CHAPTER 7 Alternatives

7.1 Introduction

The California Environmental Quality Act (CEQA) requires that an Environmental Impact Report (EIR) describe and evaluate a range of reasonable alternatives to a project or to the location of a project, which would feasibly attain most of the basic project objectives and avoid or substantially lessen significant project impacts. This chapter describes the development of the project alternatives, presents the project alternatives, evaluates the alternatives for consistency with stated project objectives, and summarizes and compares the environmental impacts and economic feasibility of the alternatives, in order to make recommendations on the environmentally superior alternative.

The CEQA Guidelines set forth the following criteria for selecting alternatives:

1. ". . . [T]he discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly." Section 15126.6(b)
2. "The range of potential alternatives shall include those that could feasibly accomplish most of the basic purposes of the project and could avoid or substantially lessen one or more of the significant effects." Section 15126.6(c)
3. "The specific alternative of 'no project' shall also be evaluated along with its impacts." Section 15126.6(e)(1)
4. "The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project. Of those alternatives, the EIR need examine in detail only the ones that the lead agency determines could meet most of the basic objectives of the project. The range of feasible alternatives shall be selected and discussed in a manner to foster meaningful public participation and informed decision making." Section 15126.6(f)

To determine the alternatives to be considered in the EIR, the project's objectives and potential significant effects should be included in the evaluation.

7.2 Selection of Alternatives

7.2.1 Attainment of Project Objectives

As described above, the ability of an alternative to attain most of the basic objectives of the project must be considered (CEQA Guidelines Section 15126[a]). As described in Chapter 3, "Background and Project Description," the objectives of the Fish Habitat Flows and Water Right Project (Fish Flow Project) are to manage Lake Mendocino and Lake Sonoma water supply releases to provide instream flows that will improve habitat for threatened and endangered fish species, and to update the Water Agency's existing water rights to reflect current conditions.

The new minimum instream flow requirements proposed by the Fish Flow Project were developed to meet the requirements of the Russian River Biological Opinion (described below) to improve habitat for threatened and endangered salmonid species.

As described in Chapter 3, "Background and Project Description," the National Marine Fisheries Service (NMFS) issued its Russian River Biological Opinion on September 24, 2008 (NMFS, 2008). The California Department of Fish and Wildlife (CDFW) issued a consistency determination on November 9, 2009, finding that the NMFS' Russian River Biological Opinion was consistent with the requirements of the CESA and adopting the measures identified in the Russian River Biological Opinion.

NMFS concluded that the continued operations of Coyote Valley Dam and Warm Springs Dam by the United States Army Corps of Engineers (USACE) and the Water Agency in a manner similar to recent historic practices are likely to jeopardize and adversely modify critical habitat for endangered Central California Coast coho salmon and threatened Central California Coast steelhead. To avoid jeopardizing these listed species, the Russian River Biological Opinion includes a recommended set of actions for the Water Agency's operations evaluated in the Russian River Biological Opinion, including reducing minimum instream flow requirements in the Russian River and Dry Creek. The Russian River Biological Opinion recommended species changes in minimum instream flow requirements during Normal hydrologic years on the Upper Russian River, Lower Russian River, and Dry Creek, and during Dry hydrologic years on Dry Creek. These recommendations are described in Chapter 3, "Background and Project Description," and in this chapter.

As described in Chapter 3, "Background and Project Description," the State Water Resources Control Board (SWRCB)'s Decision 1610 approved a hydrologic index for the Russian River watershed, which defines a hydrologic condition based on cumulative inflow into Lake Pillsbury in the Eel River watershed beginning on October 1 of each year. Thresholds of cumulative Lake Pillsbury inflow are defined for the first of each month from January 1 to June 1 to determine the hydrologic condition in the Russian River watershed. The Decision 1610 Hydrologic Index includes three water supply hydrologic conditions: *Normal*, *Dry*, and *Critical*. These conditions are each used to determine a corresponding schedule of minimum instream flow requirements for the Upper Russian River, the Lower Russian River, and Dry Creek.

In 2002, 2004, 2007, and 2009, water storage levels in Lake Mendocino declined to low levels. In 2002, the Decision 1610 Hydrologic Index designated the water year as a "dry" year, and thus authorized reductions in the minimum instream flow requirements, but this was not the case in 2004, 2007 or 2009. In those years, the Water Agency petitioned for and the SWRCB approved temporary urgency changes to Water Agency water right permits to temporarily reduce the minimum instream flow requirements, to preserve Lake Mendocino water storage and to maintain a reliable water supply. Low water storage levels in Lake Mendocino during these years were due to lack of rainfall and, in 2007 and 2009, were also due to lower inflows into the East Fork Russian River from PG&E's PVP, resulting from the 2004 changes in the FERC license for the PVP.

Because of the changes in operation of PG&E's PVP since 2006, and consequent reductions in PG&E's PVP diversions from the Eel River into the Russian River, the relationship between Eel River hydrologic conditions and Russian River hydrologic conditions has changed and it is no longer reasonable to use cumulative Lake Pillsbury inflows to determine the water-year type (*Normal*, *Dry*, or *Critical*) that governs Russian River and Dry Creek minimum instream flow requirements. It would better reflect local hydrologic conditions if the water-year type for Russian River minimum instream flow requirements were based on conditions in the Russian River watershed rather than on conditions in the Eel River watershed.

7.2.2 Alternatives Considered During the Screening Process

This EIR describes and evaluates a reasonable range of alternatives in accordance with CEQA Guidelines Section 15126(a). Because the range of alternatives considered must meet most of the basic objectives of the project, alternatives evaluated were limited to management of water supply releases from Lake Mendocino and Lake Sonoma to meet minimum instream flow requirements in the Russian River and Dry Creek. Selecting another location for project alternatives would not be feasible.

Minimum Instream Flows

Alternatives evaluated using the screening process included those identified in the Russian River Biological Opinion, by Water Agency staff and in comments provided by regulatory agencies, public agencies and members of the public in response to the Notice of Preparation (NOP) of Environmental Impact Report (EIR) issued for the Fish Flow Project in 2010. The Water Agency screened 21 minimum instream flow alternatives and 7 combined hydrologic index and minimum instream flow requirement alternatives. The alternatives screening process consisted of several rounds of evaluation using screening criteria described below. All minimum instream flow requirement alternatives considered are listed on Table 7-1.

The minimum instream flow requirement alternatives included No Project 1, No Project 2, and the minimum instream flows recommended in the Russian River Biological Opinion. The No Project 1 minimum instream flow alternative included the minimum instream flow requirements in the Water Agency's water right permits established by the SWRCB's Decision 1610 (Decision 1610 minimum instream flow requirements).

The No Project 2 minimum instream flow alternative included the temporary instream flows recommended in the Russian River Biological Opinion. The Russian River Biological Opinion requires annual Water Agency petitions for temporary changes to minimum instream flow requirements for the mainstem Russian River, but not to the requirements for Dry Creek. These minimum instream flow changes are as follows: under *Normal* conditions from May 1 to October 15: 125 cubic feet per second (cfs) in the Upper Russian River and 70 cfs in the Lower Russian River. The Russian River Biological Opinion did not provide recommended temporary changes to minimum instream flows for *Dry* or *Critical* conditions, so these are the same as the minimum instream flow requirements included in the Water Agency's water right permits.

Table 7-1. Minimum Instream Flow Requirement Alternatives Evaluated in Screening Process for the Upper Russian River, Lower Russian River, and Dry Creek. Monthly values are in cubic feet per second (cfs). Gray cells indicate no value for that condition and month.

Water Supply Condition	Flow Alternative	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
UPPER RUSSIAN RIVER														
Normal	NP1	150	150	150	185	185	185	185	185	150	150	150	150	150
	NP2	150	150	150	185	125	125	125	125	125	125	150	150	150
	BO	150	150	150	185	185	125	125	125	125	125	125	150	150
	F1	150	150	150	185	185	110	110	110	110	110	110	150	150
	F2	125	125	125	125	125	125	125	125	125	125	125	125	125
	F3	150	150	150	150	150	150	150	150	150	150	150	150	150
	F4	125	125	125	125	125	110	110	110	110	110	110	125	125
	F5	150	150	150	150	150	110	110	110	110	110	110	150	150
	F6	150	150	150	185	185	125	125	125	125	125	125	150	150
	F7	150	150	150	185	185	125	125	125	125	125	125	150	150
	F8	125	125	125	125	125	110	110	110	110	110	110	125	125
	F9	125	125	125	125	125	110	110	110	110	110	110	125	125
	F10	125	125	125	125	125	125	125	125	125	125	125	125	125
	F11	125	125	125	125	125	125	125	125	125	125	125	125	125
	F12	125	125	125	125	125	125	125	125	125	125	125	125	125
	F13	125	125	125	90	90	90	90	90	90	90	125	125	125
	F14	125	125	125	90	90	90	90	90	90	90	125	125	125
	F15	150	150	150	150	105	105	105	105	105	105	150	150	150
	F16	150	150	150	150	90	90	90	90	90	90	150	150	150
	F17	150	150	150	150	100	100	100	100	100	100	150	150	150
	F18	105	105	105	105	105	105	105	105	105	105	105	105	105
Dry Spring 1	NP1						150	150	150	150	150	150	150	150
	NP2						125	125	125	125	125	150	150	150
	BO						125	125	125	125	125	125	150	150
	F1						110	110	110	110	110	110	125	125
	F2						125	125	125	125	125	125	125	125
	F3						150	150	150	150	150	150	150	150
	F4						110	110	110	110	110	110	125	125
	F5						110	110	110	110	110	110	150	150
	F6						125	125	125	125	125	125	150	150
	F7						125	125	125	125	125	125	150	150
	F8						110	110	110	110	110	110	125	125
	F9						110	110	110	110	110	110	125	125
	F10						125	125	125	125	125	125	125	125
	F11						125	125	125	125	125	125	125	125
	F12						125	125	125	125	125	125	125	125
	F13						90	90	90	90	90	125	125	125
	F14						90	90	90	90	90	125	125	125
	F15						105	105	105	105	105	150	150	150
	F16						90	90	90	90	90	150	150	150
	F17						100	100	100	100	100	150	150	150
	F18						105	105	105	105	105	105	105	105

Table 7-1 (continued).

Water Supply Condition	Flow Alternative	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
UPPER RUSSIAN RIVER														
Dry Spring 2	NP1										75	75	75	75
	NP2										75	75	75	75
	BO										75	75	75	75
	F1										75	75	75	75
	F2										75	75	75	75
	F3										75	75	75	75
	F4										75	75	75	75
	F5										75	75	75	75
	F6										75	75	75	75
	F7										75	75	75	75
	F8										75	75	75	75
	F9										75	75	75	75
	F10										75	75	75	75
	F11										75	75	75	75
	F12										75	75	75	75
	F13										75	75	75	75
	F14										75	75	75	75
	F15										105	125	125	125
	F16										90	100	100	100
	F17										100	100	100	100
	F18										100	100	100	100
Dry Spring 3	NP1						75	75	75	75	75	75	75	75
	NP2						75	75	75	75	75	75	75	75
	BO						75	75	75	75	75	75	75	75
	F1						75	75	75	75	75	75	75	75
	F2						75	75	75	75	75	75	75	75
	F3						75	75	75	75	75	75	75	75
	F4						75	75	75	75	75	75	75	75
	F5						75	75	75	75	75	75	75	75
	F6						75	75	75	75	75	75	75	75
	F7						75	75	75	75	75	75	75	75
	F8						75	75	75	75	75	75	75	75
	F9						75	75	75	75	75	75	75	75
	F10						75	75	75	75	75	75	75	75
	F11						75	75	75	75	75	75	75	75
	F12						75	75	75	75	75	75	75	75
	F13						75	75	75	75	75	75	75	75
	F14						75	75	75	75	75	75	75	75
	F15						75	75	75	75	75	125	125	125
	F16						70	70	70	70	70	100	100	100
	F17						80	80	80	80	80	100	100	100
	F18						65	65	65	65	65	100	100	100

Table 7-1 (continued).

Water Supply Condition	Flow Alternative	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
UPPER RUSSIAN RIVER														
Dry	NP1	75	75	75	75	75	75	75	75	75	75	75	75	75
	NP2	75	75	75	75	75	75	75	75	75	75	75	75	75
	BO	75	75	75	75	75	75	75	75	75	75	75	75	75
	F1	75	75	75	75	75	75	75	75	75	75	75	75	75
	F2	75	75	75	75	75	75	75	75	75	75	75	75	75
	F3	75	75	75	75	75	75	75	75	75	75	75	75	75
	F4	75	75	75	75	75	75	75	75	75	75	75	75	75
	F5	75	75	75	75	75	75	75	75	75	75	75	75	75
	F6	75	75	75	75	75	75	75	75	75	75	75	75	75
	F7	75	75	75	75	75	75	75	75	75	75	75	75	75
	F8	75	75	75	75	75	75	75	75	75	75	75	75	75
	F9	75	75	75	75	75	75	75	75	75	75	75	75	75
	F10	75	75	75	75	75	75	75	75	75	75	75	75	75
	F11	75	75	75	75	75	75	75	75	75	75	75	75	75
	F12	75	75	75	75	75	75	75	75	75	75	75	75	75
	F13	75	75	75	75	75	75	75	75	75	75	75	75	75
	F14	75	75	75	75	75	75	75	75	75	75	75	75	75
	F15	125	125	125	75	75	75	75	75	75	75	125	125	125
	F16	100	100	100	100	70	70	70	70	70	70	100	100	100
	F17	100	100	100	100	80	80	80	80	80	80	100	100	100
	F18	100	100	100	100	65	65	65	65	65	65	100	100	100
Critical	NP1	25	25	25	25	25	25	25	25	25	25	25	25	25
	NP2	25	25	25	25	25	25	25	25	25	25	25	25	25
	BO	25	25	25	25	25	25	25	25	25	25	25	25	25
	F1	25	25	25	25	25	25	25	25	25	25	25	25	25
	F2	25	25	25	25	25	25	25	25	25	25	25	25	25
	F3	25	25	25	25	25	25	25	25	25	25	25	25	25
	F4	25	25	25	25	25	25	25	25	25	25	25	25	25
	F5	25	25	25	25	25	25	25	25	25	25	25	25	25
	F6	25	25	25	25	25	25	25	25	25	25	25	25	25
	F7	25	25	25	25	25	25	25	25	25	25	25	25	25
	F8	25	25	25	25	25	25	25	25	25	25	25	25	25
	F9	25	25	25	25	25	25	25	25	25	25	25	25	25
	F10	25	25	25	25	25	25	25	25	25	25	25	25	25
	F11	25	25	25	25	25	25	25	25	25	25	25	25	25
	F12	25	25	25	25	25	25	25	25	25	25	25	25	25
	F13	25	25	25	25	25	25	25	25	25	25	25	25	25
	F14	25	25	25	25	25	25	25	25	25	25	25	25	25
	F15	40	40	40	40	40	40	40	40	40	40	40	40	40
	F16	30	30	30	30	30	30	30	30	30	30	30	30	30
	F17	30	30	30	30	30	30	30	30	30	30	30	30	30
	F18	25	25	25	25	25	25	25	25	25	25	25	25	25

Table 7-1 (continued).

Water Supply Condition	Flow Alternative	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
LOWER RUSSIAN RIVER														
Normal	NP1	125	125	125	125	125	125	125	125	125	125	125	125	125
	NP2	125	125	125	125	70	70	70	70	70	70	125	125	125
	BO	70	70	70	70	70	70	70	70	70	70	70	70	70
	F1	70	70	70	70	70	70	70	70	70	70	70	70	70
	F2	70	70	70	70	70	70	70	70	70	70	70	70	70
	F3	70	70	70	70	70	70	70	70	70	70	70	70	70
	F4	70	70	70	70	70	70	70	70	70	70	70	70	70
	F5	70	70	70	70	70	70	70	70	70	70	70	70	70
	F6	85	85	85	85	85	85	85	85	85	85	85	85	85
	F7	100	100	100	100	100	100	100	100	100	100	100	100	100
	F8	85	85	85	85	85	85	85	85	85	85	85	85	85
	F9	100	100	100	100	100	100	100	100	100	100	100	100	100
	F10	85	85	85	85	85	85	85	85	85	85	85	85	85
	F11	70	70	70	70	70	70	70	70	70	70	70	70	70
	F12	85	85	85	85	85	85	85	85	85	85	85	85	85
	F13	70	70	70	70	70	70	70	70	70	70	70	70	70
	F14	70	70	70	70	70	70	70	70	70	70	70	70	70
	F15	125	125	125	125	85	85	85	85	85	85	125	125	125
	F16	150	150	150	150	85	85	85	85	85	85	150	150	150
	F17	150	150	150	150	100	100	100	100	100	100	150	150	150
	F18	135	135	135	70	70	70	70	70	70	70	135	135	135
Dry	NP1	85	85	85	85	85	85	85	85	85	85	85	85	85
	NP2	85	85	85	85	70	70	70	70	70	70	85	85	85
	BO	70	70	70	70	70	70	70	70	70	70	70	70	70
	F1	70	70	70	70	70	70	70	70	70	70	70	70	70
	F2	70	70	70	70	70	70	70	70	70	70	70	70	70
	F3	70	70	70	70	70	70	70	70	70	70	70	70	70
	F4	70	70	70	70	70	70	70	70	70	70	70	70	70
	F5	70	70	70	70	70	70	70	70	70	70	70	70	70
	F6	70	70	70	70	70	70	70	70	70	70	70	70	70
	F7	70	70	70	70	70	70	70	70	70	70	70	70	70
	F8	70	70	70	70	70	70	70	70	70	70	70	70	70
	F9	70	70	70	70	70	70	70	70	70	70	70	70	70
	F10	70	70	70	70	70	70	70	70	70	70	70	70	70
	F11	70	70	70	70	70	70	70	70	70	70	70	70	70
	F12	70	70	70	70	70	70	70	70	70	70	70	70	70
	F13	70	70	70	70	70	70	70	70	70	70	70	70	70
	F14	70	70	70	70	70	70	70	70	70	70	70	70	70
	F15	125	125	125	125	85	85	85	85	85	85	125	125	125
	F16	150	150	150	150	85	85	85	85	85	85	150	150	150
	F17	150	150	150	150	85	85	85	85	85	85	150	150	150
	F18	135	135	135	70	70	70	70	70	70	70	135	135	135

Table 7-1 (continued).

Water Supply Condition	Flow Alternative	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
LOWER RUSSIAN RIVER														
Critical	NP1	35	35	35	35	35	35	35	35	35	35	35	35	35
	NP2	35	35	35	35	35	35	35	35	35	35	35	35	35
	BO	35	35	35	35	35	35	35	35	35	35	35	35	35
	F1	35	35	35	35	35	35	35	35	35	35	35	35	35
	F2	35	35	35	35	35	35	35	35	35	35	35	35	35
	F3	35	35	35	35	35	35	35	35	35	35	35	35	35
	F4	35	35	35	35	35	35	35	35	35	35	35	35	35
	F5	35	35	35	35	35	35	35	35	35	35	35	35	35
	F6	35	35	35	35	35	35	35	35	35	35	35	35	35
	F7	35	35	35	35	35	35	35	35	35	35	35	35	35
	F8	35	35	35	35	35	35	35	35	35	35	35	35	35
	F9	35	35	35	35	35	35	35	35	35	35	35	35	35
	F10	35	35	35	35	35	35	35	35	35	35	35	35	35
	F11	35	35	35	35	35	35	35	35	35	35	35	35	35
	F12	35	35	35	35	35	35	35	35	35	35	35	35	35
	F13	35	35	35	35	35	35	35	35	35	35	35	35	35
	F14	35	35	35	35	35	35	35	35	35	35	35	35	35
	F15	50	50	50	50	50	50	50	50	50	50	50	50	50
	F16	35	35	35	35	35	35	35	35	35	35	35	35	35
	F17	35	35	35	35	35	35	35	35	35	35	35	35	35
	F18	35	35	35	35	35	35	35	35	35	35	35	35	35
DRY CREEK														
Normal	NP1	75	75	75	75	80	80	80	80	80	80	80	105	105
	NP2	75	75	75	75	80	80	80	80	80	80	80	105	105
	BO	75	75	75	75	40	40	40	40	40	40	40	105	105
	F1	75	75	75	75	40	40	40	40	40	40	40	105	105
	F2	75	75	75	75	40	40	40	40	40	40	40	105	105
	F3	75	75	75	75	40	40	40	40	40	40	40	105	105
	F4	75	75	75	75	40	40	40	40	40	40	40	105	105
	F5	75	75	75	75	40	40	40	40	40	40	40	105	105
	F6	75	75	75	75	40	40	40	40	40	40	40	105	105
	F7	75	75	75	75	40	40	40	40	40	40	40	105	105
	F8	75	75	75	75	40	40	40	40	40	40	40	105	105
	F9	75	75	75	75	40	40	40	40	40	40	40	105	105
	F10	75	75	75	75	40	40	40	40	40	40	40	105	105
	F11	75	75	75	75	50	50	50	50	50	50	105	105	105
	F12	75	75	75	75	50	50	50	50	50	50	105	105	105
	F13	75	75	75	75	40	40	40	40	40	40	40	105	105
	F14 - F18	75	75	75	75	50	50	50	50	50	50	105	105	105

Table 7-1 (continued).

Water Supply Condition	Flow Alternative	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
LOWER RUSSIAN RIVER														
Dry	NP1	75	75	75	25	25	25	25	25	25	25	25	75	75
	NP2	75	75	75	25	25	25	25	25	25	25	25	75	75
	BO	75	75	75	25	25	25	25	25	25	25	25	75	75
	F1	75	75	75	25	25	25	25	25	25	25	25	75	75
	F2	75	75	75	25	25	25	25	25	25	25	25	75	75
	F3	75	75	75	25	25	25	25	25	25	25	25	75	75
	F4	75	75	75	25	25	25	25	25	25	25	25	75	75
	F5	75	75	75	25	25	25	25	25	25	25	25	75	75
	F6	75	75	75	25	25	25	25	25	25	25	25	75	75
	F7	75	75	75	25	25	25	25	25	25	25	25	75	75
	F8	75	75	75	25	25	25	25	25	25	25	25	75	75
	F9	75	75	75	25	25	25	25	25	25	25	25	75	75
	F10	75	75	75	25	25	25	25	25	25	25	25	75	75
	F11	75	75	75	75	50	50	50	50	50	50	75	75	75
	F12	75	75	75	75	50	50	50	50	50	50	75	75	75
	F13	75	75	75	25	25	25	25	25	25	25	25	75	75
	F14 - F18	75	75	75	75	50	50	50	50	50	50	75	75	75
Critical	NP1	75	75	75	25	25	25	25	25	25	25	25	75	75
	NP2	75	75	75	25	25	25	25	25	25	25	25	75	75
	BO	75	75	75	25	25	25	25	25	25	25	25	75	75
	F1	75	75	75	25	25	25	25	25	25	25	25	75	75
	F2	75	75	75	25	25	25	25	25	25	25	25	75	75
	F3	75	75	75	25	25	25	25	25	25	25	25	75	75
	F4	75	75	75	25	25	25	25	25	25	25	25	75	75
	F5	75	75	75	25	25	25	25	25	25	25	25	75	75
	F6	75	75	75	25	25	25	25	25	25	25	25	75	75
	F7	75	75	75	25	25	25	25	25	25	25	25	75	75
	F8	75	75	75	25	25	25	25	25	25	25	25	75	75
	F9	75	75	75	25	25	25	25	25	25	25	25	75	75
	F10	75	75	75	25	25	25	25	25	25	25	25	75	75
	F11	75	75	75	75	50	50	50	50	50	50	75	75	75
	F12	75	75	75	75	50	50	50	50	50	50	75	75	75
	F13	75	75	75	25	25	25	25	25	25	25	25	75	75
	F14 - F18	75	75	75	75	50	50	50	50	50	50	75	75	75

The Russian River Biological Opinion minimum instream flow requirement alternative included the following in *Normal* hydrologic conditions: Upper Russian River (125 cfs), Lower Russian River (70 cfs), and Dry Creek (40 cfs) as recommended in the Biological Opinion. In *Dry* hydrologic conditions, the alternative included a 70 cfs minimum instream flow requirement in the Lower Russian River. The Russian River Biological Opinion did not provide recommended permanent changes to minimum instream flows for *Dry* conditions in the Upper Russian River and Lower Russian River, or *Critical* conditions for all three reaches, so the minimum instream flow requirements are the same as those included in the Water Agency's water right permits.

Hydrologic Index

The report, "Development of the Russian River Hydrologic Index for the Fish Habitat Flows and Water Rights Project" describes the process of developing the proposed Russian River Hydrologic Index (Appendix G). The Water Agency convened a technical advisory group to aid in the development and evaluation of hydrologic index alternatives. The group consisted of representatives from state and federal agencies and consultants to the Water Agency. The involved federal agencies included: 1) National Oceanic and Atmospheric Administration (NOAA) National Weather Service; 2) NOAA Hydrometeorology Testbed; 3) United States Geological Survey (USGS); and 4) United States Army Corps of Engineers (USACE). California State agencies included: 1) California Department of Water Resources; and 2) University of California at Berkeley. Consultants included Alan Lily from Barkiewicz, Kronick and Shanahan, P.C. and Steve Grinnell. Staff from USACE Hydrologic Engineering Center (HEC) acted as the technical lead. The technical advisory group met to review and provide input on the technical analysis being completed by HEC with support from the Water Agency. Based on discussions and analysis, the technical advisory group concluded that the hydrologic index established by the SWRCB's Decision 1610 and included in the Water Agency's water right permits (Decision 1610 Hydrologic Index) no longer accurately reflected the water supply condition of the Russian River system and that a new index should be developed to replace it.

During the technical advisory group process, HEC and the Water Agency analyzed a number of hydrologic index alternatives including:

- Lake Mendocino Cumulative Inflow;
- Lake Mendocino Storage;
- Separate Hydrologic Indices;
    - Upper Russian River based on Lake Mendocino cumulative inflow
    - Lower Russian River based on Lake Sonoma storage
- Water Balance Index that incorporated long-range flow forecast from the NOAA California Nevada River Forecast Center and a simple water balance model to forecast available water and set the hydrologic condition.

HEC also investigated variations to other components of the hydrologic index, such as the frequency of evaluation (monthly, semi-monthly, and weekly) and the number of minimum instream flow schedules. Three schedules as used by the existing Decision 1610 Hydrologic Index and additional schedules were reviewed to provide smaller incremental changes to the

minimum instream flow requirements. HEC completed a report that summarized their analysis and findings (HEC, 2012).

Building off of the analysis completed by HEC and recommendations from the technical advisory group, the Water Agency completed further evaluation of hydrologic index alternatives. Results of this evaluation determined that a hydrologic index that incorporates Lake Mendocino cumulative inflow and storage provides significant improvements in water supply reliability while also providing stable flow regimes for reaches downstream of Lake Mendocino and Lake Sonoma. This index, known as the Russian River Hydrologic Index, was selected as the preferred hydrologic index. See Appendix G for further details regarding the development of the proposed Russian River Hydrologic Index.

7.2.3 Alternatives Screening Process

The purpose of the alternatives screening process was to evaluate alternatives for selection of a proposed project to be evaluated in the Fish Flow Project EIR. As stated above, the objectives of the Fish Flow Project are to manage Lake Mendocino and Lake Sonoma water supply releases to provide instream flows that will improve habitat for threatened and endangered fish species, and to update the Water Agency's existing water rights to reflect current conditions. From this objective, the Water Agency developed several screening criteria to measure the potential of each alternative to meet this objective.

The screening process involved multiple phases of screening using the screening criteria. First, all minimum instream flow requirement alternatives were evaluated individually using criteria for initial screening. The purpose of this initial screening was to evaluate if the minimum instream flow requirement alternative could achieve most of the Fish Flow Project's basic objective to improve habitat conditions for threatened and endangered fish species. The alternatives evaluated in the initial screening were modeled with the Decision 1610 Hydrologic Index. The minimum instream flow requirement alternatives that best met most of the basic objective to improve habitat conditions for threatened and endangered fish species were then evaluated in combination with the Russian River Hydrologic Index.

In the second phase of the screening analysis, the minimum instream flow requirement alternatives that moved forward from the initial screening were then combined with the Russian River Hydrologic Index. The Russian River Hydrologic Indexuses five minimum instream flow schedules, which differs from the Decision 1610 Hydrologic Index, which has three minimum instream flow schedules. Each minimum instream flow alternative evaluated in the initial phase was modified to incorporate five schedules of minimum instream flows. These combined alternatives were evaluated against the initial screening criteria to determine the alternative that best met the objective to improve habitat conditions for threatened and endangered fish species, as well as operational feasibility criteria to ensure that minimum instream flows would be reliably maintained and that the hydrologic index and minimum instream flow requirements maximized the occurrence of instream flow conditions favored for salmonid habitat and other beneficial uses. The advantages and disadvantages of these remaining alternatives were carefully weighed with respect to CEQA's criteria for selecting alternatives, compliance with the

Russian River Biological Opinion, maintaining other beneficial uses, and meeting the project objectives to form the proposed project.

7.2.4 Alternatives Screening Criteria

Minimum Instream Flow Requirements

As stated previously, the objectives of the Fish Flow Project are to manage Lake Mendocino and Lake Sonoma water supply releases to provide instream flows that will improve habitat for threatened and endangered fish species, and to update the Water Agency's existing water rights to reflect current conditions.

To comply with the requirements of the Russian River Biological Opinion and to meet the Fish Flow Project's objectives, the Water Agency developed screening criteria. To meet this criterion, the minimum instream flow requirement alternative had to achieve two specific results:

1. the alternative should increase the quality of available rearing habitat in the Upper Russian River and Dry Creek for juvenile salmonids during the rearing season from June to September; and
2. the alternative should maximize the preservation of cold water available in Lake Mendocino to support the peak of the fall-run Chinook salmon migration and spawning habitat from mid-October to mid-November.

Rearing Habitat

The first criteria, Rearing Habitat, included a number of categories based on habitat benefits for juvenile salmonids to review the potential for each minimum instream flow alternative to meet the project objectives. Each of these categories were evaluated at modeling junctions (some of which are associated with USGS stream gages) in the Upper Russian River ("Forks" or the confluence of the Russian River and East Fork Russian River, Hopland gage, and Cloverdale gage) or Dry Creek (Dry Creek at Lambert Bridge and at the mouth of Dry Creek gage) from June to September. The three categories were:

1. Increase in Total Weighted Usable Area: Using the Russian River River 2D evaluation of juvenile steelhead rearing habitat in the Russian River upstream of Cloverdale (Sonoma County Water Agency, 2016), this category evaluated the potential change in total weighted usable area for rearing habitat. Weighted usable area (WUA) is an expression of estimated depths and velocities within sections of a river that meet habitat suitability indices.

2. Increase in Riffle Velocity Weighted Usable Area: Using the Russian River River 2D evaluation of juvenile steelhead rearing habitat in the Russian River upstream of Cloverdale (Sonoma County Water Agency, 2016), this category evaluated the potential change in suitable velocity WUA (excluding depth and cover suitability) for juvenile salmonids rearing habitat at riffles.

3. Increase in Riffle Velocity Weighted Usable Area as Percent of Wetted Area: Using the Russian River River 2D evaluation of juvenile steelhead rearing habitat in the Russian River upstream of Cloverdale (Sonoma County Water Agency, 2016), this category evaluated the potential change in suitable velocity WUA (excluding depth and cover suitability) for juvenile steelhead rearing habitat at riffles as a percent of the wetted area of the river channel. Since a decrease in minimum instream flow requirements could result in a change in the wetted area of some parts of the river channel, depending on river geomorphology, it is important to consider both metrics.

4. Increase in the Number of Days that Water Temperatures are less than 68 degrees Fahrenheit: This category evaluated suitable rearing habitat temperatures for juvenile salmonids in the Russian River upstream of Cloverdale and in Dry Creek to ensure an increase in the number of days that water temperatures were less than 68 degrees Fahrenheit (degrees F).

Spawning Habitat

The second criteria, Spawning Habitat, included a number of categories based on habitat benefits for fall-run Chinook salmon to review the potential for each minimum instream flow alternative to meet the project objectives. Each of these categories were evaluated at modeling junctions in the Upper Russian River ("Forks" or the confluence of the Russian River and East Fork Russian River, Hopland gage, and Cloverdale gage), Dry Creek (Dry Creek at Lambert Bridge and at the mouth of Dry Creek gage), or the Lower Russian River (Guerneville gage at Hacienda bridge) from October 16 to November 15 to coincide with the typical peak of the adult fall-run Chinook salmon migration in the Russian River. The three categories were:

1. Increase in the Number of Days Instream Flow is above 105 cubic feet per second: This category evaluated suitable passage flows of 105 cubic feet per second (cfs) or above in the Upper Russian River at Hopland, Cloverdale, and Healdsburg for adult Chinook salmon migration into the Upper Russian River.
2. Increase in the Number of Days Instream Flow is above 135 cfs: This category evaluated suitable passage flows of 135 cfs or above in the Lower Russian River at the Guerneville gage for adult Chinook salmon migration into the Lower Russian River and Dry Creek.
3. Decrease in Temperature: This category evaluated overall water temperature in the Upper Russian River at the Forks, Hopland, Cloverdale, and Dry Creek at Warm Springs Dam, Lambert Bridge, and the mouth of Dry Creek to ensure the alternative did not result in an increase in water temperatures.

Flow Reliability

The third criteria, Flow Reliability, included a single category to evaluate reliable conditions to maintain minimum instream flows in the Upper Russian River at the Cloverdale gage. Lake Mendocino has minimal capacity for carry-over storage and this criteria evaluates whether an alternative can reliably maintain the minimum instream flow requirements to the Cloverdale gage for the entire model simulation period (1910-2013).

1. Decrease in Days Flow is less than 25 cfs: This category evaluated reliable flow conditions, which reflected that water in storage in Lake Mendocino would be available to maintain minimum instream flows of at least 25 cfs in the Upper Russian River.

Combined Minimum Instream Flow Requirements and Hydrologic Index

In the second phase of the screening analysis, the minimum instream flow requirement alternatives that moved forward from the initial screening were then combined with the Russian River Hydrologic Index. These combined alternatives were evaluated against the initial screening criteria described above (Rearing Habitat, Spawning Habitat, Flow Reliability) plus an additional hydrologic index criteria (described below) to determine the alternative that best met the objective to improve habitat conditions for threatened and endangered fish species, as well as operational feasibility criteria to ensure that minimum instream flows would be reliably maintained and that the hydrologic index and minimum instream flow requirements maximized the occurrence of instream flow conditions favored for salmonid habitat and other beneficial uses.

To ensure that the combined hydrologic index and minimum instream flow alternatives best maximized the occurrence of instream flows favored for salmonid habitat and beneficial uses, the following criteria was used:

1. Decrease in Dry Hydrologic Condition Days (Flow Schedules 3, 4, and 5): This category evaluated the Russian River Hydrologic Index's 5 flow schedules in the Upper Russian River and Lower Russian River to ensure that the combined hydrologic index and minimum instream flow alternative maximized the occurrence of instream flows favored for salmonid habitat and beneficial uses (Schedules 1 and 2).

7.2.5 Alternatives Not Considered Further

Minimum Instream Flow Requirement Alternatives

Fourteen of 21 flow alternatives discussed above were removed from further consideration after the initial screening process, and will not be discussed further in this chapter. These alternatives generally did not meet screening criteria for suitable passage flows in the Lower Russian River for adult Chinook salmon migration into the Lower Russian River and Dry Creek. Some of these alternatives also resulted in declines in the number of days that temperatures were less than 68 degrees F in Dry Creek. The minimum instream flow alternatives that were removed from further consideration were F1, F2, F4 through F10, F12, F13, F14, F16, and F17 (Table 7-1). Although the F15 minimum instream flow alternative had the smallest improvement in flow reliability, it was carried forward to provide a Lower Russian River minimum instream flow above the 70 cfs recommended in the Russian River Biological Opinion for the second phase of screening.

Combined Hydrologic Index and Minimum Instream Flow Requirement Alternatives

Seven of the 21 minimum instream flow requirement alternatives evaluated were carried forward to the combined hydrologic index and minimum instream flow requirement screening alternatives. These minimum instream flow requirement alternatives were No Project 1, No Project 2, Russian River Biological Opinion, F3, F11, F15, and F18 (Table 7-1).

The screened minimum instream flow alternatives were combined with the Russian River Hydrologic Indexby modifying each minimum instream flow alternative to incorporate five schedules of minimum instream flows implemented with the preferred hydrologic index (Table 7-2). These combined alternatives were evaluated against the initial screening criteria to determine the alternative that best met the objective to improve habitat conditions for threatened and endangered fish species, as well as operational feasibility criteria to ensure that minimum instream flows would be reliably maintained and that the hydrologic index and minimum instream flow requirements maximized the occurrence of instream flow conditions favored for salmonid habitat and other beneficial uses. The combined preferred hydrologic index and F18 minimum instream flow alternative best met most of the project objectives by maintaining lower rearing habitat velocities, water temperatures, and dissolved oxygen in the Upper Russian River, improving flow reliability, while also maintaining passage for adult Chinook salmon migration in the fall and was selected as the Proposed Project.

7.3 Alternatives Analysis

The discussion of alternatives does not need to be exhaustive. The key issue is whether a reasonable range of alternatives is considered that could feasibly accomplish most of the basic project objectives and could avoid or substantially reduce its significant environmental impacts. Thus, the EIR provides decision-makers and the public with the feasible alternatives available to reduce or avoid those substantial adverse effects that would result from the Proposed Project.

The alternatives are analyzed in this chapter for their ability to meet the project objectives (described in Section 7.2.1), potential to result in environmental impacts, and their relative merits and drawbacks in comparison to the Proposed Project. Impacts for each alternative are based on the Standards of Significance and Methodology outlined in each sub-chapter of Chapter 4, “Environmental Setting, Impacts, and Mitigation Measures.” The environmental impacts of the alternatives were evaluated in the same resource categories as the Proposed Project: Hydrology; Water Quality; Fisheries Resources; Vegetation and Wildlife; Recreation; Energy; Greenhouse Gases and Climate Change; Cultural Resources; and Aesthetics.

The impacts of each alternative were compared to the impacts of the Proposed Project. Impact assessment for the alternatives focuses on the impacts of the Proposed Project that would change, for better or worse, as a result of implementing the alternative instead of the Proposed Project. Impacts that would remain the same for an alternative as they would for the Proposed Project are not discussed.

A summary of the results of the evaluation of alternatives is presented in Table 7-A.

Table 7-2. Combined Hydrologic Index and Minimum Instream Flow Requirement Alternatives with five Flow Schedules. Monthly values are in cubic feet per second (cfs).

Flow Schedule	Flow Alternative	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
UPPER RUSSIAN RIVER														
1	BO	150	150	150	185	185	125	125	125	125	125	125	150	150
	NP1	150	150	150	185	185	185	185	185	150	150	150	150	150
	NP2	150	150	150	185	125	125	125	125	125	125	150	150	150
	F3	150	150	150	150	150	150	150	150	150	150	150	150	150
	F11	125	125	125	125	125	125	125	125	125	125	125	125	125
	F15	150	150	150	150	105	105	105	105	105	105	150	150	150
	F18	105	105	105	105	105	105	105	105	105	105	105	105	105
2	BO	115	115	115	130	130	100	100	100	100	100	100	115	115
	NP1	115	115	115	130	130	130	130	130	115	115	115	115	115
	NP2	115	115	115	130	100	100	100	100	100	100	115	115	115
	F3	115	115	115	115	115	115	115	115	115	115	115	115	115
	F11	100	100	100	100	100	100	100	100	100	100	100	100	100
	F15	135	135	135	135	85	85	85	85	85	85	135	135	135
	F18	105	105	105	105	85	85	85	85	85	85	105	105	105
3	BO	75	75	75	75	75	75	75	75	75	75	75	75	75
	NP1	75	75	75	75	75	75	75	75	75	75	75	75	75
	NP2	75	75	75	75	75	75	75	75	75	75	75	75	75
	F3	75	75	75	75	75	75	75	75	75	75	75	75	75
	F11	75	75	75	75	75	75	75	75	75	75	75	75	75
	F15	125	125	125	125	75	75	75	75	75	75	125	125	125
	F18	100	100	100	100	65	65	65	65	65	65	100	100	100
4	BO	50	50	50	50	50	50	50	50	50	50	50	50	50
	NP1	50	50	50	50	50	50	50	50	50	50	50	50	50
	NP2	50	50	50	50	50	50	50	50	50	50	50	50	50
	F3	50	50	50	50	50	50	50	50	50	50	50	50	50
	F11	50	50	50	50	50	50	50	50	50	50	50	50	50
	F15	75	75	75	75	50	50	50	50	50	50	75	75	75
	F18	70	70	70	70	45	45	45	45	45	45	45	70	70
5	BO	25	25	25	25	25	25	25	25	25	25	25	25	25
	NP1	25	25	25	25	25	25	25	25	25	25	25	25	25
	NP2	25	25	25	25	25	25	25	25	25	25	25	25	25
	F3	25	25	25	25	25	25	25	25	25	25	25	25	25
	F11	25	25	25	25	25	25	25	25	25	25	25	25	25
	F15	25	25	25	25	25	25	25	25	25	25	25	25	25
	F18	25	25	25	25	25	25	25	25	25	25	25	25	25

Table 7-2 (continued).

Flow Schedule	Flow Alternative	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
LOWER RUSSIAN RIVER														
1	BO	70	70	70	70	70	70	70	70	70	70	70	70	70
	NP1	125	125	125	125	125	125	125	125	125	125	125	125	125
	NP2	125	125	125	125	70	70	70	70	70	70	125	125	125
	F3	70	70	70	70	70	70	70	70	70	70	70	70	70
	F11	70	70	70	70	70	70	70	70	70	70	70	70	70
	F15	125	125	125	125	85	85	85	85	85	85	125	125	125
	F18	135	135	135	135	70	70	70	70	70	70	135	135	135
2	BO	70	70	70	70	70	70	70	70	70	70	70	70	70
	NP1	105	105	105	105	105	105	105	105	105	105	105	105	105
	NP2	105	105	105	105	70	70	70	70	70	70	105	105	105
	F3	70	70	70	70	70	70	70	70	70	70	70	70	70
	F11	70	70	70	70	70	70	70	70	70	70	70	70	70
	F15	125	125	125	125	85	85	85	85	85	85	125	125	125
	F18	135	135	135	135	70	70	70	70	70	70	135	135	135
3	BO	70	70	70	70	70	70	70	70	70	70	70	70	70
	NP1	85	85	85	85	85	85	85	85	85	85	85	85	85
	NP2	85	85	85	85	70	70	70	70	70	70	85	85	85
	F3	70	70	70	70	70	70	70	70	70	70	70	70	70
	F11	70	70	70	70	70	70	70	70	70	70	70	70	70
	F15	125	125	125	125	85	85	85	85	85	85	125	125	125
	F18	135	135	135	135	70	70	70	70	70	70	135	135	135
4	BO	50	50	50	50	50	50	50	50	50	50	50	50	50
	NP1	60	60	60	60	60	60	60	60	60	60	60	60	60
	NP2	60	60	60	60	60	60	60	60	60	60	60	60	60
	F3	50	50	50	50	50	50	50	50	50	50	50	50	50
	F11	50	50	50	50	50	50	50	50	50	50	50	50	50
	F15	85	85	85	85	65	65	65	65	65	65	85	85	85
	F18	85	85	85	85	50	50	50	50	50	50	85	85	85
5	BO	35	35	35	35	35	35	35	35	35	35	35	35	35
	NP1	35	35	35	35	35	35	35	35	35	35	35	35	35
	NP2	35	35	35	35	35	35	35	35	35	35	35	35	35
	F3	35	35	35	35	35	35	35	35	35	35	35	35	35
	F11	35	35	35	35	35	35	35	35	35	35	35	35	35
	F15	50	50	50	50	50	50	50	50	50	50	50	50	50
	F18	35	35	35	35	35	35	35	35	35	35	35	35	35

Table 7-2 (continued).

Flow Schedule	Flow Alternative	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
DRY CREEK														
	BO	75	75	75	75	40	40	40	40	40	40	40	105	105
	NP1	75	75	75	75	80	80	80	80	80	80	80	105	105
	NP2	75	75	75	75	80	80	80	80	80	80	80	105	105
1	F3	75	75	75	75	40	40	40	40	40	40	40	105	105
	F11	75	75	75	75	50	50	50	50	50	50	105	105	105
	F15	75	75	75	75	50	50	50	50	50	50	105	105	105
	F18	75	75	75	75	50	50	50	50	50	50	105	105	105
	BO	75	75	75	75	40	40	40	40	40	40	40	105	105
	NP1	75	75	75	50	50	50	50	50	50	50	50	90	90
	NP2	75	75	75	50	50	50	50	50	50	50	50	90	90
2	F3	75	75	75	75	40	40	40	40	40	40	40	105	105
	F11	75	75	75	75	50	50	50	50	50	50	105	105	105
	F15	75	75	75	75	50	50	50	50	50	50	105	105	105
	F18	75	75	75	75	50	50	50	50	50	50	105	105	105
	BO	75	75	75	75	25	25	25	25	25	25	25	75	75
	NP1	75	75	75	25	25	25	25	25	25	25	25	75	75
	NP2	75	75	75	25	25	25	25	25	25	25	25	75	75
3	F3	75	75	75	75	25	25	25	25	25	25	25	75	75
	F11	75	75	75	50	50	50	50	50	50	50	75	75	75
	F15	75	75	75	50	50	50	50	50	50	50	75	75	75
	F18	75	75	75	50	50	50	50	50	50	50	75	75	75
	BO	75	75	75	75	25	25	25	25	25	25	25	75	75
	NP1	75	75	75	75	25	25	25	25	25	25	25	75	75
	NP2	75	75	75	75	25	25	25	25	25	25	25	75	75
4	F3	75	75	75	75	25	25	25	25	25	25	25	75	75
	F11	75	75	75	50	50	50	50	50	50	50	75	75	75
	F15	75	75	75	50	50	50	50	50	50	50	75	75	75
	F18	75	75	75	50	50	50	50	50	50	50	75	75	75
	BO	75	75	75	75	25	25	25	25	25	25	25	75	75
	NP1	75	75	75	25	25	25	25	25	25	25	25	75	75
	NP2	75	75	75	25	25	25	25	25	25	25	25	75	75
5	F3	75	75	75	75	25	25	25	25	25	25	25	75	75
	F11	75	75	75	50	50	50	50	50	50	50	75	75	75
	F15	75	75	75	50	50	50	50	50	50	50	75	75	75
	F18	75	75	75	50	50	50	50	50	50	50	75	75	75

7.3.1. Summary of Proposed Project Impacts

Chapter 4, “Environmental Setting, Impacts, and Mitigation Measures,” and its sub-chapters, discloses the project-specific environmental impacts of the project. Based on the analysis presented in Chapter 4, implementation of the Proposed Project would result in the following beneficial and significant and unavoidable impacts:

Beneficial

1. Changes in minimum instream flow could benefit the quantity of rearing habitat for steelhead fry in the Upper Russian River (Impact 4.3-1).
2. Changes in minimum instream flow could benefit the quantity of habitat for rearing Chinook salmon fry in the Upper Russian River (Impact 4.3-3).
3. Changes in minimum instream flow could benefit the quantity of habitat in the Upper Russian River rearing juvenile Chinook salmon (Impact 4.3-4).
4. Changes in minimum instream flow could benefit the movement of salmonids in the Upper Russian River (Impact 4.3-6).
5. Changes in minimum instream flow could benefit the movement of salmonids in Dry Creek. (Impact 4.3-8).
6. Changes in minimum instream flow could benefit the quantity of spawning habitat for salmonids in the Russian River (Impact 4.3-9).
7. Changes in minimum instream flow could benefit the rearing habitat for juvenile steelhead through elevated water temperatures in the months April through November in the Russian River (above Cloverdale) and in Dry Creek. (Impact 4.3-21)
8. Changes in minimum instream flow could benefit the habitat for spawning sunfish through increased reservoir releases at Lake Mendocino (Impact 4.3-27).
9. Changes in minimum instream flow could benefit the habitat for spawning sunfish through increased reservoir releases at Lake Sonoma. (Impact 4.3-28).

Significant and Unavoidable

1. The Fish Flow Project could contribute to inundation by seiche, tsunami, or mudflow (Impact 4.1-5). The Project would potentially increase water elevations in the Russian River Estuary during lagoon conditions when the river mouth is closed or an outlet channel is in place. In the very unlikely event of a tsunami of sufficient magnitude, the Proposed Project may result in increased risk to people and structures from flooding.
2. Changes in minimum instream flow requirements could result in a violation of water quality standards or waste discharge requirements or otherwise degrade water quality relating to biostimulatory substances in the Russian River (Impact 4.2-4). Elevated nitrogen and phosphorus concentrations that exceed United States Environmental Protection Agency (USEPA) criteria, along with depressed and supersaturated dissolved oxygen concentrations observed under Baseline Conditions would likely continue under the Proposed Project.
3. 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 (Impact 4.10.1). Water right permits along the Russian River may have terms that restrict diversions, including a minimum bypass flow rate below which diversions are not authorized. The Proposed Project would result in lower instream flows that could adversely affect when holders of these permits could divert water.

Chapter 4, "Environmental Setting, Impacts, and Mitigation Measures," and its sub-chapters, did not identify any significant, but mitigable, environmental impacts.

7.3.2 Summary of Alternatives Evaluated

The minimum instream flow requirement alternatives evaluated included No Project 1, No Project 2, and the minimum instream flows recommended in the Russian River Biological Opinion.

No Project 1 Alternative

CEQA Guidelines Section 15125.6(e)(1) requires that a no project alternative be described and analyzed. Evaluation of a no project alternative allows decision-makers to compare the impacts of approving the project with the impacts of not approving the project. Under the No Project 1 Alternative, the Water Agency would continue to make releases from Coyote Valley Dam and Warm Springs Dam to maintain the minimum instream flow requirements specified in its water right permits. Implementation of the Proposed Project would not proceed under the No Project 1 Alternative and the Water Agency's water supply operations would not be in compliance with the Russian River Biological Opinion.

No Project 2 Alternative

Under the No Project 2 Alternative, the Water Agency would continue to make releases from Coyote Valley Dam and Warm Springs Dam to maintain the minimum instream flow requirements specified in its water right permits, but would include the temporary instream flows changes in compliance with the Russian River Biological Opinion. The Russian River Biological Opinion requires annual Water Agency petitions for temporary changes to minimum instream flow requirements for the mainstem Russian River, but not to the requirements for Dry Creek. These minimum instream flow changes are as follows: under *Normal* conditions from May 1 to October 15: 125 cfs in the Upper Russian River and 70 cfs in the Lower Russian River. The Russian River Biological Opinion did not provide recommended temporary changes to minimum instream flows for *Dry* or *Critical* conditions, so these are the same as the minimum instream flow requirements included in the Water Agency's water right permits and approved by the SWRCB's Decision 1610. As described in Chapter 3, "Background and Project Description," the Water Agency has filed temporary urgency change petitions as required by the Russian River Biological Opinion and received temporary urgency change orders issued by the SWRCB, in several years since the Biological Opinion was provided by NMFS. Under the No Project 2 Alternative, the Water Agency's water supply operations would comply with the Russian River Biological Opinion's recommendations for temporary changes in minimum instream flows; however, no changes in reservoir operations through implementation of the Russian River

Hydrologic Index would occur. Reservoir operations would continue to follow the Decision 1610 Hydrologic Index.

Russian River Biological Opinion Alternative

Under the Russian River Biological Opinion Alternative, the Water Agency would continue to make releases from Coyote Valley Dam and Warm Springs Dam to maintain minimum instream flow requirements, but minimum instream flow requirements would be as follows: in *Normal* hydrologic conditions: Upper Russian River (125 cfs), Lower Russian River (70 cfs), and Dry Creek (40 cfs) as recommended in the Biological Opinion. In *Dry* hydrologic conditions, the alternative included a 70 cfs minimum instream flow requirement in the Lower Russian River. The Russian River Biological Opinion did not provide recommended permanent changes to minimum instream flows for *Dry* conditions in the Upper Russian River and Lower Russian River, or *Critical* conditions for all three reaches, so the minimum instream flow requirements are the same as those included in the Water Agency's water right permits and approved by the SWRCB's Decision 1610. However, no changes in reservoir operations through implementation of the Russian River Hydrologic Index would occur. Reservoir operations would continue to follow the Decision 1610 Hydrologic Index.

7.3.3 Comparison of Alternatives

No Project 1 Alternative

Ability to Meet Project Objectives

The No Project 1 Alternative assumes that the Proposed Project would not proceed to implementation. That would result in the continued potential for the Water Agency's existing water supply operations to jeopardize the continued existence of and critical habitat for steelhead and coho salmon in the Russian River and Dry Creek. The No Project 1 Alternative would not manage water supply releases to improve habitat for threatened and endangered fish species. The No Project 1 Alternative would also result in the Water Agency being out of compliance with the California and federal Endangered Species Acts by continuing to potentially jeopardize steelhead and coho salmon by not implementing the Reasonable and Prudent Alternative (RPA) for reducing minimum instream flows as identified in the Russian River Biological Opinion and CDFW's Consistency Determination. Such non-compliance could result in the loss of the incidental take granted to the Water Agency by the Russian River Biological Opinion, potentially exposing the Water Agency to liability in the event its activities resulted in "take" of listed species.

Environmental Effects

The No Project 1 Alternative would result in the continuation of existing conditions within the Russian River and Dry Creek. The Water Agency would continue to make releases from Coyote Valley Dam and Warm Springs Dam to maintain the minimum instream flow requirements specified in its water right permits. These water supply operations have been found to be detrimental to threatened and endangered fish species and could result in the Water Agency being out of compliance with the Russian River Biological Opinion. Implementation of the No Project 1 Alternative would not meet project objectives related to the improvement of

habitat for threatened and endangered fish species. The Proposed Project's benefits identified in Section 7.3.1 above would not be achieved under the No Project 1 Alternative. Implementation of the No Project 1 Alternative would not avoid significant and unavoidable impacts associated with risk of flooding from tsunami, which is an existing condition in the Russian River Estuary, or potential for violations of water quality standards or degradation of water quality relating to biostimulatory substances in the Russian River as these conditions occur under Baseline Conditions. The No Project 1 Alternative would avoid the Proposed Project's significant and unavoidable impact related to changes in minimum instream flow requirements that could adversely affect the ability of some water right permit holders to divert from the Russian River.

No Project 2 Alternative

Ability to Meet Project Objectives

The No Project 2 Alternative would meet some of the basic project objectives by reducing minimum instream flows, on a temporary, annual basis, which would allow the Water Agency to manage water supply releases during the rearing season to improve habitat for threatened and endangered fish species. While the Water Agency would be in compliance with the Russian River Biological Opinion on a temporary basis, the loss of incidental take granted to the Water Agency by the Russian River Biological Opinion could be an issue as no permanent change to minimum instream flow requirements would occur.

Environmental Effects

The No Project 2 Alternative would result in the continuation of existing conditions within the Russian River and Dry Creek, except during the rearing season when minimum instream flow requirements would be reduced on a temporary basis. Outside the rearing season, the Water Agency would continue to make releases from Coyote Valley Dam and Warm Springs Dam to maintain the minimum instream flow requirements specified in its water right permits. Implementation of the No Project 2 Alternative would meet some of the project objectives related to the improvement of habitat for threatened and endangered fish species. The Proposed Project's benefits identified in Section 7.3.1 above would be achieved for steelhead fry rearing habitat, Chinook salmon fry rearing habitat, Chinook salmon juvenile rearing habitat, adult passage flows in the Upper Russian River, adult passage flows into Dry Creek, improve the quantity of spawning habitat for salmon in the Russian River, and habitat for spawning sunfish in Lake Mendocino.

Water temperatures for juvenile steelhead rearing habitat would not be affected by the No Project 2 Alternative in the Upper Russian River above Cloverdale or in Dry Creek, and the Proposed Project beneficial impact on temperatures would not be achieved. Water surface elevation changes in Lake Sonoma would be nearly identical between the No Project 2 Alternative and Baseline Conditions, and the Proposed Project beneficial impact on habitat for spawning sunfish would not be achieved.

Implementation of the No Project 2 Alternative would not avoid significant and unavoidable impacts associated with risk of flooding from tsunami, which is an existing condition in the

Russian River Estuary, or potential for violations of water quality standards or degradation of water quality relating to biostimulatory substances in the Russian River as these conditions occur under Baseline Conditions. The No Project 2 Alternative would not avoid the Proposed Project's significant and unavoidable impact related to changes in minimum instream flow requirements that could adversely affect the ability of some water right permit holders to divert from the Russian River as the minimum instream flow requirements under this alternative would be below the minimum bypass flow terms included in many of these permits.

Russian River Biological Opinion Alternative

Ability to Meet Project Objectives

The Russian River Biological Opinion Alternative would meet some of the basic objectives by reducing minimum instream flows in the Russian River and Dry Creek that would allow the Water Agency to manage water supply releases during the rearing season to improve habitat for threatened and endangered fish species.

Environmental Effects

The minimum instream flows under the Russian River Biological Opinion Alternative would be higher than the Proposed Project, which could result in reductions water supply stored in Lake Mendocino earlier in a year, reducing the availability of cold water stored in the reservoir for releases into the end of the rearing season and the beginning of the fall-run Chinook salmon migration and spawning season.

Implementation of the Russian River Biological Opinion Alternative would not avoid significant and unavoidable impacts associated with risk of flooding from tsunami, which is an existing condition in the Russian River Estuary, or potential for violations of water quality standards or degradation of water quality relating to biostimulatory substances in the Russian River as these conditions occur under Baseline Conditions. The Russian River Biological Opinion Alternative would minimize the Proposed Project's significant and unavoidable impact related to changes in minimum instream flow requirements that could adversely affect the ability of some water right permit holders to divert from the Russian River as the minimum instream flow requirements under this alternative are higher than under the Proposed Project.

7.3.4 Environmentally Superior Alternative

CEQA Guidelines Section 15126.6 suggests that an EIR should identify the "environmentally superior" alternative. The lead agency is not required by CEQA to adopt an environmentally superior alternative that will not feasibly attain project objectives or reduce environmental effects. In the process of selecting the environmentally superior alternative, CEQA requires that a lead agency demonstrate why a project or alternative is selected. Such demonstrationwould be provided in the findings adopted by the Water Agency's Board of Directors. In determining the environmentally superior alternative, the Water Agency compared the impacts of each alternative to the impacts of the Proposed Project.

The CEQA Guidelines indicate that when the no project alternative is the environmentally superior alternative, the EIR should identify an environmentally superior alternative from among

the proposed action and other "action" alternatives. Although the no project alternative is often perceived to be the environmentally superior alternative because it avoids the direct impacts associated with a proposed project, this is not necessarily the case. In this case, based on the discussion above, the No Project 1 Alternative is not the environmentally superior alternative. Implementation of the No Project 1 Alternative would not meet project objectives related to the improvement of habitat for threatened and endangered fish species. The Proposed Project's benefits identified in Section 7.3.1 above would not be achieved under the No Project 1 Alternative. Implementation of the No Project 1 Alternative would not avoid significant and unavoidable impacts associated with risk of flooding from tsunami, which is an existing condition in the Russian River Estuary, or potential for violations of water quality standards or degradation of water quality relating to biostimulatory substances in the Russian River as these conditions occur under Baseline Conditions. The No Project 1 Alternative would also result in the Water Agency being out of compliance with the California and federal Endangered Species Acts by continuing to potentially jeopardize steelhead and coho salmon by not implementing the Reasonable and Prudent Alternative (RPA) for reducing minimum instream flows as identified in the Russian River Biological Opinion. Such non-compliance could result in the loss of the incidental take granted to the Water Agency by the Russian River Biological Opinion, potentially exposing the Water Agency to liability in the event its activities resulted in "take" of listed species.

With regard to the other alternatives considered, the Proposed Project is the environmentally superior alternative. Both the No Project 2 and Russian River Biological Opinion alternatives would meet most of the basic objectives of the Fish Flow Project and would achieve some of the improvements to habitat for threatened and endangered fish species. Implementation of the No Project 2 and Russian River Biological Opinion alternatives would not avoid significant and unavoidable impacts associated with risk of flooding from tsunami, which is an existing condition in the Russian River Estuary, or potential for violations of water quality standards or degradation of water quality relating to biostimulatory substances in the Russian River as these conditions occur under Baseline Conditions. The No Project 2 Alternative would not avoid the Proposed Project's significant and unavoidable impact related to changes in minimum instream flow requirements that could adversely affect the ability of some water right permit holders to divert from the Russian River, while the Russian River Biological Opinion Alternative would minimize this impact. The Proposed Project would achieve the project objectives to manage Lake Mendocino and Lake Sonoma water supply releases to provide instream flows that will improve habitat for threatened and endangered fish species by achieving the most beneficial habitat impacts.

7.4 References

HEC. (2012). *Determination of a hydrologic index for the Russian River watershed using HEC-ResSim.* Davis, California: U.S. Army Corps of Engineers Hydrologic Engineering Center.

NMFS. (2008, September 24). Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River [...]. *Endangered Species Act, Section 7 Consultation*. Southwest Region: National Marine Fisheries Service.

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