID-PG&E contract and to maintain FERC-required minimum releases into the East Fork Russian River.

PG&E's original FERC license for the PVP was issued in 1922 and expired in 1972. After a series of one-year annual licenses, FERC issued a new 50-year PVP license to PG&E in 1983. This license expires in 2022. The 1983 license required PG&E to complete a 10-year study, in cooperation with the California Department of Fish and Game and U.S. Fish and Wildlife Service to determine PVP impacts on Eel River fishery. As discussed in Chapter 3, "Background and Project Description," following the 10-year study required by the 1983 license, PG&E applied to FERC for an amendment to its PVP license in 1998, requesting to change the required minimum instream flows in the Eel River to benefit Eel River salmon species listed as threatened species under the federal Endangered Species Act.[5] FERC prepared an Environmental Impact Statement (EIS) under the National

[5] Intervenors in the FERC proceeding on PG&E's 1998 license amendment request included the California Farm Bureau Federation; CDFG; California Trout, Inc.; California Sportfishing Protection Alliance; individually by the Cities of Healdsburg, Petaluma, Rohnert Park, Santa Rosa, Sonoma, and Ukiah; individually by the Counties of Humboldt,

Environmental Policy Act (NEPA), which evaluated the potential environmental impacts of various PVP flow scenarios on environmental conditions in the Eel River and Russian River watersheds. In 2002, NMFS issued a Biological Opinion under the federal Endangered Species Act for the proposed license amendment. FERC amended PG&E's license in 2004 to require implementation of the "reasonable and prudent alternative" and the "reasonable and prudent measures" that the Biological Opinion stated were necessary for the PVP to avoid jeopardizing the continued existence of the ESA-listed salmon species in the Eel River watershed. PG&E began operations of the PVP in accordance with its amended FERC license in 2006. Since water year 2006-2007, PG&E has operated the PVP in compliance with the terms of the amended license.[6] The 2006 implementation of the 2004 license amendment has significantly decreased PVP flows into the Russian River watershed. The timing of PG&E's PVP diversions has also changed since 2006, with significant reductions in springtime diversions.

The PVP is a past, present, and ongoing related project, the past and ongoing effects of which are included in the Proposed Project environmental setting and baseline operational conditions. Please refer to Chapter 4, "Environmental Setting, Impacts, and Mitigation Measures" for a discussion of Proposed Project's environmental setting and baseline.

This EIR's analysis of the Proposed Project assumes the continued operation of the PVP under the terms of its FERC license, including the flow regime imposed by the 2004 FERC order, as it has been implemented since 2006. The baseline condition assumes continuation of the PVP flows into the Russian River watershed that have occurred since 2006. Although the diversion reductions that began in 2006 have had serious impacts on Lake Mendocino's water supply reliability, there currently are no foreseeable proceedings to modify the PVP Eel River instream flow requirements in a manner that would increase flows into the Russian River watershed. Accordingly, baseline condition represents the most accurate estimate of near-term future PVP operations.

Relationship to Proposed Project

When the effects of another project like the PVP are reflected in an EIR's description of existing environmental conditions, and, as a result, also included in the cumulative impact analysis, a

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Lake, and Mendocino; Friends of the Eel River; Friends of the Russian River; John R. Calaprice; Marin Municipal Water District; Mendocino County Inland Water and Power District; Mendocino County Farm Bureau; Mendocino County Russian River Flood Control and Water Conservation Improvement District; Mendocino County Water Agency; NOAA Fisheries; Northcoast Environmental Center; North Marin Water District; Northern California Association of River Guides; PVID; Redwood Chapter of the Sierra Club; Round Valley Indian Tribes; Russian River Chamber of Commerce; Russian River Region, Inc.; Salmon Trollers Marketing Association; Santa Rosa Chamber of Commerce; Sonoma County and Sonoma Water; Sonoma County Alliance; Sonoma County Grape Growers Association; Sonoma County Farm Bureau; Sonoma County Manufacturing Group; Sweetwater Springs Water District; Trout Unlimited; Interior; Town of Windsor; U.S. Department of Agriculture's Forest Service; Interior; United Winegrowers of Sonoma County; Windsor Water District and Redwood Valley Water District. See FERC Order Amending License Footnote 19 http://www.ferc.gov/whats-new/comm-meet/012204/H-2.pdf

[6] FERC issued the license amendment to PG&E in 2004. However, the terms of the license were not interpreted and implemented fully until 2006.

separate analysis of the effects of that project is not required.[7] However, a No PVP scenario is analyzed in Section 5.7.

The geographic area affected by the PVP overlaps with the area affected by the Proposed Project in the Russian River watershed.

D. No Potter Valley Project Diversions Scenario

As discussed in Chapter 3, "Background and Project Description," the historical importance of flows from the PVP on Lake Mendocino water supplies is demonstrated by the fact that the SWRCB's Decision 1610, which adopted several terms now in the Water Agency's water right permits, established a hydrologic index for the Russian River and Dry Creek minimum instream flow requirements in these permits that is based on cumulative inflows into Lake Pillsbury. The implementation beginning in 2006 of the 2004 license amendment has significantly decreased PVP flows into the Russian River watershed. Reduced inflows in the spring have contributed to declining water supply reliability of Lake Mendocino through the summer months (SCWA 2015). As a result, the Water Agency has had to file several Temporary Urgency Change Petitions (TUCP) with the SWRCB, requesting order to temporarily reduce the minimum instream flow requirements in the Water Agency's water right permits as necessary to preserve water supply storage in Lake Mendocino for subsequent downstream beneficial uses. Given the importance of the PVP diversions to the agricultural, commercial, and industrial economy in Mendocino and Sonoma counties, as well as the importance of a sufficient water supply in Lake Mendocino to maintain beneficial uses, including habitat for threatened and endangered salmonids in the Russian River watershed, it is reasonable to assume that decisions about the extent of PVP diversions into the Russian River watershed made in any future proceedings by FERC (or by any other regulatory agencies potentially having jurisdiction over PVP flows) will recognize the importance of those diversions to Mendocino and Sonoma counties and the Russian River fishery.

PG&E's existing PVP license expires in 2022. If PG&E decides to apply for a new license, it must formally initiate re-licensing proceedings before FERC no later than April 2017. At this time, it is not known what actions PG&E may decide to take regarding a new FERC license for the PVP. However, whatever actions PG&E decides to take regarding the PVP, the FERC proceedings for the PVP will be pending during the time that the Proposed Project is being considered and implemented.

As discussed above, the FERC proceedings that led to the 2004 PVP license amendment were lengthy and controversial, and it is likely that that the new FERC proceedings regarding the PVP also will be lengthy and controversial. Because the PVP affects fishery species listed under the Endangered Species Act in both watersheds, it is foreseeable that NMFS will evaluate the fishery effects of the PVP on both the Eel and the Russian River fisheries. It also is foreseeable that FERC will prepare an EIS that will evaluate the fishery effects and other environmental and economic impacts associated with alternative PVP scenarios. The alternatives likely to be

[7] City of Long Beach v. Los Angeles Unified School Dist. (2009) 176 Cal.App.4th 889, 908-912.

analyzed in a new EIS include continuation of existing operations, alternative scenarios under which diversions from the Eel River into the Russian River would be modified or reduced, and also a scenario in which the PVP would be decommissioned. It is not clear how long this FERC process will take or what its ultimate outcome will be.

To address these uncertainties and to bracket the range of potential FERC actions regarding the PVP, this EIR includes both scenarios under which PVP flows into the Russian River watershed remain at existing (post-2006) levels and a scenario under which PVP flows into the Russian River would be reduced to zero. The assumption that PVP flows into the East Fork Russian River will remain at present levels is reasonable, given the history of the FERC proceedings regarding the PVP that led to the 2004 license amendment and the historical reliance of Mendocino and Sonoma counties on the diversions. While the Water Agency does not believe that a scenario of no future flows from the PVP into the Russian River watershed is likely, the Water Agency nevertheless has conducted modeling to analyze the potential cumulative impacts of such a scenario (the No PVP scenario). The No PVP scenario assumes FERC would issue an order that would result in no future PVP diversions from the Eel River into the Russian River watershed. Concurrent implementation of the Proposed Project and No PVP scenario are modeled and analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures,” of this chapter.

Relationship to Proposed Project

The geographic area affected by the No PVP scenario would overlap the area affected by the Proposed Project in the Russian River watershed.

Impacts Identified

Because no CEQA or NEPA review has been conducted for a No PVP scenario in the Russian River watershed, the impacts that would occur under such a scenario have not been evaluated in any environmental documents. In general, implementation of No PVP diversions could contribute to operational impacts in the environmental resource categories of hydrology (surface water and groundwater), water quality, fisheries, vegetation and wildlife, recreation, energy resources, greenhouse gas emissions and climate change, aesthetics and public services and utilities.

Potential for Contribution to Cumulative Impacts

In general, concurrent implementation of the Proposed Project and the No PVP diversions could contribute to cumulative operational impacts in the environmental resource categories of hydrology (surface water and groundwater), water quality, fisheries, vegetation and wildlife, recreation, energy resources, greenhouse gas emissions and climate change, aesthetics and public services and utilities. The Water Agency conducted modeling, using the best available data and modeling tools to assess whether concurrent implementation of the Proposed Project and the No PVP scenario would have cumulative operational impacts to environmental resources. Future evaluation of Lake Mendocino operational responses under a No PVP scenario could benefit from additional data collection on PVP inflows to the East Fork Russian

River, particularly related to surface water/groundwater interactions and water quality. Concurrent implementation of the Proposed Project and the No PVP and potential cumulative impacts are analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

Results of the Russian River ResSim modeling provide the monthly percentages of occurrence of the Proposed Project flow schedules (Tables 5.4-2 and 5.4-3) under the Russian River Hydrologic Index as described in the "Development of the Russian River Hydrologic Index for the Fish Habitat Flows and Water Rights Project" report in Appendix G. The Proposed Project and No PVP scenario were evaluated to determine the changes in monthly percent of occurrences of flow schedules (Tables 5.4-4 and 5.4-5).

As described in Chapter 3, “Background and Project Description,” and the “Russian River Hydrologic Modeling for the Fish Habitat Flows and Water Rights Project” in Appendix G, and in Figure 5.4-1 below, water supply storage in Lake Mendocino would be more reliable under the Proposed Project when compared to Baseline Conditions and the Proposed Project would maximize the occurrence of Schedule 1 minimum instream flows and minimize the occurrence of Schedule 5 flows. Schedule 1 reflects the highest flows and wettest conditions, while Schedule 5 reflects the lowest flows and the driest conditions.

The results of the Proposed Project and No PVP scenarios demonstrate that there would be a significant change in reservoir reliability under the no PVP scenario (Figure 5.4-2). Figure 5.4-2 shows that the modeled Proposed Project and No PVP scenario (Cumulative 1 Scenario) Lake Mendocino storage volumes at the 90, 75, 50, 25, and 10 percent exceedances. The changes in cumulative inflow into and storage condition in Lake Mendocino under the No PVP scenario would result in a large increase in the frequency of occurrence of drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project. Under the Proposed Project, Schedules 3, 4, and 5 would occur approximately 6, 4, and 1 percent of the time under historical hydrology. Under the No PVP scenario, Schedules 3, 4, and 5 would occur approximately 11, 32, and 17 percent of the time under historical hydrology.

Table 5.4-2. Monthly Percentage of Occurrence (%) of Upper Russian River Minimum Instream Flow Schedules 1 through 5 under the Proposed Project's Russian River Hydrologic Index. Schedule 1 flows are the highest flows (wettest) and Schedule 5 are the lowest flows (driest).

Monthly	Schedule 1	Schedule 2	Schedule 3	Schedule 4	Schedule 5
January	68	20	7	4	1
February	68	20	7	4	1
March	68	20	7	4	1
April	68	20	7	4	1
May	69	19	7	4	1
June	68	18	9	4	1
July	68	18	7	5	2
August	67	19	7	5	2
September	67	20	6	5	2
October	65	20	8	5	2
November	65	21	8	5	1
December	64	21	8	6	1
Sub-total	**67**	**20**	**7**	**4**	**1**
Total	**87**		**12**		**1**

Table 5.4-3. Monthly Percentage of Occurrence (%) of Lower Russian River and Dry Creek Minimum Instream Flow Schedules 1 through 5 under the Proposed Project's Russian River Hydrologic Index. Schedule 1 flows are the highest flows (wettest) and Schedule 5 are the lowest flows (driest).

Monthly	Schedule 1	Schedule 2	Schedule 3	Schedule 4	Schedule 5
January	68	20	7	4	1
February	68	20	7	4	1
March	68	20	7	4	1
April	68	20	7	4	1
May	69	19	7	4	1
June	68	20	7	4	1
July	68	20	7	4	1
August	68	20	7	4	1
September	68	21	6	4	1
October	69	20	6	4	1
November	69	20	6	4	1
December	69	20	6	4	1
Sub-total	***68***	***20***	***6***	***4***	***1***
Total	***89***		***10***		***1***

Table 5.4-4. Monthly Percentage of Occurrence (%) of Minimum Instream Flow Schedules 1 through 5 under the Proposed Project's Russian River Hydrologic Index and No PVP cumulative scenario. Schedule 1 flows are the highest flows (wettest) and Schedule 5 are the lowest flows (driest).

Monthly	Schedule 1	Schedule 2	Schedule 3	Schedule 4	Schedule 5
January	37	13	8	1	41
February	47	17	9	6	22
March	37	30	9	15	9
April	41	14	10	30	5
May	35	16	13	27	9
June	23	13	16	17	31
July	16	12	12	25	35
August	11	14	6	29	39
September	7	14	9	20	50
October	7	6	10	21	56
November	2	10	1	22	65
December	3	5	5	21	66
Sub-total	**22**	**14**	**9**	**20**	**36**
Total	**36**		**28**		**36**

Table 5.4-5. Monthly Percentage of Occurrence (%) Lower Russian River and Dry Creek Minimum Instream Flow Schedules 1 through 5 under the Proposed Project's Russian River Hydrologic Index and No PVP cumulative scenario. Schedule 1 flows are the highest flows (wettest) and Schedule 5 are the lowest flows (driest).

Monthly	Schedule 1	Schedule 2	Schedule 3	Schedule 4	Schedule 5
January	37	13	8	1	42
February	47	16	9	6	22
March	37	31	9	14	10
April	41	14	10	30	5
May	36	16	13	27	9
June	26	15	15	32	12
July	18	18	13	37	14
August	15	13	13	41	17
September	12	14	11	44	19
October	10	10	11	51	18
November	10	10	11	51	18
December	10	10	11	51	18
Sub-total	**25**	**15**	**11**	**32**	**17**
Total	**40**		**43**		**17**

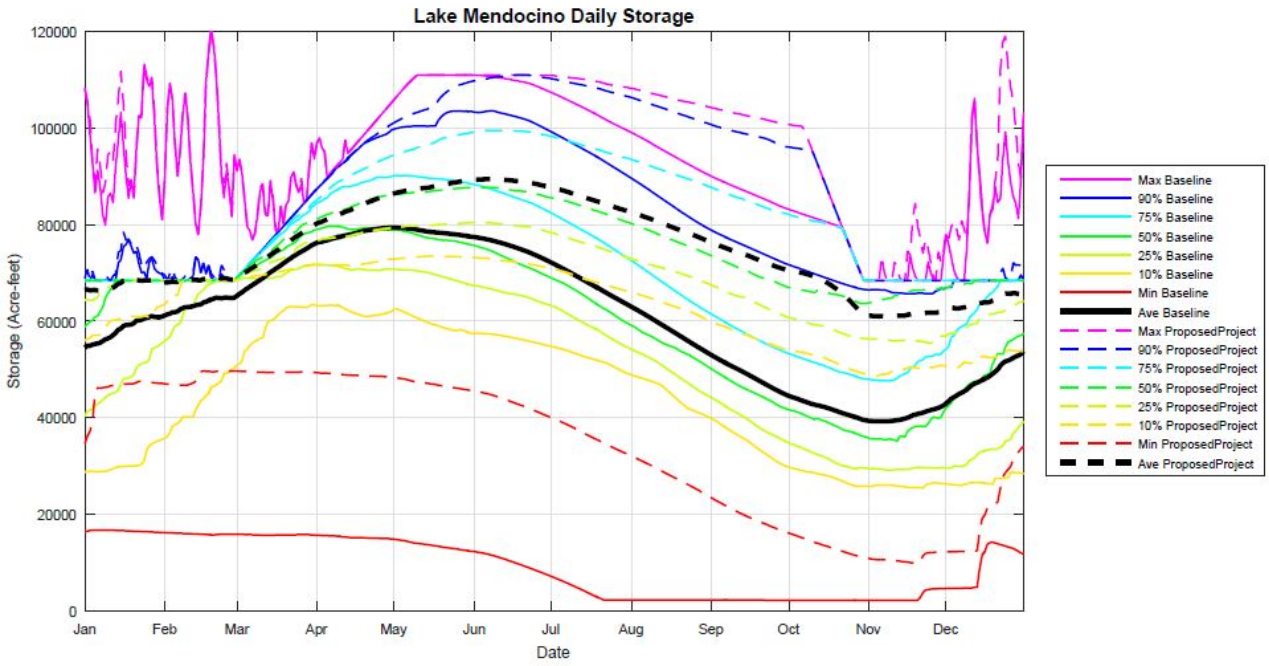

Figure 5.4-1. Modeled percent occurrence of estimated Lake Mendocino daily storage (acre-feet) for the Proposed Project (dashed lines) compared to Baseline Conditions (solid lines).

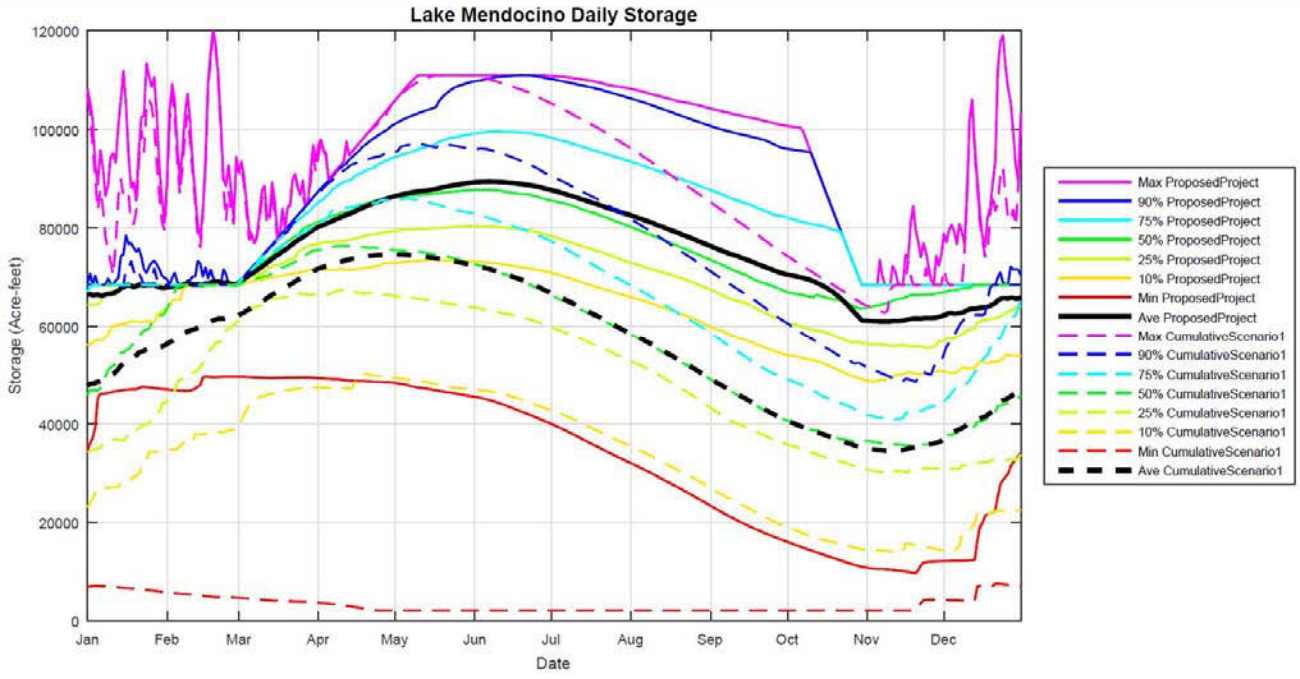

Figure 5.4-2. Modeled percent occurrence of estimated Lake Mendocino daily storage (acre-feet) for the Proposed Project (solid lines) and No PVP cumulative scenario (dashed lines).

E. Gravel Mining

1. Sonoma County Gravel Mining and the Aggregate Resources Mining Plan

Gravel mining was a common practice along the middle reach of the Russian River. Recent operations have been located along the middle and upper reaches of the Russian River, either within the channel or on adjacent alluvial terraces, along with operations along the Gualala River and Austin Creek (Sonoma County Permit and Resource Management Department 2006).

The Sonoma County Aggregate Resources Management Plan (County ARM Plan) currently serves as the regulatory document providing guidelines for management of aggregate mining in the County of Sonoma (County). The County ARM Plan includes policies on phasing out terrace pit mining and not permitting new terrace pit mining proposals after 2006, but still allowing instream mining. There are several remaining terrace sites; however, implementation of the ARM Plan limits extraction to a sustainable level. The County ARM Plan, adopted in 1980, updated in 1994, and amended in 2010 provides the regulatory guidelines for management of aggregate mining and includes: 1) the Aggregate Mining Plan: lands available for future supplies of aggregate material; 2) Managed Resources/ Open Space Plan: protection of riparian habitats, reclamation, and agricultural land preservation; and 3) identification of mining operations, including terrace mining, carried out in flood plain.

The ARM Plan states that:

- An extraction should be managed so as to minimize disturbance to physical processes that maintain channel geomorphology and provide aquatic habitat. Retain to a large extent the topographic attributes of gravel bars including a robust bar head strong enough to withstand the typical annual in-channel flows. Mining is only allowed downstream of the horizontal apex of the bar (or the lower half of the bar where no apex is apparent) with an exception to allow mining in the upper half of the bar only when the head of bar buffer is at least 8-feet above the water surface elevation measured from the upstream riffle crest at approximately 200 cfs flow, but in no case shall the head of bar buffer be less than one-third of the bar length.

- At the time of permit approval, establish minimum baseline elevations for the Lower Alexander Valley mining reach at 1-foot above the higher of either the 1997 or 2007 water surface elevations adjacent to each bar. If the water surface elevation is higher than the baseline elevation during implementation of mining activities, mining shall be limited to 1-foot above the water surface elevation at that time. This elevation shall become a performance standard to be maintained during the permit period. The low flow channel elevation shall be monitored each year and compared to the baseline reference elevation to indicate possible areas of channel lowering.

Impacts Identified

Gravel mining typically causes environmental impacts such as erosion, incision of tributaries, channelization and reductions in spawning habitat due to increased turbidity and ensuing embeddedness (spaces between gravel) of gravels in fine materials that prohibits spawning.

Gravel mining, along with reduction in sediment supply caused by Coyote Valley Dam, along with channelization efforts have resulted in bed elevation decreases in the main stem of the Russian River in Mendocino County. This bed lowering, or incision in the Ukiah Valley reach of the Russian River has reduced the elevation of the river's thalweg by 18 feet in some areas. This incision of the mainstem has in turn caused incision of tributary streams (National Marine Fisheries Service 2008).

Excessive extraction of instream gravels in Sonoma County has impacted three mining areas that include the Alexander valley, and the middle Reach. The Alexander reach, which is approximately 16 miles long, has experienced channel incision of up to 12 feet near the Geyserville Bridge (Florsheim, J.L, and P. Goodwin 1993). The channel sinuously in this reach has decreased due to instream mining, channelization and agricultural activities.

The most current information for the Middle Reach indicates that replenishment of gravel exceeds extraction. County regulations, such as the County ARM Plan and the Mendocino County Aggregate resources Management Plan attempt to maintain extraction rates below annual replenishment rates. These regulations appear to be successful with a Middle Reach sediment recharge rate averaging 430,800 tons, and 183,000 tons proposed for harvest in this area of the Russian River (National Marine Fisheries Service 2008).

Gravel extraction in the main stem of the Russian River has impacted salmonid habitat over time by altering the channel's natural geomorphology. Channel incision creates migration barriers at the mouths of tributaries and lowers the water table which in turn affects perennial stream flow. Impacts to spawning habitat are due to changes in sediment transport, and gravel quality that reduces the overall spawning habitat quality for salmonids attempting to utilize main stem habitat. Effects to riparian vegetation, pools and riffle sequences and gravel quality from gravel extraction limit rearing opportunities for juvenile salmonids. Large scale extraction of gravel is not expected to occur in the future with the current gravel management plan that exists in Sonoma County. Current gravel extraction practices are much improved with most operators following NMFS 2004 sediment removal guidelines which minimize impacts to salmonid habitat at a localized level. Improvements in gravel extraction methods in specific reaches of the main riffle frequency, and riparian vegetation in the future (National Marine Fisheries Service 2008).

Relationship to Proposed Project

The mining operations governed by the County ARM Plan are located within the Russian River Watershed, and occur within the geographic scope of the Proposed Project.

Potential for Contribution to Cumulative Impacts

Concurrent implementation of the Proposed Project would not include new construction of water facilities, infrastructure, or any other type of construction or land disturbance, and as a result, would not contribute to cumulative short and long-term impacts associated with construction activities and therefore are not cumulatively considerable. As discussed in Chapter 4, the Proposed Project would not include any operational impacts that would contribute to bed erosion or resource extraction impacts generally associated with mining operations, and therefore, would not be cumulatively considerable when implemented in conjunction with gravel mining operations and, will not be analyzed in Section 5.7, "Cumulative Impacts and Mitigation Measures" of this chapter.

2. Syar Alexander Valley Instream Mining Project and Sonoma County ARM Plan Amendments Draft Environmental Impact Report

Project and Sonoma County ARM Plan Amendments and the Sonoma County Board of Supervisors certified the Final EIR on December 7, 2010. The EIR addressed the potential impacts of Syar's request for an ARM Plan amendment, Sonoma County Surface Mining and Reclamation Ordinance (SMARO) amendment, Use Permit, and approval of a reclamation plan to mine gravel bars along a 6.5mile stretch of the Russian River (from River Mile 47.5 to 54). The Syar Alexander Valley Instream Mining Project would allow for continued commercial extraction of aggregate from gravel bars within this stretch of the Russian River within the Alexander Valley reach (Permit and Resource Management Department 2010). As a condition of the project being approved, amendments to the Sonoma County ARM Plan and the SMARO were approved. The amendments were intended to improve the mining standards to preserve the geomorphic processes that protect aquatic habitat, wildlife and vegetation, and fisheries.

The project's primary purpose was for Syar to mine gravel bars in the Alexander Valley reach of the Russian River to produce a sustainable yield of aggregate, while simultaneously implementing enhancement proposals to improve aquatic habitat. This would be accomplished through implementation of an adaptive management strategy (AMS), in which annual mining plans and enhancement components are reviewed and authorized by applicable resource agencies.

Identified Impacts

The EIR for Syar Alexander Valley Instream Mining Project and Sonoma County ARM Plan Amendments identified less than significant impacts to the following resources: geology, minerals and soils, geomorphology; fisheries resources; cultural resources; air quality; aesthetics; noise; public services and utilities; land use; and recreation.

The EIR identified significant impacts, but would be mitigated to a level of less than significant through implementation of mitigation to the following resources: geology, minerals and soils, geomorphology; hydrology and water quality; vegetation and wildlife; fisheries resources; cultural resources; traffic and circulation; air quality, aesthetics; noise; public services and utilities; hazards and hazardous materials; energy; land use; and recreation.

The EIR identifies significant adverse impacts that would result from the project and imposes measures to mitigate them to the extent feasible. All project impacts can be mitigated to a level that is less than significant with the following exceptions: air quality; aesthetics; noise; and traffic and circulation (Permit and Resource Management Department 2010). Please refer to the EIR for Syar Alexander Valley Instream Mining Project and Sonoma County ARM Plan Amendments for a detailed description of all impacts and mitigation measures.

Relationship to Proposed Project

The Syar Alexander Valley Instream Mining Project governed by the County ARM Plan is located within the Russian River Watershed, and would occur within the geographic scope of the Proposed Project.

Potential for Contribution to Cumulative Impacts

Concurrent implementation of the Proposed Project would not include new construction of water facilities, infrastructure, or any other type of construction or land disturbance, and as a result, would not contribute to cumulative short and long-term impacts associated with construction activities and therefore are not cumulatively considerable. As discussed in Chapter 4, the Proposed Project would not include any operational impacts that would contribute to bed erosion or resource extraction impacts generally associated with mining operations, and therefore, would not be cumulatively considerable when implemented in conjunction with gravel mining operations and, will not be analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

3. Mendocino County Gravel Mining and the Upper Russian River Aggregate Resources Management Plan

Presently, there currently is no approved resource management plan for aggregate mining in and along waterways in Mendocino County. In March 1997, a team of consultants prepared the Upper Russian River Aggregate Resources Management Plan for the Mendocino County Water Agency, but the Mendocino County Board of Supervisors has not approved it. The Upper Russian River Aggregate Resources Management Plan is currently inactive. The intent of the report is to serve as a planning document to guide the County of Mendocino in future river management and land use decisions in the Russian River watershed. The report summarizes the historic and existing river status in terms of fluvial geomorphology, fisheries, and riparian habitat conditions. Impacts of in-stream gravel extraction on rivers are reviewed and alternative aggregate sources are discussed (Mendocino County Water Agency 1997).

At this time, applications for use permits for gravel mining in or adjacent to the Russian River and its tributaries are considered on a case-by-case basis by the County of Mendocino based on review by and recommendations from the Mendocino County Water Agency. Currently, Ford Gravel (Granite Construction) and Redwood Valley Gravel Companies are the only two companies that hold vested right permits for instream mining. The vested right permits for all sources is approximately 50,000 to 100,000 yards annually. However, recent mining activities for both companies have been minimal. Ford Gravel Company has applied for permits to terrace

mine adjacent to the Russian River. The appropriate studies and environmental review will be conducted prior to the mining activity.

Impacts Identified

Gravel mining typically causes environmental impacts such as erosion, incision of tributaries, channelization and reductions in spawning habitat due to increased turbidity and ensuing embeddedness (spaces between gravel) of gravels in fine materials that prohibits spawning.

As discussed above under the Sonoma County Aggregate Resources Management Plan, gravel mining, along with reduction in sediment supply caused by Coyote Valley Dam, along with channelization efforts have resulted in bed elevation decreases in the main stem of the Russian River in Mendocino County. This bed lowering, or incision in the Ukiah Valley reach of the Russian River has reduced the elevation of the river's thalweg by 18 feet in some areas. This incision of the mainstem has in turn caused incision of tributary streams (National Marine Fisheries Service 2008).

Excessive extraction of instream gravels in Sonoma County has impacted three mining areas that include the Alexander valley, and the middle Reach. The Alexander reach, which is approximately 16 miles long, has experienced channel incision of up to 12 feet near the Geyserville Bridge (Florsheim, J.L, and P. Goodwin 1993). The channel sinuously in this reach has decreased due to instream mining, channelization and agricultural activities.

The most current information for the Middle Reach indicates that replenishment of gravel exceeds extraction. County regulations, such as the County ARM Plan and the Mendocino County Aggregate resources Management Plan attempt to maintain extraction rates below annual replenishment rates. These regulations appear to be successful with a Middle Reach sediment recharge rate averaging 430,800 tons, and 183,000 tons proposed for harvest in this area of the Russian River (National Marine Fisheries Service 2008).

Gravel extraction in the main stem of the Russian River has impacted salmonid habitat over time by altering the channel's natural geomorphology. Channel incision creates migration barriers at the mouths of tributaries and lowers the water table which in turn affects perennial stream flow. Impacts to spawning habitat are due to changes in sediment transport, and gravel quality that reduces the overall spawning habitat quality for salmonids attempting to utilize main stem habitat. Effects to riparian vegetation, pools and riffle sequences and gravel quality from gravel extraction limit rearing opportunities for juvenile salmonids. Large scale extraction of gravel is not expected to occur in the future with the current gravel management plan that exists in Sonoma County. Current gravel extraction practices are much improved with most operators following NMFS 2004 sediment removal guidelines which minimize impacts to salmonid habitat at a localized level. Improvements in gravel extraction methods in specific reaches of the main riffle frequency, and riparian vegetation in the future (National Marine Fisheries Service 2008).

Relationship to Proposed Project

The mining operations governed by the County of Mendocino and the proposed Upper Russian River ARM Plan are located within the Russian River Watershed, and occur within the

geographic scope of the Proposed Project. In addition, the proposed Redwood Valley Gravel and Ford Gravel operations would be located within the Russian River Watershed, and would occur within the geographic scope of the Proposed Project.

Potential for Contribution to Cumulative Impacts

Concurrent implementation of the Proposed Project would not include new construction of water facilities, infrastructure, or any other type of construction or land disturbance, and as a result, would not contribute to cumulative short and long-term impacts associated with construction activities and therefore are not cumulatively considerable. As discussed in Chapter 4, the Proposed Project would not include any operational impacts that would contribute to bed erosion or resource extraction impacts generally associated with mining operations, and therefore, would not be cumulatively considerable when implemented in conjunction with gravel mining operations and, will not be analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

4. Kunzler Terrace Mine Project Environmental Impact Report

In November 2012, Masonite Corporation sued the County of Mendocino, the Mendocino County Board of Supervisors and Granite Construction Company over a 65-acre terrace mining operation on Kunzler Ranch Road. The project is being challenged for potential adverse visual, noise, dust, traffic, water quality and flooding impacts, and has not moved forward at this time (Revelle 2012).

Identified Impacts

The Draft EIR for Kunzler Terrace Mine Project identified impacts as significant, but would be reduced to less than significant with the incorporation of mitigation measures to the following resources: air quality; biological resources; cultural resources; hazardous and hazardous materials; hydrology and water quality; and traffic and transportation.

Agricultural resources and traffic and transportation impacts have been identified as significant and unavoidable and cannot be eliminated or reduced to a less than significant level. Implementation of the project would result in the permanent conversion of land designated by the Department of Conservation FMMP as *Prime Farmland, Farmland of Statewide Importance or Uniqlle Farmland.* In addition, under the 2030 with Project condition study area intersections could operate at a deficient level of service (Mendocino County Planning Commission 2010). Please refer to the Kunzler Terrace Mine Project EIR for a detailed description of all impacts and mitigation measures.

Relationship to Proposed Project

The proposed Kunzler Terrace Mine Project is be located within the Russian River Watershed, and would occur within the geographic scope of the Proposed Project.

Potential for Contribution to Cumulative Impacts

Concurrent implementation of the Proposed Project would not include new construction of water facilities, infrastructure, or any other type of construction or land disturbance, and as a result, would not contribute to cumulative short and long-term impacts associated with construction activities and therefore are not cumulatively considerable. As discussed in Chapter 4, the Proposed Project would not include any operational impacts that would contribute to bed erosion or resource extraction impacts generally associated with mining operations, and therefore, would not be cumulatively considerable when implemented in conjunction with gravel mining operations and, will not be analyzed in Section 5.7, "Cumulative Impacts and Mitigation Measures" of this chapter.

F. Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report

The City of Ukiah (City) holds water rights Permit 12952 for the diversion of Russian River underflow for municipal purposes. Water can be diverted at a rate not to exceed 20.0 cubic feet per second from January 1 through December 31 prior to the Permit's expiration date of December 31, 2000. Ukiah filed a Petition for Extension of Time for Permit 12952 with the State Water Resources Control Board (SWRCB). The Petition for Extension of Time would allow the City additional time in which to perfect the full beneficial use of water authorized by Permit 12952. The Petition asked for an 80-year extension (i.e., to December 1, 2080). Second, Ukiah has also filed a Petition for Change in Point of Diversion to add additional diversion points to Permit 12952. Third, Ukiah filed a Petition for Change in Place of Use for Permit 12952. The Petition identified the Place of Use as the City of Ukiah's 1995 Sphere of Influence proposed in the City of Ukiah's General Plan, last revised in 1995 ("1995 Sphere of Influence"). A Draft EIR was released in March 2013 for Amendment of Water Right Permit 12952 (Application 15704) for the City. The Draft EIR addresses the potential impacts of the City's request for a Water Right Permit amendment.

Identified Impacts

The Draft EIR for the Amendment of Water Right Permit 12952 (Application 15704) for the City identified the less than significant impacts to the following resources: air quality, biological resources, cultural, energy, geology and soil, hazards and hazardous materials, hydrology and water quality, land use, noise, traffic and circulation, utilities and public services, and visual resources.

The Draft EIR for the City identified the proposed installation of new wells and additional diversion of water not resulting in any significant impacts that cannot be mitigated to a less than significant level. The Draft EIR identified impacts as less than significant with mitigation to the following resources: biological resources, cultural, traffic and circulation, and visual resources.

The Draft EIR for the City identified indirect impacts resulting from additional development within the proposed Place of Use that could occur if the project is approved and would result in the

following significant and unavoidable impacts: traffic and circulation (New development that could occur if the project is approved would increase traffic volumes on the City street system potentially resulting in unacceptable levels of service); utilities and public services (Providing water to the new development could exceed the City's water treatment, storage, and/or delivery capacities; and occupants of new development would increase the demand for parks and other recreational facilities); land use (New development that could occur if the project is approved would result in the conversion of Farmland to non-agricultural uses); and global climate change (New development that could occur if the project is approved would increase the emission of greenhouse gases). Please refer to the Amendment of the City of Ukiah's Water Right Permit 12952 (Application 15704) Draft EIR for a detailed description of all impacts and mitigation measures.

Water Agency staff reviewed the Draft EIR to assess whether impacts to Lake Mendocino and Russian River in-stream flows were adequately evaluated. Based on this review, Water Agency's staff concluded that the City of Ukiah did not adequately assess its project's impact to many resource categories (i.e., hydrology and water quality (groundwater and surface water interactions, stream flow and water supply) and fisheries) within the DEIR. For example, the analysis for assessing water availability that is described in the Draft EIR does not account for the various types of water (natural flow water, PVP import water, water released from Lake Mendocino storage) that are in the river under different conditions versus the types of water that may be diverted under various water rights. The City of Ukiah may divert only natural flow water and PVP import water under its water right Permit 12952, but the Draft EIR does not recognize that the City may not divert water released from Lake Mendocino storage under this permit.

It is the Water Agency's staff opinion that the implementation of the City of Ukiah's Amendment of Water Right Permit could have impacts on Lake Mendocino's storage for water supply of Russian River water users in Mendocino and Sonoma Counties in addition to releases that help the Water Agency meet minimum instream flow requirements under the Russian River Biological Opinion in the lower Russian River. The impact to releases could jeopardize Russian River fisheries that depend on these required minimum flows and impact the water supplies of Russian River water users. In addition, the City of Ukiah's Amendment of Water Right Permit could contribute to operational impacts in the environmental resource categories of hydrology, water quality, vegetation and wildlife, recreation, energy resources, greenhouse gas emissions and climate change, aesthetics and public services and utilities.

Given the aforementioned responsibilities and substantial interests of the Water Agency including concerns that the proposed water right permit amendment by the City of Ukiah could impact and adversely affect Russian River fisheries and water supplies for Mendocino and Sonoma Counties, the Water Agency submitted comments to the City of Ukiah's on the Draft EIR for the Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah to address identified potential impacts.

More recently, since 2014, the City of Ukiah, the Water Agency and other Mendocino and Sonoma County water supply entities in the upper Russian River have coordinated more closely to share information and work on initiatives to improve overall water supply resiliency for the

upper Russian River. These efforts have included: (1) working together to manage the region's limited water supplies during the recent drought, (2) conduct an assessment of Lake Mendocino's future water supply reliability, and (3) coordination and support for integrated water resource projects such as initiating a regional water conservation program and the City of Ukiah's recycled water project intended to reduce diversions from the Russian River.

Relationship to Proposed Project

The proposed Amendment of Water Right Permit 12952 is located within the Russian River Watershed, and would occur within the geographic scope of the Proposed Project.

Potential for Contribution to Cumulative Impacts

The City of Ukiah's Draft EIR Cumulative Impact Section only addresses the following impacts: 1) construction of new water delivery facilities could have significant site-specific impacts; 2) construction of new recreational facilities could have significant site specific impacts; 3) cumulative development could result in the conversion of Farmland to other uses; and 4) cumulative development would result in substantial emission of greenhouse gas. As discussed above, it is the Water Agency's staff opinion that the City of Ukiah did not adequately assess its project's impact to many resource categories.

The water right permits (Decision 1610) that the SWRCB has issued to the Water Agency requires the Water Agency to maintain specified minimum instream flows in all reaches of the Russian River from Lake Mendocino to the Pacific Ocean. Under most conditions, diversions of water from the river and pumping of groundwater that affects river flows will increase the amounts of water that the Water Agency must release from Lake Mendocino to maintain these required minimum flows, and such increased releases will affect that amounts of water that remain in Lake Mendocino storage to meet future instream flow requirements and the needs all water users that depend on the Russian River. The Draft EIR should evaluate the cumulative effects of such affects to river flows and the amounts of water the Water Agency must release from Lake Mendocino to maintain required minimum flows.

In general, concurrent implementation of the Fish Habitat Flows and Water Rights Project and the City of Ukiah's Amendment of Water Right Permit could have significant impacts on Lake Mendocino's water supply storage and releases and could contribute to cumulative operational impacts in the environmental resource categories of hydrology, water quality, fisheries, vegetation and wildlife, recreation, energy resources, greenhouse gas emissions and climate change, aesthetics and public services and utilities. Accordingly, the Water Agency conducted modeling to assess whether concurrent implementation of the Proposed Project and the City of Ukiah's Amendment of Water Right Permit would have cumulative operational impacts to environmental resources. Concurrent implementation of the two projects and potential cumulative impacts are analyzed in Section 5.7, "Cumulative Impacts and Mitigation Measures" of this chapter.

To address the short term impact analysis that was conducted in the City of Ukiah's DEIR, concurrent implementation of the Proposed Project would not include new construction of water

facilities, infrastructure, or any other type of construction or land disturbance, and as a result, would not contribute to cumulative short-term impacts associated with construction activities and therefore are not cumulatively considerable.

G. 2015 Urban Water Management Plan – Future Water Rights Application with the SWRCB

The Water Agency's 2015 Urban Water Management Plan (UWMP), was adopted on June 21, 2016, in accordance with the Urban Water Management Planning Act (UWMPA).[8] The UWMPA requires every urban water supplier that provides water for municipal purposes to more than 3,000 customers, or supplying more than 3,000 acre-feet (ac-ft) of water annually, to adopt and submit a plan every five years to the California Department of Water Resources (DWR). The UWMP is a long-range planning document for the Water Agency's wholesale water supply. Included in the UWMP is a description of the water supply system, current and projected water uses, reliability of water supplies, water shortage contingency planning, and water demand management measures (Sonoma County Water Agency 2016).

The water demand projections described in the 2015 UWMP are based on projected population growth and development within the Water Agency's contractors and Marin Municipal Water District's (MMWD) service areas. As noted in the 2015 UWMP, water use may exceed the existing annual diversion and rediversion limit of 75,000 acre feet per year (AFY) by approximately 2035. The potential increase is estimated to be approximately 117 AFY in 2035 and about 988 AFY by 2040. If the trends in these projections continue, then it may be necessary for the Water Agency to make the necessary filings with the SWRCB (which may be an application for a new water-right permit or petitions to amend the Water Agency's existing permits) in approximately 2030, so that the Water Agency will be authorized to divert and redivert more than 75,000 AFY in 2035. Even with an incremental increase of 1,000 AFY in the annual diversion and rediversion limit of Russian River water, there still will be sufficient water in the Russian River and Lake Mendocino and Lake Sonoma for the Water Agency to make these diversions and rediverisons. The Water Agency would need to prepare an environmental impact analysis under CEQA before the SWRCB may act on any such request from the Water Agency. The Water Agency's 2010 Plan estimated that an additional 5,000 AFY (above the 75,000 AFY limit) would be needed by about 2027. The new, lower estimates reflect the increased water conservation implemented by the Water Agency's customers and resulting lower projected future demands for water. The need to increase the 75,000 AFY diversion and re-diversion limit in the Water Agency's water-right permits and the schedule for requesting any new water-right permit or changes to the Water Agency's existing permits will be reevaluated in the Water Agency's 2020 UWMP.

Identified Impacts

The Water Agency would need to prepare an environmental impact analysis under CEQA to identify potential impacts associated with the future water rights project identified in the UWMP.

[8] California Water Code, Sections 10610 through 10656.

It is assumed that the future water rights project (an additional 1,000 AFY) would have similar impacts as the Proposed Project in the environmental resource categories of hydrology, water quality, fisheries, vegetation and wildlife, recreation, energy resources, greenhouse gas emissions and climate change, aesthetics and public services and utilities, as discussed in Chapter 4, “Environmental Setting, Impacts, and Mitigation Measures.”

Relationship to Proposed Project

The future water rights project identified in the UWMP is located within the geographic scope as the Proposed Project.

Potential for Contribution to Cumulative Impacts

In general, concurrent implementation of the Proposed Project and the Water Agency’s future water rights identified in the UWMP could contribute to cumulative operational impacts in the environmental resource categories of hydrology, water quality, fisheries, vegetation and wildlife, recreation, energy resources, greenhouse gas emissions and climate change, aesthetics and public services and utilities. The Water Agency conducted modeling to assess whether concurrent implementation of the Proposed Project and the Water Agency’s future water rights identified in the UWMP would have cumulative operational impacts to environmental resources. Concurrent implementation of the two projects and potential cumulative impacts are analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter.

5.5 Related Projects to Be Analyzed

Please refer to Table 5.5-1 for a summary of related projects to be analyzed, types of impacts anticipated from the implementation of related project and the Proposed Project, and the potential for the proposed project to contribute to cumulative impacts associated with these projects. The cumulative impact analysis focuses on potential adverse environmental impacts. The related projects identified above in Section 5.4 that only have beneficial impacts are not analyzed in Section 5.7, “Cumulative Impacts and Mitigation.”

Table 5.5-1. Summary of related projects to be analyzed, types of impacts anticipated from the implementation of related project and the proposed project and the potential for the proposed project to contribute to cumulative impacts associated with these projects.

Related Project to be Analyzed	Related Project Anticipated Impacts	Proposed Project Anticipated Impacts (no construction-related impacts)	Potential for the Proposed Project to Contribute to Cumulative Impacts
No Potter Valley Project	In general implementation could contribute to impacts on: • Hydrology • Water Quality • Fisheries • Vegetation and Wildlife • Recreation • Energy Resources • Greenhouse Gas Emissions and Climate Change • Aesthetics • Public Services and Utilities	• Hydrology • Water Quality • Fisheries • Vegetation and Wildlife • Recreation • Energy Resources • Greenhouse Gas Emissions and Climate Change • Aesthetics • Public Services and Utilities	Yes for all environmental resource categories
Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report	In general implementation could contribute to impacts on: • Hydrology • Water Quality • Fisheries • Vegetation and Wildlife • Recreation • Energy Resources • Greenhouse Gas Emissions and Climate Change • Aesthetics • Public Services and Utilities	• Hydrology • Water Quality • Fisheries • Vegetation and Wildlife • Recreation • Energy Resources • Greenhouse Gas Emissions and Climate Change • Aesthetics • Public Services and Utilities	Yes for all environmental resource categories
2015 Urban Water Management Plan – Future Water Rights Application with the SWRCB	In general implementation could contribute to impacts on: • Hydrology • Water Quality • Fisheries • Vegetation and Wildlife • Recreation • Energy Resources • Greenhouse Gas Emissions and Climate Change • Aesthetics • Public Services and Utilities	• Hydrology • Water Quality • Fisheries • Vegetation and Wildlife • Recreation • Energy Resources • Greenhouse Gas Emissions and Climate Change • Aesthetics • Public Services and Utilities	Yes for all environmental resource categories

5.6 Approach to Cumulative Analysis

The analysis of cumulative impacts focuses on the impacts of the implementation of the Proposed Project by environmental resource categories along with the related projects identified in Table 5.5-1 that when considered concurrently, may result in a cumulatively considerable impact.

Standards of Significance

The standards of significance and methodology used to determine cumulative impacts under the same environmental resource categories as the impacts of the Proposed Project are based on the standards of significance and methodology outlined in each of sub-chapter of Chapter 4, "Environmental Setting, Impacts, and Mitigation Measures." Please refer to these sub-chapters for more comprehensive information regarding the standards of significance and methodologies used to analyze impacts to particular environmental resource categories.

Methodology

Cumulative impacts were evaluated for the same environmental resource categories as the impacts of the Fish Habitat Flows and Water Rights Project from Chapter 4.0, “Environmental Setting, Impacts, and Mitigation Measures.” For each Fish Habitat Flows and Water Rights Project potential impact and mitigation measure, the cumulative impact analysis addresses whether a significant cumulative impact would occur (using the standards of significance in each sub-chapter of Chapter 3), and whether the Fish Habitat Flows and Water Rights Project’s contribution to a cumulative impact would be cumulatively considerable. As defined in CEQA Guidelines Section 15065(a)(3), "cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (identified in Section 5.5).CEQA Guidelines Section 15130(a)(3) indicate that a project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact. When the effects of a past project are reflected in existing environmental conditions, and are necessarily included in the cumulative impact analysis as a result, a separate analysis of the effects of the past project is not required.[9] Because the PVP is a past related project, which its effects are reflected in existing environmental conditions/baseline operational condition of the Proposed Project and in other related projects, it will not be analyzed in Section 5.7, “Cumulative Impacts and Mitigation Measures” of this chapter. The cumulative impact analysis only focused on potential adverse environmental impacts. The beneficial impacts of the Fish Habitat Flows and Water Rights Project and related projects identified in Chapter 5 are not analyzed in this chapter.

The methodology used to assess the impacts of the Proposed Project in combination with related projects varies with the type of resource or impact being addressed. In some cases, the impacts have been determined by applying quantitative methods or reasoning; in other cases, a

[9] City of Long Beach v. Los Angeles Unified School Dist. (2009) 176 Cal.App.4th 889, 908-912.

more qualitative approach was used because quantitative methods or reasoning were not applicable or practical.

Qualitative Cumulative Impact Assessment

The qualitative analysis of cumulative impacts considers projects that are in the planning stage or are being discussed by various entities, but that have not been sufficiently defined to be considered “reasonably foreseeable” and quantifiable. Projects that are not yet quantifiable, but that could have an effect on various resources, are addressed qualitatively to provide as much information on potential cumulative impacts as possible. Cumulative impacts related to resources that are not dependent on hydrology, water surface elevation, or water quality or that are not effectively evaluated using hydrologic modeling, such as vegetation and wildlife, are evaluated qualitatively.

Quantitative Cumulative Impact Assessment

To quantitatively evaluate changes in hydrologic conditions that may be caused by projects, they must be well-defined and reasonably foreseeable. Therefore, only those projects that have been adequately defined (i.e., in recent project-level environmental documents or hydrologic modeling) and that have the potential to contribute to cumulative impacts are included in the quantitative assessment. This quantitative analysis focuses largely on water-related issues because the anticipated future cumulative conditions have been established through the hydrologic modeling process. To the extent possible, cumulative impacts related to resources such as hydrology, water quality, fisheries, aesthetics, recreation, and energy resources are evaluated quantitatively utilizing model output to provide an indication of the potential incremental contributions of the Proposed Project to cumulative impacts. However, to fully address cumulative impacts, these analyses also may be supplemented with an accompanying qualitative analysis.

Many assumptions were incorporated into the models. These assumptions are summarized here, but are described in more detail in Appendix G.

Baseline Condition

The Baseline Condition modeled includes the hydrologic index and minimum instream flows required by the Water Agency’s water right permits and approved by the SWRCB’s Decision 1610 and assumes that delivery curtailments required by the SWRCB under certain hydrologic conditions are met. The Baseline Condition also assumes that flows diverted from the Eel River into the Russian River via PG&E’s PVP are in accordance with the 2004 license issued by FERC for PG&E’s operation of PVP and are consistent with PVP operations from water years 2006 to 2014. The Baseline Condition represents the operation of water supply releases from Lake Mendocino and Lake Sonoma from 2006 to 2014. The Water Agency’s water diversions are based on average water year 2009 to 2013 water diversions of 55,211 acre-feet per year (AFY) (51,588 AFY reported by the Water Agency and 3,623 AFY reported by Russian River customers). Water Agency diversions from 2009 to 2014 were selected as these years include the Water Agency and its contractors’ compliance with SB7x7 and meeting the required goals to reduce per capita water use 20 percent by the year 2020 with an interim goal of a 10 percent

reduction by 2015. The Baseline Condition assumes system losses not associated with Water Agency diversions to be consistent with the range of hydrologic conditions from 2002 to 2013.

Proposed Project

The Proposed Project incorporates the proposed Russian River Hydrologic Index, the accompanying minimum instream flow requirements, and full Water Agency water right demand of 75,000 AFY, as discussed in Chapter 3, "Background and Project Description." All other assumptions remain the same as in the Baseline Condition.

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

This scenario is the same as the Proposed Project scenario except that it is evaluated together with a future related project that assumes flows diverted by Pacific Gas and Electric Company from the Eel River into the East Branch of the Russian River through the Potter Valley Project tunnel will be ceased entirely. All other assumptions are consistent with the Proposed Project scenario.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952 [Reasonably Foreseeable Project])

This scenario is the same as the Proposed Project scenario except that it is evaluated together with a reasonably foreseeable related project that assumes the operation of the Russian River Project in the future that incorporates an increased demand for the City of Ukiah in the Hopland model reach as discussed in and projected 2040 storage capacity for Lake Pillsbury, Lake Mendocino and Lake Sonoma; all other assumptions are consistent with the Proposed Project scenario. The City of Ukiah prepared a Draft EIR in 2013 which projects an annual demand of 11,527 acre-feet by the year 2085. This is an increase of 8,442 acre-feet per year over the 2009 to 2013 average demand used to quantify Baseline Conditions. To simulate the effects of this increased demand, model datasets were developed which increase the demand by 8,442 per year acre-feet for the Hopland model junction. See Appendix G for more information on the model assumption.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB) [Reasonably Foreseeable Project])

This scenario is the same as the Proposed Project scenario except that it is evaluated together with a reasonably foreseeable related project that assumes the operation of the Russian River Project in the future that incorporates an increased Water Agency demand projected for the year 2040 as analyzed in the 2015 UWMP and projected 2040 storage capacity for Lake Pillsbury, Lake Mendocino and Lake Sonoma; all other assumptions are consistent with the Proposed Project scenario.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

This scenario is the same as the Proposed Project scenario except that it is evaluated together with No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB related projects.

5.7 Cumulative Impacts and Mitigation Measures

Pursuant to CEQA Section 15130(a) (1), the discussion below provides rationale to explain why cumulative impacts are not considered significant when the combined cumulative impact associated with the Proposed Project's incremental effect and the effects of other projects is not significant. Furthermore, the discussion below explains if the Proposed Project's contribution to a significant cumulative impact will be rendered less than cumulatively considerable and thus is not significant. A project's contribution is less than cumulatively considerable if the project is required to implement or fund its fair share of a mitigation measure or measures designed to alleviate the cumulative impact [CEQA Section 15130(a) (3)].

This discussion reflects the severity of the impacts and their likelihood of occurrence, but is developed at a lesser level of detail that the impact discussion provided in Chapter 4, "Environmental Setting, Impacts, and Mitigation Measures" [CEQA Guidelines Section 15130(b)].The discussion is guided by standards of practicality and reasonableness, and focuses on the cumulative impact to which the identified other projects contribute rather than the attributes of other projects which do not contribute to the cumulative impact.

The following cumulative impact analysis is organized by environmental resource categories, as presented in Chapter 4, "Environmental Setting, Impacts, and Mitigation Measures." The impact analysis focuses on the environmental resources categories and impact statements analyzed in Chapter 4, for which the Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact. Where appropriate, additional measures are identified to mitigate potentially significant cumulative impacts. The analysis that concluded no impact for environmental resource categories in Chapter 4 are not discussed. The analysis also includes the geographic scope under each environmental category.

5.7.1 Hydrology

Geographic Scope

The geographic scope of potential cumulative impacts on hydrology include the areas within which the Proposed Project could cause a significant and/or less than significant impact. As explained in Chapter 4.1, "Hydrology," impacts to hydrology could occur in the Upper and Lower Russian River and in Dry Creek, and Lake Sonoma, and in the Russian River Estuary. The No Potter Valley Project, UWMP Future Water Rights Petition, and Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report are the related projects within the geographic scope.

Cumulative Impact Analysis

The Proposed Project could result in cumulative impacts on hydrology in the Upper and Lower Russian River, Dry Creek, in Lake Sonoma and in the Russian River Estuary in combination with the following related projects: No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights

Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario).

As described in Chapter 3, “Background and Project Description,” and the “Russian River Hydrologic Modeling for the Fish Habitat Flows and Water Rights Project” in Appendix G, water supply storage in Lake Mendocino would be more reliable under the Proposed Project when compared to Baseline Conditions and the Proposed Project would maximize the occurrence of Schedule 1 minimum instream flows and minimize the occurrence of Schedule 5 flows. Schedule 1 reflects the highest flows and wettest conditions, while Schedule 5 reflects the lowest flows and the driest conditions. The results of the Proposed Project and No PVP scenarios demonstrate that there would be a significant change in reservoir reliability under the no PVP scenario. The changes in cumulative inflow into and storage condition in Lake Mendocino under the No PVP scenario would result in a large increase in the frequency of occurrence of drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project. Under the Proposed Project, Schedules 3, 4, and 5 would occur approximately 6, 4, and 1 percent of the time under historical hydrology. Under the No PVP scenario, Schedules 3, 4, and 5 would occur approximately 11, 32, and 17 percent of the time under historical hydrology.

The Proposed Project would not require construction, operation, or maintenance of new facilities and, therefore no cumulative analysis will be conducted for construction related impacts to hydrology.

The analysis on the potential cumulative impacts on hydrology focuses on the change in water levels in the Russian River watershed that would occur under the Proposed Project in combination with individual related projects. Modeling using historical hydrology data (described below) was used to simulate water surface elevations in Lake Sonoma and stage downstream of the reservoirs in the Upper Russian River, Dry Creek, and the Lower Russian River, and the corresponding changes that would occur under Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios. Modeled projected changes in reservoir water surface elevations and monthly instream flows under the Proposed Project were then compared to the Cumulative 1, 2, 3 and 4 scenarios to evaluate potential cumulative impacts on hydrology. If a cumulative scenario resulted in a substantial decrease in the river stage (in the Upper and Lower Reach of the Russian River, or Dry Creek) below that of the Proposed Project, the impact to groundwater was considered a cumulatively significant impact. If a cumulative scenario resulted in an increase in stage above that of the Proposed Project, there would be no impact on groundwater and it would not be cumulatively considerable. If a cumulative scenario resulted in a substantial change (increase or decrease) in the river stage (in the Upper and Lower Reach of the Russian River, or Dry Creek) or decrease in the water surface elevation (in Lake Sonoma) below that of the Proposed Project, the impact to hydrology was considered a cumulatively significant impact. If a cumulative scenario resulted in an increase in water surface elevation in Lake Sonoma above that of the Proposed Project, there would be no impact on hydrology and it would not be cumulatively considerable. If a cumulative scenario resulted in an increase in the elevated water levels (Russian River Estuary) above that of the Proposed Project, the impact to hydrology was considered a cumulatively significant impact.

To qualitative analysis was conducted to assess whether the Proposed Project would contribute to a cumulatively considerable hydrologic impact associated with contributing to inundation by seiche, tsunami, or mudflow in the Russian River Estuary. The assessment qualitatively compared conditions under the Proposed Project to the Cumulative 1, 2, 3 and 4 scenarios.

The assessment of whether the Proposed Project would contribute to cumulatively considerable impacts associated with potential changes to groundwater and surface water conditions (including erosion and flooding hazards) relied on a qualitative evaluation that compared conditions under the Proposed Project to the Cumulative 1, 2, 3 and 4 scenarios. The qualitative evaluation relied on a quantitative hydrologic model, the Russian River ResSim model, that used 104 years (1910 to 2013) of estimated unimpaired hydrology to analyze potential impacts (detailed in Appendix G). The model estimated daily flows for the 104 years of record at nodes along the Upper Russian River, Dry Creek, and the Lower Russian River, then calculated exceedance probability, which is the probability that an event (a particular flow, in this case) will be exceeded during a one-year period. Exceedance probabilities estimated by the model range from 0.99 to 0.01, where the lowest flow would be exceeded in 99 percent of all years (0.99 exceedance probability) and the highest flow would be exceeded in 1 percent of all years (0.01 exceedance probability). The analysis assigned modeled instream flow results to exceedance probabilities to describe flow occurring during different conditions, with 0.99 exceedance simulating the driest condition and 0.05 exceedance simulating the wettest condition (Table 5.7.1-1, Table 5.7.1-2 and Table 5.7.1-3).

The model results were compared against stage-discharge rating curves to evaluate stage and water surface elevation change to analyze effects on groundwater levels and to determine potential effects on erosion by exposure of streambanks or shoreline. Estimates of stage came from the latest stage-discharge rating curves at USGS gages within the project reaches (rating curves retrieved June 8, 2016 from USGS 2016a, b, c, d, e, and f):

- Upper Russian River
    - Russian River near Hopland (USGS gage # 11461000)
    - Russian River near Cloverdale (USGS gage # 11462080)
    - Russian River near Healdsburg (USGS gage # 11464000)
- Dry Creek
    - Dry Creek near Geyserville (USGS gage # 11465200)
    - Dry Creek near Healdsburg (Dry Creek mouth) (USGS gage # 11465350)
- Lower Russian River
    - Russian River near Guerneville (Hacienda Bridge) (USGS gage # 11467000)

The model calculated stage for a smaller set of nodes than for instream flow, which used unique points as well as selected USGS gage locations.

Table 5.7.1-1. Estimated discharge cubic feet per second (cfs) at various flow exceedances at nodes in the Upper Russian River under the Proposed Project (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Proposed Project	0.99	Coyote Valley Dam	28	26	26	26	26	26	27	27	41	109	123	109
		Forks	68	75	75	75	75	75	75	56	61	105	118	111
		Hopland	54	79	79	94	86	87	79	53	54	69	77	84
		Cloverdale	55	80	80	100	111	116	85	54	54	64	67	76
		Healdsburg	45	79	81	113	137	176	99	54	45	45	45	45
	0.95	Coyote Valley Dam	88	26	26	26	26	26	27	27	75	124	142	130
		Forks	96	84	105	106	110	110	105	72	90	123	137	128
		Hopland	76	82	110	114	151	144	117	74	72	86	96	95
		Cloverdale	74	89	120	128	201	194	136	75	64	78	84	89
		Healdsburg	54	106	128	153	309	312	183	84	54	54	54	54
	0.9	Coyote Valley Dam	106	36	26	26	66	26	27	34	86	132	158	149
		Forks	114	105	110	110	171	110	110	90	98	133	153	146
		Hopland	102	114	114	126	242	173	129	94	84	100	113	111
		Cloverdale	98	117	124	155	325	240	161	98	79	95	103	107
		Healdsburg	74	120	137	210	474	396	235	117	74	74	74	74
	0.75	Coyote Valley Dam	132	95	77	93	203	27	30	62	103	148	172	171
		Forks	133	110	110	217	312	110	110	99	110	146	168	167
		Hopland	115	114	124	289	455	230	156	104	106	114	129	134
		Cloverdale	116	124	152	371	604	352	216	122	104	114	122	128
		Healdsburg	114	135	195	543	959	638	341	152	113	94	94	94
	0.5	Coyote Valley Dam	152	110	110	241	307	27	48	80	122	166	185	183
		Forks	150	114	238	460	555	183	110	110	128	163	180	179
		Hopland	129	132	327	702	891	401	202	118	114	125	136	145
		Cloverdale	125	150	439	1000	1270	666	306	147	119	120	126	136
		Healdsburg	114	176	672	1668	2103	1245	536	207	121	114	114	114
	0.05	Coyote Valley Dam	815	294	1801	2001	2001	592	98	114	167	194	217	212
		Forks	814	763	3115	3815	3616	1952	513	171	170	190	212	208
		Hopland	790	1261	4990	6578	6372	3290	1150	290	157	148	168	171
		Cloverdale	786	1847	6937	9083	8698	4922	1829	448	194	140	151	158
		Healdsburg	775	2915	10706	13804	13702	7872	3383	811	280	130	114	114

Table 5.7.1-2. Estimated discharge cubic feet per second (cfs) at various flow exceedances at nodes in Dry Creek under the Proposed Project (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Proposed Project	0.99	Warm Springs Dam	70	75	75	75	75	75	70	70	70	70	100	72
		Dry Cr at Geyserville	72	78	79	78	78	81	76	74	73	75	101	78
		Dry Creek Mouth	57	82	82	82	82	92	84	79	62	68	87	81
	0.95	Warm Springs Dam	82	75	75	75	75	75	70	70	70	71	109	103
		Dry Cr at Geyserville	87	92	90	79	81	86	80	75	74	79	109	104
		Dry Creek Mouth	73	108	112	85	92	104	91	83	67	74	94	89
	0.9	Warm Springs Dam	92	105	78	75	75	75	70	70	70	86	113	108
		Dry Cr at Geyserville	93	107	108	81	87	89	82	76	75	89	114	108
		Dry Creek Mouth	78	112	112	91	108	113	96	86	69	80	99	94
	0.75	Warm Springs Dam	105	105	105	75	75	75	75	70	70	103	119	114
		Dry Cr at Geyserville	107	109	110	90	132	125	89	78	77	105	120	115
		Dry Creek Mouth	92	112	117	112	190	180	113	91	74	92	106	99
	0.50	Warm Springs Dam	125	105	105	75	154	184	102	70	79	115	128	122
		Dry Cr at Geyserville	128	111	125	179	314	255	133	83	87	116	128	122
		Dry Creek Mouth	112	114	160	300	507	371	184	103	84	103	114	108
	0.05	Warm Springs Dam	157	119	1075	2000	2000	2000	586	189	150	167	176	170
		Dry Cr at Geyserville	159	225	1952	3287	3643	2421	758	238	152	168	176	171
		Dry Creek Mouth	149	460	2900	5100	5130	3204	1112	330	140	153	161	156

Table 5.7.1-3. Estimated discharge cubic feet per second (cfs) at various flow exceedances at nodes in the Lower Russian River under the Proposed Project (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Proposed Project	0.99	Russian R at Dry C	164	181	184	200	222	274	181	169	172	190	199	187
		Hacienda Bridge	64	99	149	149	149	238	108	64	64	64	64	64
	0.95	Russian R at Dry C	185	230	240	239	429	425	279	191	185	196	206	199
		Hacienda Bridge	84	149	163	203	426	419	221	84	84	84	84	84
	0.90	Russian R at Dry C	190	235	250	303	576	519	337	201	189	198	210	204
		Hacienda Bridge	84	149	176	300	633	545	295	104	84	84	84	84
	0.75	Russian R at Dry C	198	247	315	669	1160	841	460	240	197	205	217	211
		Hacienda Bridge	84	168	282	740	1368	986	465	153	84	84	84	84
	0.50	Russian R at Dry C	233	289	852	1969	2686	1621	748	307	205	212	224	217
		Hacienda Bridge	149	232	1000	2492	3466	2133	848	246	87	84	84	84
	0.05	Russian R at Dry C	886	3354	13282	18135	18152	10908	4356	1129	382	230	237	236
		Hacienda Bridge	797	3942	15122	21825	22086	13811	6206	1336	353	90	84	84

Existing conditions reflect the impacts of past projects. The standards of significance for impacts on hydrology are described in Chapter 4.1, “Hydrology,” under “Methodology and Significance Criteria.” These standards also apply to the significance of cumulative impacts on hydrology

The cumulative impact discussion follows the impact statements 4.1-1, 4,1-2, 4.1-3, and 4.1-5, analyzed in Chapter 4.1, “Hydrology,” Section “Impacts, and Mitigation Measures,” and focuses on the hydrologic resources for which the Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact.

> **Impact 5.7.1-1. Implementation of the Fish Habitat Flows and Water Rights Project could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level in the Upper Russian River in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)**

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario, instream flow in the Upper Russian River would be lower than the Proposed Project during nearly all months, at all exceedances, and all nodes (Table 5.7.1-4).

A comparison of stage at USGS gage sites along the Upper Russian River using modeled flow results and the most recent rating curves (USGS 2016a, b, c), shows stage would be lower under the Cumulative 1 Scenario than under the Proposed Project during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-5). The greatest differences would occur at Hopland and Cloverdale at the 0.50, 0.75, 0.90, 0.95, and 0.99 exceedances, up to 0.6 feet (approximately 7 inches), but generally less than 0.3 feet (approximately 4 inches). The decreases in stage could be substantial as flow would already be lower than the Proposed Project across nearly all months, all exceedances, and all nodes (Table 5.7.1-4). During wetter conditions (the 0.05 exceedance) stage decreases would be less than other exceedances from June through September, but greater than all other exceedances in October. The greatest stage decreases occur in October during the 0.05 exceedance (1.2 to 2.9 feet), substantially greater than any other month or exceedance. Under the Cumulative 1 Scenario, these decreases in stage at Hopland are substantial and would likely decrease groundwater table elevation and the impact on hydrology would be cumulatively significant and unavoidable and no mitigation is available.

Table 5.7.1-4. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 1 Scenario in the Upper Russian River. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 1 Scenario	0.99	Coyote Valley Dam	0%	0%	0%	0%	0%	0%	0%	0%	-29%	-49%	-24%	-73%
		Forks	-42%	-60%	-60%	-51%	-50%	-24%	-42%	-29%	-46%	-41%	-24%	-57%
		Hopland	-24%	-43%	-43%	-52%	-48%	-18%	-43%	-15%	-17%	-35%	-26%	-46%
		Cloverdale	-18%	-43%	-42%	-48%	-53%	-11%	-35%	-17%	-17%	-30%	-24%	-41%
		Healdsburg	0%	-43%	-43%	-40%	-46%	-2%	-24%	-17%	0%	-1%	0%	-14%
	0.95	Coyote Valley Dam	-67%	0%	0%	-2%	-1%	0%	0%	0%	-53%	-29%	-20%	-21%
		Forks	-41%	-61%	-66%	-59%	-32%	-28%	-29%	-30%	-44%	-30%	-21%	-21%
		Hopland	-41%	-45%	-59%	-58%	-18%	-7%	-26%	-39%	-38%	-37%	-31%	-23%
		Cloverdale	-38%	-46%	-57%	-49%	-13%	-6%	-21%	-28%	-29%	-35%	-32%	-26%
		Healdsburg	-17%	-55%	-52%	-35%	-14%	-2%	-14%	-24%	-17%	-17%	-17%	-17%
	0.90	Coyote Valley Dam	-46%	-28%	0%	-2%	-61%	0%	0%	-21%	-46%	-26%	-25%	-26%
		Forks	-46%	-65%	-64%	-51%	-39%	-5%	-32%	-43%	-43%	-28%	-26%	-27%
		Hopland	-55%	-61%	-61%	-37%	-32%	-5%	-21%	-43%	-44%	-39%	-35%	-31%
		Cloverdale	-50%	-58%	-56%	-34%	-26%	-2%	-14%	-37%	-39%	-40%	-37%	-37%
		Healdsburg	-39%	-55%	-50%	-24%	-18%	-2%	-8%	-29%	-39%	-39%	-39%	-39%
	0.75	Coyote Valley Dam	-44%	-72%	-67%	-72%	-87%	0%	-3%	-48%	-36%	-23%	-26%	-28%
		Forks	-43%	-62%	-54%	-49%	-51%	0%	-15%	-37%	-32%	-25%	-27%	-29%
		Hopland	-51%	-61%	-47%	-37%	-35%	-1%	-9%	-39%	-45%	-35%	-36%	-36%
		Cloverdale	-52%	-56%	-35%	-29%	-25%	-1%	-6%	-31%	-45%	-41%	-40%	-39%
		Healdsburg	-61%	-51%	-30%	-20%	-17%	-2%	-3%	-20%	-52%	-52%	-52%	-52%
	0.50	Coyote Valley Dam	-39%	-66%	-76%	-89%	-73%	0%	-37%	-33%	-25%	-24%	-25%	-25%
		Forks	-39%	-34%	-53%	-40%	-32%	-1%	0%	-18%	-22%	-25%	-26%	-25%
		Hopland	-47%	-40%	-34%	-25%	-21%	0%	-2%	-14%	-33%	-33%	-31%	-34%
		Cloverdale	-48%	-41%	-24%	-16%	-15%	0%	-2%	-13%	-34%	-36%	-34%	-36%
		Healdsburg	-32%	-34%	-9%	-10%	-8%	-3%	0%	-4%	-12%	-18%	-18%	-35%
	0.05	Coyote Valley Dam	-80%	-63%	-78%	0%	0%	-44%	-13%	-15%	-15%	-12%	-13%	-13%
		Forks	-80%	-31%	-22%	-11%	-6%	-18%	-3%	-17%	-14%	-12%	-14%	-14%
		Hopland	-83%	-23%	-15%	-5%	-5%	-8%	-1%	-7%	-16%	-13%	-14%	-16%
		Cloverdale	-84%	-13%	-11%	-5%	-2%	-4%	-1%	-5%	-15%	-12%	-11%	-14%
		Healdsburg	-85%	-11%	-7%	-2%	-2%	-3%	-1%	-3%	-12%	-4%	0%	0%

Table 5.7.1-5. Estimated stage (feet) at various flow exceedances at gages in the Upper Russian River under Proposed Project Conditions (left panel of table) and difference under Cumulative 1 Scenario (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node[1]	Proposed Project					Cumulative 1 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Hopland	0.0	0.1	0.0	0.0	0.1	-0.5	-0.5	-0.3	-0.5	-0.6
	Cloverdale	1.8	1.9	1.9	2.0	1.8	-0.1	-0.2	-0.1	-0.3	-0.1
	Healdsburg	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0.95	Hopland	0.1	0.1	0.2	0.1	0.1	-0.5	-0.4	-0.3	-0.2	-0.6
	Cloverdale	1.9	2.0	2.1	2.1	2.0	-0.2	-0.3	-0.3	-0.2	-0.3
	Healdsburg	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0.90	Hopland	0.1	0.1	0.2	0.2	0.2	-0.5	-0.4	-0.3	-0.3	-0.6
	Cloverdale	2.1	2.2	2.3	2.3	2.2	-0.3	-0.4	-0.4	-0.3	-0.5
	Healdsburg	1.1	1.1	1.1	1.1	1.1	-0.1	-0.1	-0.1	-0.1	-0.1
0.75	Hopland	0.2	0.2	0.3	0.4	0.2	-0.5	-0.3	-0.4	-0.4	-0.5
	Cloverdale	2.3	2.4	2.4	2.5	2.4	-0.4	-0.4	-0.4	-0.4	-0.5
	Healdsburg	1.2	1.2	1.2	1.2	1.3	-0.2	-0.2	-0.2	-0.2	-0.3
0.50	Hopland	0.2	0.3	0.4	0.4	0.3	-0.3	-0.3	-0.3	-0.4	-0.5
	Cloverdale	2.4	2.4	2.4	2.5	2.4	-0.3	-0.4	-0.4	-0.4	-0.5
	Healdsburg	1.3	1.3	1.3	1.3	1.3	-0.1	-0.2	-0.2	-0.2	-0.2
0.05	Hopland	0.5	0.4	0.6	0.6	3.2	-0.2	-0.1	-0.2	-0.2	-2.9
	Cloverdale	2.8	2.5	2.6	2.7	4.5	-0.1	-0.1	-0.1	-0.2	-2.0
	Healdsburg	1.6	1.3	1.3	1.3	2.5	-0.1	0.0	0.0	0.0	-1.2

[1]The rating curve at the Hopland USGS gage begins at -1.5 feet. As such, application of the rating curve yields negative values at depths less than 1.5 feet. These negative values do not indicate or suggest drying of the Upper Russian River.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)
Under the Cumulative 2 Scenario, instream flow in the Upper Russian River would be higher than the Proposed Project from June through September at the Coyote Valley Dam and Forks nodes across all exceedances, and through October and November at the 0.75 and 0.50 exceedances, respectively (Table 5.7.1-6). Discharge would be equal to or lower than the Proposed Project at all nodes during all other months across all exceedances.

A comparison of stage at USGS gage sites along the Upper Russian River using modeled flow results and the most recent rating curves (USGS 2016a, b, c), shows stage would be the same or lower under the Cumulative 2 Scenario than under the Proposed Project during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-7). The greatest differences would occur at Hopland and Cloverdale at the 0.90, 0.95, and 0.99 exceedances, up to 0.6 feet (approximately 7 inches), but generally less than 0.2 feet (approximately 2 inches). This decrease in stage may slightly decrease groundwater table elevation, but groundwater moves much more slowly through its medium than surface water, and groundwater elevation changes are more gradual than surface water changes. The amplitude of fluctuations would likely be greatest near the surface water connection with typical seasonal fluctuations in the Russian River ranging from 5 feet to10 feet. As these seasonal fluctuations far exceed the potential stage change under the Cumulative 2 Scenario, the effect on the groundwater table elevation in the Upper Russian River would be cumulatively less than significant with no mitigation required.

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)
Under the Cumulative 3 Scenario, instream flow in the Upper Russian River would be lower than the Proposed Project across nearly all months, all exceedances, and all nodes (Table 5.7.1-8). Flow would be the same or higher from April through June, and during December and January, at the Forks, Hopland, and Cloverdale nodes during wetter flow conditions (0.05 exceedance).

A comparison of stage at USGS gage sites along the Upper Russian River using modeled flow results and the most recent rating curve (USGS 2016a, b, c), shows stage would be the same or lower under the Cumulative 3 Scenario than under the Proposed Project during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-9). The greatest differences would occur at Hopland and Cloverdale at the 0.90, 0.95, and 0.99 exceedances, up to 0.4 feet (approximately 5 inches), but generally less than 0.1 foot (approximately 1 inch). This decrease in stage may slightly decrease groundwater table elevation, but groundwater moves much more slowly through its medium than surface water, and groundwater elevation changes are more gradual than surface water changes. The amplitude of fluctuations would likely be greatest near the surface water connection with typical seasonal fluctuations in the Russian River ranging from 5 feet to10 feet. As these seasonal fluctuations far exceed the potential stage change under the Cumulative 3 Scenario, the effect on the groundwater table elevation in the Upper Russian River would be cumulatively less than significant with no mitigation required.

Table 5.7.1-6. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 2 Scenario in the Upper Russian River. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 2 Scenario	0.99	Coyote Valley Dam	0%	0%	0%	0%	0%	0%	0%	0%	4%	6%	11%	5%
		Forks	-23%	-38%	-33%	0%	0%	-6%	0%	9%	20%	9%	12%	3%
		Hopland	-31%	-43%	-43%	-8%	-8%	-11%	0%	-8%	-17%	-12%	-5%	-12%
		Cloverdale	-18%	-41%	-42%	0%	-24%	-8%	-2%	0%	-15%	-13%	-3%	-12%
		Healdsburg	0%	-43%	-42%	-5%	-16%	-2%	0%	0%	0%	0%	0%	0%
	0.95	Coyote Valley Dam	-9%	0%	0%	-2%	0%	0%	0%	0%	9%	11%	6%	8%
		Forks	-2%	-6%	-29%	-1%	-3%	-5%	-12%	4%	5%	9%	7%	8%
		Hopland	-16%	-4%	-26%	0%	-7%	-6%	-7%	0%	-6%	-10%	-8%	-6%
		Cloverdale	-13%	-7%	-20%	-1%	-6%	-4%	-6%	0%	-8%	-7%	-5%	-5%
		Healdsburg	0%	-12%	-7%	-3%	-4%	-2%	-4%	0%	-1%	0%	0%	0%
	0.90	Coyote Valley Dam	-2%	-28%	0%	0%	-61%	0%	0%	-18%	9%	10%	3%	4%
		Forks	-6%	-11%	-5%	0%	-24%	0%	-5%	-3%	10%	9%	3%	4%
		Hopland	-26%	-14%	-4%	-6%	-15%	-5%	-8%	-21%	-12%	-13%	-15%	-9%
		Cloverdale	-26%	-4%	-5%	-4%	-8%	-3%	-7%	-10%	-7%	-16%	-17%	-12%
		Healdsburg	-27%	-5%	-5%	-4%	-6%	-2%	-4%	-5%	0%	0%	-27%	-27%
	0.75	Coyote Valley Dam	3%	-13%	-34%	-10%	-27%	0%	0%	-1%	12%	10%	8%	6%
		Forks	3%	0%	0%	-3%	-8%	0%	0%	4%	12%	10%	9%	6%
		Hopland	-1%	0%	-8%	-7%	-8%	-3%	-6%	-9%	-10%	0%	-3%	-6%
		Cloverdale	-3%	-4%	-9%	-5%	-4%	-3%	-4%	-9%	-8%	-4%	-5%	-9%
		Healdsburg	-18%	-6%	-8%	-2%	-2%	-3%	-3%	-4%	-17%	0%	0%	0%
	0.50	Coyote Valley Dam	3%	1%	0%	-7%	-7%	0%	-2%	4%	9%	9%	9%	7%
		Forks	4%	4%	-6%	-3%	-4%	-1%	0%	0%	9%	9%	9%	7%
		Hopland	-5%	-14%	-6%	-3%	-4%	-2%	-4%	-3%	0%	-2%	-1%	-1%
		Cloverdale	-3%	-15%	-5%	-1%	-3%	-1%	-3%	-7%	-2%	-1%	-1%	-1%
		Healdsburg	0%	-8%	-1%	-1%	0%	-2%	-1%	-5%	-2%	0%	0%	0%
	0.05	Coyote Valley Dam	-5%	-24%	-15%	0%	0%	-12%	2%	7%	5%	9%	4%	7%
		Forks	-5%	-13%	-2%	0%	0%	-2%	2%	6%	5%	9%	4%	7%
		Hopland	-8%	-11%	-2%	0%	0%	-2%	1%	-2%	-10%	-1%	-5%	-2%
		Cloverdale	-8%	-6%	-1%	0%	0%	0%	0%	-2%	-10%	0%	-2%	-1%
		Healdsburg	-8%	-4%	-1%	0%	0%	0%	0%	-1%	-7%	0%	0%	0%

Table 5.7.1-7. Estimated stage (feet) at various flow exceedances at gages in the Upper Russian River under Proposed Project Conditions (left panel of table) and difference under Cumulative 2 Scenario (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node[1]	Proposed Project					Cumulative 2 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Hopland	0.0	0.1	0.0	0.0	0.1	-0.5	-0.3	-0.1	-0.2	-0.6
	Cloverdale	1.8	1.9	1.9	2.0	1.8	-0.1	-0.1	0.0	-0.1	0.0
	Healdsburg	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0.95	Hopland	0.1	0.1	0.2	0.1	0.1	-0.2	-0.2	-0.1	-0.1	-0.4
	Cloverdale	1.9	2.0	2.1	2.1	2.0	-0.1	-0.1	0.0	0.0	-0.1
	Healdsburg	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0.90	Hopland	0.1	0.1	0.2	0.2	0.2	-0.2	-0.2	-0.2	-0.1	-0.3
	Cloverdale	2.1	2.2	2.3	2.3	2.2	-0.1	-0.1	-0.2	-0.1	-0.2
	Healdsburg	1.1	1.1	1.1	1.1	1.1	0.0	0.0	-0.1	-0.1	-0.1
0.75	Hopland	0.2	0.2	0.3	0.4	0.2	-0.1	0.0	0.0	-0.1	0.0
	Cloverdale	2.3	2.4	2.4	2.5	2.4	-0.1	0.0	0.0	-0.1	0.0
	Healdsburg	1.2	1.2	1.2	1.2	1.3	-0.1	0.0	0.0	0.0	-0.1
0.50	Hopland	0.2	0.3	0.4	0.4	0.3	0.0	0.0	0.0	0.0	-0.1
	Cloverdale	2.4	2.4	2.4	2.5	2.4	0.0	0.0	0.0	0.0	0.0
	Healdsburg	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0
0.05	Hopland	0.5	0.4	0.6	0.6	3.2	-0.1	0.0	-0.1	0.0	-0.2
	Cloverdale	2.8	2.5	2.6	2.7	4.5	-0.1	0.0	0.0	0.0	-0.1
	Healdsburg	1.6	1.3	1.3	1.3	2.5	0.0	0.0	0.0	0.0	-0.1

[1]The rating curve at the Hopland USGS gage begins at -1.5 feet. As such, application of the rating curve yields negative values at depths less than 1.5 feet. These negative values do not indicate or suggest drying of the Upper Russian River.

Table 5.7.1-8. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 3 Scenario in the Upper Russian River. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 3 Scenario	0.99	Coyote Valley Dam	0%	0%	0%	0%	0%	0%	0%	0%	-19%	-5%	0%	-10%
		Forks	-1%	-5%	0%	0%	0%	-6%	0%	-3%	-4%	-4%	0%	-10%
		Hopland	0%	0%	0%	-1%	-7%	-6%	0%	-6%	-13%	0%	0%	-11%
		Cloverdale	0%	1%	0%	0%	-22%	-3%	0%	0%	-14%	0%	0%	0%
		Healdsburg	0%	0%	0%	0%	-12%	0%	0%	0%	0%	0%	0%	0%
	0.95	Coyote Valley Dam	-1%	0%	0%	-1%	0%	0%	0%	0%	-8%	-4%	-4%	-2%
		Forks	-2%	-6%	0%	-1%	-5%	-5%	-15%	-2%	-12%	-5%	-4%	-2%
		Hopland	-2%	0%	-1%	0%	-2%	-2%	-2%	0%	-4%	-8%	-5%	-1%
		Cloverdale	-5%	0%	-2%	0%	-2%	0%	-2%	0%	-3%	-4%	-2%	-2%
		Healdsburg	0%	0%	-1%	0%	-2%	0%	-1%	0%	-1%	0%	0%	0%
	0.90	Coyote Valley Dam	-4%	-28%	0%	0%	-36%	0%	0%	-18%	-5%	-3%	-7%	-5%
		Forks	-4%	0%	-5%	0%	-19%	0%	-5%	-15%	-6%	-3%	-7%	-5%
		Hopland	-8%	-4%	0%	-1%	-9%	-1%	-2%	-21%	-11%	-12%	-12%	-6%
		Cloverdale	-4%	-1%	0%	0%	-5%	0%	-2%	-9%	-7%	-15%	-16%	-11%
		Healdsburg	0%	-3%	-1%	-1%	-3%	0%	-1%	-5%	0%	0%	0%	0%
	0.75	Coyote Valley Dam	-2%	-7%	-9%	-4%	-13%	0%	0%	-6%	-2%	-3%	-2%	-1%
		Forks	-2%	0%	0%	-2%	-7%	0%	0%	-9%	0%	-2%	-2%	-1%
		Hopland	-1%	0%	-1%	-3%	-6%	0%	-1%	-9%	-8%	0%	-1%	-2%
		Cloverdale	-1%	-2%	-3%	-2%	-3%	-1%	0%	-6%	-8%	-3%	-1%	-2%
		Healdsburg	-4%	-3%	-2%	0%	-1%	-1%	-1%	-3%	-17%	0%	0%	0%
	0.50	Coyote Valley Dam	-1%	-2%	-3%	-3%	-6%	0%	-2%	-3%	-1%	-2%	-1%	-1%
		Forks	-1%	-3%	-3%	-2%	-4%	-1%	0%	0%	-1%	-2%	-1%	-1%
		Hopland	-1%	-8%	-3%	-1%	-3%	0%	0%	-2%	0%	-2%	0%	0%
		Cloverdale	-1%	-11%	-2%	0%	-2%	0%	0%	-2%	-2%	-1%	-1%	0%
		Healdsburg	0%	-9%	-2%	-1%	0%	-1%	0%	-1%	-3%	0%	0%	0%
	0.05	Coyote Valley Dam	-4%	-11%	-8%	0%	0%	-11%	0%	-2%	-2%	-1%	0%	0%
		Forks	-4%	-3%	0%	1%	0%	-2%	2%	6%	-1%	-1%	-1%	0%
		Hopland	-5%	-7%	-1%	1%	0%	-1%	1%	2%	2%	-1%	-2%	-1%
		Cloverdale	-5%	-1%	1%	0%	0%	0%	0%	1%	1%	0%	-2%	0%
		Healdsburg	-5%	-1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table 5.7.1-9. Estimated stage (feet) at various flow exceedances at gages in the Upper Russian River under Proposed Project Conditions (left panel of table) and difference under Cumulative 3 Scenario (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node[1]	Proposed Project					Cumulative 3 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Hopland	0.0	0.1	0.0	0.0	0.1	-0.4	-0.2	-0.1	-0.2	-0.4
	Cloverdale	1.8	1.9	1.9	2.0	1.8	-0.1	0.0	0.0	0.0	0.0
	Healdsburg	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0.95	Hopland	0.1	0.1	0.2	0.1	0.1	-0.2	-0.2	-0.1	-0.1	-0.3
	Cloverdale	1.9	2.0	2.1	2.1	2.0	0.0	0.0	0.0	0.0	0.0
	Healdsburg	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0.90	Hopland	0.1	0.1	0.2	0.2	0.2	-0.2	-0.1	-0.1	-0.1	-0.2
	Cloverdale	2.1	2.2	2.3	2.3	2.2	-0.1	-0.1	-0.1	-0.1	0.0
	Healdsburg	1.1	1.1	1.1	1.1	1.1	0.0	0.0	0.0	0.0	0.0
0.75	Hopland	0.2	0.2	0.3	0.4	0.2	-0.1	0.0	0.0	0.0	0.0
	Cloverdale	2.3	2.4	2.4	2.5	2.4	-0.1	0.0	0.0	0.0	0.0
	Healdsburg	1.2	1.2	1.2	1.2	1.3	-0.1	0.0	0.0	0.0	0.0
0.50	Hopland	0.2	0.3	0.4	0.4	0.3	0.0	0.0	0.0	0.0	0.0
	Cloverdale	2.4	2.4	2.4	2.5	2.4	0.0	0.0	0.0	0.0	0.0
	Healdsburg	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0
0.05	Hopland	0.5	0.4	0.6	0.6	3.2	0.0	0.0	0.0	0.0	-0.1
	Cloverdale	2.8	2.5	2.6	2.7	4.5	0.0	0.0	0.0	0.0	-0.1
	Healdsburg	1.6	1.3	1.3	1.3	2.5	0.0	0.0	0.0	0.0	-0.1

[1]The rating curve at the Hopland USGS gage begins at -1.5 feet. As such, application of the rating curve yields negative values at depths less than 1.5 feet. These negative values do not indicate or suggest drying of the Upper Russian River.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)
Under the Cumulative 4 Scenario, instream flow in the Upper Russian River would be lower than the Proposed Project during nearly all months, all exceedances, and all nodes (Table 5.7.1-10).

A comparison of stage at USGS gage sites along the Upper Russian River using modeled flow results and the most recent rating curves (USGS 2016a, b, c), shows stage would be lower under the Cumulative 4 Scenario than under the Proposed Project during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-11). The greatest differences would occur at Hopland and Cloverdale, up to 1.5 feet. The decreases in stage at Hopland could be substantial as flow would already be lower than the Proposed Project across nearly all months, all exceedances, and all nodes (Table 5.7.1-10). During wetter conditions (the 0.05 exceedance) stage decreases would be less than other exceedances from June through September, but greater than all other exceedances in October. The greatest stage decreases occur in October during the 0.05 exceedance (1.2 to 2.9 feet), substantially greater than any other month or exceedance. Under the Cumulative 4 Scenario, these decreases in stage at Hopland are substantial and would likely decrease groundwater table elevation and the impact on hydrology would be cumulatively significant and unavoidable and no mitigation is available.

Table 5.7.1-10. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 4 Scenario in the Upper Russian River. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 4 Scenario	0.99	Coyote Valley Dam	-93%	-75%	-62%	0%	0%	0%	0%	0%	-29%	-39%	-9%	-99%
		Forks	-98%	-93%	-88%	-54%	-48%	-25%	-41%	-20%	-30%	-29%	-8%	-99%
		Hopland	-98%	-94%	-88%	-52%	-48%	-30%	-43%	-16%	-17%	-35%	-26%	-99%
		Cloverdale	-100%	-100%	-78%	-50%	-55%	-20%	-40%	-17%	-17%	-30%	-25%	-100%
		Healdsburg	-100%	-100%	-67%	-51%	-49%	-5%	-32%	-17%	-1%	-1%	-1%	-100%
	0.95	Coyote Valley Dam	-97%	-45%	0%	-2%	-1%	0%	0%	0%	-39%	-18%	-8%	-27%
		Forks	-95%	-86%	-63%	-57%	-32%	-28%	-29%	-23%	-30%	-20%	-9%	-24%
		Hopland	-92%	-86%	-59%	-61%	-23%	-12%	-32%	-39%	-38%	-40%	-32%	-44%
		Cloverdale	-93%	-78%	-58%	-52%	-17%	-9%	-26%	-28%	-29%	-36%	-33%	-37%
		Healdsburg	-100%	-71%	-56%	-38%	-16%	-5%	-17%	-24%	-17%	-17%	-17%	-17%
	0.90	Coyote Valley Dam	-74%	-28%	0%	-2%	-61%	0%	0%	-21%	-31%	-14%	-14%	-16%
		Forks	-44%	-66%	-60%	-51%	-39%	-5%	-32%	-33%	-28%	-16%	-15%	-17%
		Hopland	-56%	-61%	-61%	-43%	-34%	-9%	-28%	-43%	-46%	-41%	-40%	-32%
		Cloverdale	-54%	-60%	-57%	-35%	-29%	-5%	-20%	-37%	-41%	-43%	-44%	-37%
		Healdsburg	-39%	-62%	-51%	-28%	-19%	-4%	-12%	-29%	-39%	-39%	-39%	-39%
	0.75	Coyote Valley Dam	-40%	-72%	-67%	-72%	-87%	0%	-10%	-40%	-25%	-12%	-17%	-20%
		Forks	-38%	-58%	-53%	-49%	-53%	0%	-15%	-29%	-22%	-13%	-18%	-21%
		Hopland	-55%	-61%	-55%	-39%	-37%	-4%	-14%	-48%	-49%	-37%	-38%	-38%
		Cloverdale	-55%	-58%	-44%	-31%	-27%	-3%	-10%	-34%	-47%	-42%	-40%	-41%
		Healdsburg	-61%	-56%	-36%	-21%	-18%	-3%	-6%	-22%	-52%	-52%	-52%	-52%
	0.50	Coyote Valley Dam	-34%	-65%	-77%	-89%	-77%	0%	-37%	-25%	-16%	-13%	-17%	-17%
		Forks	-33%	-51%	-53%	-42%	-35%	-1%	0%	-15%	-14%	-14%	-17%	-17%
		Hopland	-50%	-63%	-37%	-27%	-23%	-2%	-7%	-20%	-35%	-34%	-34%	-36%
		Cloverdale	-51%	-51%	-26%	-18%	-16%	-1%	-5%	-16%	-41%	-37%	-38%	-38%
		Healdsburg	-51%	-36%	-10%	-12%	-9%	-3%	-1%	-8%	-15%	-18%	-35%	-35%
	0.05	Coyote Valley Dam	-79%	-63%	-87%	0%	-8%	-47%	-12%	-7%	-11%	-3%	-7%	-6%
		Forks	-79%	-31%	-26%	-13%	-7%	-18%	-2%	-17%	-9%	-2%	-8%	-6%
		Hopland	-83%	-24%	-18%	-7%	-5%	-8%	-2%	-12%	-24%	-14%	-20%	-16%
		Cloverdale	-84%	-14%	-12%	-7%	-2%	-5%	0%	-8%	-23%	-12%	-18%	-14%
		Healdsburg	-85%	-11%	-8%	-4%	-2%	-3%	-1%	-4%	-18%	-5%	0%	0%

Table 5.7.1-11. Estimated stage (feet) at various flow exceedances at gages in the Upper Russian River under Proposed Project Conditions (left panel of table) and difference under Cumulative 4 Scenario (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node[1]	Proposed Project					Cumulative 4 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Hopland	0.0	0.1	0.0	0.0	0.1	-0.5	-0.5	-0.3	-1.5	-1.5
	Cloverdale	1.8	1.9	1.9	2.0	1.8	-0.1	-0.2	-0.1	-0.3	-0.7
	Healdsburg	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0.95	Hopland	0.1	0.1	0.2	0.1	0.1	-0.5	-0.5	-0.4	-0.4	-1.5
	Cloverdale	1.9	2.0	2.1	2.1	2.0	-0.2	-0.3	-0.3	-0.2	-0.3
	Healdsburg	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0
0.90	Hopland	0.1	0.1	0.2	0.2	0.2	-0.5	-0.4	-0.4	-0.3	-0.6
	Cloverdale	2.1	2.2	2.3	2.3	2.2	-0.3	-0.4	-0.4	-0.4	-0.5
	Healdsburg	1.1	1.1	1.1	1.1	1.1	-0.1	-0.1	-0.1	-0.1	-0.1
0.75	Hopland	0.2	0.2	0.3	0.4	0.2	-0.5	-0.3	-0.4	-0.4	-0.6
	Cloverdale	2.3	2.4	2.4	2.5	2.4	-0.5	-0.4	-0.4	-0.4	-0.6
	Healdsburg	1.2	1.2	1.2	1.2	1.3	-0.2	-0.2	-0.2	-0.2	-0.3
0.50	Hopland	0.2	0.3	0.4	0.4	0.3	-0.3	-0.3	-0.4	-0.4	-0.5
	Cloverdale	2.4	2.4	2.4	2.5	2.4	-0.4	-0.4	-0.4	-0.4	-0.5
	Healdsburg	1.3	1.3	1.3	1.3	1.3	-0.1	-0.2	-0.3	-0.3	-0.3
0.05	Hopland	0.5	0.4	0.6	0.6	3.2	-0.3	-0.1	-0.2	-0.2	-2.9
	Cloverdale	2.8	2.5	2.6	2.7	4.5	-0.3	-0.1	-0.2	-0.2	-2.0
	Healdsburg	1.6	1.3	1.3	1.3	2.5	-0.1	0.0	0.0	0.0	-1.2

[1]The rating curve at the Hopland USGS gage begins at -1.5 feet. As such, application of the rating curve yields negative values at depths less than 1.5 feet. These negative values do not indicate or suggest drying of the Upper Russian River.

Impact 5.7.1-2. Implementation of the Fish Habitat Flows and Water Rights Project could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level in Dry Creek in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively not Considerable)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario, instream flow in Dry Creek would be similar or greater than the Proposed Project from May through October at all exceedances (with the exception of the Warm Springs Dam node in October at the 0.95 exceedance) and similar or lower from November through April (with the exception of the Warm Springs Dam node in November at the 0.05 exceedance) (Table 5.7.1-12).

A comparison of stage at USGS gage sites along Dry Creek using modeled flow results and the most recent rating curves from each gage (USGS 2016d, e) shows stage would be the same or higher under the Cumulative 1 Scenario during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-13). The greatest changes would be increases occurring from July through October at the 0.50 exceedance, up to 0.3 feet (approximately 4 inches). Thus, these increases in stage may slightly increase groundwater table elevation under the Cumulative 1 Scenario and therefore, the impact to hydrology would not be cumulatively considerable.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Cumulative 2 Scenario, instream flow in Dry Creek would be similar or greater than the Proposed Project from May through October at all exceedances and similar or lower from November through April (with the exception of the Warm Springs Dam node in November and February at the 0.05 exceedance) (Table 5.7.1-14).

A comparison of stage at USGS gage sites along Dry Creek using modeled flow results and the most recent rating curves from each gage (USGS 2016d, e) shows stage would generally be the same as the Proposed Project under the Cumulative 2 Scenario months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-15). The only estimated changes would be increases occurring in October at the 0.05 exceedance, and in September at the 0.99 exceedance (driest condition) at the Dry Creek at Geyserville stream gage. Thus, these increases in stage may slightly increase the groundwater table elevation under the Cumulative 2 Scenario and therefore, the impact to hydrology would not be cumulatively considerable.

Table 5.7.1-12. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 1 Scenario at various flow exceedances at nodes in Dry Creek. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 1 Scenario	0.99	Warm Springs Dam	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	2%
		Dry Cr at Geyserville	6%	-2%	-2%	0%	0%	0%	-1%	1%	2%	0%	4%	25%
		Dry Creek Mouth	29%	0%	0%	0%	0%	0%	-3%	2%	8%	1%	4%	4%
	0.95	Warm Springs Dam	-7%	0%	0%	0%	0%	0%	0%	0%	0%	7%	5%	10%
		Dry Cr at Geyserville	4%	-15%	-13%	0%	0%	0%	-3%	1%	3%	3%	6%	10%
		Dry Creek Mouth	12%	-24%	-26%	-1%	0%	0%	-3%	2%	7%	3%	8%	13%
	0.90	Warm Springs Dam	4%	-29%	-4%	0%	0%	0%	0%	0%	0%	11%	8%	18%
		Dry Cr at Geyserville	9%	-27%	-25%	0%	0%	0%	-4%	1%	2%	10%	8%	18%
		Dry Creek Mouth	21%	-25%	-21%	0%	0%	0%	-2%	1%	7%	9%	9%	22%
	0.75	Warm Springs Dam	22%	-29%	-29%	0%	0%	0%	-7%	0%	0%	20%	24%	30%
		Dry Cr at Geyserville	22%	-21%	-19%	0%	-6%	-5%	-3%	0%	6%	20%	24%	29%
		Dry Creek Mouth	29%	-13%	-7%	0%	-3%	-5%	-2%	1%	9%	24%	25%	36%
	0.50	Warm Springs Dam	15%	-11%	-29%	0%	-13%	-8%	-3%	0%	34%	34%	32%	34%
		Dry Cr at Geyserville	14%	-2%	-7%	-6%	-4%	-4%	-1%	1%	26%	34%	32%	33%
		Dry Creek Mouth	18%	1%	-6%	-4%	-3%	-2%	-1%	1%	24%	37%	36%	37%
	0.05	Warm Springs Dam	22%	31%	-25%	0%	0%	0%	-3%	1%	8%	10%	9%	10%
		Dry Cr at Geyserville	23%	-6%	-11%	-9%	-10%	0%	0%	0%	8%	10%	9%	10%
		Dry Creek Mouth	24%	-5%	-3%	0%	0%	0%	0%	0%	7%	11%	9%	11%

Table 5.7.1-13. Estimated stage (feet) at various flow exceedances at gages in Dry Creek under Proposed Project Conditions (left panel of table) and difference under Cumulative 1 Scenario minimum instream flow releases (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node	Proposed Project					Cumulative 1 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Dry Creek at Geyserville	0.9	1.0	1.2	1.0	0.9	0.0	0.0	0.0	0.2	0.0
	Dry Creek Mouth	4.6	4.7	4.8	4.7	4.6	0.0	0.0	0.0	0.0	0.1
0.95	Dry Creek at Geyserville	0.9	1.0	1.3	1.2	1.1	0.0	0.0	0.1	0.1	0.0
	Dry Creek Mouth	4.6	4.7	4.8	4.8	4.7	0.0	0.0	0.0	0.1	0.1
0.90	Dry Creek at Geyserville	1.0	1.1	1.3	1.3	1.1	0.0	0.1	0.1	0.2	0.1
	Dry Creek Mouth	4.7	4.7	4.9	4.8	4.7	0.0	0.1	0.1	0.1	0.1
0.75	Dry Creek at Geyserville	1.0	1.2	1.3	1.3	1.2	0.0	0.2	0.2	0.3	0.2
	Dry Creek Mouth	4.7	4.8	4.9	4.9	4.8	0.0	0.1	0.2	0.2	0.2
0.50	Dry Creek at Geyserville	1.1	1.3	1.4	1.4	1.4	0.2	0.3	0.3	0.3	0.1
	Dry Creek Mouth	4.8	4.9	5.0	4.9	5.0	0.1	0.2	0.3	0.3	0.1
0.05	Dry Creek at Geyserville	1.6	1.7	1.8	1.7	1.6	0.1	0.1	0.1	0.1	0.2
	Dry Creek Mouth	5.1	5.2	5.3	5.2	5.2	0.1	0.1	0.1	0.1	0.2

Table 5.7.1-14. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 2 Scenario at various flow exceedances at nodes in Dry Creek. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 2 Scenario	0.99	Warm Springs Dam	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
		Dry Cr at Geyserville	3%	0%	0%	0%	0%	0%	-1%	0%	0%	0%	0%	10%
		Dry Creek Mouth	15%	0%	0%	0%	0%	0%	-2%	0%	1%	0%	0%	3%
	0.95	Warm Springs Dam	7%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
		Dry Cr at Geyserville	2%	-6%	-3%	0%	0%	0%	-2%	0%	0%	0%	0%	2%
		Dry Creek Mouth	4%	-7%	-3%	0%	0%	0%	-2%	0%	1%	0%	0%	3%
	0.90	Warm Springs Dam	2%	-9%	-4%	0%	0%	0%	0%	0%	0%	0%	0%	1%
		Dry Cr at Geyserville	2%	-1%	-1%	0%	0%	0%	-1%	0%	0%	0%	0%	1%
		Dry Creek Mouth	3%	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	1%
	0.75	Warm Springs Dam	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
		Dry Cr at Geyserville	5%	0%	-1%	0%	-2%	-3%	0%	0%	1%	0%	1%	1%
		Dry Creek Mouth	7%	0%	0%	0%	-1%	-2%	0%	0%	2%	0%	0%	2%
	0.50	Warm Springs Dam	3%	0%	0%	0%	-3%	0%	0%	0%	4%	2%	4%	5%
		Dry Cr at Geyserville	3%	0%	0%	1%	0%	0%	0%	0%	3%	2%	4%	5%
		Dry Creek Mouth	5%	1%	1%	1%	0%	0%	0%	0%	2%	3%	4%	5%
	0.05	Warm Springs Dam	13%	6%	-8%	0%	12%	0%	-2%	0%	1%	4%	3%	4%
		Dry Cr at Geyserville	18%	0%	-4%	0%	2%	-1%	0%	0%	1%	4%	3%	4%
		Dry Creek Mouth	22%	0%	-1%	0%	1%	-1%	0%	0%	2%	4%	4%	4%

Table 5.7.1-15. Estimated stage (feet) at various flow exceedances at gages in Dry Creek under Proposed Project Conditions (left panel of table) and difference under Cumulative 2 Scenario minimum instream flow releases (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node	Proposed Project					Cumulative 2 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Dry Creek at Geyserville	0.9	1.0	1.2	1.0	0.9	0.0	0.0	0.0	0.1	0.0
	Dry Creek Mouth	4.6	4.7	4.8	4.7	4.6	0.0	0.0	0.0	0.0	0.1
0.95	Dry Creek at Geyserville	0.9	1.0	1.3	1.2	1.1	0.0	0.0	0.0	0.0	0.0
	Dry Creek Mouth	4.6	4.7	4.8	4.8	4.7	0.0	0.0	0.0	0.0	0.0
0.90	Dry Creek at Geyserville	1.0	1.1	1.3	1.3	1.1	0.0	0.0	0.0	0.0	0.0
	Dry Creek Mouth	4.7	4.7	4.9	4.8	4.7	0.0	0.0	0.0	0.0	0.0
0.75	Dry Creek at Geyserville	1.0	1.2	1.3	1.3	1.2	0.0	0.0	0.0	0.0	0.0
	Dry Creek Mouth	4.7	4.8	4.9	4.9	4.8	0.0	0.0	0.0	0.0	0.0
0.50	Dry Creek at Geyserville	1.1	1.3	1.4	1.4	1.4	0.0	0.0	0.0	0.0	0.0
	Dry Creek Mouth	4.8	4.9	5.0	4.9	5.0	0.0	0.0	0.0	0.0	0.0
0.05	Dry Creek at Geyserville	1.6	1.7	1.8	1.7	1.6	0.0	0.0	0.0	0.0	0.2
	Dry Creek Mouth	5.1	5.2	5.3	5.2	5.2	0.0	0.0	0.0	0.0	0.2

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario, instream flow in Dry Creek would be similar or greater than the Proposed Project from May through October at all exceedances (with the exception of the Warm Springs Dam and Dry Creek at Geyserville nodes in September at the 0.95 exceedance, and at all nodes in October at the 0.75 exceedance) and similar or lower from November through April (Table 5.7.1-16).

A comparison of stage at USGS gage sites along Dry Creek using modeled flow results and the most recent rating curves from each gage (USGS 2016d, e) shows stage would generally be the same as or slightly greater than the Proposed Project under the Cumulative 3 Scenario months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-17). The only estimated decreases would occur in October at the 0.75 exceedance and would be far less than potential seasonal fluctuations in groundwater table elevation. In general, the increases in stage may slightly increase the groundwater table elevation. Therefore, under the Cumulative 3 Scenario, the impact to hydrology would not be cumulatively considerable.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Under the Cumulative 4 Scenario, instream flow in Dry Creek would be similar or greater than the Proposed Project from May through October at all exceedances (with the exception of the Warm Springs Dam node in October at the 0.95 exceedance) and similar or lower from November through April (with the exception of the Warm Springs Dam node in November at the 0.05 exceedance) (Table 5.7.1-18).

A comparison of stage at USGS gage sites along Dry Creek using modeled flow results and the most recent rating curves from each gage (USGS 2016d, e) shows stage would be the same or higher under the Cumulative 4 Scenario during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-18). The greatest changes would be increases occurring from July through October under estimated the 0.50 exceedance, up to 0.3 feet (approximately 4 inches). Thus, these increases in stage may slightly increase groundwater table elevation under the Cumulative 4 Scenario and therefore, the impact to hydrology would not be cumulatively considerable.

Table 5.7.1-16. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 3 Scenario at various flow exceedances at nodes in Dry Creek. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 3 Scenario	0.99	Warm Springs Dam	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	12%	1%
		Dry Cr at Geyserville	1%	0%	0%	0%	0%	0%	-1%	0%	1%	1%	12%	5%
		Dry Creek Mouth	9%	0%	0%	0%	0%	0%	-3%	0%	2%	4%	15%	-2%
	0.95	Warm Springs Dam	3%	0%	0%	0%	0%	0%	0%	0%	0%	11%	8%	-3%
		Dry Cr at Geyserville	-1%	-9%	-3%	0%	0%	0%	-2%	0%	1%	7%	8%	-3%
		Dry Creek Mouth	5%	-11%	-2%	0%	0%	0%	-2%	0%	2%	7%	10%	15%
	0.90	Warm Springs Dam	-1%	-21%	-4%	0%	0%	0%	0%	0%	0%	11%	9%	8%
		Dry Cr at Geyserville	-1%	-2%	-1%	0%	0%	0%	-1%	0%	1%	10%	9%	8%
		Dry Creek Mouth	0%	0%	0%	0%	0%	0%	-1%	0%	2%	11%	10%	10%
	0.75	Warm Springs Dam	-6%	0%	0%	0%	0%	0%	0%	0%	0%	7%	7%	7%
		Dry Cr at Geyserville	-6%	0%	0%	0%	-2%	-2%	0%	0%	1%	6%	7%	6%
		Dry Creek Mouth	-9%	0%	-1%	0%	-1%	-2%	0%	0%	2%	8%	8%	7%
	0.50	Warm Springs Dam	1%	0%	0%	0%	-3%	-1%	0%	0%	7%	8%	7%	4%
		Dry Cr at Geyserville	0%	0%	-1%	0%	-1%	0%	0%	0%	4%	8%	6%	4%
		Dry Creek Mouth	1%	-1%	-1%	0%	0%	0%	0%	0%	1%	8%	8%	3%
	0.05	Warm Springs Dam	5%	-3%	-9%	0%	0%	0%	-2%	0%	1%	3%	4%	3%
		Dry Cr at Geyserville	5%	0%	-2%	-2%	0%	-1%	0%	0%	1%	3%	4%	3%
		Dry Creek Mouth	4%	0%	-2%	0%	1%	-1%	-1%	0%	1%	4%	3%	4%

Table 5.7.1-17. Estimated stage (feet) at various flow exceedances at gages in Dry Creek under Proposed Project Conditions (left panel of table) and difference under Cumulative 3 Scenario (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node	Proposed Project					Cumulative 3 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Dry Creek at Geyserville	0.9	1.0	1.2	1.0	0.9	0.0	0.0	0.1	0.0	0.0
	Dry Creek Mouth	4.6	4.7	4.8	4.7	4.6	0.0	0.0	0.1	0.0	0.0
0.95	Dry Creek at Geyserville	0.9	1.0	1.3	1.2	1.1	0.0	0.0	0.1	0.0	0.0
	Dry Creek Mouth	4.6	4.7	4.8	4.8	4.7	0.0	0.0	0.1	0.1	0.0
0.90	Dry Creek at Geyserville	1.0	1.1	1.3	1.3	1.1	0.0	0.1	0.1	0.1	0.0
	Dry Creek Mouth	4.7	4.7	4.9	4.8	4.7	0.0	0.1	0.1	0.1	0.0
0.75	Dry Creek at Geyserville	1.0	1.2	1.3	1.3	1.2	0.0	0.1	0.1	0.1	-0.1
	Dry Creek Mouth	4.7	4.8	4.9	4.9	4.8	0.0	0.1	0.1	0.0	-0.1
0.50	Dry Creek at Geyserville	1.1	1.3	1.4	1.4	1.4	0.0	0.1	0.1	0.0	0.0
	Dry Creek Mouth	4.8	4.9	5.0	4.9	5.0	0.0	0.1	0.1	0.0	0.0
0.05	Dry Creek at Geyserville	1.6	1.7	1.8	1.7	1.6	0.0	0.0	0.0	0.0	0.1
	Dry Creek Mouth	5.1	5.2	5.3	5.2	5.2	0.0	0.0	0.0	0.0	0.0

Table 5.7.1-18. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 4 Scenario at various flow exceedances at nodes in Dry Creek. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 4 Scenario (% above or below Proposed Project)	0.99	Warm Springs Dam	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	14%	1%
		Dry Cr at Geyserville	6%	-2%	-2%	0%	0%	1%	-1%	1%	3%	1%	14%	14%
		Dry Creek Mouth	35%	0%	0%	0%	0%	1%	-3%	1%	9%	6%	15%	7%
	0.95	Warm Springs Dam	-6%	0%	0%	0%	0%	0%	0%	0%	0%	20%	15%	15%
		Dry Cr at Geyserville	7%	-15%	-13%	0%	1%	0%	-3%	1%	3%	15%	15%	15%
		Dry Creek Mouth	23%	-24%	-25%	0%	1%	0%	-3%	2%	8%	14%	17%	18%
	0.90	Warm Springs Dam	15%	-29%	-4%	0%	0%	0%	0%	0%	0%	19%	25%	25%
		Dry Cr at Geyserville	19%	-26%	-24%	0%	1%	0%	-4%	1%	3%	17%	25%	25%
		Dry Creek Mouth	32%	-23%	-19%	0%	1%	-1%	-3%	1%	9%	17%	26%	31%
	0.75	Warm Springs Dam	31%	-29%	-29%	0%	0%	0%	-7%	0%	0%	27%	37%	38%
		Dry Cr at Geyserville	30%	-17%	-16%	0%	-11%	-8%	-3%	0%	9%	25%	37%	37%
		Dry Creek Mouth	39%	-7%	-4%	-1%	-7%	-8%	-3%	1%	14%	30%	41%	47%
	0.50	Warm Springs Dam	21%	-1%	-29%	0%	-22%	-9%	-4%	0%	42%	42%	42%	42%
		Dry Cr at Geyserville	20%	-1%	-5%	-9%	-7%	-4%	-2%	1%	33%	42%	42%	42%
		Dry Creek Mouth	24%	5%	-6%	-6%	-5%	-2%	-2%	1%	31%	47%	48%	47%
	0.05	Warm Springs Dam	38%	40%	-36%	0%	0%	0%	-3%	0%	6%	12%	12%	11%
		Dry Cr at Geyserville	36%	-6%	-12%	-12%	-16%	-1%	0%	0%	6%	12%	12%	11%
		Dry Creek Mouth	35%	-5%	-4%	-1%	0%	-1%	-1%	0%	6%	13%	13%	12%

Table 5.7.1-19. Estimated stage (feet) at various flow exceedances at gages in Dry Creek under Proposed Project Conditions (left panel of table) and difference under Cumulative 4 Scenario minimum instream flow releases (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node	Proposed Project					Cumulative 4 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Dry Creek at Geyserville	0.9	1.0	1.2	1.0	0.9	0.0	0.0	0.1	0.1	0.0
	Dry Creek Mouth	4.6	4.7	4.8	4.7	4.6	0.0	0.0	0.1	0.0	0.1
0.95	Dry Creek at Geyserville	0.9	1.0	1.3	1.2	1.1	0.0	0.1	0.1	0.1	0.1
	Dry Creek Mouth	4.6	4.7	4.8	4.8	4.7	0.0	0.1	0.1	0.1	0.1
0.90	Dry Creek at Geyserville	1.0	1.1	1.3	1.3	1.1	0.0	0.1	0.2	0.2	0.1
	Dry Creek Mouth	4.7	4.7	4.9	4.8	4.7	0.0	0.1	0.2	0.2	0.2
0.75	Dry Creek at Geyserville	1.0	1.2	1.3	1.3	1.2	0.1	0.2	0.3	0.3	0.3
	Dry Creek Mouth	4.7	4.8	4.9	4.9	4.8	0.1	0.2	0.3	0.3	0.2
0.50	Dry Creek at Geyserville	1.1	1.3	1.4	1.4	1.4	0.3	0.4	0.4	0.4	0.2
	Dry Creek Mouth	4.8	4.9	5.0	4.9	5.0	0.2	0.3	0.3	0.3	0.2
0.05	Dry Creek at Geyserville	1.6	1.7	1.8	1.7	1.6	0.1	0.1	0.1	0.1	0.4
	Dry Creek Mouth	5.1	5.2	5.3	5.2	5.2	0.0	0.1	0.1	0.1	0.3

Impact 5.7.1-3. Implementation of the Fish Habitat Flows and Water Rights Project could substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level in the Lower Russian River in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less- than-Significant)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario, instream flow in the Lower Russian River would be similar or lower than the Proposed Project across nearly all months, all exceedances, and all nodes (**Figure 5.7.1-20**).

A comparison of stage at the Russian River at Guerneville (Hacienda Bridge) USGS gage using modeled flow results and the most recent rating curve (USGS 2016f) shows stage would be the same or lower under the Cumulative 1 Scenario than under the Proposed Project during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; **Figure 5.7.1-21**). The greatest decreases would occur in October at the 0.05 and 0.50 exceedances, up to 2.5 feet, and would occur under all but the driest conditions at generally less than 0.2 foot (approximately 2 inches). These decreases in stage may slightly decrease the groundwater table elevation, but as described in Section 4.1," Hydrology," seasonal groundwater fluctuations exceed the potential stage change under the Cumulative 1 Scenario. Thus, under the Cumulative 1 Scenario, the decrease in stage at in October at 0.05 exceedance is substantial and would likely decrease groundwater table elevation, but would occur relatively infrequently during wetter flow conditions and therefore, the impact on hydrology would be cumulatively less than significant and no mitigation is required.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Cumulative 2 Scenario, instream flow in the Lower Russian River would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Table 5.7.1-22).

A comparison of stage at the Russian River at Guerneville (Hacienda Bridge) USGS gage using modeled flow results and the most recent rating curve (USGS 2016f) shows stage would be the same or lower under the Cumulative 2 Scenario than under the Proposed Project during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-23). The greatest decreases would occur in October at the 0.05 and 0.50 exceedances, up to 0.2 foot. Thus, these decreases in stage may slightly decrease groundwater table elevation, but as described in Section 4.1 "Hydrology," seasonal groundwater fluctuations exceed the potential stage change under the Cumulative 2 Scenario and therefore, the impact on hydrology would be cumulatively less than significant and no mitigation is required.

Table 5.7.1-20. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 1 Scenario at various flow exceedances at nodes in the Lower Russian River. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 1 Scenario	0.99	Russian R at Dry C	-19%	-22%	-21%	-24%	-30%	-1%	-11%	-3%	-8%	-8%	-8%	-12%
		Hacienda Bridge	0%	-30%	-54%	-50%	-42%	-4%	-16%	0%	0%	0%	0%	0%
	0.95	Russian R at Dry C	-17%	-34%	-33%	-20%	-14%	-3%	-11%	-10%	-10%	-7%	-5%	-7%
		Hacienda Bridge	-24%	-54%	-39%	-27%	-16%	-2%	-13%	-18%	-24%	-24%	-24%	-24%
	0.90	Russian R at Dry C	-13%	-31%	-30%	-17%	-13%	-2%	-7%	-11%	-10%	-6%	-5%	-7%
		Hacienda Bridge	-24%	-34%	-44%	-16%	-14%	-3%	-6%	-27%	-24%	-24%	-24%	-24%
	0.75	Russian R at Dry C	-11%	-28%	-24%	-17%	-14%	-2%	-3%	-13%	-8%	-5%	-6%	-6%
		Hacienda Bridge	-18%	-41%	-30%	-14%	-11%	-3%	-3%	-19%	-24%	-24%	-24%	-24%
	0.50	Russian R at Dry C	-19%	-20%	-16%	-10%	-7%	-1%	-1%	-6%	-5%	-4%	-5%	-4%
		Hacienda Bridge	-44%	-36%	-14%	-6%	-6%	-1%	-1%	-6%	-3%	0%	-18%	-18%
	0.05	Russian R at Dry C	-72%	-9%	-5%	-1%	-2%	-2%	-1%	-1%	-10%	-2%	-1%	-4%
		Hacienda Bridge	-81%	-6%	-4%	-1%	-1%	-2%	-1%	-2%	-12%	-7%	0%	0%

Table 5.7.1-21. Estimated stage (feet) at various flow exceedances at gages in the Lower Russian River under Proposed Project Conditions (left panel of table) and difference under the Cumulative 1 Scenario (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node	Proposed Project					Cumulative 1 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Hacienda Bridge	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0
0.95	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	-0.2	-0.2	-0.2	-0.2	-0.2
0.90	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	-0.2	-0.2	-0.2	-0.2	-0.2
0.75	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	-0.2	-0.2	-0.2	-0.2	-0.1
0.50	Hacienda Bridge	1.3	1.3	1.3	1.3	1.8	0.0	0.0	-0.1	-0.1	-0.5
0.05	Hacienda Bridge	2.8	1.4	1.3	1.3	4.3	-0.2	0.0	0.0	0.0	-2.5

Table 5.7.1-22. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 2 Scenario at various flow exceedances at nodes in the Lower Russian River. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 2 Scenario	0.99	Russian R at Dry C	-8%	-2%	-2%	0%	-11%	-1%	0%	0%	-3%	-5%	-5%	-7%
		Hacienda Bridge	0%	0%	-30%	0%	-7%	-3%	0%	0%	0%	0%	0%	0%
	0.95	Russian R at Dry C	-1%	-3%	-5%	-1%	-6%	-2%	-4%	-1%	-1%	-1%	-1%	0%
		Hacienda Bridge	0%	0%	-8%	-4%	-4%	-2%	-4%	0%	-18%	-18%	-18%	-18%
	0.90	Russian R at Dry C	-1%	-2%	-3%	-2%	-3%	-1%	-3%	-1%	-1%	0%	0%	0%
		Hacienda Bridge	0%	0%	-5%	-4%	-6%	-2%	-3%	-5%	0%	0%	0%	0%
	0.75	Russian R at Dry C	-1%	-3%	-6%	-2%	-1%	-2%	-3%	-2%	-1%	0%	0%	0%
		Hacienda Bridge	0%	-7%	-7%	-1%	-1%	-3%	-3%	-4%	0%	0%	0%	0%
	0.50	Russian R at Dry C	-1%	-8%	-3%	0%	-1%	-1%	-1%	-5%	0%	0%	0%	0%
		Hacienda Bridge	-10%	-13%	-2%	0%	-1%	0%	-1%	-5%	-3%	0%	0%	0%
	0.05	Russian R at Dry C	-7%	-1%	-2%	0%	0%	0%	-1%	-1%	-5%	0%	0%	0%
		Hacienda Bridge	-7%	-2%	0%	0%	0%	-1%	0%	-2%	-5%	0%	0%	0%

Table 5.7.1-23. Estimated stage (feet) at various flow exceedances at gages in the Lower Russian River under Proposed Project Conditions (left panel of table) and difference under the Cumulative 2 Scenario (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node	Proposed Project					Cumulative 2 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Hacienda Bridge	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0
0.95	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	-0.1	-0.1	-0.1	-0.1	0.0
0.90	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0
0.75	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0
0.50	Hacienda Bridge	1.3	1.3	1.3	1.3	1.8	0.0	0.0	0.0	0.0	-0.1
0.05	Hacienda Bridge	2.8	1.4	1.3	1.3	4.3	-0.1	0.0	0.0	0.0	-0.2

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario, instream flow in the Lower Russian River would be similar or higher from June or July through August, September or October at the Russian River at Dry Creek node at all exceedances, and similar or lower at the Hacienda Bridge node during all months and exceedances (except or March and April during dry [0.99 exceedance] conditions) (Table 5.7.1-24).

A comparison of stage at the Russian River at Guerneville (Hacienda Bridge) USGS gage using modeled flow results and the most recent rating curve (USGS 2016f) shows stage would be the same or lower under the Cumulative 3 Scenario than under the Proposed Project during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-25). The greatest decreases would be up to 0.1 foot. Thus, these decreases in stage may slightly decrease groundwater table elevation, but as described in Section 4.1, “Hydrology,” seasonal groundwater fluctuations exceed the potential stage change under the Cumulative 3 Scenario and therefore, the impact on hydrology would be cumulatively less-than- significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Under the Cumulative 1 Scenario, instream flow in the Lower Russian River would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Table 5.7.1-26).

A comparison of stage at the Russian River at Guerneville (Hacienda Bridge) USGS gage using modeled flow results and the most recent rating curve (USGS 2016f) shows stage would be the same or lower under the Cumulative 4 Scenario than under the Proposed Project during months when unimpaired flow is typically declining and main stem flows are becoming dominated by reservoir releases (June through October; Table 5.7.1-27). The greatest decreases would occur in October at the 0.05 and 0.50 exceedances, up to 2.5 feet, and would occur under all but the driest conditions at generally less than 0.2 foot (approximately 2 inches). These decreases in stage may slightly decrease groundwater table elevation, but as described in Section 4.1, “Hydrology,” seasonal groundwater fluctuations exceed the potential stage change under the Cumulative 4 Scenario. Thus, under the Cumulative 4 Scenario, the decreases in stage at in October at the 0.05 exceedance are substantial and would likely decrease groundwater table elevation, but would occur relatively infrequently during wetter flow conditions and therefore, the impact on hydrology would be cumulatively less than significant and no mitigation is required.

Table 5.7.1-24. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 3 Scenario at various flow exceedances at nodes in the Lower Russian River. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 3 Scenario	0.99	Russian R at Dry C	-8%	-1%	-1%	0%	-9%	0%	-2%	-1%	1%	1%	-1%	-6%
		Hacienda Bridge	0%	0%	-30%	0%	-6%	2%	3%	0%	0%	0%	0%	0%
	0.95	Russian R at Dry C	-1%	-1%	-2%	0%	-4%	-1%	-1%	-2%	1%	5%	5%	0%
		Hacienda Bridge	0%	0%	-4%	0%	-3%	-1%	0%	0%	-18%	-18%	-18%	-18%
	0.90	Russian R at Dry C	1%	-2%	0%	0%	-2%	0%	-1%	-2%	2%	4%	4%	4%
		Hacienda Bridge	0%	0%	-2%	-2%	-3%	-1%	0%	-3%	0%	0%	0%	0%
	0.75	Russian R at Dry C	-2%	-2%	-2%	0%	0%	-1%	-1%	-2%	0%	3%	4%	4%
		Hacienda Bridge	0%	-3%	-4%	0%	-1%	-2%	-1%	-2%	0%	0%	0%	0%
	0.50	Russian R at Dry C	5%	-6%	-1%	0%	0%	-1%	0%	-1%	-2%	4%	4%	3%
		Hacienda Bridge	-6%	-9%	-1%	0%	0%	0%	0%	0%	-3%	0%	0%	0%
	0.05	Russian R at Dry C	-4%	-1%	-1%	0%	0%	-1%	0%	0%	0%	2%	2%	0%
		Hacienda Bridge	-6%	-2%	0%	0%	0%	-1%	0%	0%	-2%	-7%	0%	0%

Table 5.7.1-25. Estimated stage (feet) at various flow exceedances at gages in the Lower Russian River under Proposed Project Conditions (left panel of table) and difference under the Cumulative 3 Scenario Project (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node	Proposed Project					Cumulative 3 Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Hacienda Bridge	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0
0.95	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	-0.1	-0.1	-0.1	-0.1	0.0
0.90	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0
0.75	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	0.0	0.0	0.0	0.0	0.0
0.50	Hacienda Bridge	1.3	1.3	1.3	1.3	1.8	0.0	0.0	0.0	0.0	-0.1
0.05	Hacienda Bridge	2.8	1.4	1.3	1.3	4.3	0.0	0.0	0.0	0.0	-0.1

Table 5.7.1-26. Percent difference in discharge cubic feet per second (cfs) between the Proposed Project and the Cumulative 4 Scenario at various flow exceedances at nodes in the Lower Russian River. Positive percent indicates increase over Proposed Project Conditions (shaded blue); negative percent indicates decrease (shaded red); 0% indicates no change (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulatvie 4 Scenario	0.99	Russian R at Dry C	-20%	-33%	-22%	-26%	-31%	-4%	-18%	-5%	-5%	-3%	-2%	-10%
		Hacienda Bridge	0%	-30%	-54%	-54%	-44%	-5%	-22%	0%	0%	0%	0%	0%
	0.95	Russian R at Dry C	-14%	-36%	-34%	-23%	-16%	-5%	-13%	-11%	-7%	-2%	0%	-3%
		Hacienda Bridge	-24%	-54%	-39%	-31%	-18%	-3%	-15%	-18%	-24%	-24%	-24%	-24%
	0.90	Russian R at Dry C	-10%	-34%	-30%	-19%	-14%	-3%	-10%	-13%	-7%	-2%	0%	-2%
		Hacienda Bridge	-24%	-34%	-44%	-18%	-16%	-4%	-9%	-26%	-24%	-24%	-24%	-24%
	0.75	Russian R at Dry C	-11%	-28%	-27%	-18%	-15%	-4%	-5%	-13%	-7%	0%	-1%	-3%
		Hacienda Bridge	-18%	-41%	-34%	-15%	-13%	-4%	-5%	-19%	-24%	-24%	-24%	-24%
	0.50	Russian R at Dry C	-17%	-21%	-16%	-11%	-8%	-2%	-2%	-9%	-5%	-1%	-2%	-3%
		Hacienda Bridge	-44%	-36%	-15%	-7%	-6%	-1%	-2%	-11%	-3%	0%	-18%	-18%
	0.05	Russian R at Dry C	-71%	-10%	-6%	-1%	-2%	-2%	-1%	-2%	-14%	0%	0%	-4%
		Hacienda Bridge	-81%	-6%	-4%	-1%	-2%	-1%	-1%	-4%	-18%	-7%	0%	0%

Table 5.7.1-27. Estimated stage (feet) at various flow exceedances at gages in the Lower Russian River under Proposed Project Conditions (left panel of table) and difference under the Cumulative 4 Scenario (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Exceedance	Node	Proposed Project					Cumulative 4Scenario				
		Jun	Jul	Aug	Sep	Oct	Jun	Jul	Aug	Sep	Oct
0.99	Hacienda Bridge	1.2	1.2	1.2	1.2	1.2	0.0	0.0	0.0	0.0	0.0
0.95	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	-0.2	-0.2	-0.2	-0.2	-0.2
0.90	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	-0.2	-0.2	-0.2	-0.2	-0.2
0.75	Hacienda Bridge	1.3	1.3	1.3	1.3	1.3	-0.2	-0.2	-0.2	-0.2	-0.1
0.50	Hacienda Bridge	1.3	1.3	1.3	1.3	1.8	0.0	0.0	-0.1	-0.1	-0.5
0.05	Hacienda Bridge	2.8	1.4	1.3	1.3	4.3	-0.3	0.0	0.0	0.0	-2.5

Impact 5.7.1-4. Implementation of the Fish Habitat Flows and Water Rights Project could substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or sedimentation on- or off-site in the Upper Russian River in combination with the No Potter Valley Project (Cumulative 1 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)

Impact 5.7.1-5. Implementation of the Fish Habitat Flows and Water Rights Project could substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or sedimentation on- or off-site in the Upper Russian River in combination with the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario) and the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario). (Cumulatively Less than Significant)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario, stage at USGS gages along the Upper Russian would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Table 5.7.1-28). The stage change at the Hopland USGS gage at the 0.50 exceedance is 0.5 to 0.6 foot compared to the overall stage heights of 0.5 to 3.5 feet and would expose previously submerged streambank (**Figure 5.7.1-1**). The bank would be exposed throughout the year and would likely lead to greater erosion from surface runoff during precipitation or bank erosion from high water velocity.

At the 0.05 exceedance (wettest condition), the Cumulative 1 Scenario results in large stage decreases in October relative to the Proposed Project (Table 5.7.1-28). The greatest changes would occur upstream near Coyote Valley Dam at the Hopland USGS gage. The decreases in stage in October would be relatively large and would persist through November and December, with lower decreases persisting through the remainder of the year, including during the rainy season (**Figure 5.7.1-2**). Under the Cumulative 1 Scenario, streambanks would be exposed throughout the year and would be likely lead to greater erosion from surface runoff during precipitation or bank erosion from high water velocity. Thus, under the Cumulative 1 Scenario, the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively significant and unavoidable and no mitigation is available.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Cumulative 2 Scenario, stage at USGS gages along the Upper Russian would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Table 5.7.1-29). The stage decrease at the Hopland USGS gage at the 0.50 and 0.05 exceedances flow would be 0.1 throughout most of the year, but greater (up to 0.6 foot) in October, November, and December (**Figure 5.7.1-3** and **Figure 5.7.1-4**). These decreases would expose previously submerged streambank but exposure would be relatively small compared to overall stage heights and would not be likely to cause increased erosion. Further, since the changes are relatively small compared to the overall stage heights, there would be little effect.

Table 5.7.1-28. Changes in stage (feet) compared to the Proposed Project under the Cumulative 1 Scenario Alternative at USGS gages along the Upper Russian River by month at various exceedance probabilities (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 1 Scenario	0.99	Hopland	-0.6	-0.6	-0.6	-0.5	-0.6	-0.4	-0.6	-0.5	-0.5	-0.5	-0.3	-0.5
		Cloverdale	-0.1	-0.4	-0.4	-0.5	-0.6	-0.1	-0.3	-0.1	-0.1	-0.2	-0.1	-0.3
		Healdsburg	0.0	-0.2	-0.2	-0.2	-0.2	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
	0.95	Hopland	-0.6	-0.6	-0.6	-0.6	-0.3	-0.1	-0.3	-0.5	-0.5	-0.4	-0.3	-0.2
		Cloverdale	-0.3	-0.4	-0.6	-0.5	-0.1	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.2
		Healdsburg	0.0	-0.2	-0.2	-0.2	-0.1	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0
	0.90	Hopland	-0.6	-0.6	-0.6	-0.4	-0.6	-0.1	-0.2	-0.4	-0.5	-0.4	-0.3	-0.3
		Cloverdale	-0.5	-0.6	-0.6	-0.4	-0.3	0.0	-0.2	-0.3	-0.3	-0.4	-0.4	-0.3
		Healdsburg	-0.1	-0.2	-0.2	-0.1	-0.2	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
	0.75	Hopland	-0.5	-0.6	-0.5	-0.6	-0.8	0.0	-0.1	-0.4	-0.5	-0.3	-0.4	-0.4
		Cloverdale	-0.5	-0.6	-0.4	-0.3	-0.4	0.0	-0.1	-0.3	-0.4	-0.4	-0.4	-0.4
		Healdsburg	-0.3	-0.2	-0.1	-0.2	-0.2	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.2
	0.5	Hopland	-0.5	-0.5	-0.7	-0.7	-0.6	0.0	0.0	-0.2	-0.3	-0.3	-0.3	-0.4
		Cloverdale	-0.5	-0.5	-0.3	-0.3	-0.3	0.0	0.0	-0.1	-0.3	-0.4	-0.4	-0.4
		Healdsburg	-0.2	-0.2	-0.2	-0.2	-0.2	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2
	0.05	Hopland	-2.9	-1.1	-1.2	-0.4	-0.4	-0.5	-0.1	-0.2	-0.2	-0.1	-0.2	-0.2
		Cloverdale	-2.0	-0.3	-0.5	-0.3	-0.1	-0.2	0.0	-0.1	-0.1	-0.1	-0.1	-0.2
		Healdsburg	-1.2	-0.2	-0.4	-0.1	-0.1	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0

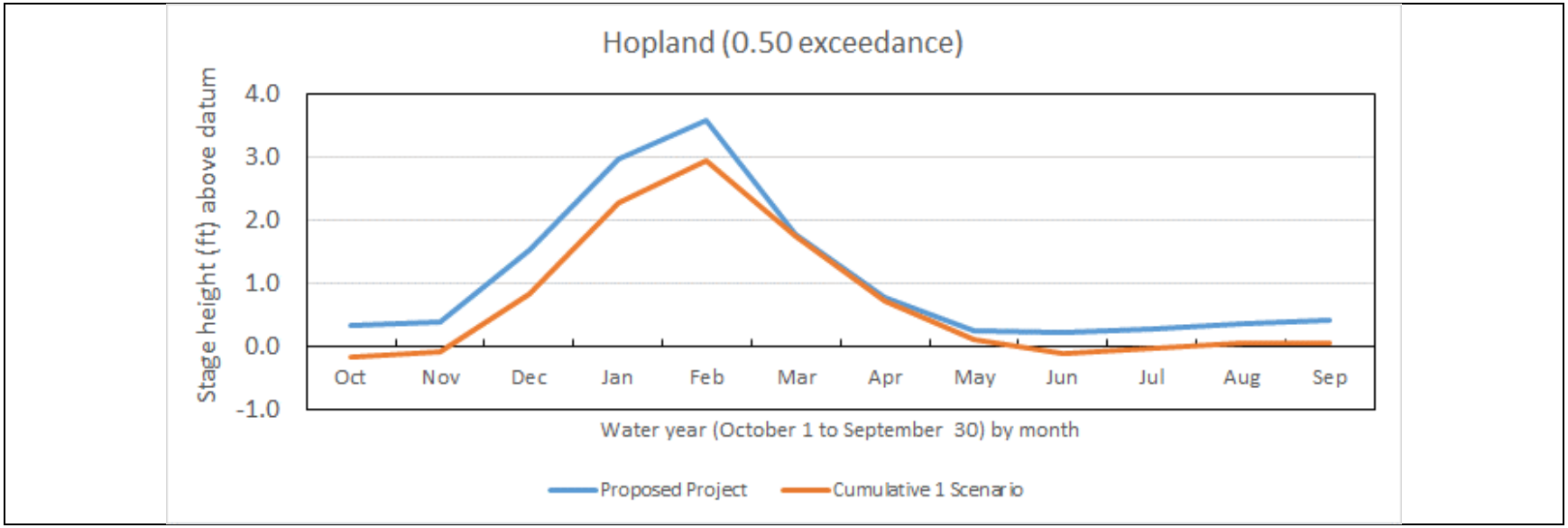

Figure 5.7.1-1. Stage height at the Hopland USGS gage under the Proposed Project and the Cumulative 1 Scenario (0.50 exceedance).

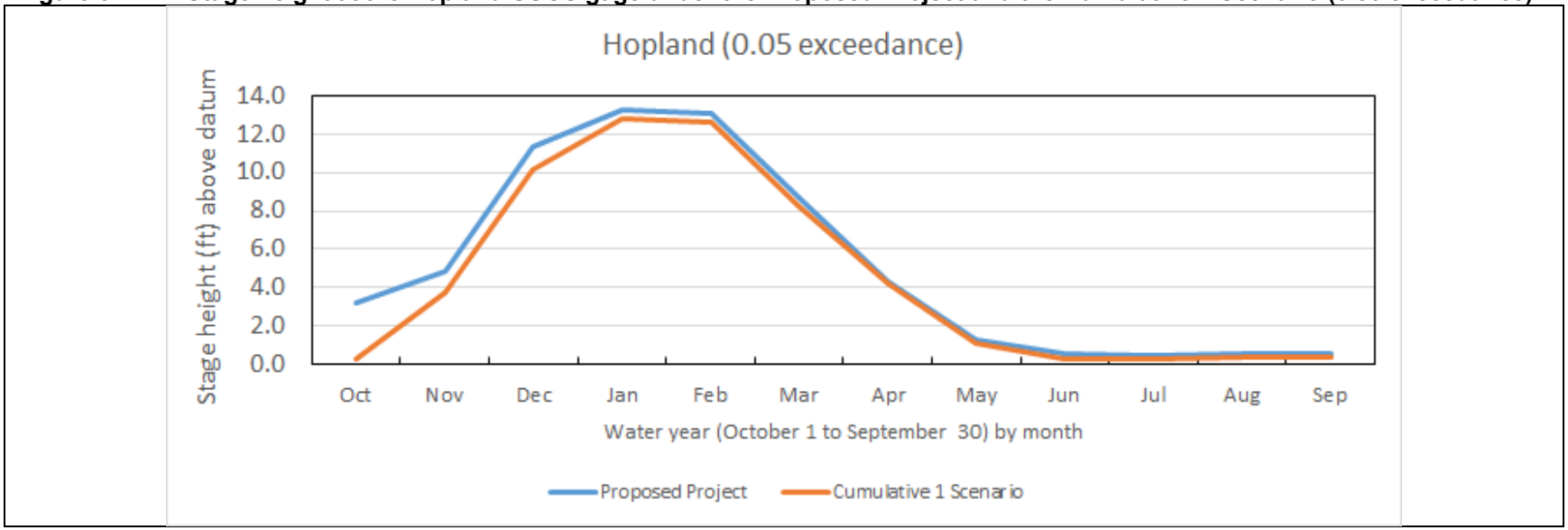

Figure 5.7.1-2. Stage height at the Hopland USGS gage under the Proposed Project and the Cumulative 1 Scenario (0.05 exceedance).

Table 5.7.1-29. Changes in stage (feet) compared to the Proposed Project under the Cumulative 2 Scenario Alternative at USGS gages along the Upper Russian River by month at various exceedance probabilities (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 2 Scenario	0.99	Hopland	-0.6	-0.6	-0.6	-0.1	-0.3	-0.4	-0.3	-0.4	-0.5	-0.3	-0.1	-0.2
		Cloverdale	0.0	-0.3	-0.4	0.0	-0.2	-0.1	0.0	0.0	-0.1	-0.1	0.0	-0.1
		Healdsburg	0.0	-0.2	-0.2	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.95	Hopland	-0.4	-0.3	-0.3	0.0	-0.2	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1
		Cloverdale	-0.1	0.0	-0.2	0.0	-0.1	0.0	-0.1	0.0	-0.1	-0.1	0.0	0.0
		Healdsburg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.90	Hopland	-0.3	-0.1	0.0	-0.1	-0.3	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.1
		Cloverdale	-0.2	0.0	0.0	0.0	-0.1	0.0	-0.1	-0.1	-0.1	-0.1	-0.2	-0.1
		Healdsburg	-0.1	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1
	0.75	Hopland	0.0	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	-0.1	0.0	0.0	-0.1
		Cloverdale	0.0	0.0	-0.1	-0.1	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	-0.1
		Healdsburg	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
	0.5	Hopland	-0.1	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.0
		Cloverdale	0.0	-0.2	-0.1	0.0	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
		Healdsburg	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.05	Hopland	-0.2	-0.6	-0.3	0.0	-0.1	-0.1	0.0	-0.1	-0.1	0.0	-0.1	0.0
		Cloverdale	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
		Healdsburg	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

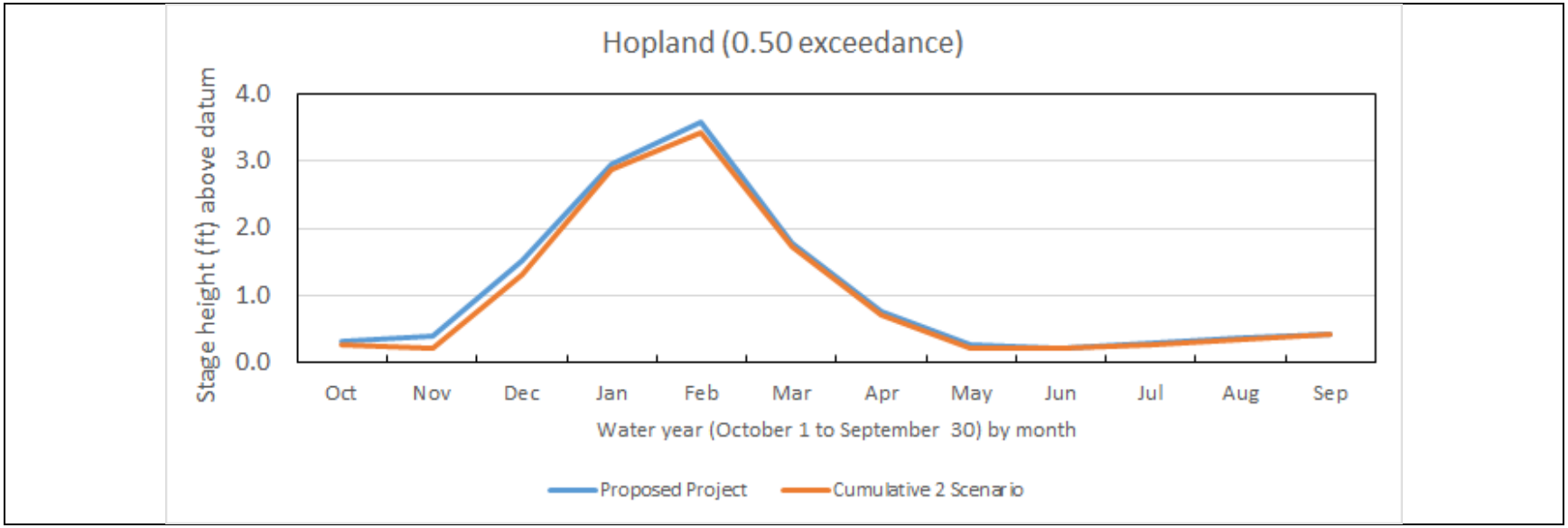

Figure 5.7.1-3. Stage height at the Hopland USGS gage under the Proposed Project and the Cumulative 2 Scenario (0.50 exceedance).

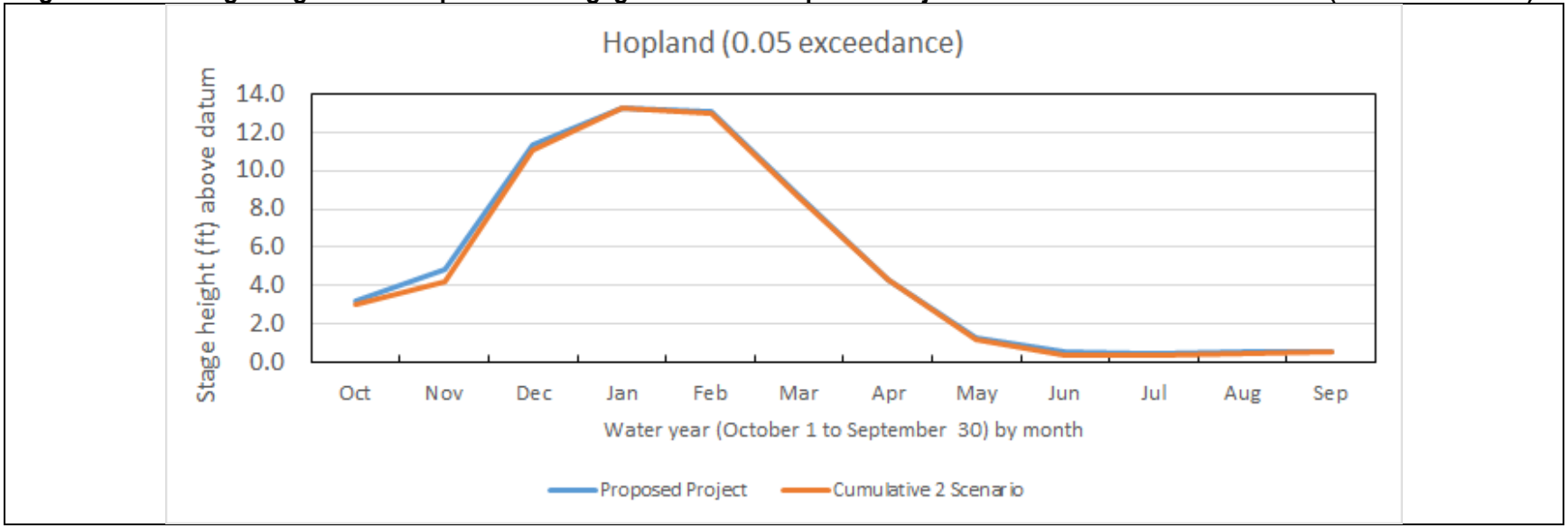

Figure 5.7.1-4. Stage height at the Hopland USGS gage under the Proposed Project and the Cumulative 2 Scenario (0.05 exceedance).

on water surface slope, and resulting erosion from or within tributaries under the Cumulative 2 Scenario and the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario, stage at USGS gages along the Upper Russian would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Table 5.7.1-30).

The stage decrease at the Hopland USGS gage at the 0.50 and 0.05 exceedances flow would be 0.1 to 0.5 foot throughout the year (**Figure 5.7.1-5** and **Figure 5.7.1-6**). These decreases would expose previously submerged streambank but exposure would be relatively small compared to overall stage heights and would not be likely to cause increased erosion. Further, since the changes are relatively small compared to the overall stage heights, there would be little effect on water surface slope, and resulting erosion from or within tributaries under the Cumulative 3 Scenario and the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Under the Cumulative 4 Scenario, stage at USGS gages along the Upper Russian would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Table 5.7.1-31).

At the 0.50 exceedance, the stage decrease at the Hopland USGS gage would be 0.1 to 0.8 foot compared to the overall stage heights of 0.5 to 3.5 feet and would expose previously submerged streambank (**Figure 5.7.1-7**). The bank would be exposed throughout the year and would likely lead to greater erosion from surface runoff during precipitation or bank erosion from high water velocity

At the 0.05 exceedance, the Cumulative 4 Scenario results in large stage decreases in October relative to the Proposed Project (**Figure 5.7.1-8**). The greatest changes would occur upstream near Coyote Valley Dam at the Hopland USGS gage. The decreases in stage in October would be large (2.9 feet), and relatively large stage decreases would persist through November and December, with lower decreases persisting throughout the year, including during the rainy season (Table 5.7.1-31). Under the Cumulative 4 Scenario, streambanks would be exposed throughout the year and would be likely lead to greater erosion from surface runoff during precipitation or bank erosion from high water velocity. Thus, under the Cumulative 4 Scenario, the impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively significant and unavoidable and no mitigation is available.

Table 5.7.1-30. Changes in stage (feet) compared to the Proposed Project under the Cumulative 3 Scenario Alternative at USGS gages along the Upper Russian River by month at various exceedance probabilities (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 3 Scenario	0.99	Hopland	-0.4	-0.3	-0.3	-0.1	-0.3	-0.3	-0.3	-0.4	-0.4	-0.2	-0.1	-0.2
		Cloverdale	0.0	0.0	0.0	0.0	-0.2	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
		Healdsburg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.95	Hopland	-0.3	-0.3	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1
		Cloverdale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Healdsburg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.90	Hopland	-0.2	0.0	0.0	0.0	-0.2	0.0	0.0	-0.2	-0.2	-0.1	-0.1	-0.1
		Cloverdale	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
		Healdsburg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.75	Hopland	0.0	0.0	0.0	-0.1	-0.2	0.0	0.0	-0.2	-0.1	0.0	0.0	0.0
		Cloverdale	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	0.0	0.0	0.0
		Healdsburg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0
	0.5	Hopland	0.0	-0.1	-0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Cloverdale	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Healdsburg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.05	Hopland	-0.1	-0.5	-0.1	0.0	-0.1	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0
		Cloverdale	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Healdsburg	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

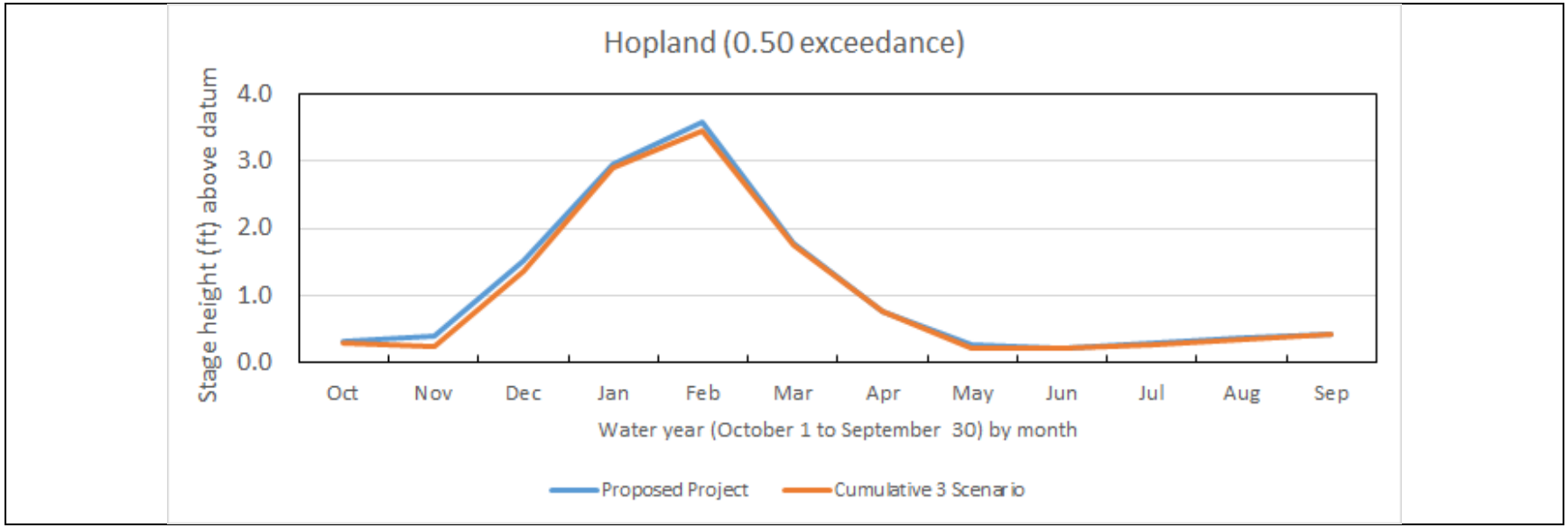

Figure 5.7.1-5. Stage height at the Hopland USGS gage under the Proposed Project and the Cumulative 3 Scenario (0.50 exceedance).

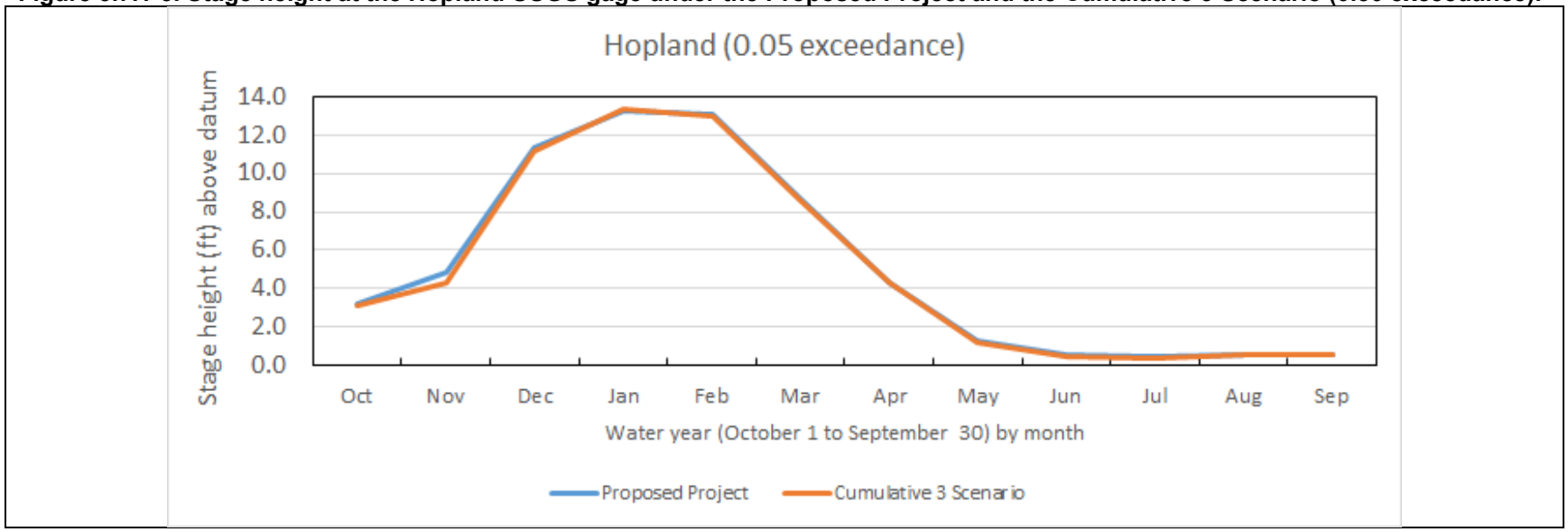

Figure 5.7.1-6. Stage height at the Hopland USGS gage under the Proposed Project and the Cumulative 3 Scenario (0.05 exceedance).

Table 5.7.1-31. Changes in stage (feet) compared to the Proposed Project under the Cumulative 4 Scenario Alternative at USGS gages along the Upper Russian River by month at various exceedance probabilities (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alternative	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 4 Scenario	0.99	Hopland	-1.5	-1.5	-1.4	-0.5	-0.6	-0.5	-0.6	-0.5	-0.5	-0.5	-0.3	-1.5
		Cloverdale	-0.7	-0.9	-0.8	-0.5	-0.6	-0.2	-0.3	-0.1	-0.1	-0.2	-0.1	-0.3
		Healdsburg	0.0	-0.3	-0.3	-0.2	-0.2	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
	0.95	Hopland	-1.5	-1.4	-0.6	-0.6	-0.4	-0.2	-0.4	-0.5	-0.5	-0.5	-0.4	-0.4
		Cloverdale	-0.3	-0.7	-0.6	-0.6	-0.2	-0.1	-0.3	-0.2	-0.2	-0.3	-0.3	-0.2
		Healdsburg	0.0	-0.2	-0.3	-0.2	-0.1	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0
	0.90	Hopland	-0.6	-0.6	-0.6	-0.4	-0.6	-0.1	-0.3	-0.4	-0.5	-0.4	-0.4	-0.3
		Cloverdale	-0.5	-0.7	-0.6	-0.4	-0.3	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4	-0.4
		Healdsburg	-0.1	-0.3	-0.2	-0.1	-0.2	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
	0.75	Hopland	-0.6	-0.6	-0.6	-0.6	-0.8	-0.1	-0.2	-0.5	-0.5	-0.3	-0.4	-0.4
		Cloverdale	-0.6	-0.7	-0.5	-0.4	-0.4	0.0	-0.1	-0.3	-0.5	-0.4	-0.4	-0.4
		Healdsburg	-0.3	-0.3	-0.2	-0.2	-0.3	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.2
	0.5	Hopland	-0.5	-0.8	-0.7	-0.7	-0.7	-0.1	-0.1	-0.2	-0.3	-0.3	-0.4	-0.4
		Cloverdale	-0.5	-0.6	-0.3	-0.3	-0.3	0.0	0.0	-0.2	-0.4	-0.4	-0.4	-0.4
		Healdsburg	-0.3	-0.2	-0.2	-0.2	-0.2	0.0	0.0	-0.1	-0.1	-0.2	-0.3	-0.3
	0.05	Hopland	-2.9	-1.1	-1.4	-0.5	-0.5	-0.5	-0.1	-0.3	-0.3	-0.1	-0.2	-0.2
		Cloverdale	-2.0	-0.3	-0.6	-0.4	-0.1	-0.2	0.0	-0.1	-0.3	-0.1	-0.2	-0.2
		Healdsburg	-1.2	-0.2	-0.4	-0.2	-0.1	-0.1	0.0	-0.1	-0.1	0.0	0.0	0.0

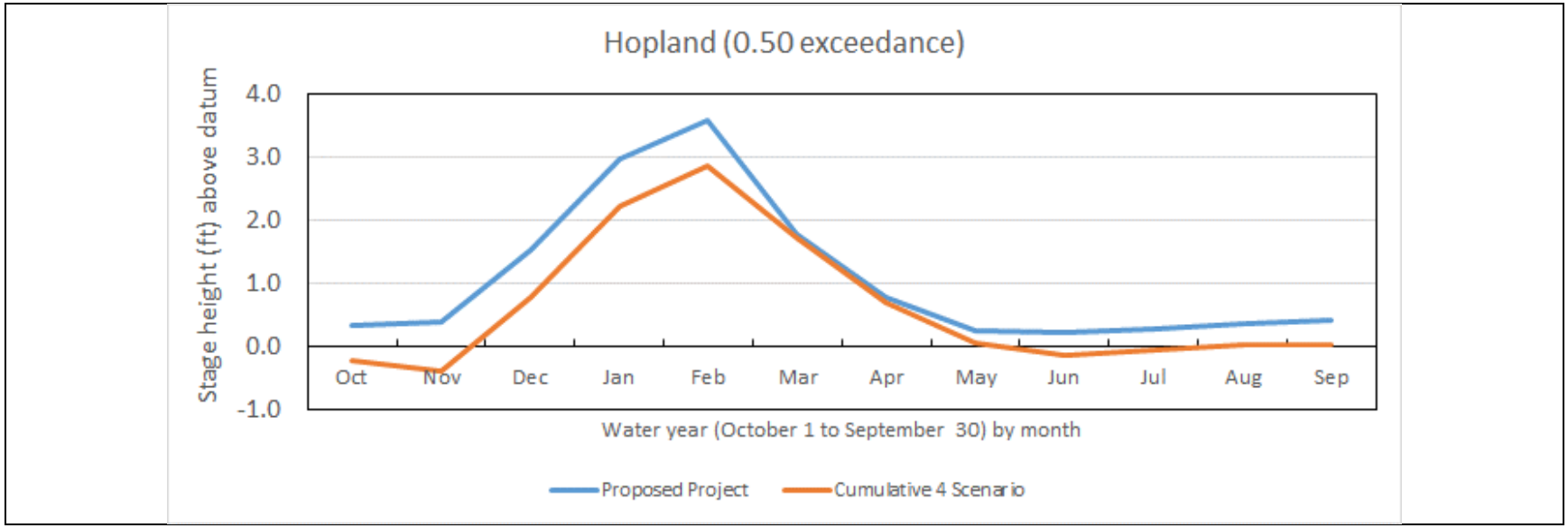

Figure 5.7.1-7. Stage height at the Hopland USGS gage under the Proposed Project and the Cumulative 4 Scenario (0.50 exceedance).

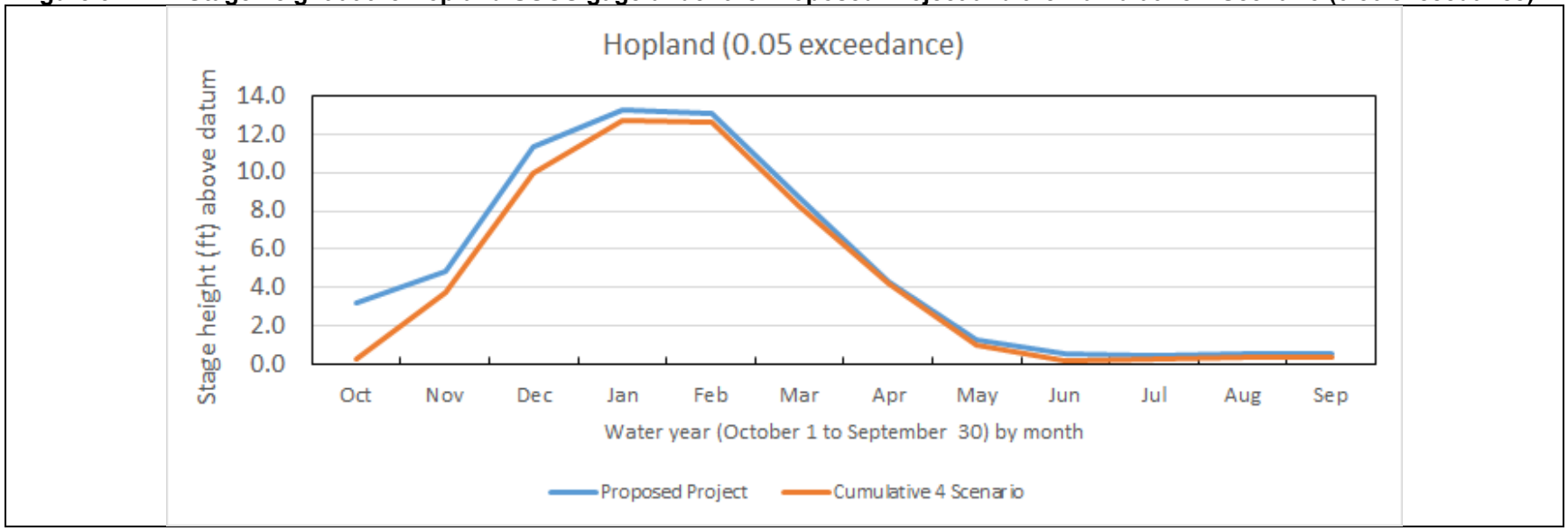

Figure 5.7.1-8. Stage height at the Hopland USGS gage under the Proposed Project and the Cumulative 4 Scenario (0.05 exceedance).

Impact 5.7.1-6. Implementation of the Fish Habitat Flows and Water Rights Project could substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or sedimentation on- or off-site in Dry Creek in combination with the No Potter Valley Project (Cumulative 1 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)

Impact 5.7.1-7. Implementation of the Fish Habitat Flows and Water Rights Project could substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or sedimentation on- or off-site in Dry Creek in combination with the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario) and the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario). (Cumulatively Less than Significant)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario, at USGS gages along Dry Creek, stage increases relative to the Proposed Project would occur from June through October, while stage would be similar or lower from November through May, with the largest decreases occurring from December through February under the 0.05 exceedance (wetter condition) (Table 5.7.1-32).

Modeling data show that stage would be slightly greater (0.1 to 0.3 foot) from June through October during the 0.50 exceedance conditions and similar or slightly lower the remainder of the year. Increases in stage would occur during lower flows from June to October, with low velocity, and are not likely to cause increased erosion (**Figure 5.7.1-9**). The stage decrease from November through April would be relatively small (0.1 foot) compared to the overall stage height (1.3 to 3.5 feet), there would be little effect on water surface slope, and resulting erosion from or within tributaries.

At the 0.05 exceedance, potential stage decreases from November through February would potentially expose up to 0.7 foot of streambank to erosion from runoff during months with heavy precipitation (**Figure 5.7.1-10**). This degree of potential exposure would occur relatively infrequently, but banks would be exposed more consistently across all exceedances from November through February (Table 5.7.1-32). The potential impact to drainage patterns and erosion and sedimentation could be significant. Thus, under the Cumulative 1 Scenario, the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively significant and unavoidable and no mitigation is available.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Cumulative 2 Scenario, at USGS gages along Dry Creek, stage relative to the Proposed Project would the same at the 0.50, 0.75, 0.90, 0.95, and 0.99 exceedances (with the exception a decrease of 0.1 foot at the Dry Creek at Geyserville gage during November at 0.95 exceedance) (Table 5.7.1-33). During wetter conditions (0.05 exceedance), stage would increase relative to the Proposed Project during October and February, and decrease in December and March (at the Dry Creek mouth USGS gage). Modeling data show that stage

Table 5.7.1-32.Changes in stage (feet) compared to the Proposed Project under the Cumulative 1 Scenario Alternative at USGS gages along Dry Creek by month at various exceedance probabilities (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 1 Scenario	0.99	Dry Cr at Geyserville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
		Dry Creek Mouth	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.95	Dry Cr at Geyserville	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
		Dry Creek Mouth	0.1	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	0.90	Dry Cr at Geyserville	0.1	-0.3	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
		Dry Creek Mouth	0.1	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	0.75	Dry Cr at Geyserville	0.2	-0.2	-0.2	0.0	-0.1	0.0	0.0	0.0	0.0	0.2	0.2	0.3
		Dry Creek Mouth	0.2	-0.1	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.1	0.2	0.2
	0.50	Dry Cr at Geyserville	0.1	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.2	0.3	0.3	0.3
		Dry Creek Mouth	0.1	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.1	0.2	0.3	0.3
	0.05	Dry Cr at Geyserville	0.2	-0.1	-0.5	-0.6	-0.7	0.0	0.0	0.0	0.1	0.1	0.1	0.1
		Dry Creek Mouth	0.2	-0.1	-0.4	-0.1	-0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1

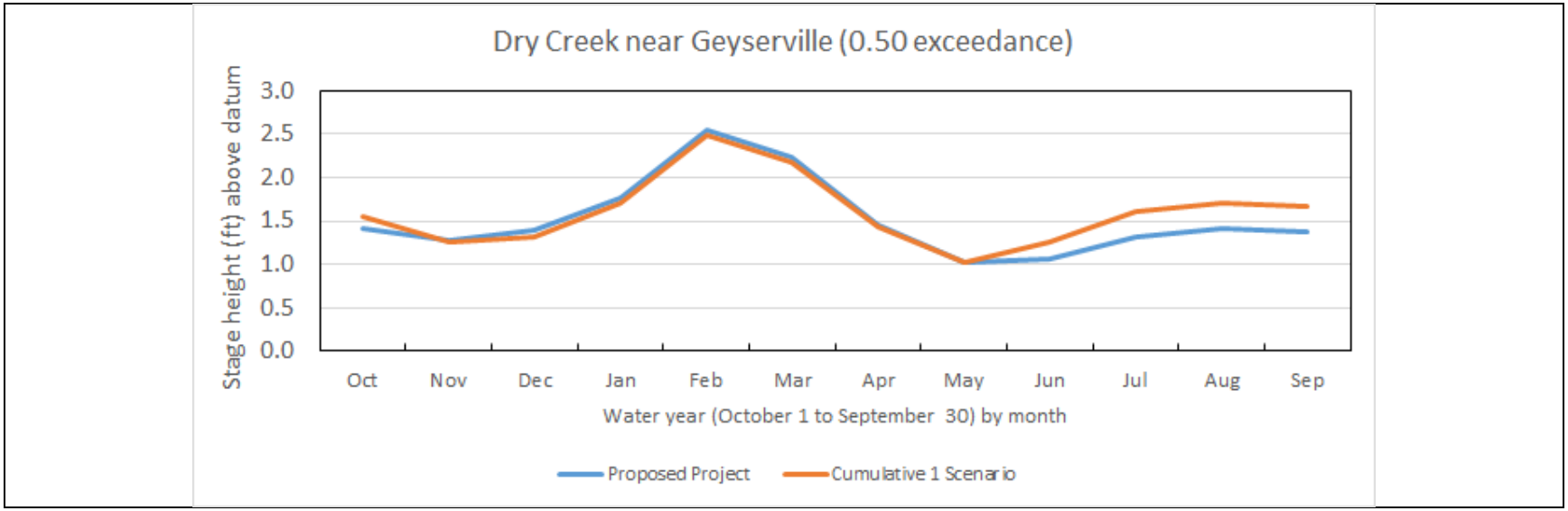

Figure 5.7.1-9. Stage height at the Dry Creek near Geyserville USGS gage under the Proposed Project and the Cumulative 1 Scenario (0.50 exceedance).

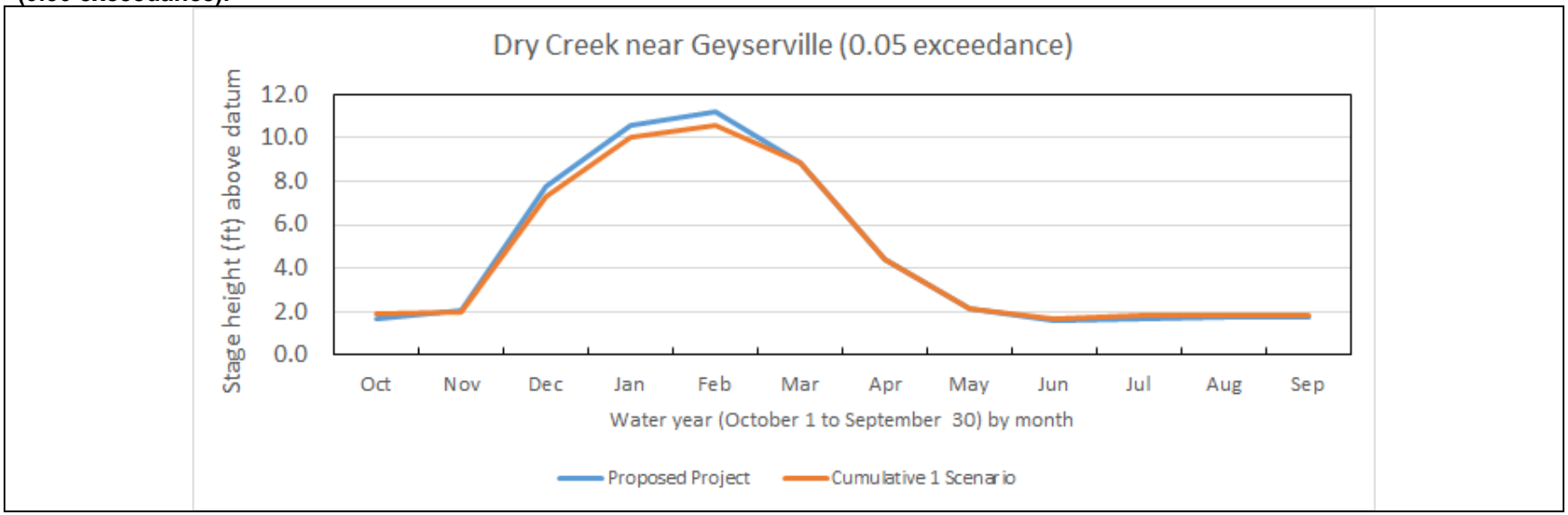

Figure 5.7.1-10. Stage height at the Dry Creek near Geyserville USGS gage under the Proposed Project and the Cumulative 1 Scenario (0.05 exceedance).

Table 5.7.1-33. Changes in stage (feet) compared to the Proposed Project under the Cumulative 2 Scenario Alternative at USGS gages along Dry Creek by month at various exceedance probabilities (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 2 Scenario	0.99	Dry Cr at Geyserville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
		Dry Creek Mouth	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.95	Dry Cr at Geyserville	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Dry Creek Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.90	Dry Cr at Geyserville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Dry Creek Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.75	Dry Cr at Geyserville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Dry Creek Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.50	Dry Cr at Geyserville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Dry Creek Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.05	Dry Cr at Geyserville	0.2	0.0	-0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Dry Creek Mouth	0.2	0.0	-0.2	0.0	0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0

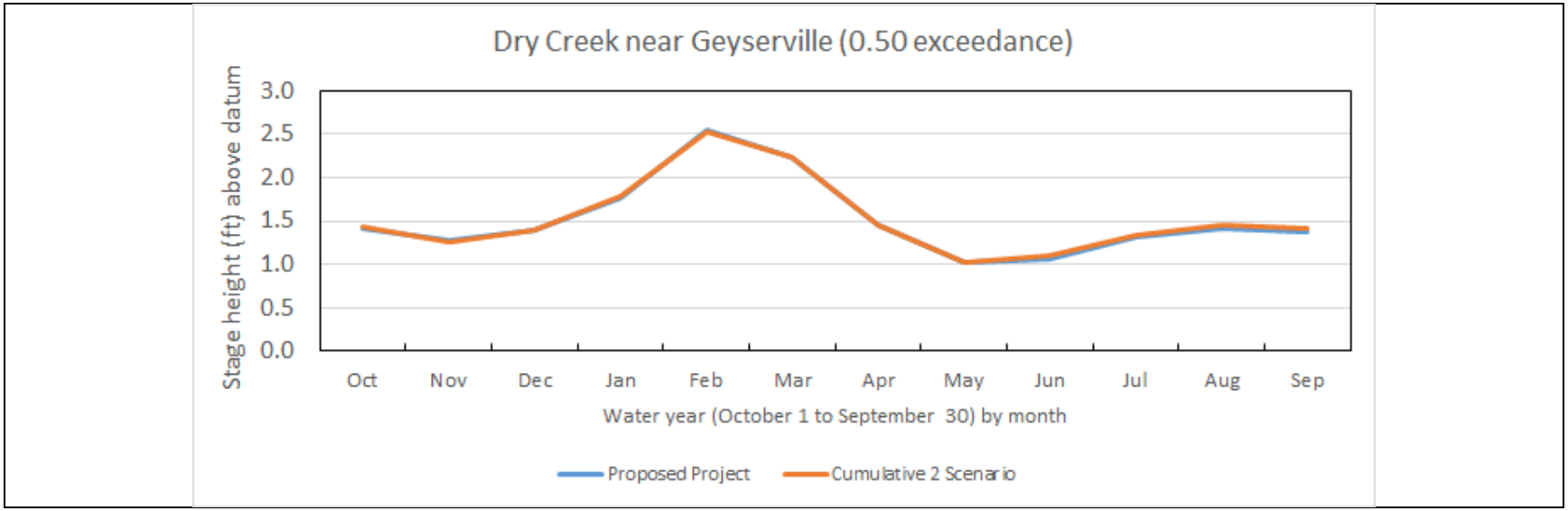

Figure 5.7.1-11. Stage height at the Dry Creek near Geyserville USGS gage under the Proposed Project and the Cumulative 2 Scenario (0.50 exceedance).

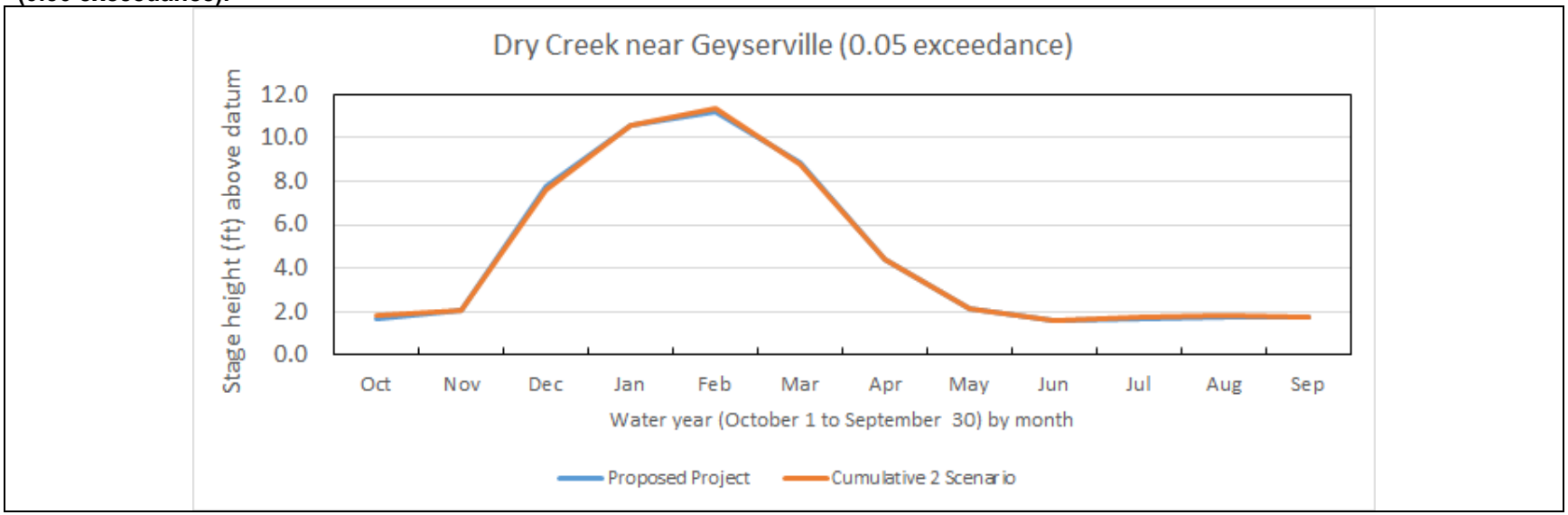

Figure 5.7.1-12. Stage height at the Dry Creek near Geyserville USGS gage under the Proposed Project and the Cumulative 2 Scenario (0.05 exceedance).

would be the same relative to the Proposed Project during median flow conditions (**Figure 5.7.1-11**) and there would be no effect on erosion. During wet conditions (0.05 exceedance), potential stage increases in October and February (0.2 foot), and decreases in December (0.2 foot) would be small compared to overall stage heights (1.4 to 2.5 feet) and there would be little effect on bank erosion or water surface slope resulting in erosion from or within tributaries (**Figure 5.7.1-12**). Thus, under the Cumulative 2 Scenario, the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario, at USGS gages along Dry Creek, stage relative to the Proposed Project would the same or slightly greater at the 0.50, 0.75, 0.90, 0.95, and 0.99 exceedances (with the exception of October at 0.75 exceedance and November at 0.95 exceedance) (Table 5.7.1-34). During wetter conditions (0.05 exceedance), stage would increase slightly relative to the Proposed Project during October and February (0.1 to 0.2 foot), and decrease slightly in December, January, March, and April (0.1 to 0.2 foot). Modeling data show that stage would be largely the same relative to the Proposed Project during median flow conditions, with slight increases (0.1 foot) in July and August (**Figure.5.7.1-13**), but there would be little effect on erosion. During wet conditions (0.05 exceedance), potential stage increases in October and February (0.1 to 0.2 foot), and decreases in December (0.1 to 0.2 foot) would be small compared to overall stage heights (1.4 to 2.5 feet) and there would be little effect on bank erosion or water surface slope resulting in erosion from or within tributaries (**Figure 5.7.1-14**). Thus, under the Cumulative 3 Scenario, the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Under the Cumulative 4 Scenario, at USGS gages along Dry Creek, stage increases relative to the Proposed Project would occur from June through October, while stage would be similar or lower from November through May, with the largest decreases occurring from December through February under wetter flow conditions (0.05 exceedance) (Table 5.7.1-35).

Modeling data show that stage would be slightly greater (0.1 to 0.3 foot) from June through October during the 0.50 exceedance and similar or slightly lower the remainder of the year. Increases in stage would occur during lower flows from June to October, with low velocity, and are not likely to cause increased erosion (**Figure 5.7.1-15**). The stage decrease from November through April would be relatively small (0.1 foot) compared to the overall stage height (1.3 to 3.5 feet), there would be little effect on water surface slope, and resulting erosion from or within tributaries.

At the 0.05 exceedance, potential stage decreases from November through February would potentially expose up to 1.1 foot of streambank to erosion from runoff during months with heavy precipitation (**Figure 5.7.1-16**). This degree of potential exposure would occur relatively

Table 5.7.1-34. Changes in stage (feet) compared to the Proposed Project under the Cumulative 3 Scenario Alternative at USGS gages along Dry Creek by month at various exceedance probabilities (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 3 Scenario	0.99	Dry Cr at Geyserville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
		Dry Creek Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	0.95	Dry Cr at Geyserville	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
		Dry Creek Mouth	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	0.90	Dry Cr at Geyserville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Dry Creek Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	0.75	Dry Cr at Geyserville	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Dry Creek Mouth	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
	0.50	Dry Cr at Geyserville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
		Dry Creek Mouth	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
	0.05	Dry Cr at Geyserville	0.1	0.0	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
		Dry Creek Mouth	0.0	0.0	-0.2	0.0	0.2	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0

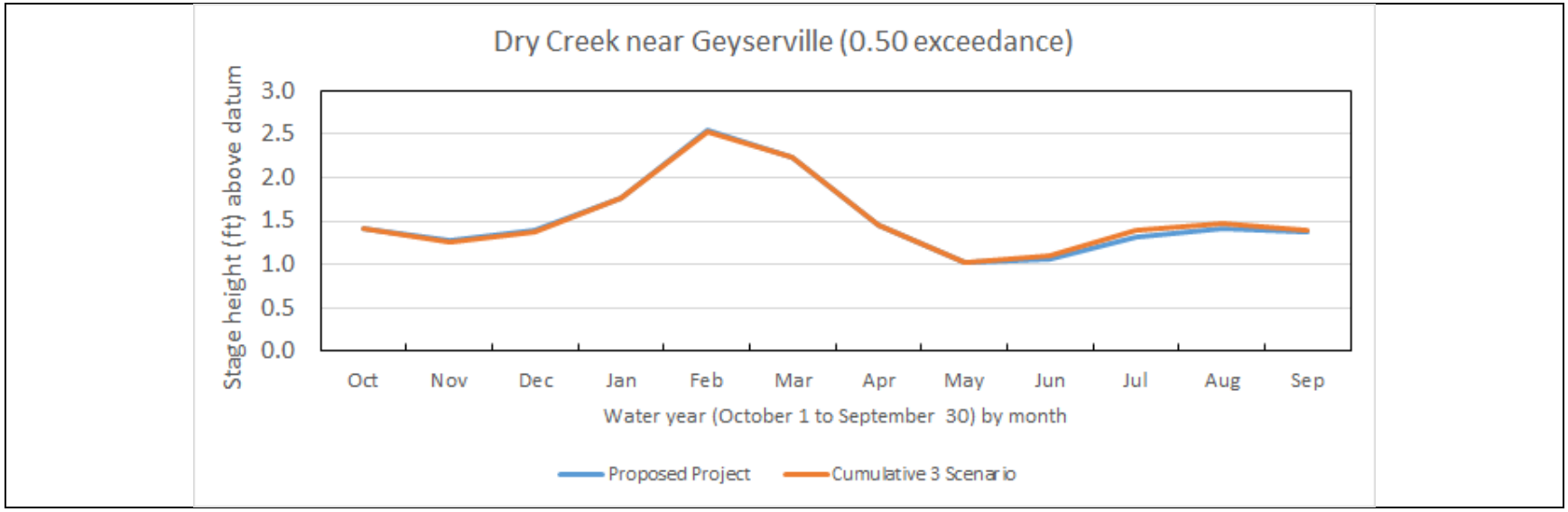

Figure.5.7.1-13. Stage height at the Dry Creek near Geyserville USGS gage under the Proposed Project and the Cumulative 3 Scenario (0.50 exceedance).

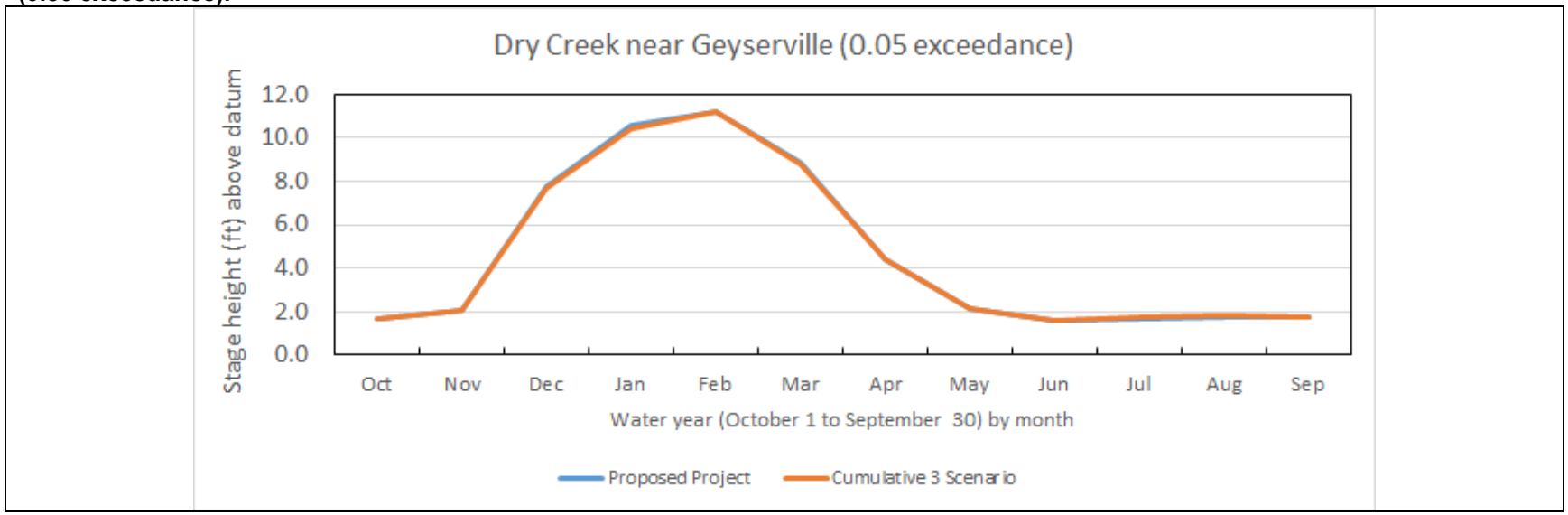

Figure 5.7.1-14. Stage height at the Dry Creek near Geyserville USGS gage under the Proposed Project and the Cumulative 3 Scenario (0.05 exceedance).

Table 5.7.1-35. Changes in stage (feet) compared to the Proposed Project under the Cumulative 4 Scenario Alternative at USGS gages along Dry Creek by month at various exceedance probabilities (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (no shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 4 Scenario	0.99	Dry Cr at Geyserville	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
		Dry Creek Mouth	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
	0.95	Dry Cr at Geyserville	0.1	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
		Dry Creek Mouth	0.1	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	0.90	Dry Cr at Geyserville	0.1	-0.2	-0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2
		Dry Creek Mouth	0.2	-0.2	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2
	0.75	Dry Cr at Geyserville	0.3	-0.2	-0.2	0.0	-0.1	-0.1	0.0	0.0	0.1	0.2	0.3	0.3
		Dry Creek Mouth	0.2	-0.1	0.0	0.0	-0.1	-0.1	0.0	0.0	0.1	0.2	0.3	0.3
	0.50	Dry Cr at Geyserville	0.2	0.0	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.3	0.4	0.4	0.4
		Dry Creek Mouth	0.2	0.0	-0.1	-0.1	-0.1	0.0	0.0	0.0	0.2	0.3	0.3	0.3
	0.05	Dry Cr at Geyserville	0.4	-0.1	-0.6	-0.7	-1.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
		Dry Creek Mouth	0.3	-0.1	-0.5	-0.3	0.0	-0.1	-0.1	0.0	0.0	0.1	0.1	0.1

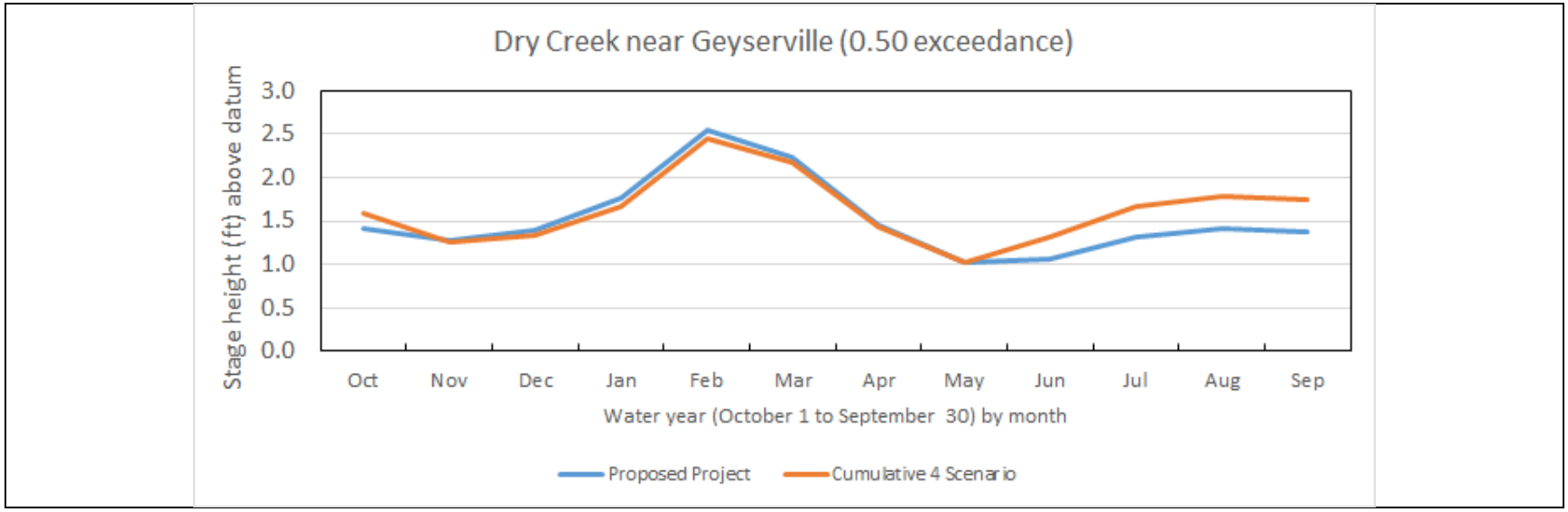

Figure 5.7.1-15. Stage height at the Dry Creek near Geyserville USGS gage under the Proposed Project and the Cumulative 4 Scenario (0.50 exceedance).

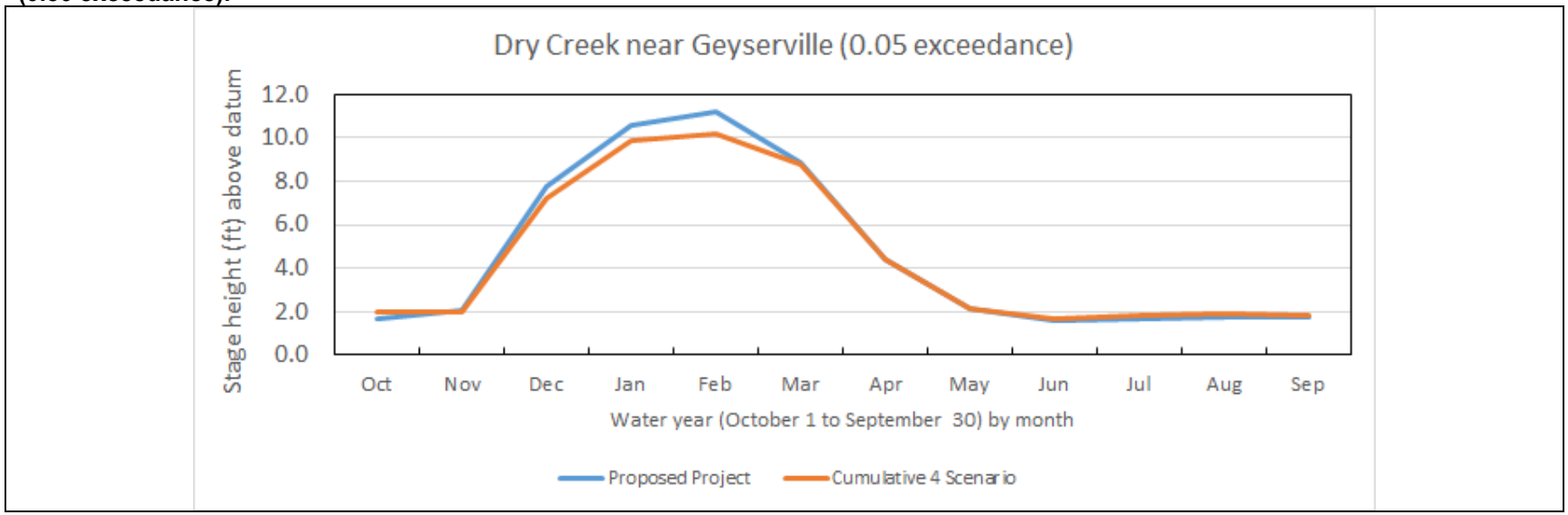

Figure 5.7.1-16. Stage height at the Dry Creek near Geyserville USGS gage under the Proposed Project and the Cumulative 4 Scenario (0.05 exceedance).

infrequently, but banks would be exposed more consistently across all exceedances from November through February. The potential impact to drainage patterns and erosion and sedimentation could be significant. Thus, under the Cumulative 4 Scenario, the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively significant and unavoidable and no mitigation is available.

Impact 5.7.1-8. Implementation of the Fish Habitat Flows and Water Rights Project could substantially alter the existing drainage pattern of a site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or sedimentation on- or off-site in the Lower Russian River in combination with the No Potter Valley Project (Cumulative 1 Scenario), the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less than Significant)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario, stage (relative to the Proposed Project) at the Hacienda Bridge USGS gage in the Lower Russian River would be similar or lower occur during all months and exceedances (Table 5.7.1-36).

Modeling data show that stage decreases are greatest from October through February across all exceedances, with the greatest decrease occurring in October during the 0.05 exceedance (wettest conditions). Decreases in stage from May to October would occur during lower flows, with low velocity, and would not be likely to cause increased erosion (**Figure 5.7.1-17** and **Figure 5.7.1-18**). Decreases from November through February would expose streambanks to erosion from surface runoff during precipitation or bank erosion from high water velocity, although the decreases would be slight compared to natural stage increases during the 0.50 (2 to 9 feet) and 0.05 exceedances (5 to 25 feet). The decrease in stage in October at 0.05 exceedance would be large (2.5 feet) relative to overall stage height (4.3 feet), but would also occur during periods of seasonal low flow. This could still cause bank erosion, but this potential change would occur relatively infrequently (at the 0.05 exceedance [approximately one out of twenty years]) during a single month (October). Further, natural stage increases due to seasonal rainfall would exceed the magnitude and duration of this stage increase. Under the Proposed Project and Cumulative 1 Scenario at the 0.05 exceedance, stage would increase above 5.0 feet (up to 25.0 feet) from November through May. Thus, under the Cumulative 1 Scenario, the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Cumulative 2 Scenario, stage (relative to the Proposed Project) at the Hacienda Bridge USGS gage in the Lower Russian River would be similar or lower occur during all months and exceedances (Table 5.7.1-37). Modeling data show that stage would be largely the same relative to the Proposed Project during all exceedances flow conditions, with slight decreases (0.1 to 0.3 foot), but there would likely be little effect on erosion. The decreases

Table 5.7.1-36. Estimated stage (feet) at various flow exceedances in the Lower Russian River under the Cumulative 1 Scenario Alternative (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 1 Scenario	0.99	Hacienda Br	0.0	-0.2	-0.6	-0.5	-0.4	0.0	-0.1	0.0	0.0	0.0	0.0	0.0
	0.95	Hacienda Br	-0.2	-0.6	-0.4	-0.3	-0.3	0.0	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2
	0.90	Hacienda Br	-0.2	-0.3	-0.5	-0.2	-0.3	0.0	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2
	0.75	Hacienda Br	-0.1	-0.5	-0.4	-0.3	-0.4	-0.1	0.0	-0.2	-0.2	-0.2	-0.2	-0.2
	0.50	Hacienda Br	-0.5	-0.5	-0.4	-0.3	-0.3	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.1
	0.05	Hacienda Br	-2.5	-0.3	-0.4	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2	0.0	0.0	0.0

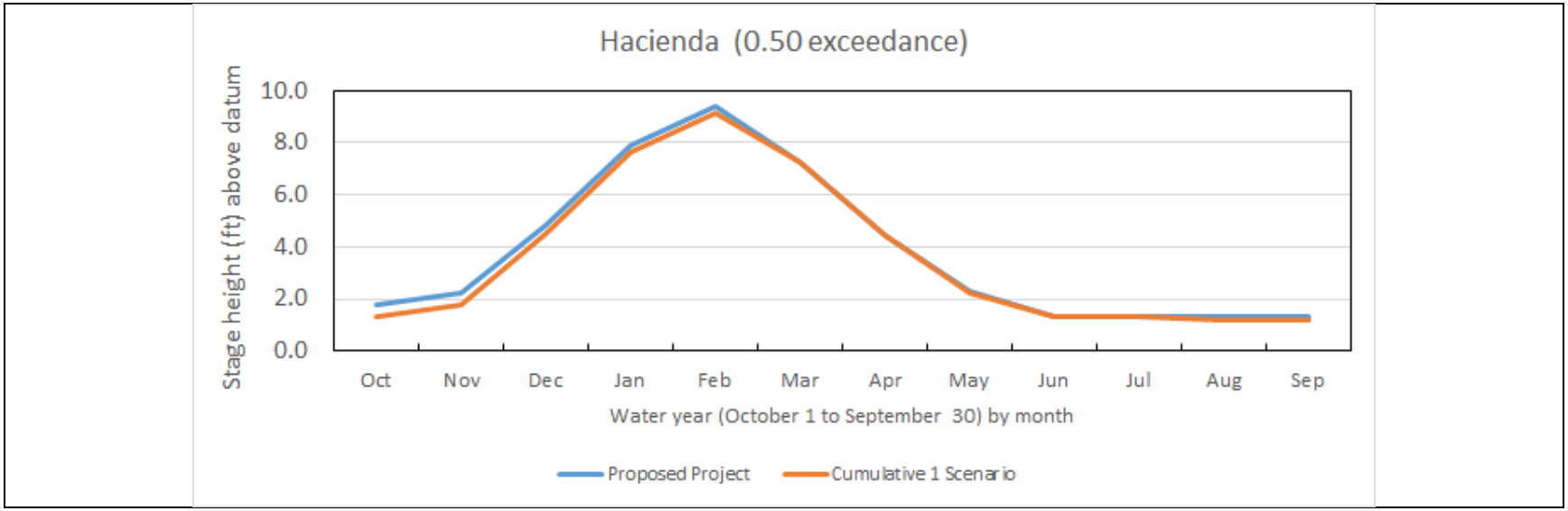

Figure 5.7.1-17. Stage height at the Hacienda Bridge USGS gage under the Proposed Project and the Cumulative 1 Scenario (0.50 exceedance).

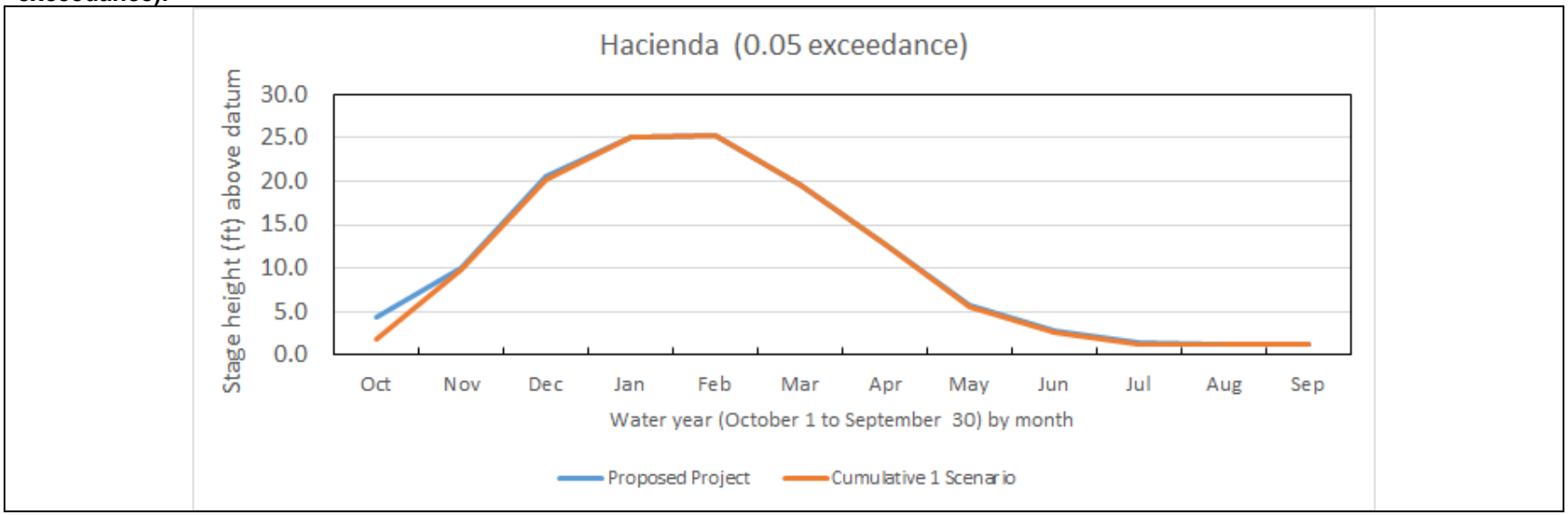

Figure 5.7.1-18. Stage height at the Hacienda Bridge USGS gage under the Proposed Project and the Cumulative 1 Scenario (0.05 exceedance).

Table 5.7.1-37. Estimated stage (feet) at various flow exceedances in the Lower Russian River under the Cumulative 2 Scenario Alternative (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 2 Scenario	0.99	Hacienda Br	0.0	0.0	-0.3	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.95	Hacienda Br	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
	0.90	Hacienda Br	0.0	0.0	-0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.75	Hacienda Br	0.0	-0.1	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
	0.50	Hacienda Br	-0.1	-0.2	-0.1	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0
	0.05	Hacienda Br	-0.2	-0.1	0.0	0.0	0.0	-0.1	0.0	0.0	-0.1	0.0	0.0	0.0

would be small compared to overall stage heights (**Figure 5.7.1-19** and **Figure 5.7.1-20**) and there would be little effect on bank erosion or water surface slope resulting in erosion from or within tributaries. Thus, under the Cumulative 2 Scenario, the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario, stage (relative to the Proposed Project) at the Hacienda Bridge USGS gage in the Lower Russian River would be similar or lower occur during all months and exceedances (Table 5.7.1-38). Modeling data show that stage would be largely the same relative to the Proposed Project during all exceedances flow conditions, with slight decreases (0.1 to 0.3 foot), but there would likely be very little effect on erosion. The decreases would be small compared to overall stage heights (**Figure 5.7.1-21**and **Figure 5.7.1-22**) and there would be little effect on bank erosion or water surface slope resulting in erosion from or within tributaries. Thus, under the Cumulative 3 Scenario, the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP

Under the Cumulative 4 Scenario, stage (relative to the Proposed Project) at the Hacienda Bridge USGS gage in the Lower Russian River would be similar or lower occur during all months and exceedances (Table 5.7.1-39).

Modeling data show that stage decreases are greatest from October through February across all exceedances, with the greatest decrease occurring in October during wetter conditions (0.05 exceedance). Decreases in stage from May to October would occur during lower flows, with low velocity, and would not be likely to cause increased erosion (**Figure 5.7.1-23** and **Figure 5.7.1-24**). Decreases from November through February would expose streambanks to erosion from surface runoff during precipitation or bank erosion from high water velocity, although the decreases would be slight compared to natural stage increases during the 0.50 (2 to 9 feet) and 0.05 exceedances (5 to 25 feet). The decrease in stage in October at the 0.05 exceedance would be large (2.5 feet) relative to overall stage height (4.3 feet), but would also occur during periods of seasonal low flow. This could still cause bank erosion, but this potential change would occur relatively infrequently (0.05 exceedance [approximately one out of twenty years]) during a single month (October). Further, natural stage increases due to seasonal rainfall would exceed the magnitude and duration of this stage increase. Under the Proposed Project and Cumulative 1 Scenario during the 0.05 exceedance, stage would increase above 5.0 feet (up to 25.0 feet) from November through May. Thus, under the Cumulative 4 Scenario, the potential impacts on hydrology associated with drainage patterns, resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

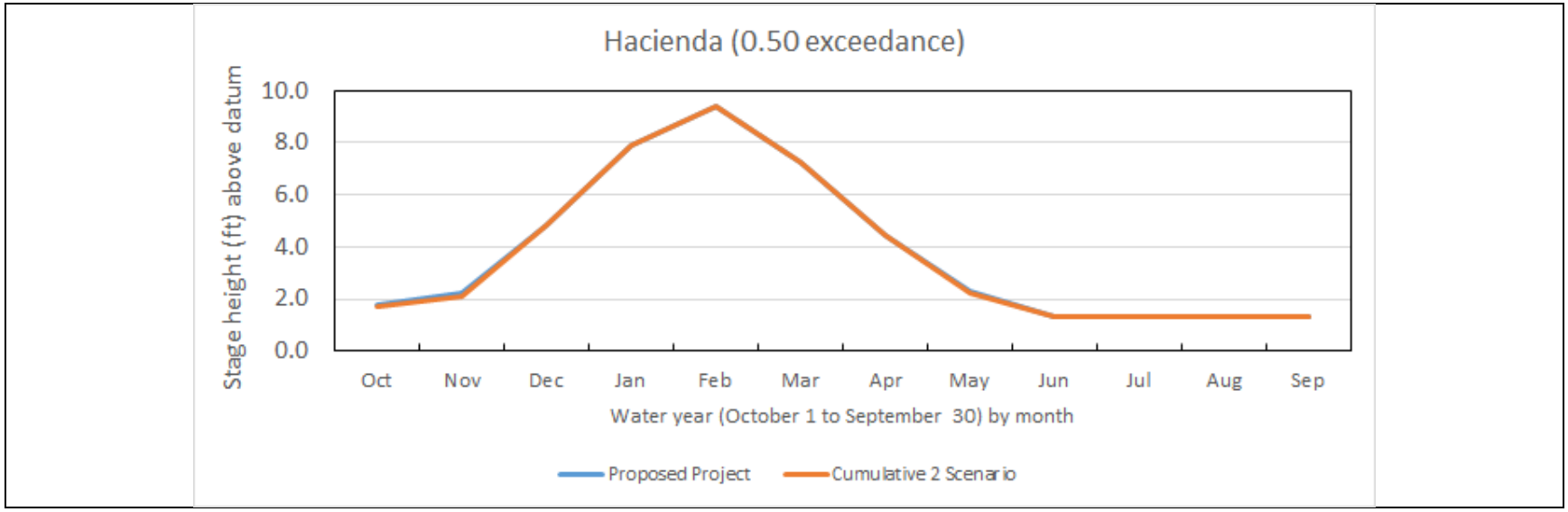

Figure 5.7.1-19. Stage height at the Hacienda Bridge USGS gage under the Proposed Project and the Cumulative 2 Scenario (0.50 exceedance).

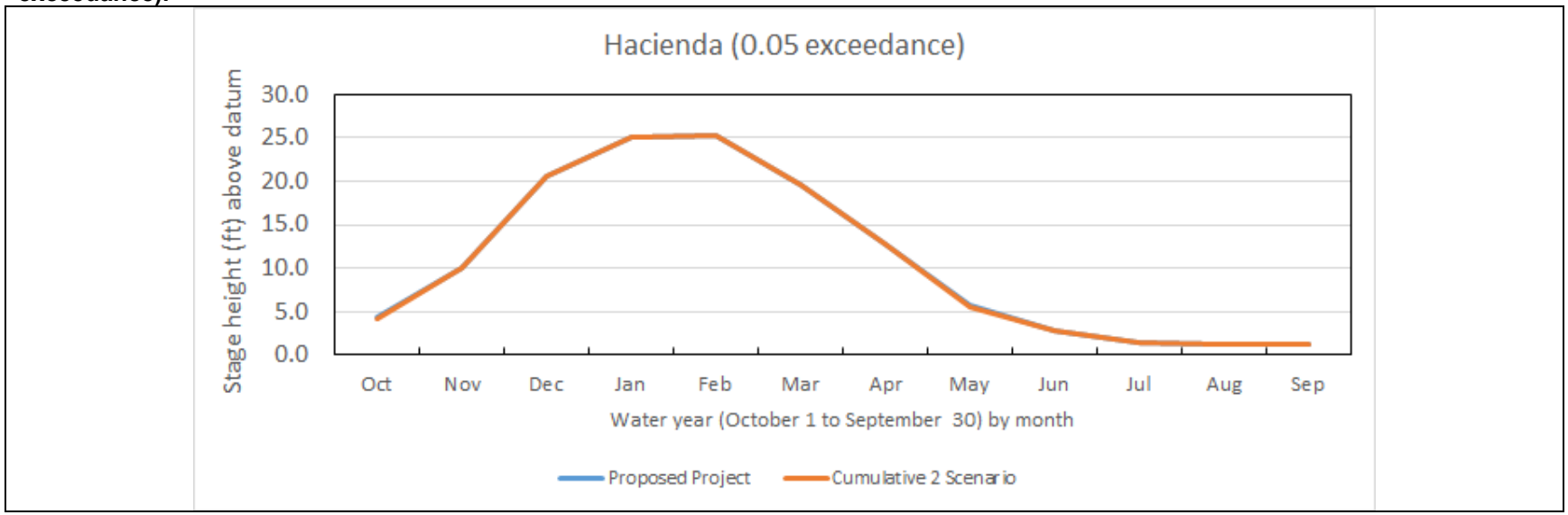

Figure 5.7.1-20. Stage height at the Hacienda Bridge USGS gage under the Proposed Project and the Cumulative 2 Scenario (0.05 exceedance).

Table 5.7.1-38. Estimated stage (feet) at various flow exceedances in the Lower Russian River under the Cumulative 3 Scenario Alternative (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 3 Scenario	0.99	Hacienda Br	0.0	0.0	-0.3	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.95	Hacienda Br	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1
	0.90	Hacienda Br	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.75	Hacienda Br	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.50	Hacienda Br	-0.1	-0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	0.05	Hacienda Br	-0.1	-0.1	0.0	0.1	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0

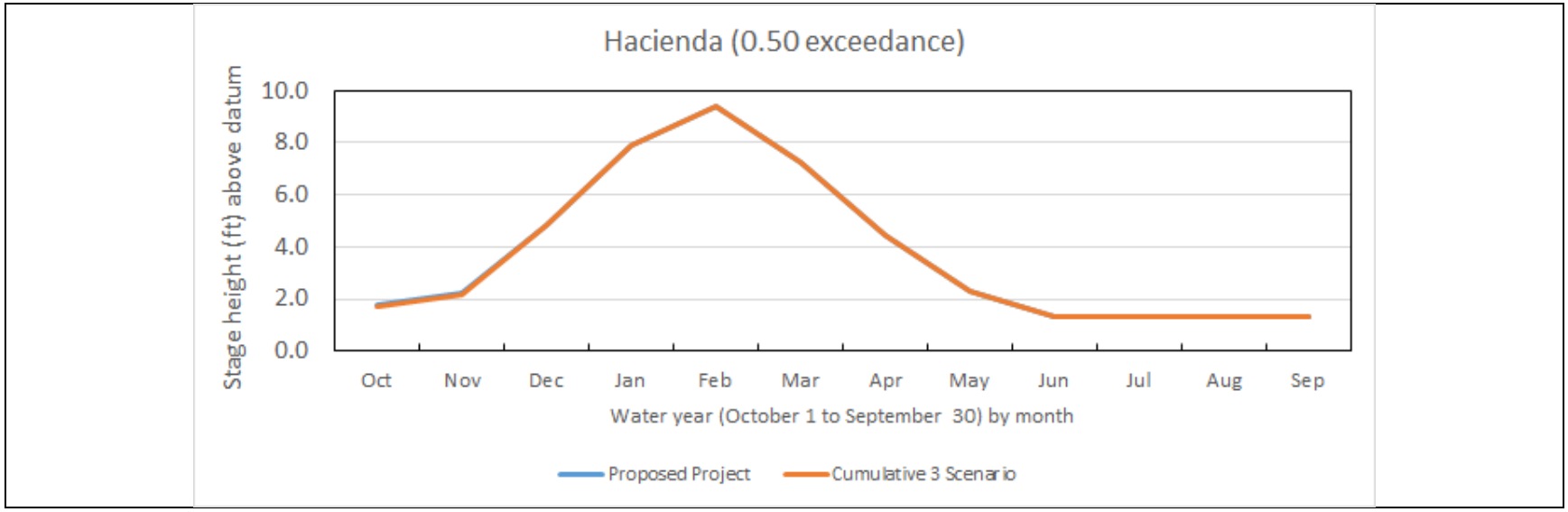

Figure 5.7.1-21. Stage height at the Hacienda Bridge USGS gage under the Proposed Project and the Cumulative 3 Scenario (0.50 exceedance).

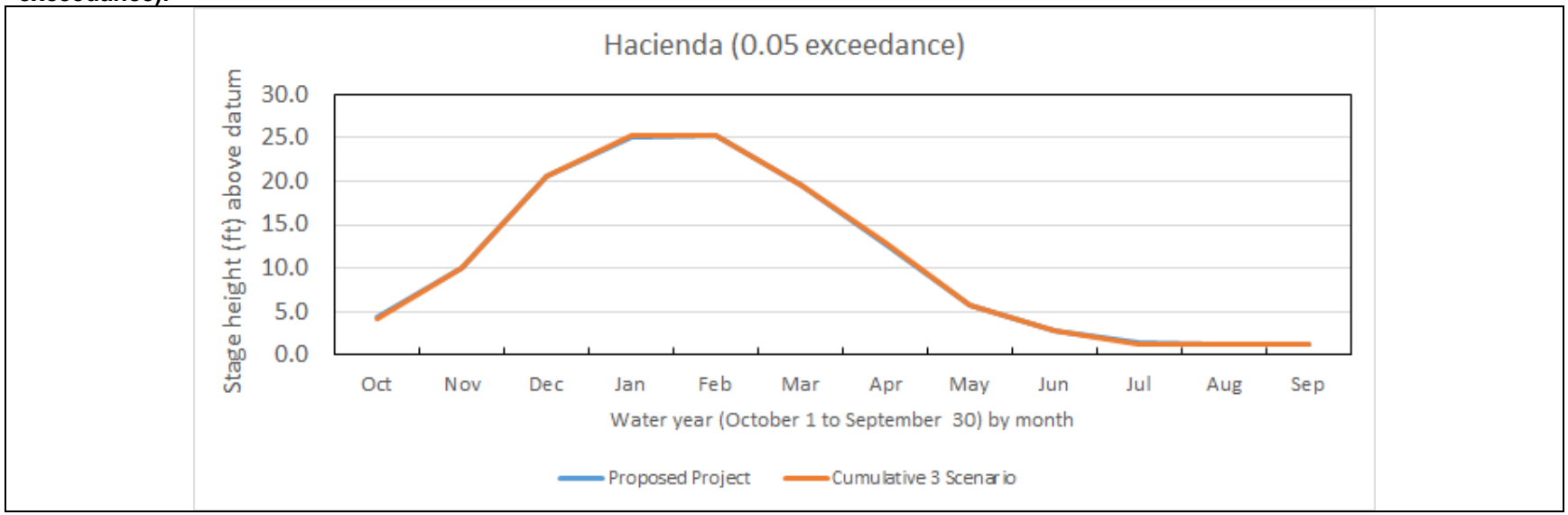

Figure 5.7.1-22. Stage height at the Hacienda Bridge USGS gage under the Proposed Project and the Cumulative 3 Scenario (0.05 exceedance).

Table 5.7.1-39. Estimated stage (feet) at various flow exceedances in the Lower Russian River under the Cumulative 4 Scenario Alternative (decreases in stage (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 4 Scenario	0.99	Hacienda Br	0.0	-0.2	-0.6	-0.6	-0.5	-0.1	-0.2	0.0	0.0	0.0	0.0	0.0
	0.95	Hacienda Br	-0.2	-0.6	-0.4	-0.4	-0.3	-0.1	-0.2	-0.1	-0.2	-0.2	-0.2	-0.2
	0.90	Hacienda Br	-0.2	-0.3	-0.5	-0.3	-0.3	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2
	0.75	Hacienda Br	-0.1	-0.5	-0.5	-0.3	-0.4	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-0.2
	0.50	Hacienda Br	-0.5	-0.5	-0.4	-0.3	-0.3	0.0	0.0	-0.1	0.0	0.0	-0.1	-0.1
	0.05	Hacienda Br	-2.5	-0.3	-0.5	-0.1	-0.2	-0.1	-0.1	-0.1	-0.3	0.0	0.0	0.0

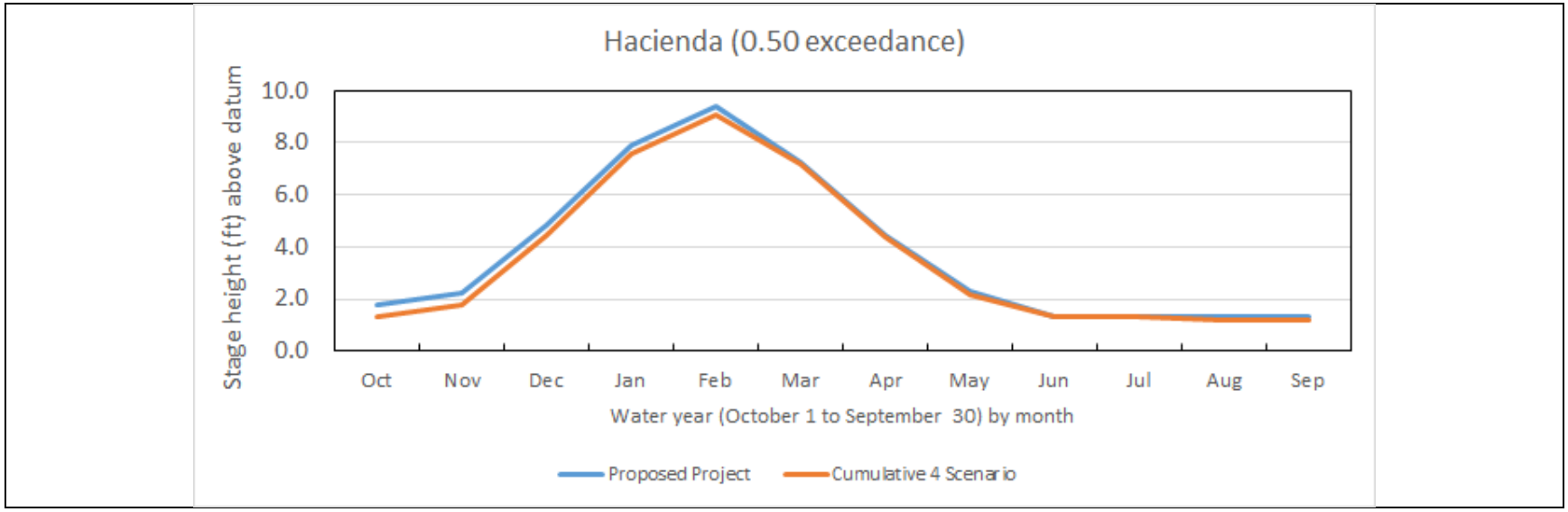

Figure 5.7.1-23. Stage height at the Hacienda Bridge USGS gage under the Proposed Project and the Cumulative 4 Scenario (0.50 exceedance).

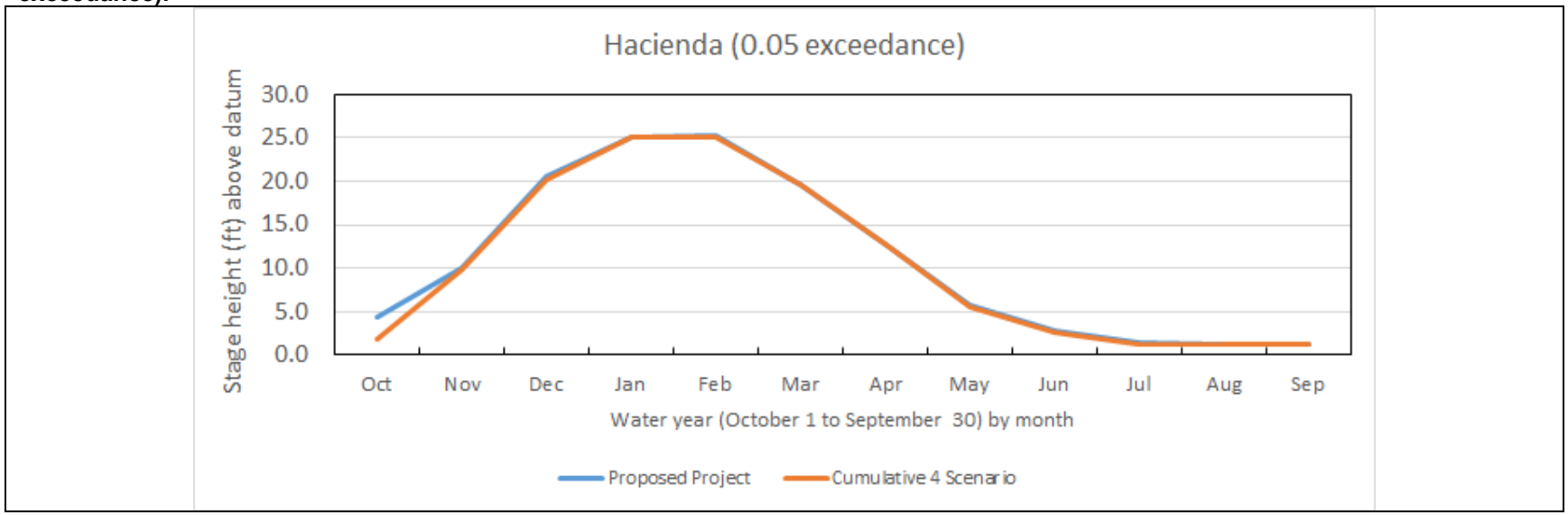

Figure 5.7.1-24. Stage height at the Hacienda Bridge USGS gage under the Proposed Project and the Cumulative 4 Scenario (0.05 exceedance).

Impact 5.7.1-9. Implementation of the Fish Habitat Flows and Water Rights Project could substantially alter the area of exposed shoreline within Lake Sonoma in a manner which would result in substantial erosion or sedimentation on-or off-site in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less than Significant)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario water surface elevation would decrease in Lake Sonoma in nearly all months during all exceedances, with the exception of February through May under median flow conditions, and March through May and July through August under the 0.05 exceedance (Table 5.7.1-40). Decreases in water surface elevation would be less than 5 feet under median flows and less than 8 feet in most cases during drier conditions. The area of exposed shoreline during median flows would be similar to the Proposed Project from February through June with moderate increases from July through January (**Figure 5.7.1-25**). Thus, under the Cumulative 1 Scenario, the potential impact on hydrology resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Cumulative 2 Scenario water surface elevation would decrease in Lake Sonoma in all months during all exceedances (Table 5.7.1-41). Decreases in stage would be 1 foot or less under the 0.50 exceedance and less than 3 feet during drier conditions. The area of exposed shoreline during the 0.50 exceedance would be similar to the Proposed Project from February through June with moderate increases from July through January (**Figure 5.7.1-26**). Thus, under the Cumulative 2 Scenario, the potential impact on hydrology resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario water surface elevation would decrease in Lake Sonoma in all months during all exceedances (Table 5.7.1-42). Decreases in stage would be 1 feet under the 0.50 exceedance and less than 3 feet during drier conditions. The area of exposed shoreline during the 0.50 exceedance would be similar to the Proposed Project from February through May with moderate increases from June through January (**Figure 5.7.1-27**). Thus, under the Cumulative 3 Scenario, the potential impact on hydrology resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required. .

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Under the Cumulative 4 Scenario water surface elevation would decrease in Lake Sonoma in nearly all months during all exceedances, with the exception of February through March under the 0.05 exceedance. (Table 5.7.1-43). Decreases in stage would be less than 5 feet under the 0.50 exceedance and less than 6 feet in most cases during drier conditions. The area of

Table 5.7.1-40. Estimated difference (feet) in water surface elevation at various flow exceedances in Lake Sonoma under the Cumulative 1 Scenario Alternative compared to Proposed Project Conditions (decreases in water surface elevation (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 1 Scenario	0.99	Sonoma	-4.7	-3.8	-3.9	-3.9	-6.1	-6.1	-6.4	-5.8	-4.5	-4.5	-4.8	-4.7
	0.95	Sonoma	-5.1	-2.1	-4.7	-3.7	-4.8	-2.7	-5.2	-5.5	-8.4	-8.0	-7.1	-6.6
	0.90	Sonoma	-5.0	-6.2	-4.9	-5.0	-3.5	-3.4	-3.4	-3.4	-4.0	-3.4	-3.2	-4.7
	0.75	Sonoma	-4.8	-5.2	-5.3	-2.6	-3.1	-0.7	-0.2	-0.3	-3.0	-2.0	-0.9	-4.0
	0.50	Sonoma	-4.6	-4.7	-2.2	-2.6	0.0	0.0	0.0	0.0	-2.2	-1.0	-0.2	-3.4
	0.05	Sonoma	-0.8	-2.2	-0.7	-0.3	-0.1	0.0	0.0	0.0	-0.2	0.0	0.0	-0.4

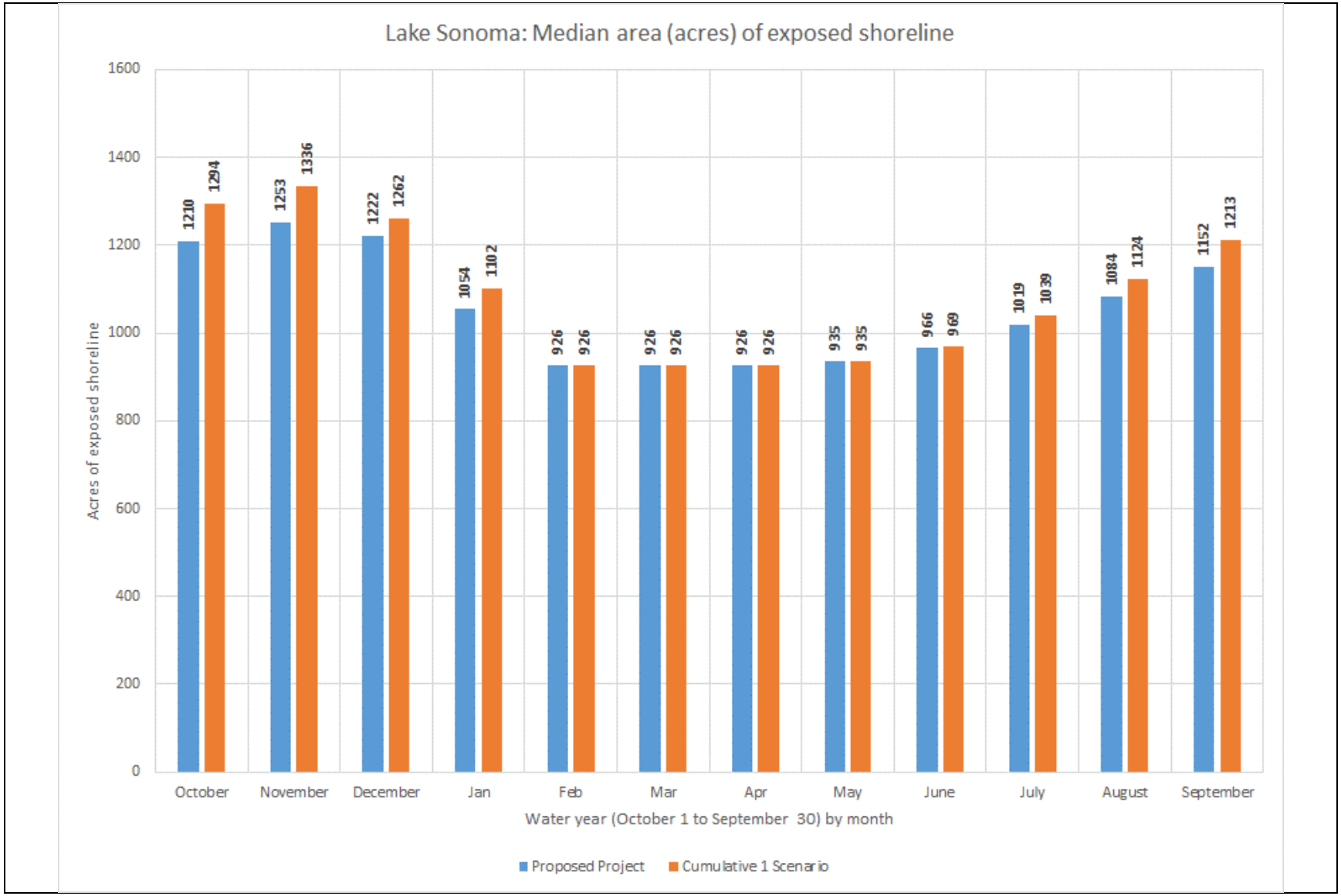

Figure 5.7.1-25. Area (acres) of exposed shoreline at Lake Sonoma under the Proposed Project and Cumulative 1 Scenario (0.50 exceedance)

Table 5.7.1-41. Estimated difference (feet) in water surface elevation at various flow exceedances in Lake Sonoma under the Cumulative 2 Scenario Alternative compared to Proposed Project Conditions (decreases in water surface elevation (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 2 Scenario	0.99	Sonoma	-1.6	-1.5	-1.7	-1.6	-2.9	-2.9	-0.6	-0.6	-1.4	-1.0	-0.7	-1.8
	0.95	Sonoma	-0.4	-0.9	-3.0	-3.3	-2.0	-1.5	-1.6	-0.2	-1.5	-1.5	-0.7	-0.9
	0.90	Sonoma	-2.6	-3.6	-3.6	-1.3	-1.0	-0.7	-1.5	-1.3	-1.6	-1.2	-1.1	-2.0
	0.75	Sonoma	-2.0	-2.2	-1.5	-0.9	-0.4	-0.1	-0.1	-0.1	-1.1	-0.7	-0.3	-1.5
	0.50	Sonoma	-0.9	-1.0	-0.8	-0.5	-0.1	-0.1	-0.1	-0.1	-0.4	-0.2	-0.1	-0.7
	0.05	Sonoma	-0.4	-0.7	-0.1	0.1	0.2	0.0	-0.1	-0.1	-0.2	-0.1	-0.1	-0.2

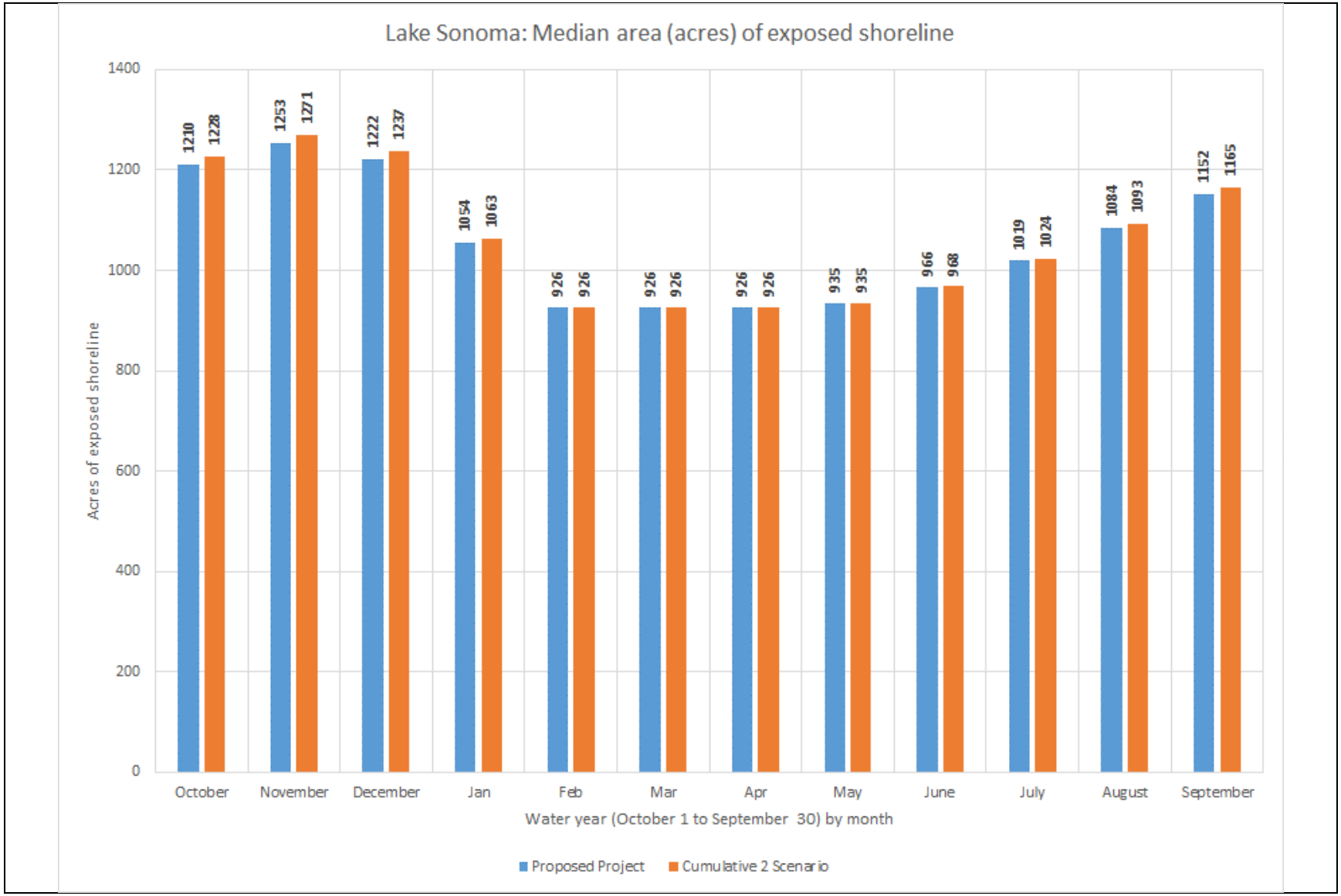

Figure 5.7.1-26. Area (acres) of exposed shoreline at Lake Sonoma under the Proposed Project and Cumulative 2 Scenario (0.50 exceedance)

Table 5.7.1-42. Estimated difference (feet) in water surface elevation at various flow exceedances in Lake Sonoma under the Cumulative 3 Scenario Alternative compared to Proposed Project Conditions (decreases in water surface elevation (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 3 Scenario	0.99	Sonoma	-3.1	-3.0	-3.2	-3.0	-4.0	-4.0	-1.2	-1.2	-2.6	-2.0	-1.4	-3.2
	0.95	Sonoma	-0.5	-0.3	-3.3	-3.1	-2.4	-2.0	-1.2	-0.6	-1.9	-1.6	-0.8	-1.1
	0.90	Sonoma	-3.0	-4.1	-3.3	-1.6	-1.3	-0.7	-1.5	-1.2	-1.8	-1.3	-1.1	-2.4
	0.75	Sonoma	-2.1	-2.2	-1.7	-1.2	-0.9	-0.1	-0.1	-0.1	-1.3	-0.8	-0.3	-1.8
	0.50	Sonoma	-1.1	-1.3	-1.1	-0.7	-0.1	-0.1	-0.1	-0.1	-0.7	-0.3	-0.1	-0.9
	0.05	Sonoma	-0.7	-0.8	-0.2	0.1	0.1	0.0	-0.1	-0.1	-0.3	-0.1	-0.1	-0.6

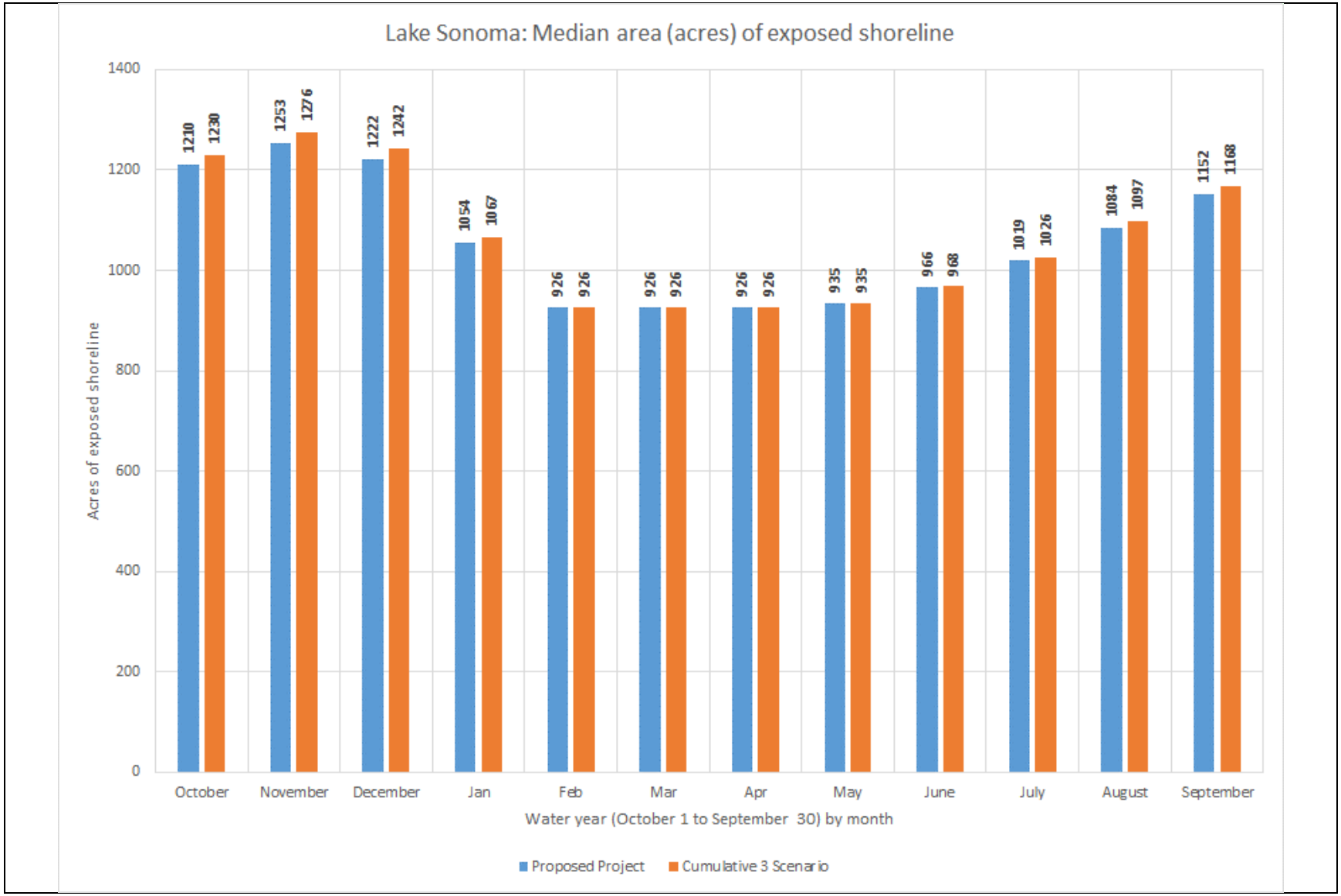

Figure 5.7.1-27. Area (acres) of exposed shoreline at Lake Sonoma under the Proposed Project and Cumulative 3 Scenario (0.50 exceedance)

Table 5.7.1-43. Estimated difference (feet) in water surface elevation at various flow exceedances in Lake Sonoma under the Cumulative 4 Scenario Alternative compared to Proposed Project Conditions. (decreases in water surface elevation (feet) indicated by negative number and red shading; increases indicated by positive numbers and blue shading) (0.99 exceedance represents driest condition; 0.05 exceedance represents wettest condition).

Alt	Exceedance	Node	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Cumulative 4 Scenario	0.99	Sonoma	-10.2	-9.6	-11.3	-11.2	-9.9	-9.8	-8.0	-7.3	-7.7	-6.8	-6.5	-8.7
	0.95	Sonoma	-11.1	-10.2	-10.5	-5.6	-7.1	-4.8	-6.5	-6.7	-10.7	-9.8	-8.3	-10.7
	0.90	Sonoma	-10.2	-10.8	-8.8	-7.3	-6.1	-5.5	-6.1	-6.0	-7.6	-6.6	-6.4	-8.8
	0.75	Sonoma	-6.5	-7.2	-7.6	-5.5	-4.7	-1.3	-0.4	-0.4	-4.2	-2.8	-1.4	-5.5
	0.50	Sonoma	-6.3	-6.7	-4.3	-3.8	-0.1	-0.1	-0.1	-0.1	-3.1	-1.5	-0.4	-4.7
	0.05	Sonoma	-1.7	-4.4	-1.0	-0.7	0.0	0.0	-0.1	-0.1	-0.6	-0.2	-0.1	-1.1

exposed shoreline during median flows would be similar to the Proposed Project from February through April with moderate increases from May through January (**Figure 5.7.1-28**). Thus, under the Cumulative 4 Scenario, the potential impact on hydrology resulting in erosion and sedimentation would be cumulatively less than significant and no mitigation is required.

management period across all flow exceedances, suggesting lower inflow into the Russian River Estuary (Table 5.7.1-22, Table 5.7.1-24, Table 5.7.1-26). Given lower inflow into the Russian River Estuary (relative to the Proposed Project), the Cumulative 1, 2, 3 and 4 scenarios could further increase the duration of elevated estuary water levels, or increase the annual frequency of flow conditions that lead to a greater duration of elevated estuary water levels, thereby increasing the risk to people or structures within this area to loss, injury, or death involving flooding in the event of a tsunami. Therefore, under Cumulative 1, 2, 3 and 4 scenarios, the impacts on hydrology could contribute to inundation by seiche, tsunami, or mudflow and therefore, would be significant and unavoidable and no mitigation is available.

5.7.2 Water Quality

Geographic

The geographic scope of potential cumulative impacts on water quality include the areas within which the Proposed Project could cause a significant and/or less than significant impact. As explained in Chapter 4.2, “Water Quality,” impacts to water quality could occur in the Upper and Lower Russian River, in Lake Sonoma and in the Russian River Estuary. The No Potter Valley Project, UWMP Future Water Rights Petition, and Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report are the related projects within the geographic scope.

Cumulative Impact Analysis

The Proposed Project could result in cumulative impacts on water quality in the Upper and Lower Russian River, in Lake Sonoma, and the Russian River Estuary in combination with the following related projects: No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario).

The Proposed Project would not require construction, operation, or maintenance of new facilities and, therefore no cumulative analysis will be conducted for construction related impacts to water quality.

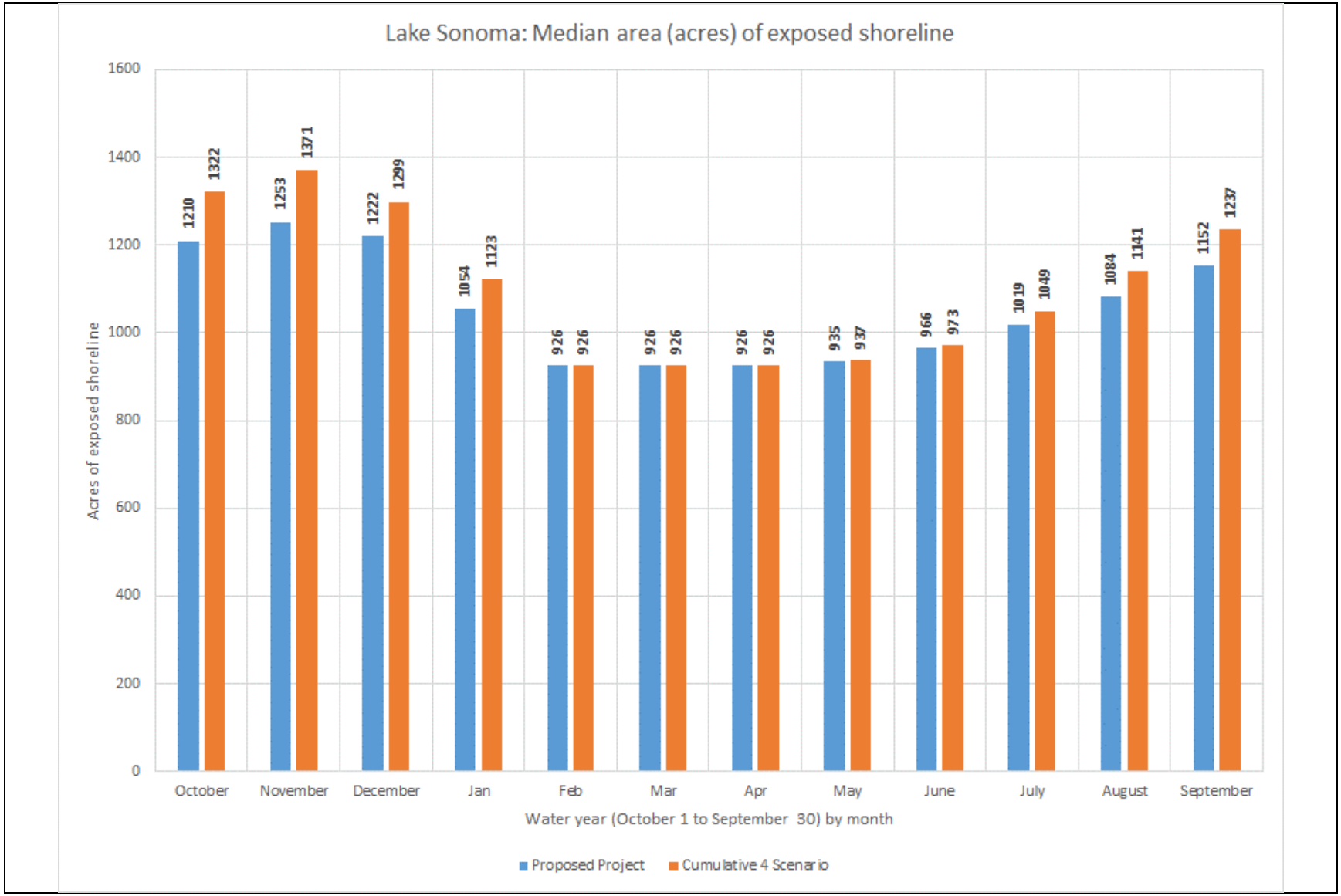

Figure 5.7.1-28. Area (acres) of exposed shoreline at Lake Sonoma under the Proposed Project and Cumulative 4 Scenario (0.50 exceedance)

The analysis of potential cumulative impacts on water quality relies on a quantitative hydrologic modeling analysis (Russian River ResSim) that simulates water surface elevation changes in Lake Sonoma and on the timing and degree of change in reservoir releases and the corresponding change in instream flow and river stage height in the Russian River that would occur under the Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios. The hydrology data analysis in Section 5.7.1, "Hydrology," was used to inform a qualitative analysis of mercury, aluminum, and specific conductance that could cause impairments in the Russian River and Lake Sonoma, and the likely effects that changes in lake water surface elevations and stream flows associated with the Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios could have on these constituents. The analysis of the effects of the cumulative scenarios (1, 2, 3, and 4) on water quality resources emphasizes potential impacts to beneficial uses that the Russian River has been identified (by the North Coast Regional Water Quality Control Board) as supporting within the project area.

If a cumulative scenario resulted in an increase in water surface elevation in Lake Sonoma above that of the Proposed Project, there would be no impact on water quality and it would not be cumulatively considerable. If a cumulative scenario resulted in a substantial change (increase or decrease) in the river stage (in the Upper and Lower Reach of the Russian River) or decrease in the water surface elevation (in Lake Sonoma) below that of the Proposed Project, the impact to water quality was considered a cumulatively significant impact. Please see Section 5.7.1, "Hydrology," for a detailed discussion and an analysis of water surface elevation and instream flow modeling results as they relate to the Proposed Project, and Cumulative 1, 2, 3 and 4.

The cumulative analysis of effects on biostimulatory substances relies on quantitative analysis of data collected by the Water Agency for the Russian River Biological Opinion and Temporary Urgency Change Orders (TUCOs) in the Russian River under a variety of instream flows that are similar to Baseline Condition minimum instream flows and the Proposed Project minimum instream flows. The collected data was quantitatively assessed against United States Environmental Protection Agency's (USEPA) recommended criteria to identify potential cumulative impacts and then was used to inform a qualitative analysis of potential cumulative impacts. Upper Russian River data was collected during minimum instream flows in 2010 and 2012 that are similar to the Baseline Conditions. Although the period of record for Baseline Conditions includes the years 2006 through 2013, Upper Russian River instream flows during 2013 were reduced through a TUCO and are similar to the Proposed Project instream flows. As such, the 2013 data that is similar to the Proposed Project instream flows was analyzed against the data collected in 2010 and 2012 during instream flows that are similar to the Baseline Conditions for changes in potential impacts. Lower Russian River data was collected during minimum instream flows in 2010, 2011, and 2012 that are similar to the Baseline Conditions. Again, although the period of record for Baseline Conditions includes the years 2006 through 2013, Lower Russian River instream flows during 2013 were reduced through a TUCO and are similar to the Proposed Project instream flows. As such, the 2013 data was analyzed with data collected in 2014 and 2015 during reduced TUCO minimum instream flows that are similar to conditions that could occur under the Proposed Project against the data collected in 2010, 2011, and 2012 during instream flows that are similar to the Baseline Condition for changes in

potential impacts. Impacts associated with biostimulatory substances for the Proposed Project are significant and unavoidable and would likely continue to be significant and unavoidable in combination with the related projects.

The cumulative impact discussion follows the impact statements 4.2-1, 4.2-2, and 4.1-4, analyzed in Chapter 4.2, "Water Quality," Section "Impacts, and Mitigation Measures," and focuses on impacts on water quality for which the Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact.

> **Impact 5.7.2-1. Implementation of the Fish Habitat Flows and Water Rights Project could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality relating to mercury accumulation in fish tissue in Lake Sonoma in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less than Significant)**

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario water surface elevation would decrease in Lake Sonoma in nearly all months during all exceedances, with the exception of February through May under median flow conditions, and March through May and July through August under the 0.05 exceedance (Section 5.7.1, "Hydrology," Table 5.7.1-40). Decreases in water surface elevation would be less than 5 feet under median flows and less than 8 feet in most cases during drier conditions. The area of exposed shoreline during median flows would be similar to the Proposed Project from February through June with moderate increases from July through January (Section 5.7.1, "Hydrology," **Figure 5.7.1-25**). Thus, under the Cumulative 1 Scenario, the potential impact on water quality resulting in erosion and sedimentation that could significantly exacerbate the water quality condition of Lake Sonoma from mercury accumulation that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Cumulative 2 Scenario water surface elevation would decrease in Lake Sonoma in all months during all exceedances (Section 5.7.1, "Hydrology," Table 5.7.1-41). Decreases in stage would be 1 foot or less under the 0.50 exceedance and less than 3 feet during drier conditions. The area of exposed shoreline during the 0.50 exceedance would be similar to the Proposed Project from February through June with moderate increases from July through January (Section 5.7.1, "Hydrology," **Figure 5.7.1-26**). Thus, under the Cumulative 2 Scenario, the potential impact on water quality resulting in erosion and sedimentation that could significantly exacerbate the water quality condition of Lake Sonoma from mercury accumulation that could result in a violation of water quality standards or waste discharge requirements or otherwise

substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario water surface elevation would decrease in Lake Sonoma in all months during all exceedances (Section 5.7.1, "Hydrology," Table 5.7.1-42). Decreases in stage would be 1 feet under the 0.50 exceedance and less than 3 feet during drier conditions. The area of exposed shoreline during the 0.50 exceedance would be similar to the Proposed Project from February through May with moderate increases from June through January (Section 5.7.1, "Hydrology," **Figure 5.7.1-27**). Thus, under the Cumulative 3 Scenario, the potential impact on water quality resulting in erosion and sedimentation that could significantly exacerbate the water quality condition of Lake Sonoma from mercury accumulation that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Under the Cumulative 4 Scenario water surface elevation would decrease in Lake Sonoma in nearly all months during all exceedances, with the exception of February through March under the 0.05 exceedance. (Section 5.7.1, "Hydrology," Table 5.7.1-43). Decreases in stage would be less than 5 feet under the 0.50 exceedance and less than 6 feet in most cases during drier conditions. The area of exposed shoreline during median flows would be similar to the Proposed Project from February through April with moderate increases from May through January (Section 5.7.1, "Hydrology," **Figure 5.7.1-28**). Thus, under the Cumulative 4 Scenario, the potential impact on hydrology resulting in erosion and sedimentation that could significantly exacerbate the water quality condition of Lake Sonoma from mercury accumulation that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Impact 5.7.2-2. Implementation of the Fish Habitat Flows and Water Rights Project could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality as it relates to aluminum and specific conductance in the Upper Russian River in combination with the No Potter Valley Project (Cumulative 1 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)

Impact 5.7.2-3. Implementation of the Fish Habitat Flows and Water Rights Project could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality as it relates to aluminum and specific conductance in the Upper Russian River in combination with the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario)

and the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario). (Cumulatively Less than Significant)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario, stage at USGS gages along the Upper Russian would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Section 5.7.1, "Hydrology," Table 5.7.1-28). The stage change at the Hopland USGS gage at the 0.50 exceedance is 0.5 to 0.6 foot compared to the overall stage heights of 0.5 to 3.5 feet and would expose previously submerged streambank (**Figure 5.7.1-1**). The bank would be exposed throughout the year and would likely lead to greater erosion from surface runoff during precipitation or bank erosion from high water velocity.

At the 0.05 exceedance (wettest condition), the Cumulative 1 Scenario results in large stage decreases in October relative to the Proposed Project (Table 5.7.1-28). The greatest changes would occur upstream near Coyote Valley Dam at the Hopland USGS gage. The decreases in stage in October would be relatively large and would persist through November and December, with lower decreases persisting through the remainder of the year, including during the rainy season (Section 5.7.1, "Hydrology," **Figure 5.7.1-2**). Under the Cumulative 1 Scenario, streambanks would be exposed throughout the year and would be likely lead to greater erosion from surface runoff during precipitation or bank erosion from high water velocity. Thus, under the Cumulative 1 Scenario, the potential impacts on water quality associated with drainage patterns, resulting in erosion and sedimentation that could significantly exacerbate the water quality condition from aluminum deposition and/or elevated specific conductance values that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively significant and unavoidable and no mitigation is available.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Cumulative 2 Scenario, stage at USGS gages along the Upper Russian would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Section 5.7.1, "Hydrology," Table 5.7.1-29). The stage decrease at the Hopland USGS gage at the 0.50 and 0.05 exceedances flow would be 0.1 throughout most of the year, but greater (up to 0.6 foot) in October, November, and December (Section 5.7.1, "Hydrology," Figure 5.7.1-3 and Figure 5.7.1-4). These decreases would expose previously submerged streambank, but exposure would be relatively small compared to overall stage heights and would not be likely to cause increased erosion. Since the changes are relatively small compared to the overall stage heights, there would be little effect on water surface slope, and resulting erosion from or within tributaries under the Cumulative 2 Scenario and the potential impacts on water quality associated with drainage patterns, resulting in erosion and sedimentation that could significantly exacerbate the water quality condition from aluminum deposition and/or elevated specific conductance values that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario, stage at USGS gages along the Upper Russian would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Section 5.7.1, "Hydrology," Table 5.7.1-30).

The stage decrease at the Hopland USGS gage at the 0.50 and 0.05 exceedances flow would be 0.1 to 0.5 foot throughout the year (Section 5.7.1, "Hydrology," **Figure 5.7.1-5** and **Figure 5.7.1-6**). These decreases would expose previously submerged streambank, but exposure would be relatively small compared to overall stage heights and would not be likely to cause increased erosion. Since the changes are relatively small compared to the overall stage heights, there would be little effect on water surface slope, and resulting erosion from or within tributaries under the Cumulative 3 Scenario and the potential impacts on water quality associated with drainage patterns, resulting in erosion and sedimentation that could significantly exacerbate the water quality condition from aluminum deposition and/or elevated specific conductance values that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Under the Cumulative 4 Scenario, stage at USGS gages along the Upper Russian would be similar or lower than the Proposed Project during all months, at all exceedances, and at all nodes (Section 5.7.1, "Hydrology," Table 5.7.1-31).

At the 0.50 exceedance, the stage decrease at the Hopland USGS gage would be 0.1 to 0.8 foot compared to the overall stage heights of 0.5 to 3.5 feet and would expose previously submerged streambank (Section 5.7.1, "Hydrology," **Figure 5.7.1-7**). The bank would be exposed throughout the year and would likely lead to greater erosion from surface runoff during precipitation or bank erosion from high water velocity

At the 0.05 exceedance, the Cumulative 4 Scenario results in large stage decreases in October relative to the Proposed Project (Section 5.7.1, "Hydrology," **Figure 5.7.1-8**). The greatest changes would occur upstream near Coyote Valley Dam at the Hopland USGS gage. The decreases in stage in October would be large (2.9 feet), and relatively large stage decreases would persist through November and December, with lower decreases persisting throughout the year, including during the rainy season (Section 5.7.1, "Hydrology," Table 5.7.1-31). Under the Cumulative 4 Scenario, streambanks would be exposed throughout the year and would be likely lead to greater erosion from surface runoff during precipitation or bank erosion from high water velocity. Thus, under the Cumulative 4 Scenario, the impacts on water quality associated with drainage patterns, resulting in erosion and sedimentation that could significantly exacerbate the water quality condition from aluminum deposition and/or elevated specific conductance values that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively significant and unavoidable and no mitigation is available.

Impact 5.7.2-4. Implementation of the Fish Habitat Flows and Water Rights Project could result in a violation water quality standards or waste discharge requirements or otherwise substantially degrade water quality as it relates to aluminum in the Lower Russian River in combination with the No Potter Valley Project (Cumulative 1 Scenario), the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less than Significant)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Under the Cumulative 1 Scenario, stage (relative to the Proposed Project) at the Hacienda Bridge USGS gage in the Lower Russian River would be similar or lower occur during all months and exceedances (Section 5.7.1, “Hydrology,” Table 5.7.1-36).

Modeling data show that stage decreases are greatest from October through February across all exceedances, with the greatest decrease occurring in October during the 0.05 exceedance (wettest conditions). Decreases in stage from May to October would occur during lower flows, with low velocity, and would not be likely to cause increased erosion (Section 5.7.1, “Hydrology,” **Figure 5.7.1-17** and **Figure 5.7.1-18**). Decreases from November through February would expose streambanks to erosion from surface runoff during precipitation or bank erosion from high water velocity, although the decreases would be slight compared to natural stage increases during the 0.50 (2 to 9 feet) and 0.05 exceedances (5 to 25 feet). The decrease in stage in October at 0.05 exceedance would be large (2.5 feet) relative to overall stage height (4.3 feet), but would also occur during periods of seasonal low flow. This could still cause bank erosion, but this potential change would occur relatively infrequently (at the 0.05 exceedance [approximately one out of twenty years]) during a single month (October). Further, natural stage increases due to seasonal rainfall would exceed the magnitude and duration of this stage increase. Under the Proposed Project and Cumulative 1 Scenario at the 0.05 exceedance, stage would increase above 5.0 feet (up to 25.0 feet) from November through May. Thus, under the Cumulative 1 Scenario, the potential impacts on water quality associated with drainage patterns, resulting in erosion and sedimentation that could significantly exacerbate the water quality condition from aluminum deposition that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Cumulative 2 Scenario, stage (relative to the Proposed Project) at the Hacienda Bridge USGS gage in the Lower Russian River would be similar or lower occur during all months and exceedances (Section 5.7.1, “Hydrology,” Table 5.7.1-37). Modeling data show that stage would be largely the same relative to the Proposed Project during all exceedances flow conditions, with slight decreases (0.1 to 0.3 foot), but there would likely be little effect on erosion. The decreases would be small compared to overall stage heights (Section 5.7.1, “Hydrology,” **Figure 5.7.1-19** and **Figure 5.7.1-20**) and there would be little effect on bank erosion or water surface slope resulting in erosion from or within tributaries. Thus, under the Cumulative 2 Scenario, the potential impacts on water quality associated with drainage patterns, resulting in

erosion and sedimentation that could significantly exacerbate the water quality condition from aluminum deposition that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario, stage (relative to the Proposed Project) at the Hacienda Bridge USGS gage in the Lower Russian River would be similar or lower occur during all months and exceedances (Section 5.7.1, "Hydrology," Table 5.7.1-38). Modeling data show that stage would be largely the same relative to the Proposed Project during all exceedances flow conditions, with slight decreases (0.1 to 0.3 foot), but there would likely be very little effect on erosion. The decreases would be small compared to overall stage heights (Section 5.7.1, "Hydrology," **Figure 5.7.1-21**and **Figure 5.7.1-22**) and there would be little effect on bank erosion or water surface slope resulting in erosion from or within tributaries. Thus, under the Cumulative 3 Scenario, the potential impacts on water quality associated with drainage patterns, resulting in erosion and sedimentation that could significantly exacerbate the water quality condition from aluminum deposition that could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP

Under the Cumulative 4 Scenario, stage (relative to the Proposed Project) at the Hacienda Bridge USGS gage in the Lower Russian River would be similar or lower occur during all months and exceedances (Section 5.7.1, "Hydrology," Table 5.7.1-39).

Modeling data show that stage decreases are greatest from October through February across all exceedances, with the greatest decrease occurring in October during wetter conditions (0.05 exceedance). Decreases in stage from May to October would occur during lower flows, with low velocity, and would not be likely to cause increased erosion (Section 5.7.1, "Hydrology," **Figure 5.7.1-23** and **Figure 5.7.1-24**). Decreases from November through February would expose streambanks to erosion from surface runoff during precipitation or bank erosion from high water velocity, although the decreases would be slight compared to natural stage increases during the 0.50 (2 to 9 feet) and 0.05 exceedances (5 to 25 feet). The decrease in stage in October at the 0.05 exceedance would be large (2.5 feet) relative to overall stage height (4.3 feet), but would also occur during periods of seasonal low flow. This could still cause bank erosion, but this potential change would occur relatively infrequently (0.05 exceedance [approximately one out of twenty years]) during a single month (October). Further, natural stage increases due to seasonal rainfall would exceed the magnitude and duration of this stage increase. Under the Proposed Project and Cumulative 4 Scenario during the 0.05 exceedance, stage would increase above 5.0 feet (up to 25.0 feet) from November through May. Thus, under the Cumulative 4 Scenario, the potential impacts on water quality associated with drainage patterns, resulting in erosion and sedimentation that could significantly exacerbate the water quality condition from aluminum deposition that could result in a violation of water quality standards or waste

discharge requirements or otherwise substantially degrade water quality would be cumulatively less than significant and no mitigation is required.

Impact 5.7.2-5. Implementation of the Fish Habitat Flows and Water Rights Project changes to minimum instream flows could result in a violation of water quality standards or waste discharge requirements or otherwise degrade water quality relating to biostimulatory substances in the Upper and Lower Russian River in combination with the No Potter Valley Project (Cumulative 1 Scenario), the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)

Cumulative 1, 2, 3 and 4 Scenarios

The Upper Russian River at Hopland and Comminsky had elevated median and mean total nitrogen and total phosphorus concentrations during 2013 that exceeded the USEPA recommended criteria, with instream flows similar to the Proposed Project (Chapter 4.2, “Water Quality,” Table 4.2.3). The median and mean chlorophyll-a concentration also exceeded the USEPA recommended criteria in 2013 (Chapter 4.2, “Water Quality,” Table 4.2-3). In addition, dissolved oxygen (DO) concentrations at Hopland and Digger Bend were observed to fluctuate with both depressed and supersaturation DO concentrations during 2013, with inflows similar to the Proposed Project (Chapter 4.2, “Water Quality,” Figures 4.2-9 and 4.2-10). Concentrations of biostimulatory substances exceeded the USEPA recommended criteria in 2013, and would likely continue to exceed USEPA recommended criteria under the Proposed Project and the Cumulative 1, 2, 3, and 4 scenarios. In addition depressed and supersaturated DO concentrations recorded in the Upper Russian River during 2013 would likely continue to occur under the Proposed Project and the Cumulative 1, 2, 3, and 4 scenarios. Therefore, these continued exceedances of USEPA recommended criteria for biostimulatory substances could result in a violation water quality standards or waste discharge requirements or otherwise substantially degrade water quality. There is much uncertainty about biostimulatory conditions in the Russian River. Elevated concentrations of biostimulatory substances exist under Baseline Conditions. Given these uncertainties, implementation of the Proposed Project and the Cumulative 1, 2, 3, and 4 scenarios could result in an impact on water quality related to biostimulatory conditions and as such, the impact could be cumulatively significant and unavoidable and no mitigation is available.

The Lower Russian River had elevated median and mean total phosphorus concentrations during 2013, 2014, and 2015 that exceeded the USEPA recommended criteria, with instream flows similar to the Proposed Project (Chapter 4.2, “Water Quality,” Table 4.2-4). The median and mean chlorophyll-a concentration did not exceed the USEPA recommended criteria in 2013, 2014, or 2015 (Table 4.2-4). However, DO concentrations at Hacienda were observed to fluctuate with both depressed and supersaturation DO concentrations during 2013, 2014, and 2015 with inflows similar to the Proposed Project (Chapter 4.2, “Water Quality,” Figure 4.2-11). Concentrations of biostimulatory substances exceeded the USEPA recommended criteria for all three years, and would likely continue to exceed USEPA recommended criteria under the

Proposed Project and the Cumulative 1, 2, 3, and 4 scenarios. In addition, depressed and supersaturated DO concentrations recorded in the Lower Russian River during 2013, 2014, and 2015 would likely continue to occur under the Proposed Project and the Cumulative 1, 2, 3, and 4 scenarios. Therefore, these continued exceedances of USEPA recommended criteria for biostimulatory substances could result in a violation of water quality standards or waste discharge requirements or otherwise substantially degrade water quality. There is much uncertainty about biostimulatory conditions in the Russian River. Elevated concentrations of biostimulatory substances exist under Baseline Conditions. Given these uncertainties, implementation of the Proposed Project and the Cumulative 1, 2, 3, and 4 scenarios could result in an impact on water quality related to biostimulatory conditions and as such, the impact could be cumulatively significant and unavoidable and no mitigation is available.

5.7.3 Fisheries Resources

Geographic Scope

The geographic scope of potential cumulative impacts on fisheries include the areas within which the Proposed Project could cause a significant and/or less than significant impact. As explained in Chapter 4.3, “Fisheries Resources,” potential impacts on fisheries could occur in the Russian River and Dry Creek. The No Potter Valley Project, UWMP Future Water Rights Petition, and Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report are the related projects within the geographic scope.

Cumulative Impact Analysis

The Proposed Project could result in cumulative impacts on fisheries in the Upper and Lower Russian River and in Dry Creek in combination with the following related projects: No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario).

The Proposed Project would not require construction, operation, or maintenance of new facilities and, therefore no cumulative analysis will be conducted for construction-related impacts to fisheries.

Existing conditions reflect the impacts of past projects. The standards of significance for impacts on fisheries are described in Chapter 4.3, “Fisheries Resources,” under “Significance Criteria.” These standards also apply to the significance of cumulative impacts to fisheries.

The analysis on the potential cumulative impacts on fisheries resources emphasizes impacts on special-status aquatic species and habitats as well as the movement of any resident or migratory fish species, or the use of fisheries rearing site, which were assessed by determining changes in stream flows in the Russian River (below Lake Mendocino) and in Dry Creek (below Lake Sonoma) and the corresponding changes to water temperature and habitat accessibility.

Modeling using historic hydrology data was used to simulate surface elevations in Lake Mendocino and Lake Sonoma and instream flows downstream of the reservoirs and the corresponding changes to water temperature that would occur under the Proposed Project and Cumulative 1, 2, 3, and 4 scenarios. Projected changes in stream flow and the corresponding changes to water temperature and habitat accessibility under the Proposed Project were then compared to the Cumulative1, 2, 3 and 4 scenarios to evaluate potential cumulative impacts to fisheries. Tables 5.7.3-1 through 5.7.3-4 below include these modeling results and illustrate water temperature in the Russian River and in Dry Creek under the Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios.

If a cumulative scenario resulted in a substantial increase in the percentage of time that instream flows would be lower and result in a substantial corresponding change in conditions (i.e., water temperature and habitat accessibility) than that of the Proposed Project, the impact on fisheries was considered a cumulatively significant impact. If a cumulative scenario resulted in a decrease in the percentage of time that stream flows would be lower and not result in a substantial corresponding change in conditions (i.e., water temperature and habitat accessible) more often than that of the Proposed Project, there would be no impact on fisheries and it would not be cumulatively considerable.

The change in modeled conditions in the Russian River between the Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios is related to the change in instream flow modeled by Russian River ResSim. The Proposed Project's Russian River Hydrologic Index is also used for the cumulative scenarios. Conditions in the Russian River can differ between these cumulative scenarios because the occurrence of Flow Schedules 1 through 5 differs between these cumulative scenarios. This is due to differences in modeled storage and cumulative inflow into Lake Mendocino, as well as differences in reservoir sedimentation and municipal demands between these cumulative scenarios. As discussed in Chapter 3, "Background and Project Description," Lake Mendocino Cumulative Inflow Conditions determine Flow Schedules for the Proposed Project (as well as Cumulative 1, 2, 3 and 4 scenarios).[10] Differences in modeled cumulative inflow into Lake Mendocino and modeled Upper Russian River demands between the cumulative scenarios could have large effects on reservoir storage and change the occurrence of Flow Schedules 1 through 5. As a result, modeled flows in the Russian River can differ greatly between the Proposed Project and the cumulative scenarios since minimum instream flows are tied to these flow schedules. Changes in modeled flow can have an effect on other modeled conditions such as juvenile salmonid rearing habitat, water temperature, and dissolved oxygen. In summary, it is the change in the occurrence of Flow Schedules 1 through 5 under the Proposed Project and the cumulative scenarios that lead to differences in minimum

[10] Minimum instream flow schedules are determined by Lake Mendocino Cumulative Inflow Condition in the Upper Russian River, Lower Russian River, and Dry Creek. From June 1 to October 1, the minimum instream flow schedule for the Upper Russian River would be determined by both the Lake Mendocino Cumulative Inflow Condition and the Lake Mendocino Storage Condition. See Chapter 3, "Background and Project Description," for a more detailed discussion.

instream flow, modeled stream flow, and fish habitat conditions between these cumulative scenarios.

The following cumulative impact discussion follows the impact statements 4.3-13, 4.3-18, 4.3-20, and 4.3-38, analyzed in Chapter 4.3, “Fisheries Resources,” Section “Impacts, and Mitigation Measures,” and focuses on impacts to fisheries for which the Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact.

Impact 5.7.3-1. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flow that could substantially effect the quality of habitat for rearing Chinook juveniles by elevated water temperatures from April through June in the Russian River and in Dry Creek in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario) (Cumulatively not Considerable).

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Modeled water temperature assessment scores from March through May for juvenile Chinook salmon rearing in the Russian River and in Dry Creek would be suitable under the Proposed Project and the Cumulative 1 Scenario, but begin to deteriorate in June downstream of Cloverdale (Table 5.7.3-1) under both the Proposed Project and the Cumulative 1 Scenario. In most years, river flows from March through May would be comprised more by unimpaired flows from the watershed and less from water releases and along with cooler ambient air temperatures, water temperatures would generally be lower and more suitable for salmonids. By June in most years, water temperatures begin to increase as unimpaired flows decline and ambient air temperatures increase. Water temperature assessment scores during June range from 5.0 at the Forks under the Proposed Project, and decline to 0.76 at Healdsburg. Under the Cumulative 1 Scenario, June scores decline from 4.99 at the Forks to 0.67 at Healdsburg. Downstream from Dry Creek. Overall in June, the Cumulative 1 Scenario results are slightly better in the Lower Russian River when compared to the Proposed Project (increased releases from Lake Sonoma result in higher and colder flows through Dry Creek and the Russian River). As stated in Chapter 4.3, “Fisheries Resources,” impact analysis, rearing juvenile Chinook salmon are in the process of migrating to the Lower Russian River where Dry Creek moderates water temperatures. Based on downstream migrant trapping in the Russian River, most juvenile Chinook salmon have likely migrated downstream of Healdsburg by the end of May. The slight reduction in water temperature downstream of Dry Creek is unlikely to be of a significant magnitude to benefit late migrating Chinook salmon smolts. Modeled temperature assessment scores in Dry Creek under the Proposed Project and the Cumulative 1 Scenario would be almost identical. Thus, there is no net change in habitat suitability for juvenile Chinook salmon rearing between the Proposed Project and the Cumulative 1 Scenario and therefore, it would not be cumulatively considerable.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Modeled water temperature assessment scores from March through June for juvenile Chinook salmon rearing in the Russian River and in Dry Creek are similar under the Proposed Project and the Cumulative 2 Scenario in the Upper and Lower Russian River as well as in Dry Creek (Table 5.7.3-1). Thus, there would be no net change in water temperature suitability for juvenile Chinook salmon rearing in the Upper and Lower Russian River and Dry Creek between the Proposed Project and the Cumulative 2 Scenario and therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Table 5.7.3-1. Modeled temperature assessment scores evaluating water temperature suitability in the Russian River and Dry Creek from the March through June juvenile Chinook salmon rearing period under the Proposed Project and the Cumulative 1, 2, 3 and 4 Scenarios. Scores near 5.0 are optimal for the completion of this life stage, while scores below 3.0 become increasingly stressful. Scores near 0 are potentially lethal.

Forks					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	5.00	5.00	5.00	5.00	5.00
April	4.98	4.99	4.98	4.98	4.99
May	4.97	4.97	4.97	4.97	4.97
June	5.00	4.99	5.00	5.00	4.99
Hopland					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	5.00	5.00	5.00	5.00	5.00
April	4.92	4.91	4.91	4.92	4.91
May	4.61	4.43	4.59	4.58	4.46
June	4.62	4.36	4.62	4.59	4.38
	Cloverdale				
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	5.00	5.00	5.00	5.00	5.00
April	4.87	4.86	4.87	4.87	4.86
May	4.16	3.93	4.13	4.12	3.95
June	3.77	3.26	3.75	3.71	3.25
Geyserville					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	4.99	4.99	4.99	4.99	4.99
April	4.56	4.54	4.55	4.56	4.53
May	3.00	2.85	2.97	2.85	2.84
June	1.69	1.37	1.65	1.65	1.36
Healdsburg					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	4.98	4.98	4.98	4.98	4.98
April	4.36	4.35	4.35	4.36	4.34
May	2.38	2.32	2.36	2.38	2.31
June	0.76	0.67	0.74	0.75	0.66

Table 5.7.3-1 continued

Russian River below Dry Creek					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	4.99	4.99	4.99	4.99	4.99
April	4.66	4.66	4.66	4.66	4.66
May	3.54	3.63	3.56	3.55	3.64
June	2.50	3.08	2.59	2.57	3.18
Hacienda					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	5.00	5.00	5.00	5.00	5.00
April	4.71	4.71	4.71	4.71	4.71
May	3.43	3.47	3.43	3.43	3.47
June	2.06	2.27	2.10	2.10	2.32
Upper Dry Creek					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	5.00	5.00	5.00	5.00	5.00
April	5.00	5.00	5.00	5.00	5.00
May	5.00	5.00	5.00	5.00	5.00
June	5.00	5.00	5.00	5.00	5.00
Lower Dry Creek					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	5.00	5.00	5.00	5.00	5.00
April	4.98	4.98	4.98	4.98	4.98
May	4.81	4.81	4.81	4.81	4.81
June	4.48	4.60	4.50	4.50	4.62

Cumulative 3 Scenario (Proposed Project & Urban Water Management Plan (UWMP) Future Water Rights Application with the SWRCB)

Modeled water temperature assessment scores for juvenile Chinook salmon rearing in the Russian River and in Dry Creek are similar under the Proposed Project and under Cumulative 3 Scenario from March through June (Table 5.7.3-1). Under both the Proposed Project and the Cumulative 3 Scenario, water temperature assessment scores are suitable upstream of Cloverdale, but deteriorate downstream from this point during May and June. However, there would be no net change in water temperature suitability for juvenile Chinook salmon rearing in the Russian River and Dry Creek between the Proposed Project and the Cumulative 3 Scenario during this same time. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Modeled water temperature assessment scores for juvenile Chinook salmon rearing in the Russian River and in Dry Creek are similar under the Proposed Project and the Cumulative 4 Scenario from March through April (Table 5.7.3-1). Under both the Proposed Project and the Cumulative 4 Scenario, water temperature assessment scores are suitable upstream of Cloverdale, but deteriorate downstream from this point during May and June. As stated in the Chapter 4 4.3, "Fisheries," impact analysis, rearing juvenile Chinook salmon are in the process of migrating to the Lower Russian River where Dry Creek inflows from Lake Sonoma moderate the temperatures. Based on downstream migrant trapping in the Russian River, most juvenile Chinook salmon have likely migrated downstream of Healdsburg by the end of May. Although water temperature assessment scores would be slightly more degraded during June, this would be unlikely to result in a significant impact to migrating Chinook juveniles under the Proposed Project and the Cumulative 4 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Impact 5.7.3-2 Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flow that could substantially affect emigrating coho salmon through elevated water temperatures in the months of March through May in the Lower Russian River and in Dry Creek in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario) (Cumulatively not Considerable).

Cumulative 1 Scenario (Proposed Project and No Potter Valley Project)

Under Cumulative 1 Scenario, water temperature assessment scores are suitable (>4.0) in the Russian River below Healdsburg and in Dry Creek during March. Under both the Proposed Project and the Cumulative 1 Scenario, temperature scores would remain suitable in Dry Creek during April and May, but would deteriorate to stressful levels in the Russian River downstream of Healdsburg. However, water temperature assessment scores for coho salmon smolts in the Russian River below Healdsburg and in Dry Creek would be similar under the Proposed Project and the Cumulative 1 Scenario (Table 5.7.3-2). Thus, there is no net change in water temperature suitability for coho salmon smolts in the Russian River and Dry Creek between the Proposed Project and the Cumulative 1 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under Cumulative 2 Scenario, water temperature assessment scores are suitable (>4.0) in the Russian River below Healdsburg and in Dry Creek during March. Temperature scores would remain suitable during Dry Creek in April and May, but would deteriorate to stressful levels in the Russian River downstream of Healdsburg. However, water temperature assessment scores for coho salmon smolts in the Russian River below Healdsburg and in Dry Creek would be similar under the Proposed Project and the Cumulative 2 Scenario (Table 5.7.3-2). Thus, there would be no net change in water temperature suitability for coho salmon smolts in the Russian

River and Dry Creek between the Proposed Project and the Cumulative 2 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

Under the Cumulative 3 Scenario, water temperature assessment scores would be suitable (>4.0) in the Russian River below Healdsburg and in Dry Creek during March. Temperature scores would remain suitable in Dry Creek during April and May, but would deteriorate to stressful levels in the Russian River downstream of Healdsburg. However, water temperature assessment scores for coho salmon smolts in the Russian River below Healdsburg and in Dry Creek would be similar under the Proposed Project and the Cumulative 3 Scenario (Table 5.7.3-2). Thus, there would be no net change in water temperature suitability for coho salmon smolts in the Russian River and Dry Creek between the Proposed Project and the Cumulative 3 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Under Cumulative 4 Scenario, water temperature assessment scores would be suitable (>4.0) in the Russian River below Healdsburg and in Dry Creek during March. Temperature scores remain suitable in Dry Creek during April and May, but would deteriorate to stressful levels in the Russian River downstream of Healdsburg. However, water temperature assessment scores for coho salmon smolts in the Russian River below Healdsburg and in Dry Creek would be similar under the Proposed Project and the Cumulative 4 Scenario (Table 5.7.3-2). Thus, there would be no net change in water temperature suitability for coho salmon smolts in the Russian River and Dry Creek between the Proposed Project and the Cumulative 4 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Impact 5.7.3-3. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flow that could substantially affect the spawning and egg incubation of steelhead through elevated water temperatures in the months of December through May in the Russian River (above Cloverdale) and in Dry Creek in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios. (Cumulative 4 Scenario) (Cumulatively not Considerable).

Cumulative 1 Scenario (Proposed Project and No Potter Valley Project)

Under Cumulative 1 Scenario, modeled water temperature assessment scores for the steelhead spawning and egg incubation period in the Russian River above Cloverdale and in Dry Creek would be suitable to optimal from December through March. Water temperatures for steelhead egg incubation would become stressful during April in the Russian River. However, these stressful conditions would occur equally under the Proposed Project and the Cumulative 1 Scenario (Table 5.7.3-3). Thus, there would be no net change in water temperature suitability for steelhead spawning and egg incubation in the Russian River and Dry Creek between the

Table 5.7.3-2. Temperature assessment scores evaluating water temperature suitability in the Russian River and Dry Creek from the March through May coho salmon smolting period under the Proposed Project and the Cumulative 1, 2, 3 and 4 Scenarios. Scores near 5.0 are optimal for the completion of this life stage, while scores below 3.0 become increasingly stressful. Scores near 0 are potentially lethal.

Healdsburg					
Month	Proposed Project	Cumulative 1 Scenario	Cumulative 2 Scenario	Cumulative 3 Scenario	Cumulative 4 Scenario
March	4.52	4.52	4.51	4.51	4.51
April	2.38	2.38	2.38	2.38	2.37
May	0.75	0.73	0.74	0.75	0.72
Russian River below Dry Creek					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	4.67	4.67	4.67	4.67	4.67
April	2.89	2.89	2.89	2.89	2.90
May	1.35	1.41	1.35	1.35	1.42
Hacienda					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	4.76	4.76	4.76	4.76	4.76
April	2.80	2.80	2.80	2.80	2.80
May	1.20	1.22	1.21	1.22	1.22
Upper Dry Creek					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	5.00	5.00	5.00	5.00	5.00
April	4.99	4.99	4.99	4.99	4.99
May	4.96	4.96	4.96	4.96	4.94
Lower Dry Creek					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
March	4.95	4.95	4.95	4.95	4.95
April	4.40	4.38	4.40	4.40	4.38
May	3.32	3.34	3.32	3.31	3.33

Table 5.7.3-3. Temperature assessment scores evaluating water temperature suitability in the Russian River above Cloverdale and Dry Creek from December through April coho salmon smolting period under the Proposed Project and the Cumulative 1, 2, 3 and 4 Scenarios. Scores near 5.0 are optimal for the completion of this life stage, while scores below 3.0 become increasingly stressful. Scores near 0 are potentially lethal.

Forks					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
December	4.94	4.97	4.94	4.94	4.98
January	5.00	5.00	5.00	5.00	5.00
February	5.00	4.98	4.99	4.99	4.98
March	4.56	4.61	4.56	4.56	4.61
April	4.08	4.14	4.09	4.09	4.15
Hopland					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
December	4.96	4.98	4.97	4.96	4.99
January	5.00	5.00	5.00	5.00	5.00
February	4.99	4.97	4.98	4.98	4.97
March	4.50	4.51	4.49	4.49	4.51
April	2.91	2.93	2.89	2.90	2.91
Cloverdale					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
December	4.97	4.99	4.98	4.97	4.99
January	5.00	5.00	5.00	5.00	5.00
February	4.98	4.97	4.98	4.98	4.97
March	4.50	4.51	4.49	4.49	4.51
April	2.52	2.52	2.50	2.51	2.50
Upper Dry Creek					
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
December	4.90	4.89	4.88	4.88	4.88
January	4.99	4.99	4.99	4.99	4.99
February	4.99	4.99	4.99	4.99	4.99
March	4.93	4.93	4.93	4.93	4.93
April	4.77	4.76	4.77	4.77	4.76

Table 5.7.3-3 continued.

	Lower Dry Creek				
	Proposed Project	**Cumulative 1 Scenario**	**Cumulative 2 Scenario**	**Cumulative 3 Scenario**	**Cumulative 4 Scenario**
December	4.92	4.91	4.91	4.91	4.90
January	4.99	4.99	4.99	4.99	4.99
February	4.96	4.96	4.96	4.96	4.96
March	4.70	4.69	4.70	4.70	4.69
April	3.79	3.77	3.79	3.79	3.77

Proposed Project and the Cumulative 1 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Modeled water temperature assessment scores for the steelhead spawning and egg incubation period in the Russian River above Cloverdale and in Dry Creek would be similar to that discussed above under the Proposed Project and the Cumulative 1 Scenario (Table 5.7.3-3). Although water temperatures would become stressful for steelhead egg incubation during April, this condition would occur equally between the Proposed Project and the Cumulative 2 Scenario. Thus, there would be no net change in water temperature suitability for steelhead spawning and egg incubation in the Russian River and Dry Creek between the Proposed Project and the Cumulative 2 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

Modeled water temperature assessment scores for the steelhead spawning and egg incubation period in the Russian River above Cloverdale and in Dry Creek would be similar to that discussed above under the Proposed Project and the Cumulative 1 Scenario (Table 5.7.3-3). Although water temperatures would become stressful for steelhead egg incubation during April, this condition would occur equally between the Proposed Project and the Cumulative 3 Scenario. Thus, there would be no net change in water temperature suitability for steelhead spawning and egg incubation in the Russian River and Dry Creek between the Proposed Project and the Cumulative 3 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Modeled water temperature assessment scores for the steelhead spawning and egg incubation period in the Russian River above Cloverdale and in Dry Creek would be similar to that discussed above under the Proposed Project and the Cumulative 1 Scenario (Table 5.7.3-3). Although water temperatures would become stressful for steelhead egg incubation during April, this conditions would occur equally between the Proposed Project and the Cumulative 4 Scenario. Thus, there would be no net change in water temperature suitability for steelhead spawning and egg incubation in the Russian River and Dry Creek between the Proposed

Project and the Cumulative 4 Scenario. Therefore, there would be no impact and would not be cumulatively considerable.

Impact 5.7.3-4. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flow that could substantially affect the habitat for spawning American shad in the Russian River in combination with the No Potter Valley Project (Cumulative 1 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less than significant).

Impact 5.7.3-5. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flow that could substantially effect the habitat for spawning American shad in the Russian River in combination with the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario) and UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario). (Cumulatively not Considerable).

Cumulative 1 Scenario (Proposed Project and No Potter Valley Project)

Modeled instream flows during the American shad upstream migration and spawning period in the Russian River and in Dry Creek would be similar under the Proposed Project Scenario and the Cumulative 1 Scenario in April and May (Table 5.7.3-4). During June, instream flows decline at a quicker rate under the Cumulative 1 Scenario compared to the Proposed Project. Under Cumulative 1 Scenario, median instream flows at Hacienda and Healdsburg during April and May (peak spawning season) would be in excess of 200 cfs and would likely be suitable for American shad spawning and egg incubation. However, flows would decline at both gages during June under the Cumulative 1 Scenario. Suitable instream flows to support egg incubation are unknown, but it would be likely that at some point flows would become unsuitable during June. Suitable spawning habitat would be available in the Russian River downstream of Dry Creek throughout the spawning season. Overall, the spawning conditions for American Shad become degraded earlier during June under the Cumulative 1 Scenario when compared to the Proposed Project. However, the difference is small and would occur after the peak of spawning. Thus, the impact to spawning conditions for American Shad in the Russian River during early June under the Cumulative 1 Scenario would be cumulatively less than significant and no mitigation is required.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Modeled instream flows from April through August during the American shad upstream migration and spawning period in the Russian River and in Dry Creek would be similar under the Proposed Project and the Cumulative 2 Scenario (Table 5.7.3-4). Median instream flows at Hacienda and Healdsburg during April and May (peak spawning season) would be in excess of 160 cfs and would likely be suitable for American shad spawning and egg incubation under both the Proposed Project and the Cumulative 2 Scenario. However, during June instream flows would decline at both gauges under both the Proposed Project and the Cumulative 2 Scenario. Suitable instream flows to support egg incubation are unknown, but would be likely that at some point flows would become unsuitable during June under both the Proposed Project and the Cumulative 2 Scenario. Suitable spawning habitat would be available in the Russian River downstream of Dry Creek throughout the spawning season under the Proposed Project and the

Cumulative 2 Scenario. Overall, there would be no additional impacts associated with the Cumulative 2 Scenario when compared to the Proposed Project. Thus, there would be no net change in stream flow for spawning American shad in the Russian River between the Proposed Project and the Cumulative 2 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

Modeled instream flows from April through August during the American shad upstream migration and spawning period in the Russian River and in Dry Creek would be similar under the Proposed Project and the Cumulative 3 Scenario (Table 5.7.3-4). Median instream flows at Hacienda and Healdsburg during April and May (peak spawning season) would be in excess of 200 cfs and would likely be suitable for American shad spawning and egg incubation under both the Proposed Project and the Cumulative 3 Scenario. However, instream flows would decline at both gauges during June under both the Proposed Project and the Cumulative 3 Scenario. Suitable instream flows to support egg incubation are unknown, but would be likely that at some point flows would become unsuitable during June under the Proposed Project and the Cumulative 3 Scenario. Suitable spawning habitat would be available in the Russian River downstream of Dry Creek throughout the spawning season under the Proposed Project and the Cumulative 3 Scenario. Overall, there would be no additional impacts associated with the Cumulative 3 Scenario when compared to the Proposed Project. There would be no net change in instream flow for spawning American shad in the Russian River between the Proposed Project and the Cumulative 3 Scenario. Therefore, there would be no impact on fisheries and it would not be cumulatively considerable.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Modeled streamflows during the American shad upstream migration and spawning period in the Russian River and in Dry Creek would be similar under the Proposed Project and the Cumulative 4 Scenario during April and May (Table 5.7.3-4). During June, instream flows would decline at a quicker rate under the Cumulative 4 Scenario when compared to the Proposed Project. Median instream flows at Hacienda and Healdsburg during April and May (peak spawning season) would be in excess of 200 cfs at Healdsburg and would likely be suitable for American shad spawning and egg incubation under the Proposed Project and the Cumulative 4 Scenario. However, instream flows would decline at both gauges during June under the Proposed Project and the Cumulative 4 Scenario. Suitable flows to support egg incubation are unknown, but would be likely that at some point flows would become unsuitable during June under both the Proposed Project and the Cumulative 4 Scenario. Suitable spawning habitat would be available in the Russian River downstream of Dry Creek throughout the spawning season under both the Proposed Project and the Cumulative 4 Scenario. Overall, the spawning conditions for American shad would become degraded earlier in June under the Cumulative 4 Scenario when compared to the Proposed Project. However, the difference is small and it would occur after the peak of spawning. Thus, the impact to spawning conditions for American shad in the Russian River in early June under the Cumulative 4 Scenario would be cumulatively less than significant and no mitigation is required.

Table 5.7.3-4. Median monthly instream flows (cubic feet per second) at Healdsburg and Hacienda under the four flow scenarios during the April to August shad upstream migration and spawning period.

Healdsburg					
	Month				
Flow alternative	April	May	June	July	August
Proposed Project	536	207	121	114	114
Cumulative 1	532	188	91	54	54
Cumulative 2	528	193	117	114	114
Cumulative 3	536.	204	117	114	114
Cumulative 4	522	176	75.6	54	45
Hacienda					
	April	May	June	July	August
Proposed Project	848	246	87	84	84
Cumulative 1	839	230	84	84	69
Cumulative 2	839.	232	84	84	84
Cumulative 3	848	244	84	84	84
Cumulative 4	830	214	84	84	69

5.7.4 Vegetation and Wildlife

Geographic Scope

The geographic scope of potential cumulative impacts on vegetation communities and wildlife includes the area within which the Proposed Project could cause a significant and/or less than significant impact. As explained in Chapter 4.4, “Vegetation and Wildlife,” potential impacts on vegetation communities and wildlife habitats could occur on along the Russian River and Dry Creek. The No Potter Valley Project scenario, UWMP Future Water Rights Petition, and Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report are the related projects within the geographic scope.

Cumulative Impact Analysis

The Proposed Project could result in cumulative impacts on vegetation communities and wildlife along the Russian River and Dry Creek in combination with the following related projects: No Potter Valley Project scenario (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario).

As described in Chapter 3, “Background and Project Description,” and the “Russian River Hydrologic Modeling for the Fish Habitat Flows and Water Rights Project” in Appendix G, water supply storage in Lake Mendocino would be more reliable under the Proposed Project when compared to Baseline Conditions and the Proposed Project would maximize the occurrence of

Schedule 1 minimum instream flows and minimize the occurrence of Schedule 5 flows. Schedule 1 reflects the highest flows and wettest conditions, while Schedule 5 reflects the lowest flows and the driest conditions. The results of the Proposed Project and No PVP scenarios demonstrate that there would be a significant change in reservoir reliability under the no PVP scenario. The changes in cumulative inflow into and storage condition in Lake Mendocino under the No PVP scenario would result in a large increase in the frequency of occurrence of drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project. Under the Proposed Project, Schedules 3, 4, and 5 would occur approximately 6, 4, and 1 percent of the time under historical hydrology. Under the No PVP scenario, Schedules 3, 4, and 5 would occur approximately 11, 32, and 17 percent of the time under historical hydrology.

The Proposed Project would not require construction, operation, or maintenance of new facilities and, therefore no cumulative analysis will be conducted for construction related impacts to vegetation communities and wildlife habitats.

Existing conditions reflect the impacts of past projects. The standards of significance for impacts on biological resources are described in Chapter 4.4, “Vegetation and Wildlife” under “Significance Criteria.” These standards also apply to the significance of cumulative impacts on vegetation communities and wildlife habitats.

The analysis of the potential cumulative impacts to vegetation communities and wildlife resources, including changes in habitat accessible to special-status species is a qualitative evaluation of whether the Proposed Project would contribute to cumulatively considerable impacts associated with Cumulative 1, 2, 3, and 4 scenarios (e.g. changes in minimum instream flows that may affect these resources). The assessment compared changes in minimum instream flows under the Proposed Project to the Cumulative 1, 2, 3 and 4 scenarios. The qualitative evaluation relied on a quantitative hydrologic model (Russian River ResSim). The Russian River ResSim model used historical hydrology to simulate minimum instream flow conditions downstream of Lakes Sonoma and Mendocino and the corresponding changes that would occur under the Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios. Modeled projected changes in minimum instream flows under the Proposed Project were then compared to the Cumulative 1, 2, 3 and 4 scenarios to evaluate potential cumulative impacts on vegetation communities and wildlife resources. Please see Section 5.7.1, “Hydrology,” for modeling results.

The cumulative impact discussion follows the impact statements 4.4-1, 4.4-3, and 4.4-4, analyzed in in Chapter 4.4, “Vegetation and Wildlife,” Section “Impacts and Mitigation Measures,” and focuses on the vegetation communities and wildlife resources for which the Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact.

Impact 5.7.4-1. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in water surface elevations and flows that could adversely affect sensitive natural communities in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario) (Cumulatively Less than Significant).

As discussed in Chapter 4.4, "Vegetation and Wildlife," changes in water surface elevation and flows associated with the implementation of the Proposed Project may result in slight changes in the distribution of coastal and valley freshwater marsh, aquatic habitats, and active stream channel. Although the adaptation of vegetative communities cannot be precisely predicted, vegetative assemblages are expected to shift slightly towards wetter conditions (i.e., wetland vegetation may shift to match changes in water surface elevation). Vegetative communities within the active channel are naturally sparse due to frequent disturbance from stream flows. It is anticipated that conditions resulting from the Proposed Project would be similar to the range of Baseline Conditions in the project area. Changes in hydrophytic vegetative assemblages would likely be towards no change in riparian communities and slight shifts along the shoreline of sensitive coastal and valley freshwater marsh. However, this shift is expected to be minimal because marsh vegetation is very restricted in the existing active channel due to the scouring and sedimentary effects of winter floods and the incised stream banks of the Russian River and Dry Creek that determine shoreline conditions favorable to marsh vegetation establishment.

Cumulative 1, 2, 3 and 4 Scenarios

An evaluation of minimum instream flows and river stage in the Russian River and Dry Creek under Cumulative 2 and 3 scenarios indicate that flows and river stage would be the same or slightly lower than that of the Proposed Project. Instream flows resulting from Cumulative 1 and 4 scenarios, would be between 40 and 60 percent less than that of the Proposed Project flows. River stage would decrease between 1 to 6 inches under the Cumulative 1 and 4 scenarios. However, a perennial water source would be maintained with minimum instream flows under all four cumulative scenarios. Flows in the Russian River and Dry Creek under the Proposed Project and the Cumulative 1, 2, 3, and 4 scenarios represent a range of variation already experienced between freshwater marsh, riparian, and the active channel brought on naturally by shifts in morphology (sediment deposition and scour) during large storms as well as the variation already experienced under Baseline Conditions. Therefore, the impact to sensitive natural communities under the Cumulative 1, 2, 3 and 4 scenarios would be cumulatively less than significant and no mitigation is required.

Impact 5.7.4.-2. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in water surface elevations the could impede the use of nursery sites in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario) (Cumulatively Less than Significant)

As discussed in Chapter 4.4, “Vegetation and Wildlife,” changes in water surface elevation and instream flows associated with the implementation of the Proposed Project may result in slight changes in the distribution of wetland communities that may be used as breeding and nursery sites for amphibians and reptiles. Foothill yellow-legged frog tadpoles and juvenile frogs use shallow waters and shoreline habitat for rearing. Hatchling western pond turtles likely use vegetated shorelines for cover and foraging. The wetland communities where nursery sites may occur may have a slight shift in the distribution in wetland vegetation, but no net loss of wetlands, and hence no net loss of amphibian and reptile nursery sites.

Cumulative 1, 2, 3 and 4 Scenarios

Flows in the Russian River and Dry Creek under the Proposed Project and the Cumulative 1, 2, 3, and 4 scenarios represent a range of variation already experienced by aquatic and wetland habitats brought on naturally by shifts in morphology (sediment deposition and scour) during large storms as well as the variation already experienced under Baseline Conditions. Also, the Proposed Project and Cumulative 1, 2, 3, and 4 scenarios would maintain perennial flows and maintain wetland communities and nursery habitats in the Russian River and Dry Creek. Therefore, the impact to wildlife nursery sites under the Cumulative 1, 2, 3 and 4 scenarios would be cumulatively less than significant and no mitigation is required.

Impact 5.7.4.-3. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes to minimum instream flows and water levels that could adversely affect special-status wildlife species in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less than Significant)

As discussed in Chapter 4.4, “Vegetation and Wildlife,” few special-status wildlife and no special-status plant species could be adversely affected by the Proposed Project. The special-status wildlife species are primarily associated with open water (aquatic), freshwater marsh, and riparian habitats. Rivers and creeks are complex, dynamic ecosystems, normally experiencing changes between seasons, between years, and between different places within a waterway. Wildlife species within these systems are adapted to fluctuating environmental conditions. For these reasons, minor shifts in aquatic and wetland habitats are not expected to result in a substantial adverse effect on special-status wildlife potentially occurring within these habitats.

Cumulative 1, 2, 3 and 4 Scenarios

Special-status wildlife could be affected by shifts in aquatic and shoreline habitats under the Proposed Project and the Cumulative 1, 2, 3, and 4 scenarios. Although the adaptation of habitat in the Russian River and Dry Creek, and its use by wildlife, cannot be precisely predicted, the changes in habitats from the Proposed Project and Cumulative 1, 2, 3, and 4 scenarios represent a range of variation already experienced by wildlife under Baseline Conditions. Also, the Proposed Project and Cumulative 1, 2, 3, and 4 scenarios would maintain perennial flows and maintain wetland communities used by special-status wildlife in the Russian

River and Dry Creek. Therefore, the impact to special-status wildlife under the Cumulative 1, 2, 3 and 4 scenarios would be cumulatively less than significant and no mitigation is required.

5.7.5 Recreation

Geographic Scope

The geographic scope of potential cumulative impacts on recreation include the areas within which the Proposed Project could cause a significant and/or less than significant impact. As explained in Chapter 4.5, “Recreation,” impacts on recreation could occur at Lake Mendocino and in the Upper and Lower Russian River. The No Potter Valley Project, UWMP Future Water Rights Petition, and Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report are the related projects within the geographic scope.

Cumulative Impact Analysis

The Proposed Project could result in cumulative impact on recreation at Lake Mendocino, Lake Sonoma, and the Russian River from Rio Lindo Academy to the Confluence of Dry Creek and Russian River from Wohler the Pacific Ocean in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario).

As described in Chapter 3, “Background and Project Description,” and the “Russian River Hydrologic Modeling for the Fish Habitat Flows and Water Rights Project” in Appendix G, water supply storage in Lake Mendocino would be more reliable under the Proposed Project when compared to Baseline Conditions and the Proposed Project would maximize the occurrence of Schedule 1 minimum instream flows and minimize the occurrence of Schedule 5 flows. Schedule 1 reflects the highest flows and wettest conditions, while Schedule 5 reflects the lowest flows and the driest conditions. The results of the Proposed Project and No PVP scenarios demonstrate that there would be a significant change in reservoir reliability under the no PVP scenario. The changes in cumulative inflow into and storage condition in Lake Mendocino under the No PVP scenario would result in a large increase in the frequency of occurrence of drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project. Under the Proposed Project, Schedules 3, 4, and 5 would occur approximately 6, 4, and 1 percent of the time under historical hydrology. Under the No PVP scenario, Schedules 3, 4, and 5 would occur approximately 11, 32, and 17 percent of the time under historical hydrology.

The Proposed Project would not require construction, operation, or maintenance of new facilities and, therefore no cumulative analysis will be conducted for construction-related impacts to recreation.

Existing conditions reflect the impacts of past projects. The standards of significance for impacts on recreational resources are described in Chapter 4.5, “Recreation” under “Significance Criteria.” These standards also apply to the significance of cumulative impacts on recreational

resources. Since recreation occurs primarily during the dry season (June through September), a seasonal component to potential cumulative impacts to recreation is considered.

The analysis on the potential cumulative impacts on recreation focuses on water surface elevation (WSE) at Lake Mendocino, instream flows in the Upper and Lower Russian River, and river stage in the Lower Russian River. The Russian River ResSim model was used to simulate WSE at Lake Mendocino, instream flows in the Upper and Lower Russian River and river stage in the Lower Russian River under different water supply conditions that would occur under the Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios during the recreation seasonal (June – September). The modeled projected changes to reservoir WSE, instream flows, and river stage under the Proposed Project were then compared to each of the Cumulative 1, 2, 3 and 4 scenarios to evaluate potential cumulative impacts on recreation. Tables 5.7.5-1 through 5.7.5-4 below include these modeling results and illustrate the estimated percentage of time that WSE and instream flows would occur under the Proposed Project and Cumulative 1 through 4 scenarios.

If a cumulative scenario resulted in a substantial increase in the percentage of time that water surface elevations would occur above 750 means sea level (msl) during the recreational season at Lake Mendocino than that of the Proposed Project, the impact on recreation resources was considered cumulatively significant. If a cumulative scenario resulted in decrease in the percentage of time that water surface elevations would occur above 750 msl during the recreational season at Lake Mendocino than that of the Proposed Project, there would be no impact to recreation and it would not be cumulatively considerable.

If a cumulative scenario resulted in a substantial increase in the percentage of time that water surface elevations would occur above 755 msl and inundate a portion of the campsites at the Kyen Campground during the recreational season at Lake Mendocino than that of the Proposed Project, the impact to recreation was considered cumulatively significant. If a cumulative scenario resulted in a decrease in the percentage of time that water surface elevations would occur above 755 msl during the recreational season than that of the Proposed Project, there would be no impact to recreation and it would not be cumulatively considerable.

If a cumulative scenario resulted in a greater decrease of river stage during the recreational season in the Russian River than that of the Proposed Project, the impact to recreation was considered cumulatively significant. If a cumulative scenario resulted in a smaller decrease of river stage during the recreational season than that of the Proposed Project, there would be no impact to recreation and it would not be cumulatively considerable.

If a cumulative scenario resulted in a substantial increase in the percentage of time that instream flows would be less than 70 cubic feet per second (cfs) during the recreational season in the Upper Russian River from Rio Lindo Academy to the Confluence of Dry Creek than that of the Proposed Project, it was considered cumulatively significant. If a cumulative scenario resulted in a decrease in the percentage of time that instream flows would be less than 70 cfs during the recreational season in the Upper Russian River from Rio Lindo Academy to the Confluence of Dry Creek than that of the Proposed Project, there would be no impact to recreation and it would not be cumulatively considerable.

If a cumulative scenario resulted in a substantial increase in the percentage of time that instream flows would be less than 80 cfs during the recreational season in the Russian River from Wohler to the Pacific Ocean than that of the Proposed Project, it was considered cumulatively significant. If a cumulative scenario resulted in a decrease in the percentage of time that instream flows would be less than 80 cfs during the recreational season in the Russian River from Wohler to the Pacific Ocean than that of the Proposed Project, there would be no impact to recreation and it would not be cumulatively considerable.

The following cumulative impact discussion follows the impact statements 4.5-5, 4.5.6, 4.5-12, 4.5-14, 4.5-16, and 4.5-18, analyzed in Chapter 4.5, “Recreation“ Section “Impacts, and Mitigation Measures,” and focuses on the recreational resources for which the Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact.

Impact 5.7.5-1. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in releases from Lake Mendocino that could result in higher water surface elevations that could inundate Inlet Road and substantially alter or inhibit access to Bushay Campground during the recreational season in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively not Considerable)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

As discussed in Chapter 4.5, “Recreation,” under the Proposed Project, Inlet Road would be inundated an estimated 14 percent to 40 percent of time during the recreational season (June through September) depending on the month. Under Cumulative 1 Scenario, Inlet Road would be inundated an estimated 0 percent to 12 percent of time during the recreational season, depending on the month (Table 5.7.5-1). Thus, under the Cumulative 1 Scenario, the estimated percentage of time that water surface elevations in Lake Mendocino would occur above 750 msl and would inundate Inlet Road and substantially alter or inhibit access to the Bushay Campground during the recreational season would occur less often than that of the Proposed Project and therefore, the impact on recreation would not be cumulatively considerable.

Table 5.7.5-1. The estimated percentage of time that water surface elevations would occur above 750 feet msl and inundate Inlet Road at Lake Mendocino under the . Proposed Project and Cumulative 1, 2, 3 and 4 scenarios. A decrease in the amount of time that Inlet Road would be inundated is shown in green.

Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Proposed Project	6%	0%	<1%	1%	<1%	<1%	22%	38%	40%	34%	26%	14%
Cumulative 1 Scenario	0%	0%	<1%	<1%	<1%	<1%	13%	18%	12%	5%	<1%	0%
Cumulative 2 Scenario	<1%	0%	<1%	1%	<1%	<1%	17%	32%	35%	29%	17%	11%
Cumulative 3 Scenario	4%	0%	<1%	1%	<1%	<1%	17%	33%	38%	31%	22%	13%
Cumulative 4 Scenario	0%	0%	<1%	<1%	<1%	<1%	10%	15%	11%	3%	<1%	0%

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

As discussed in Chapter 4.5, “Recreation,” under the Proposed Project, Inlet Road would be inundated an estimated 14 percent to 40 percent of the time during the recreational season (June through September) depending on the month. Under Cumulative 2 Scenario, Inlet Road would be inundated an estimated 11 percent to 35 percent of the time during the recreation period depending on the month (Table 5.7.5-1). Thus, under the Cumulative 2 Scenario, the estimated percentage of time that water surface elevations in Lake Mendocino would be above 750 msl and would inundate Inlet Road and substantially alter or inhibit access to the Bushay Campground during the recreational season would occur less often than that of the Proposed Project and therefore, the impact on recreation would not be cumulatively considerable.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

As discussed in Chapter 4.5, “Recreation,” under the Proposed Project, Inlet Road would be inundated an estimated 14 percent to 40 percent of the time during the recreational season (June through September) depending on the month. Under Cumulative 3 Scenario, Inlet Road would be inundated an estimated 13 percent to 38 percent of the time during the recreation period depending on the month (Table 5.7.5-1). Thus, under the Cumulative 3 Scenario, the estimated percentage of time that water surface elevations in Lake Mendocino would be above 750 msl and would inundate Inlet Road and substantially alter or inhibit access to the Bushay Campground during the recreational season would occur less often than that of the Proposed Project and therefore, the impact on recreation would not be cumulatively considerable.

Cumulative 4 Scenario (Proposed Project & No Potter Valley Project & Ukiah Amendment of Water Right Permit 12952 & UWMP Future Water Rights Application with the SWRCB)

As discussed in Chapter 4.5, "Recreation," under the Proposed Project, Inlet Road would be inundated an estimated 14 percent to 40 percent of the time during the recreation season (June through September) depending on the month. If the Cumulative 4 Scenario occurred Inlet Road would be inundated an estimated 0 percent to 11 percent of the time during the recreation period depending on the month (Table 5.7.5-1). Thus, under the Cumulative 4 Scenario, the estimated percentage of time that water surface elevations in Lake Mendocino would be above 750 msl and would inundate Inlet Road and substantially alter or inhibit access to the Bushay Campground during the recreational season would occur less often than that of the Proposed Project and therefore, the impact on recreation would not be cumulatively considerable.

Impact 5.7.5-2. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in releases from Lake Mendocino could result in higher water surface elevations that could substantially alter or inhibit access to Kyen Campground during the recreational season in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively not Considerable)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

As discussed in Chapter 4.5, "Recreation," a portion of Kyen Campground is located on the south side of Marina Drive near the north shore of Lake Mendocino. This portion of the campground contains sites 85 through 104 and is inundated when Lake Mendocino has a WSE of 755 feet msl (National Recreation Reservation Service 2014). Under the Proposed Project, a portion of the campsites at the Kyen Campground would be inundated an estimated 8 percent to 25 percent of time during the recreations season (June through September) depending upon the month. Under Cumulative 1 Scenario, a portion of the campsites at the Kyen Campground would be inundated an estimated 0 percent to 4 percent of time during the recreations season, depending upon the month (Table 5.7.5-2). Thus, under the Cumulative 1 Scenario, the estimated percentage of time that water surface elevations in Lake Mendocino would occur above 755 msl and would inundate a portion of the campsites at the Kyen Campground during the recreational season would occur less often than that of the Proposed Project and therefore, the impact on recreation would not be cumulatively considerable.

Table 5.7.5-2. The estimated percent of time that water surface elevations would be above 755 feet msl and inundate the lower portion of the Kyen Campground under the Proposed Project and the Cumulative 1, 2, 3, and 4 Scenario. A decrease in the amount of time that the lower portion of the Kyen Campground would be inundated is shown in green.

Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Proposed Project	<1%	0%	<1%	<1%	<1%	0%	3%	21%	25%	20%	12%	8%
Cumulative 1 Scenario	0%	0%	<1%	<1%	<1%	0%	1%	7%	4%	<1%	0%	0%
Cumulative 2 Scenario	0%	0%	<1%	<1%	<1%	0%	1%	14%	18%	13%	5%	0%
Cumulative 3 Scenario	0%	0%	<1%	<1%	<1%	0%	1%	14%	19%	15%	8%	1%
Cumulative 4 Scenario	0%	0%	0%	<1%	<1%	0%	<1%	3%	1%	<1%	0%	0%

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

As discussed in Chapter 4.5, “Recreation,” a portion of Kyen Campground is located on the south side of Marina Drive near the north shore of Lake Mendocino. This portion of the campground contains sites 85 through 104 and is flooded at a WSE of 755 feet msl (National Recreation Reservation Service 2014). Under the Proposed Project, a portion of the campsites at the Kyen Campground would be inundated an estimated 8 percent to 25 percent of time during the recreations season (June through September) depending upon the month. Under Cumulative 2 Scenario, a portion of the campsites at the Kyen Campground would be inundated an estimated 0 percent to 18 percent of time during the recreations season, depending upon the month (Table 5.7.5-2). Thus, under the Cumulative 2 Scenario, the estimated percentage of time that water surface elevations in Lake Mendocino would occur above 755 msl and would inundate a portion of the campsites at the Kyen Campground during the recreational season would occur less often than that of the Proposed Project and therefore, the impact on recreation would not be cumulatively considerable.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

As discussed in Chapter 4.5, “Recreation,” a portion of Kyen Campground is located on the south side of Marina Drive near the north shore of Lake Mendocino. This portion of the campground contains sites 85 through 104 and is flooded at a WSE of 755 feet msl (National Recreation Reservation Service 2014). Under the Proposed Project, a portion of the campsites at the Kyen Campground would be inundated an estimated 8 percent to 25 percent of time during the recreations season (June through September) depending upon the month. Under

Cumulative 3 Scenario, a portion of the campsites at the Kyen Campground would be inundated an estimated 1 percent to 19 percent of time during the recreations season, depending upon the month (Table 5.7.5-2). Thus, under the Cumulative 3 Scenario, the estimated percentage of time that water surface elevations in Lake Mendocino would occur above 755 msl and would inundate a portion of the campsites at the Kyen Campground during the recreational season would occur less often than that of the Proposed Project and therefore, the impact on recreation would not be cumulatively considerable.

Cumulative 4 Scenario (Proposed Project & No Potter Valley Project & Ukiah Amendment of Water Right Permit 12952 & UWMP Future Water Rights Application with the SWRCB)

As discussed in Chapter 4.5, "Recreation," a portion of Kyen Campground is located on the south side of Marina Drive near the north shore of Lake Mendocino. This portion of the campground contains sites 85 through 104 and is inundated when Lake Mendocino has a WSE of 755 feet msl (National Recreation Reservation Service 2014). Under the Proposed Project, a portion of the campsites at the Kyen Campground would be inundated an estimated 8 percent to 25 percent of time during the recreations season (June through September) depending upon the month. Under Cumulative 4 Scenario, a portion of the campsites at the Kyen Campground would be inundated an estimated 0 percent to 1 percent of time during the recreations season, depending upon the month (Table 5.7.5-2). Thus, under the Cumulative 4 Scenario, the estimated percentage of time that water surface elevations in Lake Mendocino would occur above 755 msl and would inundate a portion of the campsites at the Kyen Campground during the recreational season would occur less often than that of the Proposed Project and therefore, the impact on recreation would not be cumulatively considerable.

Impact 5.7.5-3. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flows that could result in impacts that substantially alter or inhibit access to recreational activities such as swimming and sunbathing in the Upper Russian River in combination with the No Potter Valley Project (Cumulative 1 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable).

Impact 5.7.5-4. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flows that could result in impacts that substantially alter or inhibit access to recreational activities such as swimming and sunbathing in the Upper Russian River in combination with the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario) and the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario). (Cumulatively not Considerable).

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

As discussed in Chapter 4.5, "Recreation," swimming and sunbathing are popular recreational activates in the Russian River. The most popular swimming and sunbathing areas in the Upper River are located between Pieta and Cloverdale, and near Healdsburg and in the Lower Russian River are located from Forestville to Duncans Mills. Under the Proposed Project, a

decrease in river stage at the recreation sites as a result of reducing minimum instream flows could alter access to swimming and sunbathing. However, because many of the pools in the Russian River are relatively deep, many of the popular recreation sites used for swimming and sunbathing are influenced by summer impoundments, and because there is an improvement in severe drought flows when implementing the Proposed Project over Baseline Conditions, access to swimming and sunbathing would not be substantially altered or inhibited by changes in minimum instream flows.

As discussed above, the model results of the Proposed Project and No PVP scenario demonstrate a significant change in reservoir reliability under the assumption of no PVP diversions. This change would result in an increase in drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project.

River stage changes under the Cumulative 1 Scenario were analyzed in Section 5.7.1, "Hydrology" of this chapter. In summary, the decrease in river stage under the Cumulative 1 Scenario in the Upper Russian River during the recreational season (June through September) would be an estimated 0 feet to 0.5 feet and decreases in river stage in the Lower Russian River would be an estimated 0 feet to 0.2 feet depending on the site, the flow, the month, and percent occurrence analyzed.

Under the Proposed Project disconnected surface flows are not anticipated to occur, however, under the Cumulative 1 Scenario, surface flows in the Upper Russian River could potentially become disconnected less than 1 percent of the time in June, July, August and September. This is not anticipated to occur in the Lower Russian River. Potential decreases in river stage particularly in June (Figure 5.7-1) could be substantial and could potentially lead to disconnected surface flow (flow of 0 cfs) and result in pool depths decreasing to a point that access to recreational facilities such as swimming and sunbathing could be substantially altered or inhibited. Therefore, the impact to recreation would be cumulatively significant and unavoidable and no mitigation is available.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Under the Proposed Project, a decrease in river stage at the recreation sites as a result of reducing minimum instream flows could alter access to swimming and sunbathing, but because many of the pools in the Russian River are relatively deep, many of the popular recreation sites used for swimming and sunbathing are influenced by summer impoundments, and because there is an improvement in severe drought flows when implementing the Proposed Project over Baseline Conditions, access to swimming and sunbathing would not be substantially altered or inhibited by changes in minimum instream flows.

River stage changes under the Cumulative 2 Scenario are analyzed in Section 5.7.1, "Hydrology" of this chapter. In summary, decreases in river stage in the Upper Russian River during the recreation season (June through September) would be an estimated 0 feet to 0.5 feet and decreases in stage in the Lower Russian River would be an estimated 0 feet to 0.1 feet depending on the site, the flow, the month, and percent occurrence analyzed.

Under the Cumulative 2 Scenario surface flow would not become disconnected. Because decreases in river stage are relatively small and there is not an increase in the frequency of disconnected surface flows (flows of 0 cfs) access to recreational activities such as swimming and sunbathing in the Russian River would not be substantially altered or inhibited under the Cumulative 2 Scenario. Therefore, this impact on recreation would not be cumulatively considerable.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

Under the Proposed Project, a decrease in river stage at the recreation sites as a result of reducing minimum instream flows could alter access to swimming and sunbathing. However, because many of the pools in the Russian River are relatively deep, many of the popular recreation sites used for swimming and sunbathing are influenced by summer impoundments, and because there is an improvement in severe drought flows when implementing the Proposed Project over Baseline Conditions, access to swimming and sunbathing would not be substantially altered or inhibited by changes in minimum instream flows.

River stage changes under the Cumulative 3 Scenario are analyzed in depth in Section 5.7.1, “Hydrology” of this chapter. In summary, decreases in river stage in the Upper Russian River during the recreation season (June through September) would be an estimated 0 feet to 0.4 feet and stage decreases in the Lower Russian River would be an estimated 0 feet to 0.1 feet depending on the site, the flow, the month, and percent occurrence analyzed. Because decreases in river stage are relatively small and there would not be an increase in the frequency of disconnected surface flows (flows of 0 cfs), access to recreational activities such as swimming and sunbathing in the Russian River would not be substantially altered or inhibited under the Cumulative 3 Scenario. Therefore, this impact on recreation would not be cumulatively considerable.

Cumulative 4 Scenario (Proposed Project & No Potter Valley Project & Ukiah Amendment of Water Right Permit 12952 & UWMP Future Water Rights Application with the SWRCB)

As discussed above, the model results of the Proposed Project and No PVP scenario demonstrate a significant change in reservoir reliability under the assumption of no PVP diversions. This change would result in an increase in drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project.

Under the Proposed Project, a decrease in river stage at the recreation sites as a result of reducing minimum instream flows could alter access to swimming and sunbathing. However, because many of the pools in the Russian River are relatively deep, many of the popular recreation sites used for swimming and sunbathing are influenced by summer impoundments, and because there is an improvement in severe drought flows when implementing the Proposed Project over Baseline Conditions, access to swimming and sunbathing would not be substantially altered or inhibited by changes in minimum instream flows.

River stage changes under the Cumulative 4 Scenario are analyzed in depth in Section 5.7.1, “Hydrology” of this chapter. In summary, decreases in stage in the Upper Russian River during the recreational season (June through September) would be an estimated 0 feet to 1.5 feet and

in the Lower Russian River decreases in river stage would be an estimated 0 feet to 0.3 feet depending on the site, the flow, the month, and percent occurrence analyzed.

Under the Proposed Project disconnected surface flows are not anticipated to occur, however under the Cumulative 4 Scenario surface flow could potentially become disconnected less than 1 percent of the time in June, July, August and September. A decrease of an estimated 1.5 feet in river stage could be substantial, furthermore the potential for disconnected surface flow (flow of 0 cfs) could lead to pool depths decreasing to a point that access to recreational facilities such as swimming and sunbathing could be substantially altered or inhibited. Therefore, the impact on recreation would be cumulatively significant and unavoidable and no mitigation is available.

Impact 5.7.5-5. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flows that could result in impacts that substantially alter or inhibit access to boating in the Upper Russian River from Rio Lindo Academy to the Confluence of Dry Creek in combination with the No Potter Valley Project (Cumulative 1 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)

Impact 5.7.5-6. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flows that could result in impacts that substantially alter or inhibit access to boating in the Upper Russian River from Rio Lindo Academy to the Confluence of Dry Creek in combination with the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario) and the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario). (Cumulatively Less than Significant)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

As discussed in Chapter 4.5, “Recreation,” under the Proposed Project, flow at Healdsburg (USGS gage number 11464000) during the recreational season (June through September) would be less than 70 cfs an estimated 6 percent of the time in June, 6 percent of the time in July, 6 percent of the time in August, and 7 percent of the time in September. Under the Cumulative 1 Scenario, instream flow would be less than 70 cfs an estimated 33 percent of the time in June, 58 percent of the time in July, 65 percent of the time in August, and 68 percent of the time in September (Table 5.7.5-2). Thus, under the Cumulative 1 Scenario, the section of the Upper Russian River from Rio Lindo Academy to the Confluence of Dry Creek would result in a substantial increase in the estimated percentage of time that instream flows would occur less than 70 cfs and would substantially alter or inhibit access to boating in this section of the Russian River during the recreational season more than that of the Proposed Project and therefore, the impact to recreation would be cumulatively significant and unavoidable and no mitigation is available.

Table 5.7.5-2. The estimated percentage of time that instream flows would be occur less than 70 cfs and potentially impact boating in the section of the Upper Russian River from

Rio Lindo Academy to the confluence of Dry Creek. When compared to Proposed Project, an increase in the amount of time that boating would be impacted is shown in orange.

Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Proposed Project	6%	<1%	0%	0%	<1%	<1%	<1%	2%	6%	6%	6%	7%
Cumulative 1 Scenario	68%	28%	11%	1%	<1%	<1%	<1%	6%	33%	58%	65%	68%
Cumulative 2 Scenario	12%	1%	1%	0%	<1%	<1%	<1%	2%	8%	9%	10%	10%
Cumulative 3 Scenario	7%	<1%	<1%	0%	<1%	<1%	<1%	2%	7%	8%	8%	9%
Cumulative 4 Scenario	79%	36%	11%	2%	<1%	<1%	1%	6%	38%	59%	68%	73%

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

As discussed in Chapter 4.5, "Recreation," under the Proposed Project, flow at Healdsburg (USGS gage number 11464000) during the recreational season (June through September) would be less than 70 cfs an estimated 6 percent of the time in June, 6 percent of the time in July, 6 percent of the time in August, 7 and percent of the time in September. Under the Cumulative 2 Scenario, flow would be less than 70 cfs an estimated 8 percent of the time in June, 9 percent of the time in July, 10 percent of the time in August, and 10 percent of the time in September (Table 5.7.5-2). Thus, under the Cumulative 2 Scenario, the section of the Upper Russian River from Rio Lindo Academy to the Confluence of Dry Creek would result in an increase in the estimated percentage of time that instream flows would occur less than 70 cfs and would alter or inhibit access to boating in this section of the Russian River during the recreational season more than that of the Proposed Project and therefore, the impact to recreation would be cumulatively less than significant and no mitigation is required.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

As discussed in Chapter 4.5, "Recreation," under the Proposed Project, flow at Healdsburg (USGS gage number 11464000) during the recreational season (June through September) would be less than 70 cfs an estimated 6 percent of the time in June, 6 percent of the time in July, 6 percent of the time in August, and 7 percent of the time in September. Under the Cumulative 3 Scenario, flow would be less than 70 cfs an estimated 7 percent of the time in June, 8 percent of the time in July, 8 percent of the time in August, and 9 percent of the time in September (Table 5.7.5-2). Thus, under the Cumulative 3 Scenario, the section of the Upper Russian River from Rio Lindo Academy to the Confluence of Dry Creek would result in an increase in the estimated percentage of time that instream flows would occur less than 70 cfs and would alter or inhibit access to boating in this section of the Russian River during the

recreational season more than that of the Proposed Project and therefore, the impact on recreation would be cumulatively less than significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Potter Valley Project & Ukiah Amendment of Water Right Permit 12952 & UWMP Future Water Rights Application with the SWRCB)

As discussed in Chapter 4, Sub-chapter 4.5, "Recreation," under the Proposed Project, flow at Healdsburg (USGS gage number 11464000) during the recreational season (June through September) would be less than 70 cfs an estimated 6 percent of the time in June, 6 percent of the time in July, 6 percent of the time in August, and 7 percent of the time in September. Under the Cumulative 4 Scenario, flow would be less than 70 cfs an estimated 38 percent of the time in June, 59 percent of the time in July, 68 percent of the time in August, and 73 percent of the time in September (Table 5.7.5-2). Thus, under the Cumulative 4 Scenario, the section of the Upper Russian River from Rio Lindo Academy to the Confluence of Dry Creek would result in an substantial increase in the estimated percentage of time that instream flows would occur less than 70 cfs and would substantially alter or inhibit access to boating in this section of the Russian River during the recreational season more than that of the Proposed Project and therefore, the impact to recreation would be cumulatively significant and unavoidable and no mitigation is available.

Impact 5.7.5-7. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flows that could result in impacts that substantially alter or inhibit access to recreational facilities or activities such as boating in the Russian River from Wohler to the Pacific Ocean in combination with the No Potter Valley Project (Cumulative 1 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)

Impact 5.7.5-8. Implementation of the Fish Habitat Instream Flows and Water Rights Project could result in changes in minimum instream flows that could result in impacts that substantially alter or inhibit access to recreational facilities or activities such as boating in the Russian River from Wohler to the Pacific Ocean in combination with the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario) and the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario). (Cumulatively Less than Significant)

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

As discussed above, the model results of the Proposed Project and No PVP scenario demonstrate a significant change in reservoir reliability under the assumption of no PVP diversions. This change would result in an increase in drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project.

As discussed in Chapter 4, Sub-chapter 4.5, "Recreation," under the Proposed Project, flow at Healdsburg (USGS gage number 11464000) during the recreational season (June through September) would be less than 80 cfs an estimated 4 percent of the time in June, 4 percent of the time in July, 4 percent of the time in August, and 4 percent of the time in September. Under the Cumulative 1 Scenario, flow would be less than 80 cfs an estimated 37 percent of the time

in June, 48 percent of the time in July, 56 percent of the time in August, and 61 percent of the time in September (Table 5.7.5-3). Thus, under the Cumulative 1 Scenario, the section of Russian River from Wohler to the Pacific Ocean would result in a substantial increase in the estimated percentage of time that instream flows would occur less than 80 cfs and would substantially alter or inhibit access to recreational facilities or activities such as boating in this section of the Russian River during the recreational season more than that of the Proposed Project and therefore, the impact on recreation would be cumulatively significant and unavoidable and no mitigation is available.

Table 5.7.5-3. The estimated percentage of time that instream flows would occur less than 80 cfs (measured at Hacienda) and potentially impact boating in the section of the Russian River from Wohler to the Pacific Ocean shown by month. When compared to the Proposed Project, an increase in the amount of time that flow is below 80 cfs (measured at Hacienda) is shown in orange.

Scenario	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Proposed Project	3%	<1%	0%	0%	<1%	0%	<1%	3%	4%	4%	4%	4%
Cumulative 1 Scenario	38%	7%	4%	1%	<1%	0%	<1%	10%	37%	48%	56%	61%
Cumulative 2 Scenario	3%	<1%	0%	0%	<1%	0%	<1%	3%	5%	6%	5%	5%
Cumulative 3 Scenario	3%	<1%	0%	0%	<1%	0%	<1%	3%	5%	5%	5%	5%
Cumulative 4 Scenario	38%	8%	3%	2%	<1%	<1%	<1%	10%	38%	47%	55%	61%

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

As discussed in Chapter 4.5, “Recreation,” under the Proposed Project, flow at Healdsburg (USGS gage number 11464000) during the recreational season (June through September) would be less than 80 cfs an estimated 4 percent of the time in June, 4 percent of the time in July, 4 percent of the time in August, and 4 percent of the time in September. Under the Cumulative 2 Scenario, flow would be less than 80 cfs an estimated 5 percent of the time in June, 6 percent of the time in July, 5 percent of the time in August, and 5 percent of the time in September (Table 5.7.5-3). Thus, under the Cumulative 2 Scenario, the section of Russian River from Wohler to the Pacific Ocean would result in an increase in the estimated percentage of time that instream flows would occur less than 80 cfs and would alter or inhibit access to recreational facilities or activities such as boating in this section of the Russian River during the recreational season more than that of the Proposed Project and therefore, the impact on recreation would be cumulatively less than significant and no mitigation is required.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

As discussed in Chapter 4.5, "Recreation," under the Proposed Project, flow at Healdsburg (USGS gage number 11464000) during the recreational season (June through September) would be less than 80 cfs an estimated 4 percent of the time in June, 4 percent of the time in July, 4 percent of the time in August, and 4 percent of the time in September. Under the Cumulative 3 Scenario, flow would be less than 80 cfs an estimated 5 percent of the time in June, 5 percent of the time in July, 5 percent of the time in August, and 5 percent of the time in September (Table 5.7.5-3). Thus, under the Cumulative 3 Scenario, the section of Russian River from Wohler to the Pacific Ocean would result in an increase in the estimated percentage of time that instream flows would occur less than 80 cfs and would alter or inhibit access to recreational facilities or activities such as boating in this section of the Russian River during the recreational season more than that of the Proposed Project and therefore, the impact on recreation would be cumulatively less than significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Potter Valley Project & Ukiah Amendment of Water Right Permit 12952 & UWMP Future Water Rights Application with the SWRCB)

As discussed above, the model results of the Proposed Project and No PVP scenario demonstrate a significant change in reservoir reliability under the assumption of no PVP diversions. This change would result in an increase in drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project.

Under the Proposed Project, flow at Healdsburg (USGS gage number 11464000) during the recreational season (June through September) would be less than 80 cfs an estimated 4 percent of the time in June, 4 percent of the time in July, 4 percent of the time in August, and 4 percent of the time in September. Under the Cumulative 4 Scenario, flow would be less than 80 cfs an estimated 38 percent of the time in June, 47 percent of the time in July, 55 percent of the time in August, and 61 percent of the time in September (Table 5.7.5-3). Thus, under the Cumulative 4 Scenario, the section of Russian River from Wohler to the Pacific Ocean would result in a substantial increase in the estimated percentage of time that instream flows would occur less than 80 cfs and would substantially alter or inhibit access to recreational facilities or activities such as boating in this section of the Russian River during the recreational season more than that of the Proposed Project and therefore, the impact on recreation would be cumulatively significant and unavoidable and no mitigation is available.

5.7.6 Energy

Geographic Scope

The geographic scope of potential cumulative impacts on energy includes the area within which the Proposed Project could cause a significant and/or less than significant impact. As explained in Chapter 4.6, "Energy," impacts on power production could occur at the City of Ukiah's Hydroelectric Power Plant at Coyote Valley Dam during March through September. The No Potter Valley Project, UWMP Future Water Rights Petition, and Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report are the related projects within the geographic scope.

Cumulative Impact Analysis

The Proposed Project could result in a cumulative impact on energy resources at the City of Ukiah's Lake Mendocino's Hydroelectric Power Plant at Coyote Valley Dam (Lake Mendocino's hydroelectric plant) in combination with the following related projects: No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario).

As described in Chapter 3, "Background and Project Description," and the "Russian River Hydrologic Modeling for the Fish Habitat Flows and Water Rights Project" in Appendix G, water supply storage in Lake Mendocino would be more reliable under the Proposed Project when compared to Baseline Conditions and the Proposed Project would maximize the occurrence of Schedule 1 minimum instream flows and minimize the occurrence of Schedule 5 flows. Schedule 1 reflects the highest flows and wettest conditions, while Schedule 5 reflects the lowest flows and the driest conditions. The results of the Proposed Project and No PVP scenarios demonstrate that there would be a significant change in reservoir reliability under the no PVP scenario. The changes in cumulative inflow into and storage condition in Lake Mendocino under the No PVP scenario would result in a large increase in the frequency of occurrence of drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project. Under the Proposed Project, Schedules 3, 4, and 5 would occur approximately 6, 4, and 1 percent of the time under historical hydrology. Under the No PVP scenario, Schedules 3, 4, and 5 would occur approximately 11, 32, and 17 percent of the time under historical hydrology.

The Proposed Project would not require construction, operation, or maintenance of new facilities and, therefore would not require energy to implement, thus no cumulative analysis will be conducted for consumption of energy.

The Proposed Project would, however, alter the timing and volume of releases at two existing reservoirs, Lake Mendocino and Lake Sonoma, and, consequently, the timing and amount of power produced at their associated hydroelectric production facilities. As discussed in Chapter 4.6, "Energy," impacts would only occur at the City of Ukiah's Lake Mendocino hydroelectric plant at Coyote Valley Dam (Lake Mendocino's hydroelectric plant), therefore only Lake Mendocino's hydroelectric power plant will be discussed in the cumulative impact section.

Existing conditions reflect the impacts of past projects. The standards of significance for impacts on energy resources are described in Chapter 4.6, "Energy" under "Significance Criteria." These standards also apply to the significance of cumulative impacts on energy resources.

The analysis of the potential impacts on energy resources focuses on the timing and volume of flow releases/outputs from Coyote Valley Dam that would occur under the Proposed Project in combination with individual related projects. Models were developed to simulate power generation for Coyote Valley Dam under the Proposed Project and under the Cumulative 1, 2, 3 and 4 scenarios. Daily power generation in Megawatts-hours per day (MWh) was simulated using estimates of generator power production capacity and turbine efficiency curves under the Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios. The models also incorporated

known or estimated power plant constraints such maximum and minimum power generation flows, penstock tailwater elevations and turbine headloss coefficients. These models are described further in Appendix G. The projected hydroelectric power production under the Proposed Project were then compared to each of the Cumulative 1, 2, 3 and 4 scenarios to evaluate potential cumulative impacts to energy resources. Figure 5.7.6-1 below include these modeling results and illustrate the average annual power production at Lake Mendocino's hydroelectric plant, under the Proposed Project and Cumulative 1 through 4 scenarios.

If a cumulative scenario resulted in a decrease of average annual power production below that of the Proposed Project, the impact on energy resources was cumulatively considerable. If a cumulative scenario resulted in an increase of annual power production above that of the Proposed Project, there would be no impact on energy resources and it would not be cumulatively considerable.

Cumulatively considerable impacts on energy resources under each Cumulative scenario was then evaluated to assess the extent to which the City of Ukiah's annual electricity needs would be impacted. If annual power production under a cumulative scenario was below 3,000 MWh, the low end of the range of power currently supplied by the Lake Mendocino's hydroelectric plant at Coyote Valley Dam, the cumulatively considerable impact on energy resources would be considered cumulatively significant. If annual power production under a cumulative scenario was between 3,000 MWh - 10,000 MWh needed by the City of Ukiah, which would result in a minimal increase in reliance on fossil fuels, the cumulatively considerable impact to energy resources would be considered cumulatively less than significant.

The following cumulative impact discussion follows the impact statements 4.6-1 and 4.6-2, analyzed in Chapter 4.6, "Energy" Section "Impacts, and Mitigation Measures," and focuses on the energy resources for which the Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact.

Impact 5.7.6-1. Implementation of the Fish Habitat Flows and Water Rights Project could substantially increase reliance on fossil fuels in combination with the No Potter Valley Project (Cumulative 1 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less than Significant)

Proposed Project Scenario

As discussed in Chapter 4.6, "Energy." the average annual power production would be reduced by approximately 11 percent under the Proposed Project (8,705 MWh) when compared to Baseline Conditions (9,794 MWh). This reduction represents approximately 1 percent of the City of Ukiah's annual electricity need. For the purposes of cumulative impact analysis, energy production under cumulative scenarios is compared to energy production under the Proposed Project, rather than Baseline Conditions, to evaluate the extent to which each cumulative scenario would further exacerbate reductions in energy production associated with the Proposed Project.

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Average annual power production under the Cumulative 1 Scenario (5,011 MWh) would be approximately 3,694 MWh below that of the Proposed Project (8,705 MWh), a reduction of approximately 42 percent below that of the Proposed Project (Figure 5.7.6-1). This amount of power production under the Cumulative 1 Scenario represents 3 percent of the City of Ukiah's annual electricity needs. Thus, the annual power production under Cumulative 1 Scenario would be below that of the Proposed Project and therefore, the impact on energy resources would be cumulatively less than significant and no mitigation is required.

Cumulative 2 Scenario (Proposed Project & Ukiah Amendment of Water Right Permit 12952)

Average annual power production under the Cumulative 2 Scenario (8,817 MWh) would be approximately 111 MWh above that of the Proposed Project (8,705 MWh), an increase of approximately 1 percent above the Proposed Project (Figure 5.7.6-1). This amount of power production under the Cumulative 2 Scenario represents an increase of approximately 0.10 percent of the City of Ukiah's annual electricity needs. Thus, the annual power production under Cumulative 2 Scenario would be above that of the Proposed Project and therefore, there would be no impact on energy resources and it would not be cumulatively considerable.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

Average annual power production under the Cumulative 3 Scenario (8,593 MWh) would be approximately 112 MWh below that of the Proposed Project (8,705 MWh), a reduction of approximately 1 percent below the Proposed Project (Figure 5.7.6-1). This amount of power production under the Cumulative 3 Scenario represents a reduction of approximately 0.10 percent of the City of Ukiah's annual electricity needs. Thus, the annual power production under Cumulative 3 Scenario would be below that of the Proposed Project and therefore, the impact on energy would be cumulatively less than significant and no mitigation is required.

Cumulative 4 Scenario (Proposed Project & No Potter Valley Project & Ukiah Amendment of Water Right Permit 12952 & UWMP Future Water Rights Application with the SWRCB)

Average annual power production under the Cumulative 4 Scenario (4,884 MWh) would be approximately 3,721 MWh below that of the Proposed Project (8,705 MWh), a reduction of approximately 43 percent below the Proposed Project (Figure 5.7.6-1). This amount of power production under the Cumulative 4 Scenario represents a reduction of approximately 3 percent of the City of Ukiah's annual electricity needs. Thus, the annual power production under

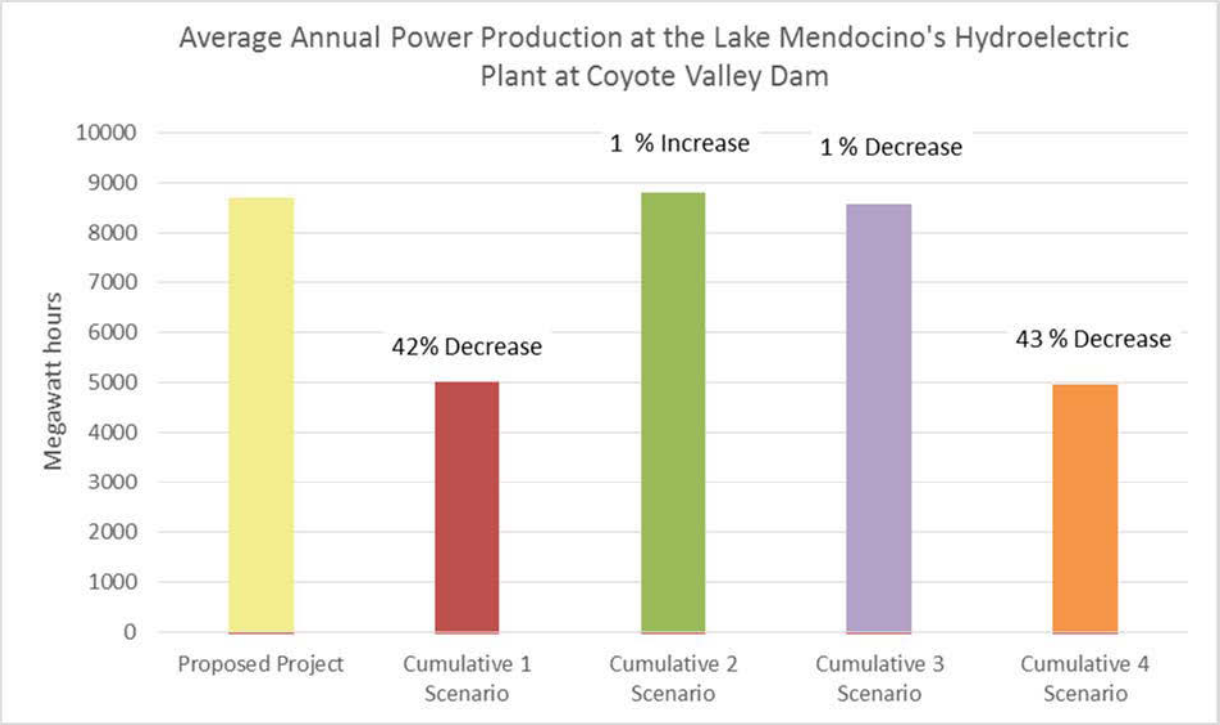

Figure 5.7.6-1. Average Annual Power Production at Lake Mendocino's Hydroelectric Plant under the Proposed Project and Cumulative 1 through 4 Scenarios

Cumulative 4 Scenario would be below that of the Proposed Project and therefore, the impact on energy resources would be cumulatively less than significant and no mitigation is required.

While the Northern California Power Agency (NCPA), meets the majority of the City of Ukiah's power needs, which totaled approximately 57 percent (108,041 MWh) in 2014 (State of California 2016), energy produced at the Lake Mendocino's hydroelectric plant directly supplements the City of Ukiah's power supply. As discussed above and detailed in Table 5.7.6-1, "Potential Power Production Changes at City of Ukiah's Lake Mendocino's Hydroelectric Plant at Coyote Valley Dam that may result from the Proposed Project and Cumulative 1, 2, 3 and 4 scenarios."

Table 5.7.6-1. Potential Power Production Changes at City of Ukiah's Lake Mendocino's Hydroelectric Plant at Coyote Valley Dam that may result from the Proposed Project and Cumulative 1, 2, 3 and 4 Scenarios.

	Average Annual Power Production at Coyote Valley Dam (MWh)	Reduction in Annual Power Production (MWh) Below Proposed Project	Percent Reduction in Annual Power Production Below Proposed Project	Increase in Annual Power Production (MWh) Above Proposed Project	Percent Increase in Annual Power Production Above Proposed Project	Portion of City of Ukiah's Energy Supply* (Percent)	Reduction in City of Ukiah's Energy Supply* (Percent)
Proposed Project	8,705	1,089 (Below Baseline Conditions)	11 (Below Baseline Conditions)			8	1
Cumulative 1 Scenario	5,011	3,694	42	-	-	5	3
Cumulative 2 Scenario	8,816	-	-	111	1	8	0.10
Cumulative 3 Scenario	8,593	112	1	-	-	8	0.10
Cumulative 4 Scenario	4,983	3,721	43	-	-	5	3

*Using the City of Ukiah's 2014 energy demands (108,041 MWh) (State of California 2016).

The Cumulative 1, 3 and 4 scenarios would reduce the amount of hydroelectric energy produced at the Lake Mendocino's hydroelectric plant below that of the Proposed Project. The additional power would be supplemented through existing agreements with the Northern California Power Agency (NCPA) (Grandi, Mel. pers. comm. July 6, 2016 n.d.). Energy supplied through the NCPA is approximately 50 percent free of GHG emissions (Northern California Power Agency 2016). Approximately 62 percent of the City of Ukiah's power supply was renewable and/or hydroelectric in origin in 2013 (California Energy Commission 2016) and 57 percent was renewable and/or hydroelectric in origin in 2014 (California Energy Commission 2016). This reduction in renewable energy from 2013 to 2014 was a result of the drought and associated reduction in hydroelectric power generation at the Lake Mendocino's hydroelectric plant and other NCPA hydroelectric facilities (Grandi, Mel. pers. comm. July 6, 2016 n.d.). The electricity currently supplied by the Lake Mendocino's hydroelectric plant at the Coyote Valley Dam is highly variable and may vary from approximately 3,000 MWh to 10,000 MWh in annual energy production depending on the water year (Grandi, Mel pers. comm. June 28, 2016 n.d.), which represents approximately 2.8 to 9.3 percent of the City of Ukiah's electricity needs.

This reduction in renewable energy production resulting from Cumulative 1, 3 and 4 scenarios would not result in a substantial increase in reliance on fossil fuels by the City of Ukiah because (1) the proportion of electricity supplied to the City of Ukiah by the Lake Mendocino's hydroelectric power plant is very small relative to other sources; (2) the energy supplied by Lake Mendocino's hydroelectric power plant under Cumulative 1 (5,012 MWh), 3 (8,593 MWh) and 4 (4,976 MWh) scenarios falls within the range of historic production, which is highly variable and may decline to as little as 3,000 MWh (a reduction of nearly 60 percent below average annual production) in some years; and (3) the reduced hydroelectric production would be remedied through existing agreements with the NCPA, which supplies electricity that is approximately 50 percent free of GHG emissions. Therefore, this potential cumulative impact would be less than significant and no mitigation is required.

Impact 5.7.6-2. Implementation of the Fish Habitat Flows and Water Rights Project could conflict with existing energy policies and standards intended to protect the environment in combination with the No Potter Valley Project (Cumulative 1 Scenario), City of Ukiah Draft Program Environmental Impact Report, UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less than Significant)

As discussed in Chapter 4.8, "Greenhouse Gas Emissions and Climate Change," the City of Ukiah has approved an existing California Renewables Portfolio (RPS) Standards Procurement Plan. According to this plan, the City of Ukiah must demonstrate that it is making reasonable progress toward ensuring that it shall meet the 25 percent RPS target by 2016 and 33 percent by 2020. As of 2015, the City of Ukiah derives 49 percent of the electricity it supplies from RPS-qualified renewable resources, consisting of geothermal power plants and small hydroelectric sources, including the Lake Mendocino's hydroelectric plant at Coyote Valley Dam (California Energy Commission 2016).

As discussed above, the average annual power production would be reduced by 42 percent under the Cumulative 1 Scenario (5,012 MWh), 0.10 percent under Cumulative 3 (8,593 MWh), and 43 percent under Cumulative 4 (4,976 MWh). These reductions represent 3 percent, 0.10 percent and 3 percent, respectively, of the City of Ukiah's annual electricity demand.

Because the City of Ukiah has met and substantially exceeded its RPS requirements, and because the City of Ukiah has other options for attaining renewable power through its membership in the NCPA, the decrease in electricity generation at Lake Mendocino's hydroelectric plant at Coyote Valley Dam would not inhibit its ability to continue to meet its RPS requirements. Therefore, the Proposed Project in combination with related projects would not result in a significant cumulative impact related to conflict with existing energy policies and standards intended to protect the environment. Therefore, the potential cumulative impact to energy resources would be less than significant and no mitigation is required.

5.7.7 Greenhouse Gas Emissions and Climate Change

Geographic Scope

The geographic scope of potential cumulative impacts on greenhouse gas emissions and climate change includes the area within which the Proposed Project could cause a significant and/or less than significant impact. As explained in Chapter 4.8, "Greenhouse Gas Emissions and Climate Change," impacts could occur at Lake Mendocino and Lake Sonoma reservoirs. The No Potter Valley Project, UWMP Future Water Rights Petition, and Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report are the related projects within the geographic scope.

Cumulative Impact Analysis

This cumulative analysis is qualitative. Existing conditions reflect the impacts of past projects. The standards of significance for impacts on greenhouse gas (GHG) emissions and climate change are described in Chapter 4.8, "Greenhouse Gas Emissions and Climate Change," under "Significance Criteria." These standards also apply to the significance of cumulative impacts on greenhouse gas emissions and climate change.

The following impact discussion follows the impact statements 4.8-1 and 4.8-2, analyzed in Chapter 4.8, "Greenhouse Gas Emissions and Climate Change" and focuses on the greenhouse gas emission and climate change resources for which the Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact.

> **Impact 5.7.7-1. Implementation of the Fish Habitat Flows and Water Rights Project could result in an increase in reservoir-generated greenhouse gas emissions in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Less than Significant)**

Impact 5.7.7-2. Implementation of the Fish Habitat Flows and Water Rights Project could substantially affect the City of Ukiah's ability to meet State of California's Renewables Portfolio Standard requirements in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenarios). (Cumulatively Less than Significant)

The quantity of GHG emissions required to induce climate change is not precisely known; however, it is clear that the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climate. Thus, from the standpoint of CEQA, the analysis of GHG emissions in the context of global climate change is inherently cumulative.

As described in Chapter 4.8, "Greenhouse Gas Emissions and Climate Change" under Impact 4.8-1, a comparison of the effects of the Proposed Project to the Baseline Conditions indicates that Lake Mendocino and Lake Sonoma reservoir-generated GHG emissions would not substantially increase under the Proposed Project. Moreover, the Proposed Project would not hinder the City of Ukiah's ability to meet the State of California's Renewables Portfolio Standard requirements. Additionally, the Proposed Project would be consistent with GHG-related goals outlined in local general plans and climate action plans. Thus, the Proposed Project would not result in a cumulatively considerable contribution to a significant cumulative impact related to global climate change. Therefore, the potential cumulative impact to greenhouse gas emissions would be less than significant and no mitigation is required.

5.7.8 Aesthetics

Geographic

The geographic scope of potential cumulative impacts on aesthetic resources include the area within which the Proposed Project could cause a significant and/or less than significant impact. As explained in Chapter 4.9, "Aesthetics," potential impacts on aesthetic resources could occur in the Upper and Lower Russian River. The No Potter Valley Project, UWMP Future Water Rights Petition, and Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report are the related projects within the geographic scope.

Cumulative Impact Analysis

The Proposed Project could result in cumulative impacts on aesthetics at the Upper and Lower Russian River in combination with the following related projects: No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario).

As described in Chapter 3, "Background and Project Description," and the "Russian River Hydrologic Modeling for the Fish Habitat Flows and Water Rights Project" in Appendix G, water

supply storage in Lake Mendocino would be more reliable under the Proposed Project when compared to Baseline Conditions and the Proposed Project would maximize the occurrence of Schedule 1 minimum instream flows and minimize the occurrence of Schedule 5 flows. Schedule 1 reflects the highest flows and wettest conditions, while Schedule 5 reflects the lowest flows and the driest conditions. The results of the Proposed Project and No PVP scenarios demonstrate that there would be a significant change in reservoir reliability under the no PVP scenario. The changes in cumulative inflow into and storage condition in Lake Mendocino under the No PVP scenario would result in a large increase in the frequency of occurrence of drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project. Under the Proposed Project, Schedules 3, 4, and 5 would occur approximately 6, 4, and 1 percent of the time under historical hydrology. Under the No PVP scenario, Schedules 3, 4, and 5 would occur approximately 11, 32, and 17 percent of the time under historical hydrology.

The Proposed Project would not require construction, operation, or maintenance of new facilities and, therefore no cumulative analysis will be conducted for construction related impacts to aesthetics.

The analysis on the potential cumulative impacts on aesthetic resources focuses on the change in water levels in the Russian River watershed that would occur under the Proposed Project in combination with individual related projects. Modeling using historic hydrology data was used to simulate water surface elevations in Lake Mendocino and Lake Sonoma and instream flow conditions downstream of the reservoirs and the corresponding changes that would occur under Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios. Modeled projected changes in reservoir water surface elevations and instream flows under the Proposed Project were then compared to Cumulative 1, 2, 3, and 4 scenarios to evaluate potential cumulative impacts on aesthetic resources.

If a cumulative scenario resulted in a substantial decrease in median monthly instream flows when compared to the Proposed Project, the impact on aesthetic resources was considered a cumulatively significant impact. If a cumulative scenario resulted in slightly lower, similar or an increase in median monthly instream flows when compared to the Proposed Project, there would be no impact on aesthetic resources and it would not be cumulatively considerable. Tables 5.7.8-1 and 5.7.8-2 below include these modeling results and illustrate the median monthly instream flows respectively, in the Upper and Lower Russian River, under Proposed Project and Cumulative 1 through 4 scenarios.

Existing conditions reflect the impacts of past projects. The standards of significance for impacts on aesthetic resources are described in Chapter 4.9, “Aesthetics,” under “Significant Criteria.” These standards also apply to the significance of cumulative impacts on aesthetic resources.

The cumulative impact discussion follows the impact statements 4.9-2 and 4.9-4, analyzed in Chapter 4.9, “Aesthetics“ Section “Impacts, and Mitigation Measures,” and focuses on the aesthetic resources for which Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact.

Impact 5.7.8-1. Implementation of the Fish Habitat Flows and Water Rights Project could have a substantial adverse effect on a scenic vista or degrade the visual character or quality of the Upper Russian River and its surroundings from June through October in combination with the No Potter Valley Project (Cumulative 1 Scenario and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)

Impact 5.7.8-2. Implementation of the Fish Habitat Flows and Water Rights Project could have a substantial adverse effect on a scenic vista or degrade the visual character or quality of the Upper Russian River and its surroundings from June through October in combination with Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario) and the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario). (Cumulatively not Considerable)

Under the Proposed Project, median monthly instream flows in the Upper Russian River (when measured at Healdsburg) range from 114 to 121 cfs from June through October. Under the Cumulative 1 Scenario, median monthly instream flows in the Upper Russian River would range from 53 to 91 cfs during the same period of time. Under the Cumulative 2 Scenario, median monthly instream flows in the Upper Russian River would range from 114 to 117 cfs during the same period of time. Under the Cumulative 3 Scenario, median monthly instream flows in the Upper Russian River would range from 114 to 117 cfs during the same period of time. Under the Cumulative 4 Scenario, median monthly instream flows in the Upper Russian River would range from 45 to 81 cfs during the same period of time.

When comparing the Proposed Project modeled projected changes in median monthly instream flows in the Upper Russian River against each cumulative scenario during June, Cumulative 2 and 3 scenarios median instream flows are slightly lower (approximately 4 cfs) when compared to the Proposed Project. The slight difference in instream flows would be likely unnoticeable due to daily fluctuations in river flows. Thus, during June, Cumulative 2 and 3 scenarios would result in a slightly lower median monthly instream flow than that of the Proposed Project and therefore, the potential impacts on aesthetic resources would not be cumulatively considerable.

Cumulative 2 and 3 scenarios from July through October had similar median monthly instream flows at approximately 114 cfs when compared to the Proposed Project. Thus, from July through October, Cumulative 2 and 3 scenarios would have similar median monthly instream flows of the Proposed Project and therefore, the potential impacts on aesthetic resources would not be cumulatively considerable.

Cumulative 1 and 4 scenarios from June through October have substantially lower median instream flows (approximately 30 to 61 cfs and 40 to 69 cfs) when compared to the Proposed Project. Thus, from June through October, Cumulative 1 and 4 scenarios would result in substantially lower median monthly instream flows than that of the Proposed Project and therefore, the potential impacts on aesthetic resources would be cumulatively significant and unavoidable and no mitigation is available.

Please refer to Table 5.7.8-1, “Upper Russian River, Healdsburg Instream Flow (cfs) Median Monthly Instream Flow from June through October under the Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios.”

Table 5.7.8-1 Upper Russian River, Healdsburg Flow (cfs) Median Monthly Instream Flow from June through October under the Proposed Project and Cumulative 1, 2, 3 and 4 Scenarios.

Scenario	June	July	August	September	October
Proposed Project	121	114	114	114	114
Cumulative 1 Scenario	91	54	54	54	53
Cumulative 2 Scenario	117	114	114	114	114
Cumulative 3 Scenario	117	114	114	114	114
Cumulative 4 Scenario	81	54	45	45	45

Impact 5.7.8-3. Implementation of the Fish Habitat Flows and Water Rights Project could have a substantial adverse effect on a scenic vista or degrade the visual character or quality of the Lower Russian River and its surroundings during June and July in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively not Considerable)

Impact 5.7.8-4. Implementation of the Fish Habitat Flows and Water Rights Project could have a substantial adverse effect on a scenic vista or degrade the visual character or quality of the Lower Russian River and its surroundings from August through October in combination with the No Potter Valley Project (Cumulative 1 Scenario) and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)

Impact 5.7-8-5. Implementation of the Fish Habitat Flows and Water Rights Project could have a substantial adverse effect on a scenic vista or degrade the visual character or quality of the Lower Russian River and its surroundings from August through October in combination with the Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario) and the UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario. (Cumulatively not Considerable)

Under the Proposed Project, median monthly instream flows in the Lower Russian River at Hacienda would range from 84 to 149 cfs (when measured at the USGS Hacienda gage). Under the Cumulative 1 Scenario, median monthly instream flows in the Lower Russian River at

Hacienda would range from 69 to 84 cfs. Under the Cumulative 2 Scenario, median monthly instream flows in the Lower Russian River at Hacienda would range from 84 to 134 cfs. Under the Cumulative 3 Scenario, median monthly instream flows in the Lower Russian River at Hacienda would range from 84 to 140 cfs. Under the Cumulative 4 Scenario, median monthly instream flows in the Lower Russian River at Hacienda would range from 69 to 84 cfs.

When comparing the Proposed Project's modeled projected changes in median monthly instream flows in the Lower Russian River to each cumulative scenario from June through October, Cumulative 1, 2, 3 and 4 scenarios median instream flows are slightly lower (approximately 3 to 4 cfs) during June when compared to the Proposed Project. The slight difference in instream flows would be likely unnoticeable due to daily fluctuations in river flows. Thus, during June, Cumulative 1, 2, 3 and 4 scenarios would result in slightly lower median monthly instream flows than that of the Proposed Project and therefore, the potential impacts on aesthetic resources would not be cumulatively considerable.

Cumulative 1, 2, 3 and 4 scenarios during July had the similar median monthly instream flows at approximately 84 cfs when compared to the Proposed Project. Thus, during July, Cumulative 1, 2, 3 and 4 scenarios would have similar median monthly instream flows of the Proposed Project and therefore, the impacts on aesthetic resources would not be cumulatively considerable.

Cumulative 1 and 4 scenarios from August through October have lower median instream flows (approximately 15 to 65 cfs) when compared to the Proposed Project. Thus, from August through October, Cumulative 1 and 4 scenarios would result in lower median monthly instream flows lower than that of the Proposed Project and therefore, the potential impacts on aesthetic resources would be cumulatively significant and unavoidable and no mitigation is available.

Cumulative 2 and 3 scenarios from August and September had similar median monthly instream flows at approximately 84 cfs when compared to the Proposed Project. Thus, from August and September, Cumulative 2 and 3 Scenario would have similar median monthly instream flows of the Proposed Project and therefore, the impact on aesthetic resources would not be cumulatively considerable.

Cumulative 2 Scenario during October had slightly lower median instream flows (approximately 15 cfs) when compared to the Proposed Project. The slight difference in instream flows would be likely unnoticeable due to daily fluctuations in river flows. Thus, during October Cumulative 2 Scenario would result in a lower median monthly instream flows than that of the Proposed Project and therefore, the potential impacts on aesthetic resources would not be cumulatively considerable.

Cumulative 3 Scenario during October would have lower median instream flows (approximately 9 cfs) when compared to the Proposed Project. The slight difference in instream flows would be likely unnoticeable due to daily fluctuations in river flows. Thus, during October, Cumulative 3 scenarios would result in a slightly lower median monthly instream flow than that of the Proposed Project and therefore, the potential impacts on aesthetic resources would not be cumulatively considerable. Please refer to Table 5.7.8-2, "Upper Russian River, Healdsburg

Flow (cfs) Median Monthly Flow from June through October under the Proposed Project and Cumulative 1, 2, 3 and 4 scenarios."

Table 5.7.8-2. Lower Russian River, Healdsburg Flow (cfs) Median Monthly Flow from June through October under the Proposed Project and Cumulative 1, 2, 3 and 4 Scenarios.

Scenario	June	July	August	September	October
Proposed Project	87	84	84	84	149
Cumulative 1 Scenario	84	84	69	69	84
Cumulative 2 Scenario	85	84	84	84	134
Cumulative 3 Scenario	84	84	84	84	140
Cumulative 4 Scenario	84	84	69	69	84

Cumulative 1, 2, 3 and 4 scenarios could cause additional exposure to existing gravel bars or expose gravel bars that might not be seen at higher instream flows in the Upper and Lower Russian River. However, rivers are highly dynamic systems, and gravel bars are a natural feature of rivers that are present and visible under numerous flow conditions. As discussed in Chapter 4.9, **"**Aesthetics,**"** and shown in Figure 4.9-7, in the Upper Russian River, instream flows of 70 cfs have a similar visual characteristic as instream flows of 249 cfs.

Most viewers of the section of the Upper Russian River from Cloverdale to Hopland would be traveling by car along Highway 101 at a high rate of speed. The views points from Highway 101 are often a few hundred feet from the river and often partially obscured by riparian vegetation and small hills. Since these observers would be traveling quickly and a few hundred feet from the river it would be unlikely that these observers would detect a change in the number or size of gravel bars.

Most viewers of the section of Lower Russian River would be traveling by car along Highway 116 at a high rate of speed. The views points from Highway 116 are often less than a few hundred feet from the river, but are heavily obscured by dense riparian vegetation. It is unlikely that observers traveling along Highway 116 would detect a change in the number or size of gravel bars since these observers would be traveling quickly and many of the views are obscured by dense vegetation.

In addition to motorists traveling along Highway 101 and 116, many people recreate on the Upper and Lower Russian River and would have long-lasting and close views of the river.

However variations in gravel bar exposure would not have a substantial adverse effect on a scenic vista or degrade the visual character or quality of the Upper and Lower Russian River and its surroundings.

5.7.9 Public Services and Utilities

Geographic Scope

The geographic scope of potential cumulative impacts on public services and utilities includes the area within which the Proposed Project could cause a significant and/or less than significant impact. As explained in Chapter 4.10, "Public Services and Utilities," potential impacts could occur in the Russian River. The No Potter Valley Project scenario, UWMP Future Water Rights Petition, and Amendment of Water Right Permit 12952 (Application 15704) for the City of Ukiah Draft Program Environmental Impact Report are the related projects within the geographic scope.

Cumulative Impact Analysis

The Proposed Project could result in cumulative impacts on public services and utilities in the Upper and Lower Russian River in combination with the following related projects: No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario).

As described in Chapter 3, "Background and Project Description," and the "Russian River Hydrologic Modeling for the Fish Habitat Flows and Water Rights Project" in Appendix G, water supply storage in Lake Mendocino would be more reliable under the Proposed Project when compared to Baseline Conditions and the Proposed Project would maximize the occurrence of Schedule 1 minimum instream flows and minimize the occurrence of Schedule 5 flows. Schedule 1 reflects the highest flows and wettest conditions, while Schedule 5 reflects the lowest flows and the driest conditions. The results of the Proposed Project and No PVP scenarios demonstrate that there would be a significant reduction in reservoir reliability under the No PVP scenario. The changes in cumulative inflow into and storage condition in Lake Mendocino under the No PVP scenario would result in a large increase in the frequency of occurrence of drier flow schedules (Schedules 3, 4, and 5) when compared to the Proposed Project. Under the Proposed Project, Schedules 3, 4, and 5 would occur approximately 6, 4, and 1 percent of the time under historical hydrology. Under the No PVP scenario, Schedules 3, 4, and 5 would occur approximately 11, 32, and 17 percent of the time under historical hydrology.

The Proposed Project would not require construction, operation, or maintenance of new facilities and, therefore, no cumulative analysis will be conducted for construction related impacts to public services and utilities.

The analysis of the potential cumulative impacts on public services and utilities is a qualitative evaluation of whether the Proposed Project would contribute to cumulatively considerable impacts associated with changes in minimum instream flows on water right permits with minimum bypass flow terms. The assessment compared changes in minimum instream flows

under the Proposed Project to the Cumulative 1, 2, 3 and 4 scenarios. The qualitative evaluation relied on a quantitative hydrologic model (Russian River ResSim). The Russian River ResSim model used historical hydrology to simulate minimum instream flow conditions downstream of Lake Mendocino and Lake Sonoma reservoirs and the corresponding changes that would occur under the Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios. Modeled projected changes in minimum instream flows under the Proposed Project were then compared to the Cumulative 1, 2, 3 and 4 scenarios to evaluate potential cumulative impacts on holders of water right permits to divert from the Russian River that have minimum bypass flow terms in their permits.

Existing conditions reflect the impacts of past projects. The standard of significance for impacts on public services and utilities are described in Chapter 4.10.4, “Public Services and Utilities,” under “Significance Criteria.” This standard also applies to the significance of cumulative impacts on public services and utilities.

The following impact discussion follows the impact statement 4.10-1, analyzed in Chapter 4.10, “Public Services and Utilities” and focuses on water rights for which the Proposed Project and related projects could cause a potentially significant and/or less than significant impact, that when considered concurrently, may result in a cumulatively considerable impact.

> **Impact 5.7.9-1. Changes in minimum instream flow requirements could adversely affect when water right permit holders may divert water from the Russian River while complying with the minimum bypass flow terms in their water right permits in combination with the No Potter Valley Project (Cumulative 1 Scenario), Ukiah Amendment of Water Right Permit 12952 (Cumulative 2 Scenario), UWMP Future Water Rights Application with the SWRCB (Cumulative 3 Scenario), and the combined Cumulative 1, 2 and 3 scenarios (Cumulative 4 Scenario). (Cumulatively Significant and Unavoidable)**

As described in Chapter 4.10, “Public Services and Utilities,” under Impact 4.10-1, there are at least 68 water right permits (5 public agencies/utilities and 63 private individuals/companies) that authorize diversions of water from the Russian River and that contain minimum bypass flow terms. Because of these terms, the changes in minimum instream flow requirements under the Proposed Project could result in lower instream flows that would adversely affect when holders of these permits could divert water from the Russian River, which would be a significant and unavoidable impact.

The Proposed Project and the Cumulative 1, 2, 3 and 4 scenarios would reduce minimum instream flows in the Russian River. These changes in minimum instream flows could potentially impact when public and private water right permit holders may divert water from the Russian River if flows drop below the minimum required bypass flow amounts (see Impact 5.10.1 in Chapter 5.10, Public Services and Utilities). The severity of such impacts would depend on the frequency of such flows, the terms in each water right permit and each permit’s authorized season of diversion. The season for which there is the highest potential for impact is from May to October, when instream flows in the Russian River transition from being dependent on

unimpaired stream flows to flows that occur with a managed-flow system that relies on releases from Lake Mendocino and Lake Sonoma to maintain required minimum instream flows.

The water right permit for River Estates Mutual Water Company has minimum bypass flow terms that would not be impacted under any of the four cumulative scenarios and will not be discussed further.

Cumulative 1 Scenario (Proposed Project & No Potter Valley Project)

Concurrent implementation of the Proposed Project and the No Potter Valley Project (Cumulative 1 Scenario) may adversely impact the ability of public and private water right permit holders with minimum bypass flow terms to divert during their permitted seasons of diversion. The No PVP scenario decreases inflows into Lake Mendocino, resulting in drier Upper Russian River flow schedules, which reduce the minimum instream flows. Under the Cumulative 1 Scenario, the times when public water right permit holders may divert water would decrease when compared to the Proposed Project as follows: 50 percent less for East Sanel Irrigation District, 16 percent less for Rains Creek Water District, 10 percent less for OCSD, and 16 percent less for Palomino Lakes. Private holders of water right permits with minimum bypass flow terms could be impacted compared to the Proposed Project through a reduction in the number of days available for diversions. This impact could occur year-round but would mainly occur during the peak months of June through October when changes in diversions could be restricted by up to 100 percent (diversions would not be authorized at any time in that month) over the Proposed Project.

Cumulative 2 Scenario (Proposed Project and Ukiah Amendment of Water Right Permit 12952)

Concurrent implementation of the Proposed Project and the City of Ukiah's water right amended permit (Cumulative 2 Scenario) may adversely impact when public and private water right permit holders with minimum bypass flow terms may divert water during their permitted seasons of diversion. This scenario includes potential increases in river diversions by extending the beneficial-use deadline in water rights Permit 12952. Under the Cumulative 2 Scenario, the times when public water right permit holders may divert water would decrease when compared to the Proposed Project as follows: 22 percent less for East Sanel Irrigation District, 8 percent less for Rains Creek Water District, 1 percent less for OCSD, and 8 percent less for Palomino Lakes. Private holders of water right permits with minimum bypass flow terms could be impacted compared to the Proposed Project through a reduction in the number of days available for diversions. This impact could occur year-round, but would mainly occur during the peak months of June through October when changes in diversions could be restricted by up to 42 percent over the Proposed Project.

Cumulative 3 Scenario (Proposed Project & UWMP Future Water Rights Application with the SWRCB)

Concurrent implementation of the Proposed Project and the 2015 Urban Water Management Plan – Future Water Rights Application with the SWRCB (Cumulative 3 Scenario) may adversely impact when public and private water right permit holders with minimum bypass flow terms may divert water during their permitted seasons of diversion. Under the Cumulative 3 Scenario, an additional 1,000 acre-feet per year would be diverted from the Russian River.

Cumulative 3 Scenario could decrease when public and private water right permit holders may divert water when compared to the Proposed Project as follows: 7 percent less for East Sanel Irrigation District, 3 percent less for Rains Creek Water District, 1 percent less for OCSD, and 3 percent less for Palomino Lakes. Private holders of water right permits with minimum bypass flow terms could be impacted compared to the Proposed Project through reductions in the numbers of days available for diversions. This impact could occur from April through December, but would mainly occur during the peak months of July through November when changes in diversions could be restricted by up to 26 percent over the Proposed Project. Cumulative 3 Scenario would have the lowest potential impact on water right diversions of the four cumulative scenarios.

Cumulative 4 Scenario (Proposed Project & No Pottery Valley Project, Ukiah Amendment of Water Right Permit 12952 and UWMP Future Water Rights Application with the SWRCB)

Concurrent implementation of the Proposed Project and the Cumulative 1, 2, and 3 scenarios (Cumulative 4 Scenario) may adversely impact when public and private water right permit holders with minimum bypass flow terms may divert water during their permitted seasons of diversion. Cumulative 4 Scenario would have the severest impacts, compared to the Cumulative 1, 2 and 3 scenarios. Under the Cumulative 4 Scenario, when public water right permit holders may divert water would decrease when compared to the Proposed Project as follows: 56 percent less for East Sanel Irrigation District, 18 percent less for Rains Creek Water District, 11 percent less for OCSD, and 18 percent less for Palomino Lakes. Private holders of water right permits with minimum bypass flow terms could be impacted compared to the Proposed Project through reductions in the numbers of days available for diversions. This impact could occur year-round, but would mainly occur during the peak months of June through November when changes in diversions could be restricted by more than 100 percent (diversions would not be authorized at any time in that month) over the Proposed Project. Due to the additive effects of Cumulative 4 Scenario, this scenario has the greatest potential impact on water rights diversions.

Because of the terms in some water right permits, the changes in minimum instream flow requirements under all of the cumulative scenarios (1, 2, 3, and 4) could result in lower instream flows that would adversely affect when holders of these permits could divert water from the Russian River. Cumulative 1 and 4 scenarios contain the No PVP scenario, which would substantially decrease the inflow into Lake Mendocino causing drier flow schedules, that would result in greater impacts than Cumulative 2 and 3 scenarios. Water right permits are issued by the SWRCB and terms, including minimum bypass flow terms like those discussed above, are enforced by the SWRCB. The Water Agency has no legal authority to amend the terms of water right permits that have such minimum bypass flow terms, and CEQA Guidelines Section 15126.4(a)(5) therefore is applicable. It provides that, under such circumstances, mitigation "need not be proposed or analyzed." This impact would be cumulatively significant and unavoidable and cannot be mitigated by the Water Agency.

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