CHAPTER 3 Background and Project Description

3.1 Introduction

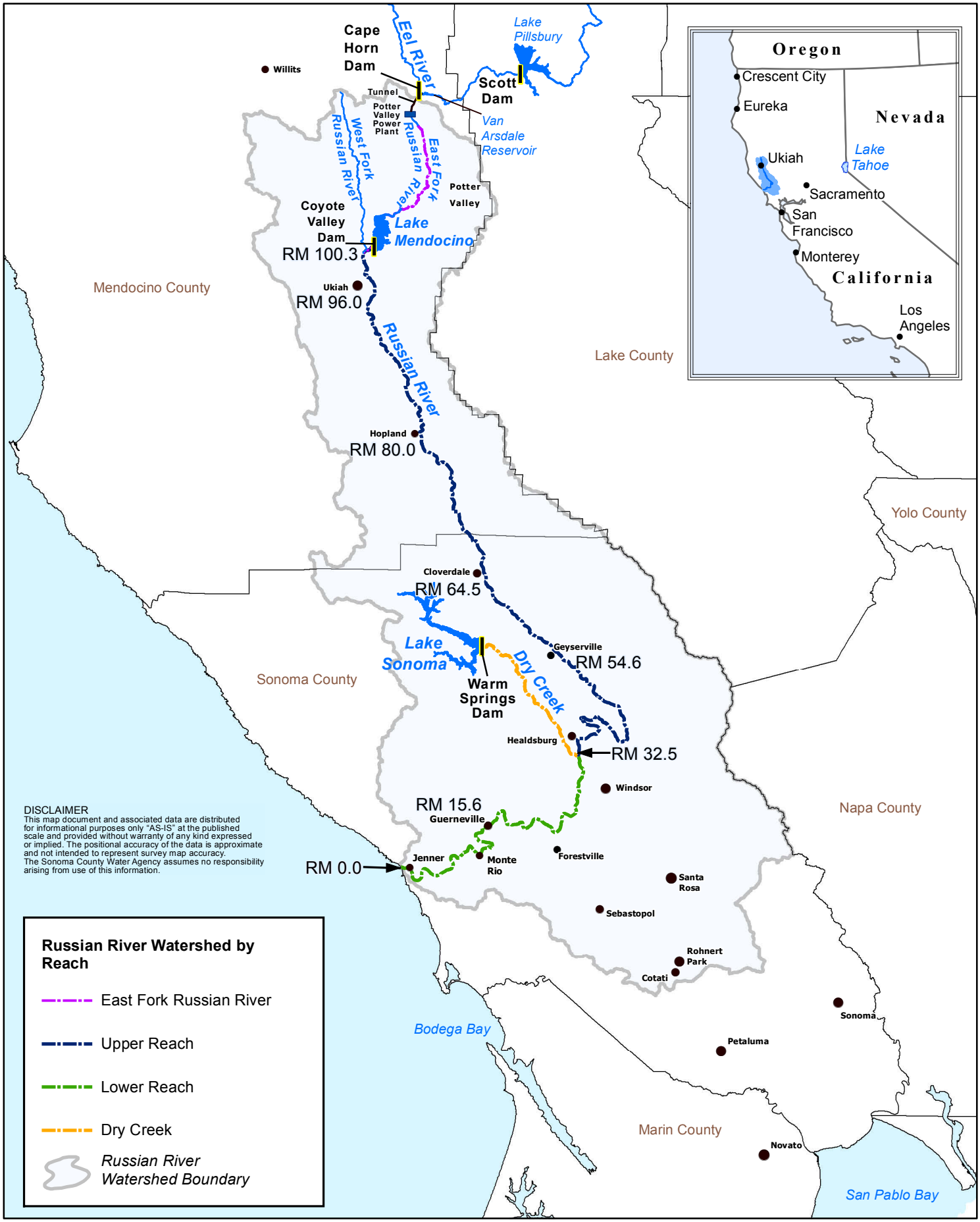
The Sonoma County Water Agency (Water Agency) operates Lake Mendocino and Lake Sonoma by collecting water to storage in the reservoirs' water-supply pools when water is available for collection, and by releasing water stored in these reservoirs to supplement natural flows as necessary to maintain the minimum instream flow requirements for the Russian River and Dry Creek established in the Water Agency's water right permits by the State Water Resources Control Board's (SWRCB)[1] Decision 1610, to meet the demands for diversions into the Water Agency's water transmission system and to meet the needs of other Russian River water users. The Water Agency's transmission system provides water to several municipal water suppliers, which deliver the water to their customers for residential, governmental, commercial, and industrial purposes.

The Fish Habitat Flows and Water Rights Project (Fish Flow Project) would change the minimum instream flow requirements in the Water Agency's water right permits in a manner that will improve rearing habitats for threatened and endangered salmon, as required by the National Marine Fisheries Service's (NMFS) Russian River Biological Opinion (Russian River Biological Opinion) and California Department of Fish and Wildlife's[2] (CDFW) Consistency Determination, add some additional authorized points of diversion, extend the deadlines for applying water to full beneficial use, and update the Water Agency's existing water rights to reflect current conditions. The Fish Flow Project is described in this chapter.[3] Chapter 1, "Introduction," provides a discussion of the intended uses of this Environmental Impact Report (EIR), including a list of agencies expected to use the EIR and list of approvals for which the EIR is anticipated to be used.

3.2 Project Location

The Fish Flow Project would change the Water Agency's water right permits, which concern minimum instream flows in and diversions from the Russian River and Dry Creek, which are located in Mendocino County and Sonoma County, California. A regional location map is included as Figure 3-1. The Russian River watershed drains an area of 1,485 square miles that includes substantial portions of Sonoma and Mendocino counties. The headwaters of the West Fork Russian River are located in central Mendocino County, approximately 15 miles north of Ukiah. The Russian River is approximately 110 miles long and runs generally southward to Forestville, where the channel's direction changes westward to the Pacific Ocean near Jenner, approximately 20

[1] In this EIR, "SWRCB" refers to both the State Water Resources Control Board and its predecessor agencies.
[2] California Department of Fish and Wildlife (CDFW) was formerly the California Department of Fish and Game (CDFG).
[3] Refer to CEQA Guidelines Section 15124 for detailed requirements of an EIR's Project Description.


Cape Horn Dam
Eel River
Lake Pillsbury
Willits
Scott Dam
Tunnel
Potter Valley Power Plant
Van Arsdale Reservoir
West Fork Russian River
East Fork Russian River
Potter Valley
Coyote Valley Dam
Lake Mendocino
RM 100.3
Mendocino County
Ukiah
RM 96.0
Russian River
Lake County
Hopland
RM 80.0
Yolo County
Cloverdale
RM 64.5
Lake Sonoma
Warm Springs Dam
Geyserville
RM 54.6
Dry Creek
Sonoma County
Healdsburg
RM 32.5
Windsor
RM 15.6
Guerneville
Napa County
Jenner
Monte Rio
Forestville
RM 0.0
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Sonoma
Bodega Bay
Petaluma
Marin County
Novato
San Pablo Bay
Oregon
Crescent City
Eureka
Nevada
Ukiah
Lake Tahoe
Sacramento
San Francisco
Monterey
California
Los Angeles
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Russian River Watershed by Reach
East Fork Russian River
Upper Reach
Lower Reach
Dry Creek
Russian River Watershed Boundary
SONOMA COUNTY WATER AGENCY
Fish Habitat Flows and Water Rights Project
N
0 5 10
Miles
Figure 3-1

miles west of Santa Rosa. Potential environmental impacts of the Fish Flow Project could occur at Lake Mendocino and Lake Sonoma, in and along the Russian River downstream of Coyote Valley Dam to Pacific Ocean, in and along Dry Creek downstream of Warm Springs Dam, and in the Water Agency's or its contractors' service areas in Sonoma and Marin counties.

3.3 Background

The Water Agency was created in 1949 by the California Legislature as a special district to provide flood protection and water supply services. The members of the Sonoma County Board of Supervisors are the Water Agency's Board of Directors. The Water Agency's powers and duties authorized by the California Legislature include the production and supply of surface water and groundwater for beneficial uses, control of flood waters, generation of electricity, provision of recreational facilities (in connection with the Water Agency's facilities), and the treatment and disposal of wastewater.

The Water Agency provides wholesale, potable water for approximately 600,000 people in Sonoma and Marin counties by supplying water to its water contractors and other water transmission system customers. The Water Agency's water contractors are the Cities of Santa Rosa, Petaluma, Rohnert Park, Cotati, and Sonoma, the Town of Windsor, and the North Marin and Valley of the Moon Water Districts. Other water transmission system customers include the Marin Municipal Water District, Forestville Water District, California-American Water Company (which provides water service in the Larkfield-Wikiup area), Kenwood Village Water Company, Lawndale Mutual Water Company, Penngrove Water Company, the County of Sonoma, the State of California, and Santa Rosa Junior College. The Water Agency supplies small quantities of water, when available, from its transmission system to several surplus water customers. The Water Agency also has agreements with other entities, known as Russian River Customers, which authorize them to divert[4] water from the Russian River under the Water Agency's water rights using their own facilities. The Russian River Customers are the City of Healdsburg, Camp Meeker Recreation and Park District,[5] and the Town of Windsor/Windsor Water District. Russian River Customers typically divert under their own water rights, but may divert under the Water Agency's water rights when required diversions are not authorized under their own water rights.

The Water Agency is the local sponsor for the two federal water supply and flood control reservoirs in the Russian River watershed. Coyote Valley Dam at Lake Mendocino is located on the East Fork of the Russian River near the City of Ukiah in Mendocino County (Figure 3-1). Warm Springs Dam at Lake Sonoma on Dry Creek is located near the City of Healdsburg in Sonoma County (Figure 3-1). The Water Agency, as local sponsor, partially financed the construction of Coyote Valley and Warm Springs dams under agreements with the U.S. Army Corps of Engineers (USACE). The Water Agency manages water supply storage within Lake Mendocino and Lake Sonoma to optimize the water supply yields of the reservoirs, and the

[4] "Divert" means the act of removingwater from streamflows for beneficial uses. "Directly divert" means to divert water that is flowing in the stream and is not derived from upstream releases of stored water. "Re-divert" means to divert water that is flowing in the stream and is derived from upstream releases of stored water or upstream imports. "Collection to storage" means to divert or re-divert water flowing in a stream into storage in a reservoir.

[5] The Water Agency has a water supply agreement with Occidental Community Services District, but it is not yet effective. Occidental Community Services District currently diverts under Camp Meeker Recreation and Park District's agreement.

Water Agency controls releases from the water supply pools[6] of both reservoirs to maintain required minimum instream flows in the Russian River and Dry Creek and to meet the diversion demands of the Water Agency and other Russian River water users. Pacific Gas and Electric Company's (PG&E) Potter Valley Hydroelectric Project (PVP), which includes Lake Pillsbury, diverts water from the Eel River watershed into the Russian River watershed, and some of this water flows into Lake Mendocino. The USACE manages flood control operations at Lake Mendocino and Lake Sonoma.

The Water Agency does not divert any water from the Russian River between Lake Mendocino and the Russian River's confluence with Dry Creek, but it does authorize diversions by the City of Healdsburg in this reach under the Water Agency's water right permits. The Water Agency diverts water from the Russian River at its Wohler and Mirabel diversion facilities near Forestville and conveys the water via its water transmission system to its customers.

3.3.1 Lake Pillsbury and Potter Valley Project

PG&E's PVP was constructed in 1908 for power generation purposes. Water is collected to storage in Lake Pillsbury, a reservoir created by the Scott Dam on the Eel River. Natural flows of Eel River water and water released from Lake Pillsbury storage are diverted 12 miles downstream from Scott Dam at Cape Horn Dam and then are conveyed through a diversion tunnel and penstocks to the Potter Valley Powerhouse, which is located in the Russian River watershed. Some of the water discharged from the powerhouse is diverted into canals from which the Potter Valley Irrigation District (PVID) receives water under a water supply agreement with PG&E and its own appropriative water rights license. The remaining water discharged from the powerhouse not consumptively used by PVID flows down the East Fork Russian River into Lake Mendocino. The PVP has a maximum flow capacity of approximately 300 cubic feet per second (cfs) and a generation capacity of 9.4 megawatts (MW). PVP diversions and operations are regulated by a license issued to PG&E by the Federal Energy Regulatory Commission (FERC) and serve multiple purposes, including power generation, Potter Valley agricultural irrigation uses, and minimum instream flow releases into the East Fork Russian River. The PVID has a water supply contract with PG&E to receive up to 50 cfs of flows from the PVP.

PG&E manages releases from Lake Pillsbury to meet FERC-required minimum release requirements in the Eel River and to provide water for diversions to the PVP powerhouse. Between 1922 and 1992, diversions from the Eel River through the PVP averaged greater than 150,000 acre-feet annually. It was during this period that the Coyote Valley Dam/Lake Mendocino project was designed, the Water Control Manual for Lake Mendocino was developed, and the SWRCB adopted water rights Decision 1610. PG&E does not manage or coordinate the operation of PVP with the USACE or Water Agency's operations of Lake Mendocino. However, the historical importance of water from the PVP to 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

[6] The water supply pools in Lake Mendocino and Lake Sonoma are sometimes referred to a "water conservation pools."

Russian River and Dry Creek minimum instream flow requirements in these permits that is based on cumulative inflows into Lake Pillsbury.

Following a 10-year FERC-required study, 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. FERC prepared an Environmental Impact Statement (EIS) under the National Environmental Policy Act (NEPA), which evaluated the potential environmental impacts of various PVP flow proposals 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 alternatives" and "reasonable and prudent measures" that the Biological Opinion stated were necessary to avoid jeopardizing the continued existence of the ESA-listed salmon species in the Eel River watershed. At the time, FERC believed that the differences between the Biological Opinion conditions and an earlier flow proposal by NMFS that had been evaluated in the EIS for the PVP were "modest differences… not likely to result in any material difference in the environmental effects" (FERC Order on Rehearing, 107 FERC Section 61,232, Para.22). PG&E began operation of the PVP in accordance with its amended FERC license in 2006, and these new operations substantially reduced the amounts of PVP diversions compared to historical levels.[7] Annual PVP diversions now average about 72,000 acre-feet, less than half the 1922-1992 average (SCWA 2015). These reductions have resulted in much lower inflows into Lake Mendocino from the East Fork Russian River than analyzed by the Biological Opinion or the EIS. Changes in the seasonal timings of PVP diversions have also affected Lake Mendocino water storage reliability. 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 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.

3.3.2 Lake Mendocino

Lake Mendocino is located approximately 4 miles northeast of the City of Ukiah on the East Fork Russian River in Mendocino County (Figure 3-1) and is created by Coyote Valley Dam. The USACE's construction of Coyote Valley Dam and Lake Mendocino was authorized by the Flood Control Act of 1944 for the purposes of flood control, water supply, recreation, and streamflow regulation. Construction was completed in 1959. Coyote Valley Dam is an earth embankment dam, approximately 160 feet high with a crest 3,500 feet long. The invert of the controlled outlet at the dam is at an elevation of 637 feet above mean sea level (MSL); the dam crest elevation is at 784 feet above MSL (USACE 1986a). Lake Mendocino's total current

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

storage capacity is 116,500 acre-feet, with a water supply pool between 68,400 acre-feet and 111,000 acre-feet, depending on time of year (Figure 3-2). Based on reservoir bathymetric surveys completed in 1952 and 2001, the estimated average sedimentation rate is approximately 143 acre-feet per year. The inside elevation of the bottom of the dam's controlled outlet establishes the top of the inactive pool, which was estimated to have a storage capacity of 135 acre-feet (USACE 1986a). Based on the average rate of sedimentation, it appears that the inactive pool has reached its capacity to accumulate sediment.

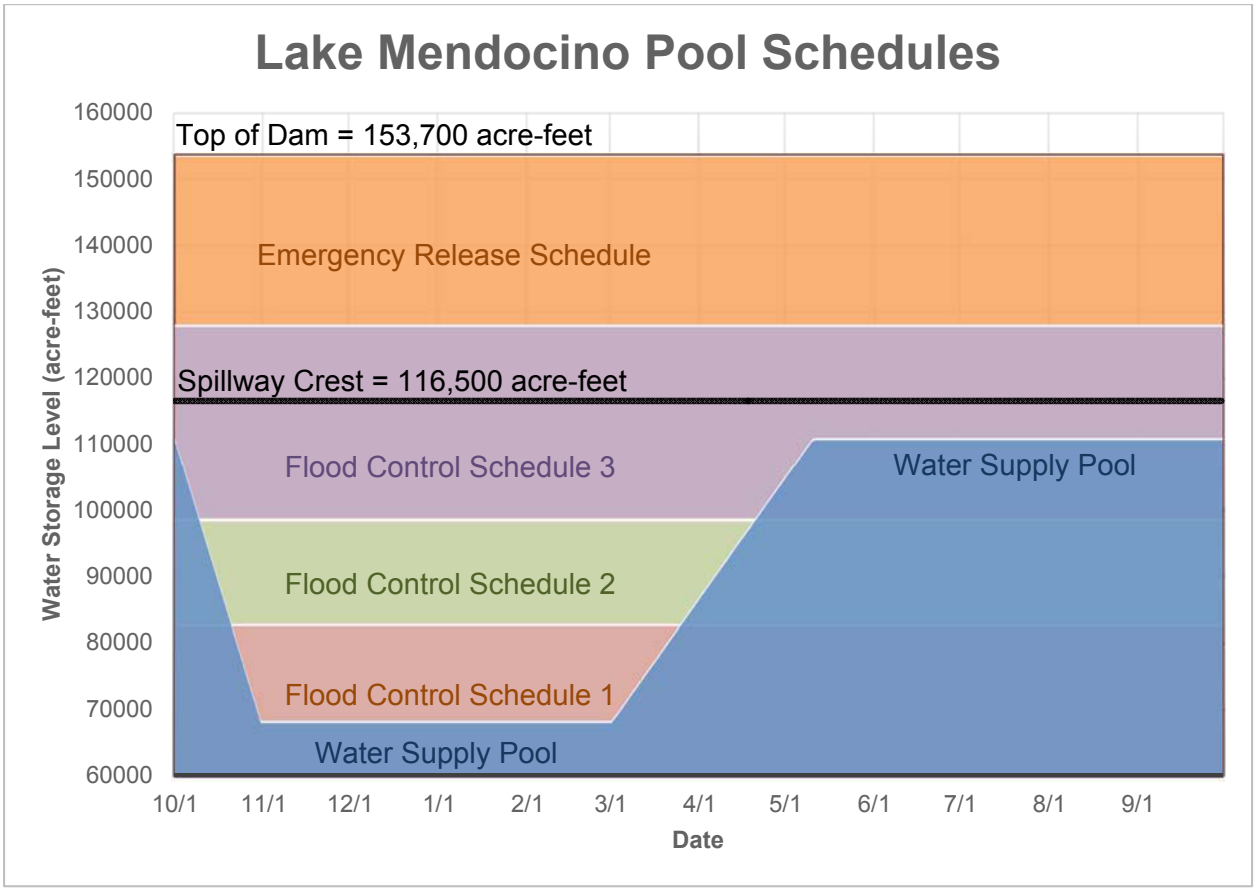


Figure 3-2. Lake Mendocino flood control and water supply pool schedules defined in the 2004 U.S. Army Corps of Engineers Coyote Valley Dam and Lake Mendocino, Russian River, California, Appendix I to Master Water Control Manual, Water Control Diagram.

The watershed contributing to Lake Mendocino encompasses an area of 105 square miles, which is approximately 7 percent of the Russian River watershed. The average annual inflow into Lake Mendocino is approximately 235,000 acre-feet per year, with a peak annual inflow of 443,000 acre-feet in 1983 and a minimum annual inflow of 60,000 acre-feet in 1977. Inflow into the reservoir consists of unimpaired flows[8] from the contributing watershed and water imported from the Eel River by the PVP. Unimpaired stream flows create most of the Russian River flows downstream of Coyote Valley Dam to the Russian River's confluence with Dry Creek during the

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

rainy season (November through April). During the drier months of May through October, water released from Lake Mendocino storage creates most of the flows in the Russian River upstream of Dry Creek.

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

Flood Management Operations

The USACE manages water releases from Coyote Valley Dam and Lake Mendocino during flood management operations according to the *Coyote Valley Dam Master Water Control Manual, Appendix I* (CVD Water Control Manual; (USACE 1986a) and (USACE 2004). The CVD Water Control Manual includes a reservoir guide curve that establishes the maximum seasonal limits for water supply storage in Lake Mendocino (Figure 3-2). The volume of the water supply pool decreases during the rainy season to increase available storage for flood management operations. The volume of the water supply pool increases in the dry season to increase water storage for water supply operations. The flood control pool is defined as the volume above the reservoir guide curve. When water storage in Lake Mendocino is above the reservoir guide curve and in the flood control pool, the USACE normally manages releases from Coyote Valley Dam. Under typical flood management operations, water is temporarily detained in the flood control pool until the risk of downstream flooding has diminished. The USACE will then release water from the reservoir to bring storage levels back down to the level defined by the reservoir guide curve. These releases are initiated in accordance with schedules established in the CVD Water Control Manual (Figure 3-2).

Water Supply Operations

The Water Agency is the local sponsor for Lake Mendocino and is responsible for making water supply releases in compliance with its water right permits. As the local sponsor, the Water Agency has the exclusive right to control releases from the water supply pool. The Water Agency makes releases from Coyote Valley Dam to maintain the minimum instream flow requirements specified in its water right permits and for downstream beneficial uses along the Upper Russian River, including diversions for domestic, municipal, industrial and agricultural purposes[9]. These releases are made by the Water Agency when reservoir storage levels are in the water supply pool, which is at or below the reservoir guide curve as established in the CVD Water Control Manual (Figure 3-2). The Water Agency and the Mendocino County Russian River Flood Control and Water Conservation Improvement District (Mendocino District) each have a water right permit for storage of water in Lake Mendocino's water supply pool, as described in Section 3.3.6, Water Right Permits below. The Water Agency makes release decisions on the Upper Russian River to comply with minimum instream flow requirements in its water right permits at compliance locations as far away as Healdsburg, over 60 miles downstream of Lake Mendocino. While the Water Agency must release enough water to satisfy diversions and stream depletions that occur along the river plus the amount needed for minimum instream flow compliance, the Water Agency does not control these diversions and

[9] Upper Russian River is defined as the Russian River between the East Fork Russian River and Dry Creek.

the streamflow loss due to diversions and depletions can only be estimated from stream gage information at the compliance locations.

Coyote Valley Dam Egg Collection Facility

The Coyote Valley Dam Egg Collection Facility is owned by the USACE and operated by the CDFW. The eggs of steelhead returning to Lake Mendocino are collected and fertilized at the facility and then transported to the Don Clausen Fish Hatchery at Lake Sonoma to be raised. After a year, young steelhead are returned to the facility located at the base of Coyote Valley Dam, housed for a period of time to imprint the fish to the site, and then are released into the Russian River. Water released from Lake Mendocino is used to support facility operations, which require a minimum flow of 25 cfs. This water is diverted from the controlled outlet at Coyote Valley Dam and then released back to the river. CDFW normally requests additional water releases from Coyote Valley Dam in the winter to promote downstream migration of juvenile steelhead released to the Russian River. These additional releases typically are during one week in February and one week in March.

City of Ukiah Hydroelectric Facility

The City of Ukiah operates the Lake Mendocino Hydroelectric Plant at Coyote Valley Dam, which uses the releases of water from the reservoir to generate power under the license for FERC Project No. 2841. This plant began operations in 1986. The plant has a total generation capacity of 3.5 megawatts (MW) from two turbine/generator units with capacities of 2,500 and 1,000 kilowatts (kW), which are located in the powerhouse at the base of Coyote Valley Dam (Beach 2002). The facility's maximum discharge capacity is 2,000 cfs and all water used at the powerplant is discharged to the East Fork Russian River immediately downstream of the facility.

3.3.3 Lake Sonoma

Lake Sonoma is located approximately 10 miles northwest of the City of Healdsburg on Dry Creek, a tributary to the Russian River, and is created by Warm Springs Dam (Figure 3-1). The USACE's construction of Warm Springs Dam and Lake Sonoma were authorized by the Flood Control Act of 1962 for the purposes of flood control, water supply, environmental stewardship, and recreation. Construction was completed in 1983. Warm Springs Dam is an earth embankment dam approximately 319 feet high with a crest 3,000 feet long. Warm Springs Dam has four intakes at different elevations, which allow releases to be managed to achieve the desired water temperatures. The deepest intake at the dam is at an elevation of 221 feet above MSL; the dam crest elevation is at 519 feet above MSL (USACE 1984). When constructed, Lake Sonoma's total storage capacity was 381,000 acre-feet, with a water supply pool of 225,000 acre-feet (Figure 3-3). The USACE has not completed a reservoir bathymetric survey since Lake Sonoma was constructed. The Water Agency has estimated an average sedimentation rate for Lake Sonoma based on bed load measurements collected by the USACE during planning of the project. An average suspended sediment yield of 3,640 tons per square mile of watershed was measured in Dry Creek near the Geyserville United State Geological Survey (USGS) gaging station for the 15-year period from 1965 to 1979. From this

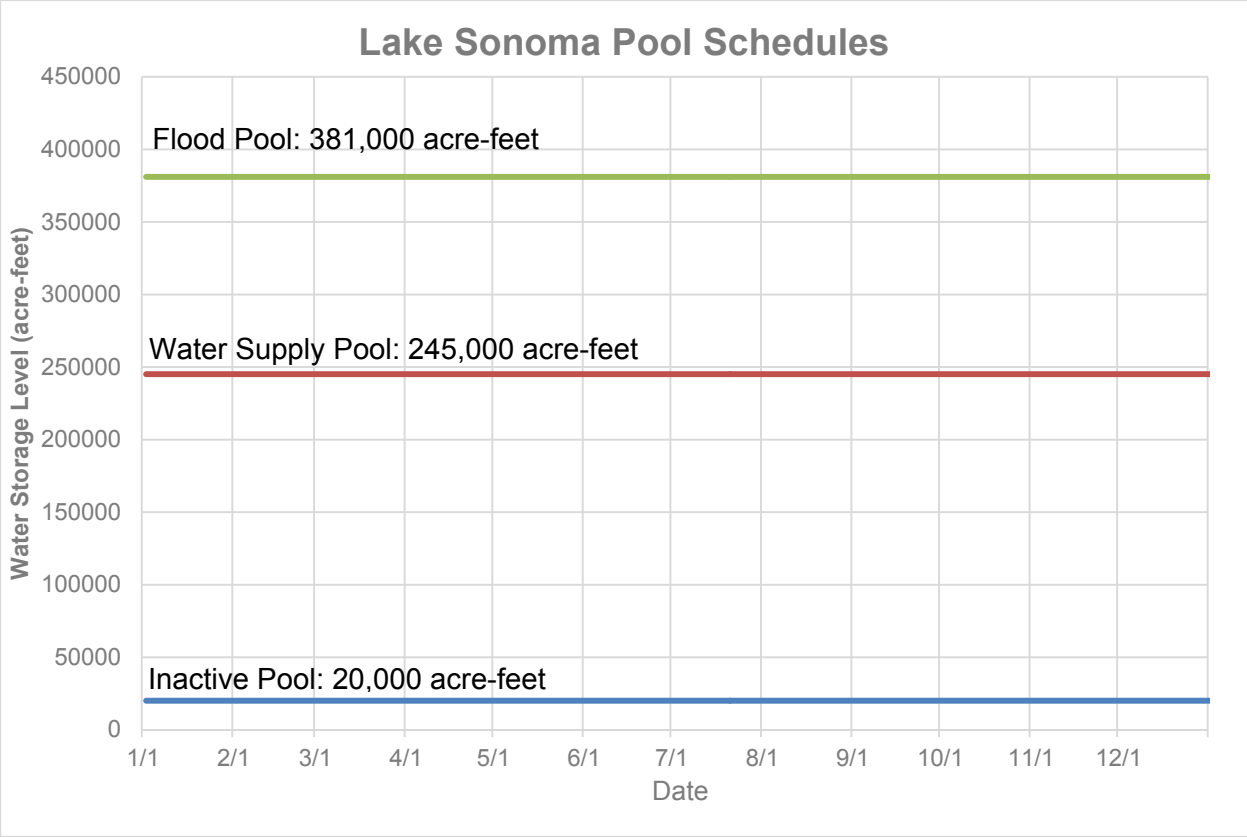


Figure 3-3. Lake Sonoma flood and water supply pool schedules defined in the 1984 U.S. Army Corps of Engineers Warm Springs Dam and Lake Sonoma, Dry Creek, California, Water Control Manual.

measurement, an annual sedimentation rate of approximately 2.3 acre-feet per square mile of watershed was estimated. Based on this rate, the current storage of the reservoir is estimated to be approximately 370,700 acre-feet; a reduction of approximately 2.6 percent of total capacity since construction. The invert of the dam's controlled outlet establishes the top of the inactive pool, which was estimated to have a storage capacity of 20,000 acre-feet (USACE 1984).

The watershed contributing to Lake Sonoma encompasses an area of 130 square miles, which is approximately 9 percent of the Russian River watershed. The average annual inflow into Lake Sonoma is approximately 170,000 acre-feet per year, with a peak annual inflow of 392,000 acre-feet in 1995 and a minimum of 41,000 acre-feet in 2014. All of the reservoir inflows come from unimpaired flows.

The USACE operates Lake Sonoma recreational facilities, which include hiking trails, picnic areas, campgrounds, and boat launches. These facilities provide opportunities for boating, swimming, and hunting. The privately-owned Lake Sonoma Marina Resort is located on the Warm Springs arm of Lake Sonoma and has a boat launch, boat rentals, fuel sales, and a day use area.

Flood Management Operations

The USACE manages water releases from Warm Springs Dam and Lake Sonoma during flood management operations according to the *Warm Springs Dam and Lake Sonoma Water Control Manual, Appendix II* (USACE 1984).The WSD Water Control Manual includes a reservoir guide curve that establishes the maximum limit for water supply storage in Lake Sonoma (Figure 3-3). The flood control pool is defined as the volume above the reservoir guide curve and below the top of the flood pool. When water storage in Lake Sonoma is above the reservoir guide curve and in the flood control pool, the USACE normally manages releases from Warm Springs Dam. Under typical flood management operations, water is temporarily detained in the flood control pool until the risk of downstream flooding has diminished. The USACE will then release water from the reservoir to bring storage levels down to the level defined by the reservoir guide curve. These releases are initiated in accordance with schedules established in the WSD Water Control Manual.

Water Supply Operations

The Water Agency is the local sponsor for Lake Sonoma and is responsible for making water supply releases. As the local sponsor, the Water Agency has the exclusive right to control releases from the water supply pool. The Water Agency makes releases from Warm Springs Dam to maintain the minimum instream flow requirements specified in its water right permits and for downstream beneficial uses, including diversions for municipal, domestic, and industrial purposes. These releases are made by the Water Agency when reservoir storage levels are in the water supply pool, which is at or below the reservoir guide curve as established in the WSD Water Control Manual.

Warm Springs Dam Hydroelectric Facility

The Water Agency operates the Warm Springs Dam Hydroelectric project under a license issued for FERC Project No. 3351. The hydroelectric plant has a total generation capacity of 2.6 MW through a single turbine and generator unit located inside the base of the dam's control structure.

Don Clausen Fish Hatchery

The Don Clausen Fish Hatchery, also known as the Warm Springs Dam Fish Hatchery, is owned by the USACE. The Don Clausen Fish Hatchery includes two primary programs, one to support the steelhead population and one to support coho salmon. CDFW operates the Don Clausen Fish Hatchery in conjunction with the Coyote Valley Dam Egg Collection Facility for the steelhead program. The USACE operates the coho salmon conservation hatchery program. The hatchery diverts flow from the releases at the Warm Springs Dam controlled outlet to support operations. Water used by the hatchery is discharged into Dry Creek downstream of the hatchery. The Water Agency coordinates its water supply releases with fish hatchery staff to ensure that releases meet the hatchery's operational needs. Minimum releases to support the hatchery typically range between 55 and 70 cfs.

3.3.4 Decision 1610 and Instream Flows

As discussed previously, the Water Agency is the local sponsor for Lake Mendocino and Lake Sonoma and manages water supply releases from both reservoirs in accordance with its water right permits. The SWRCB's Decision 1610 approved a hydrologic index and minimum instream flow requirements for the Russian River watershed in 1986. The Decision 1610 hydrologic index and minimum instream flow requirements are included in terms of the Water Agency's water right permits, as described in Section 3.3.6, Water Right Permits. The hydrologic index approved by Decision 1610 will be described in this document as the Decision 1610 Hydrologic Index. The minimum instream flow requirements included in the Water Agency's water right permits and approved by Decision 1610 will be described in this document as the Decision 1610 minimum instream flow requirements.

Hydrologic Condition

The 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.[10] 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 (Figure 3-4). The Decision 1610 Hydrologic Index defines cumulative inflow into Lake Pillsbury as the algebraic sum of releases from Lake Pillsbury, change in storage, and lake evaporation. 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[11], and Dry Creek.[12] See Figure 3-4 for the detailed schedules. *Normal* water supply conditions exist whenever a *Dry* or *Critical* water supply condition is not present.

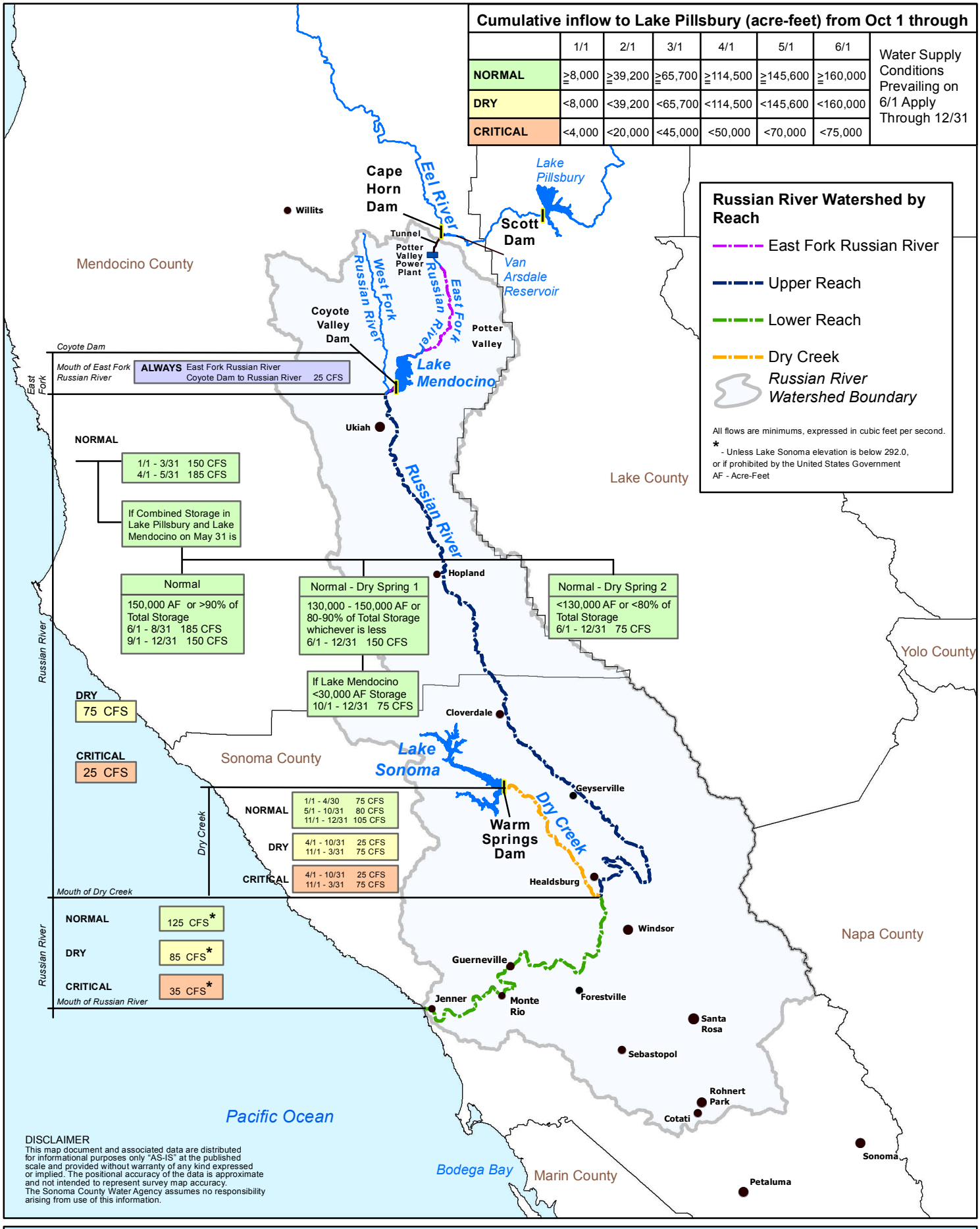
Dry water supply conditions exist when cumulative inflow to Lake Pillsbury from October 1 to the date specified below is less than:

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

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

- 4,000 acre-feet as of January 1;
- 20,000 acre-feet as of February 1;

[10] Water year is defined as the 12-month period beginning on October 1 for any given year and ends September 30 of the following year. The water year designation is defined as calendar year in which it ends. For example, water year 2016 began on October 1, 2015, and ends September 30, 2016.
[11] Lower Russian River is defined as the Russian River from its confluence with Dry Creek to the Pacific Ocean.
[12] These requirements apply to the reach of Dry Creek between Warm Springs Dam and its confluence with the Russian River.


Cumulative inflow to Lake Pillsbury (acre-feet) from Oct 1 through
1/1 2/1 3/1 4/1 5/1 6/1
NORMAL ≥8,000 ≥39,200 ≥65,700 ≥114,500 ≥145,600 ≥160,000
DRY <8,000 <39,200 <65,700 <114,500 <145,600 <160,000
CRITICAL <4,000 <20,000 <45,000 <50,000 <70,000 <75,000
Water Supply Conditions Prevailing on 6/1 Apply Through 12/31
Russian River Watershed by Reach
East Fork Russian River
Upper Reach
Lower Reach
Dry Creek
Russian River Watershed Boundary
All flows are minimums, expressed in cubic feet per second.
* - Unless Lake Sonoma elevation is below 292.0, or if prohibited by the United States Government
AF - Acre-Feet
Cape Horn Dam
Eel River
Lake Pillsbury
Willits
Scott Dam
Tunnel
Potter Valley Power Plant
Van Arsdale Reservoir
Mendocino County
West Fork Russian River
East Fork Russian River
Coyote Valley Dam
Potter Valley
Lake Mendocino
Coyote Dam
Mouth of East Fork Russian River
ALWAYS East Fork Russian River Coyote Dam to Russian River 25 CFS
East Fork
Ukiah
NORMAL
1/1 - 3/31 150 CFS
4/1 - 5/31 185 CFS
If Combined Storage in Lake Pillsbury and Lake Mendocino on May 31 is
Normal
150,000 AF or >90% of Total Storage
6/1 - 8/31 185 CFS
9/1 - 12/31 150 CFS
Normal - Dry Spring 1
130,000 - 150,000 AF or 80-90% of Total Storage whichever is less
6/1 - 12/31 150 CFS
Normal - Dry Spring 2
<130,000 AF or <80% of Total Storage
6/1 - 12/31 75 CFS
Russian River
Hopland
Lake County
Yolo County
DRY
75 CFS
If Lake Mendocino <30,000 AF Storage
10/1 - 12/31 75 CFS
Cloverdale
CRITICAL
25 CFS
Sonoma County
Lake Sonoma
Geyserville
Dry Creek
Warm Springs Dam
NORMAL
1/1 - 4/30 75 CFS
5/1 - 10/31 80 CFS
11/1 - 12/31 105 CFS
DRY
4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS
CRITICAL
4/1 - 10/31 25 CFS
11/1 - 3/31 75 CFS
Dry Creek
Healdsburg
Mouth of Dry Creek
NORMAL 125 CFS*
DRY 85 CFS*
CRITICAL 35 CFS*
Windsor
Napa County
Guerneville
Forestville
Jenner
Monte Rio
Santa Rosa
Sebastopol
Rohnert Park
Cotati
Mouth of Russian River
Pacific Ocean
Bodega Bay
Marin County
Sonoma
Petaluma
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SONOMA COUNTY WATER AGENCY
Fish Habitat Flows and Water Rights Project
Decision 1610 Index and Minimum Instream Flow Requirements
N
0 5 10 Miles
Figure 3-4

- 45,000 acre-feet as of March 1;
- 50,000 acre-feet as of April 1;
- 70,000 acre-feet as of May 1; and
- 75,000 acre-feet as of June 1.

Minimum Instream Flow Requirements

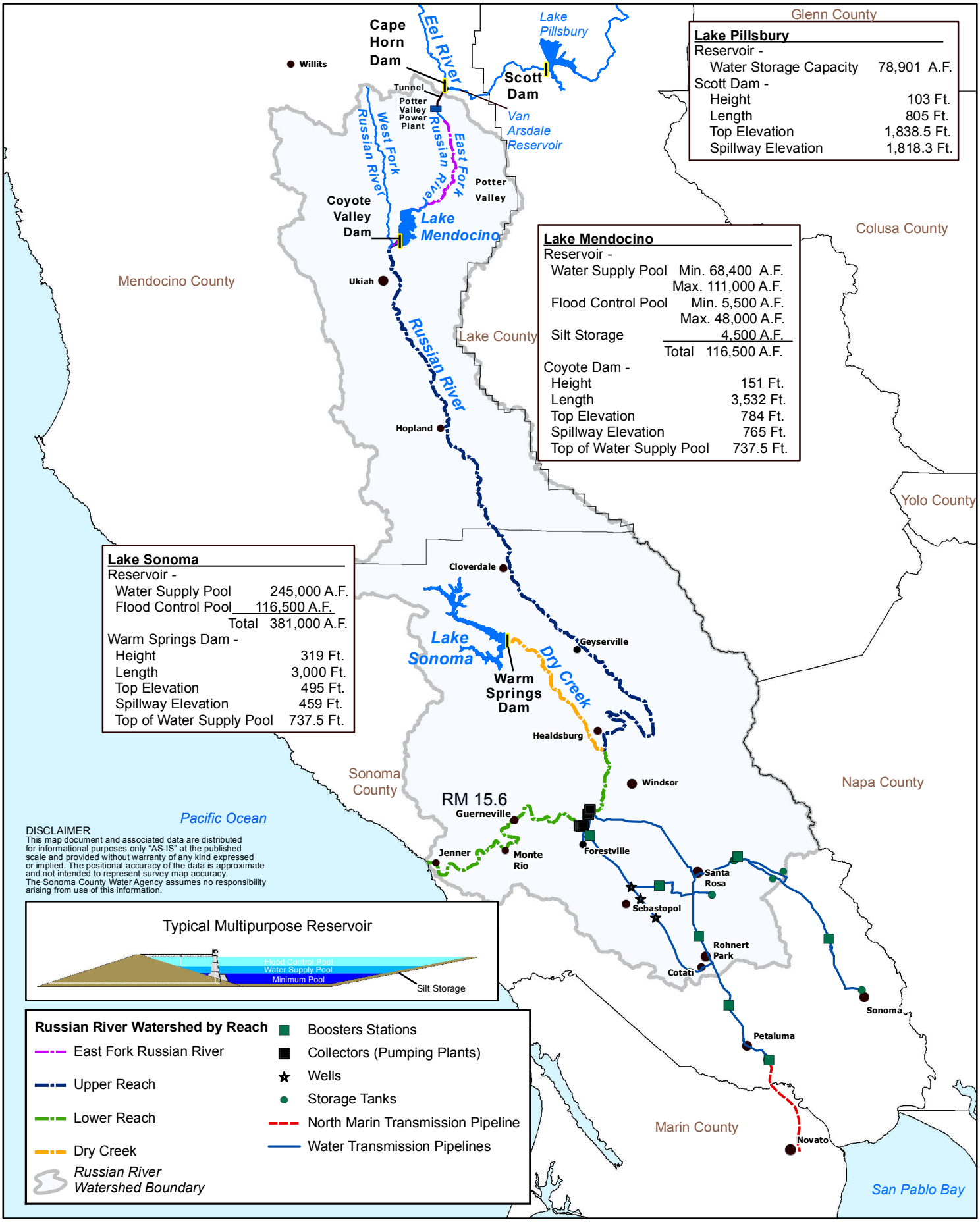
The Decision 1610 minimum instream flow requirements require a minimum flow of 25 cfs in the East Fork Russian River from Coyote Valley Dam to its confluence with the West Fork Russian River under all water supply conditions (Figure 3-4). From this point to Dry Creek, the required Upper Russian River minimum instream flows are 185 cfs from April 1 through August 1 and 150 cfs from September 1 through March 31 during *Normal* water supply conditions, 75 cfs during *Dry* conditions, and 25 cfs during *Critical* conditions. The Decision 1610 minimum instream flow requirements further specify two variations of the *Normal* water supply condition, commonly known as *Normal Dry Spring 1* and *Normal Dry Spring 2*. These conditions provide for lower minimum instream flow requirements in the Upper Russian River from the confluence of the East and West Forks to the Russian River's confluence with Dry Creek during times when the combined storage in Lake Pillsbury and Lake Mendocino on May 31 is unusually low. This Dry-Spring provision does not make any changes in minimum instream flow requirements in the Lower Russian River or Dry Creek. *Normal Dry Spring 1* conditions exist if the combined storage in Lake Pillsbury and Lake Mendocino is between 150,000 acre-feet or 90 percent of the estimated total water supply storage capacity of the reservoirs, whichever is less, and 130,000 acre-feet or 80 percent of the estimated total water supply storage capacity of the reservoirs, whichever is less, on May 31. Under *Normal Dry Spring 1* conditions, the required minimum instream flow in the Upper Russian River between the confluence of the East Fork and West Fork and Healdsburg is 150 cfs from June 1 through March 31, with a reduction to 75 cfs from October 1 through December 31 if Lake Mendocino storage is less than 30,000 acre-feet during those months. *Normal Dry Spring 2* conditions exist if the combined storage in Lake Pillsbury and Lake Mendocino is less than 130,000 acre-feet or less than 80 percent of the estimated total water supply storage capacity of the reservoirs on May 31. Under *Normal Dry Spring 2* conditions, the required minimum instream flows in the Upper Russian River are 75 cfs from June 1 through December 31 and 150 cfs from January 1 through March 31.

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

The required minimum instream flows in Dry Creek below Warm Springs Dam are 75 cfs from January 1 through April 30, 80 cfs from May 1 through October 31, and 105 cfs from November 1 to December 31 during *Normal* water supply conditions. During *Dry* and *Critical* conditions, these required minimum flows are 25 cfs from April 1 through October 31 and 75 cfs from November 1 through March 31.

3.3.5 Water Agency Water Supply Facilities

The Water Agency's water supply facilities are comprised of water diversion and treatment facilities and a transmission system that delivers water to customers. The Water Agency



SONOMA COUNTY WATER AGENCY

Fish Habitat Flows and Water Rights Project
Russian River Water System

N

0 5 10 Miles

Figure 3-5

maintains its water diversion facilities at its Wohler and Mirabel properties, located near the community of Forestville in Sonoma County, California (Figure 3-5). The Wohler and Mirabel facilities are located on the Lower Russian River, approximately 6 miles downstream of the Russian River's confluence with Dry Creek. The Water Agency's diversion facilities divert Russian River underflow, and these diversions are authorized by and reported as diversions under the Water Agency's permitted surface water rights. The Water Agency operates six radial collector wells at the Wohler and Mirabel production facilities. The first two collector wells (Collectors 1 and 2) were constructed in the late 1950s near Wohler Bridge. Collectors 3, 4, and 5 were constructed near Mirabel Park between 1975 and 1983. Collector 6, located in the Wohler area, was completed in 2006. Each collector well consists of a 13- to 18-foot-diameter concrete caisson extending vertically approximately 60 to 110 feet into the alluvial aquifer. Horizontal perforated intake laterals extend radially from the bottom of each caisson into the aquifer. Each collector well houses two vertical turbine pumps driven by electrical motors. During peak demand months, the Water Agency raises an inflatable dam on the Russian River near Mirabel, which allows for operation of five infiltration ponds at Mirabel, which increase the area of infiltration along the Russian River. Water backs up behind the inflatable dam and is diverted into the infiltration ponds to recharge the aquifer in the vicinity of Collectors 3, 4, and 5. Backwater conditions along the river also result in increased infiltration in the Wohler area, thereby enhancing the production capacities of Collectors 1, 2 and 6.

In addition to Collectors 3, 4 and 5, the Water Agency maintains seven vertical wells, referred to as the Russian River Well Field, located at the Mirabel area. These wells are not operated as primary production facilities, but are maintained for standby emergency production.

Water pumped by the collector wells is naturally filtered as it travels through the sands and gravels of the aquifer into the collectors and wells and requires no additional treatment besides disinfection and pH adjustment. The Water Agency operates two corrosion control facilities (pH adjustment), one at Wohler and one on nearby River Road, to treat water in the water transmission aqueducts to control corrosivity in end user's plumbing.

In addition to the Wohler and Mirabel water supply facilities, the Water Agency operates three vertical groundwater wells adjacent to the Russian River-Cotati Intertie pipeline (aqueduct) in the Santa Rosa Plain. These wells are the Occidental Road well, Sebastopol Road well, and Todd Road well.

The Water Agency's transmission system delivers water to its customers in Sonoma and Marin counties. The transmission system is comprised of pipelines (aqueducts), storage tanks, booster pump stations, and other appurtenances.

3.3.6 Water Right Permits

Water right permits issued by the SWRCB are required to divert water under post-1914 appropriative water rights in California. California water right permits contain terms, that among other things, specify the maximum authorized rates of direct diversion and re-diversion. "Direct diversion" refers to water diverted directly from stream flows. "Re-diversion" refers to water that

is first collected to storage in a reservoir, then released from storage and diverted again (re-diverted) at a point downstream.

Riparian water rights are associated with the ownership of land bordering a stream or lake. Riparian water rights allow contiguous property owners to directly divert and use only the natural flow of water in a stream or lake for beneficial purposes without any permit from the SWRCB. However, if water is collected to storage in one season for use in another season, then an appropriative water right is required. Riparian users must share available natural flows among themselves and their rights usually remain with the land when the property is sold.

In California, most diversions are made under appropriative rights. The basic principle of appropriative water rights law is "first in time, first in right." Under this principle, one who first appropriates water and puts it to beneficial use[13] has a right that has a high priority over the rights of later appropriators. During times of water shortage, "junior" appropriators may be prohibited from diverting water under their rights so that there is sufficient water for diversion by "senior" appropriators.

The Water Agency manages water supply releases from Coyote Valley Dam and Warm Springs Dam under water right permits originally issued by the SWRCB in Decision 1030, adopted on August 17, 1961, and then modified by Decision 1416, adopted on March 15, 1973; Order WR 74-30, adopted on October 17, 1974; Order WR 74-34, adopted on November 21, 1974; and Decision 1610, adopted on April 17, 1986. The Water Agency holds Permit 12947A for storage of water in Lake Mendocino and for direct diversion and re-diversion of water originating in the East Fork Russian River at its Wohler/Mirabel diversion facilities and other locations of its customers. Under Permit 12947A, the combined direct diversion and re-diversion rates are limited to an average monthly rate of 92 cfs and to 37,544 acre-feet per year (AFY). The Water Agency holds Permit 16596 for storage of water at Lake Sonoma and direct diversion and re-diversion of up to 180 cfs from the Russian River at the Wohler/Mirabel diversion facilities and other locations of its customers. The Water Agency also holds water right Permits 12949 and 12950 for direct diversion of 20 and 60 cfs, respectively, at the Wohler/Mirabel diversion facilities and other locations of its customers.

Water right Permit 12947A authorizes the Water Agency to store up to 122,500 AFY of water in Lake Mendocino and Permit 16596 authorizes the Water Agency to store up to 245,000 AFY of water in Lake Sonoma. The combined amount of direct diversion and re-diversion authorized under the Water Agency's four permits (12947A, 16596, 12949, and 12950) is limited to no more than 180 cfs (116.3 million gallons per day [mgd]) and 75,000 acre-feet per water year. The authorized points of diversion in these permits include the Water Agency's Wohler/Mirabel diversion facilities and facilities of its Russian River Customers. In Decision 1610, the SWRCB specified a deadline of December 1, 1999, for the Water Agency to complete full beneficial use of water under the permits. This deadline is specified in Term 8 of Permit 16596, Term 8 of Permit 12947A, Term 6 of Permit 12949, and Term 6 of Permit 12950.

[13] The beneficial uses of water, pertaining to water rights, are defined in the California Code of Regulations (CCR) §659-672 to include: domestic; irrigation; power; municipal; mining; industrial; fish and wildlife preservation and enhancement; aquaculture; recreational; stockwatering; water quality; frost protection; and heat control.

As described previously, the Decision 1610 minimum instream flow requirements are included in terms of the Water Agency's water right permits. The Decision 1610 minimum instream flow requirements for the Upper Russian River and Lower Russian River are included in Term 20 of the Water Agency's water right Permit 12947A. The Decision 1610 minimum instream flow requirements for the Lower Russian River are included in Term 17 of Permit 12949 and Term 17 of Permit 12950. The Decision 1610 minimum instream flow requirements for Dry Creek and the Lower Russian River are included in Term 13 of Permit 16596.

Decision 1610 also authorized Redwood Valley County Water District to divert up to 7,500 acre-feet of water from Lake Mendocino under the Water Agency's Permit 12947A under specific conditions. Any water diverted under the Water Agency's Permit 12947A may be used only within the Redwood Valley County Water District boundaries as they existed in 1986. Currently, there is no agreement between the Water Agency and Redwood Valley County Water District and the Redwood Valley County Water District is not diverting any water under the Water Agency's permit.

The Mendocino County Russian River Flood Control and Water Conservation Improvement District (Mendocino District) holds Permit 12947B, which authorizes the diversion and consumptive use within its service area of 8,000 AFY of water. The Mendocino District acquired this right, with a priority date of 1949, in 1961 in consideration of its reimbursing the Water Agency for 11.2 percent of the local cost of the Coyote Valley Dam Project, as discussed in the SWRCB's Decision 1030.

Decision 1030 also reserved 10,000 acre-feet per year of water from Lake Mendocino for diversions for domestic and agricultural uses within the Russian River Valley in Sonoma County, and this reservation commonly is referred to as the "10,000 acre-foot reservation." Diversions and uses of water under this reservation are reported by the individual water right holders that divert and use water under the reservation. Decision 1030 concluded that there should be sufficient water reserved for use in the Russian River Valley in Sonoma County to meet future requirements for 10 years and that after 10 years, any water not contracted for should be made available elsewhere. In Order WR 74-30, the SWRCB ordered that the Water Agency's appropriative water right permit be amended to be subject to depletion by diversion of project water not to exceed 10,000 acre-feet per year, eliminated the 10-year time limit, and allowed individuals to file applications with the SWRCB to appropriate up to 10,000 acre-feet per year for agricultural and domestic purposes within the Russian River Valley in Sonoma County for uses beginning after January 28, 1949 (SWRCB 1974). Decision 1610 did not change provisions of this order pertaining to the 10,000 acre-foot reservation. Table 3-1 provides the SWRCB's estimate of the depletion of the 10,000 acre-foot reservation on the Russian River in Sonoma County as of January 2013 (SWRCB 2013).

Table 3-1. Estimate of the Depletion of Decision 1030's 10,000 acre-foot reservation of water on the Russian River Mainstem in Sonoma County (SWRCB 2013).

Reservation application by type	Number	Water (acre-feet)	% of total
Reservation Total	N/A	10,000	100.0
Licensed Depletion (including 5 SDRs)	93	2,842	28.4
Permitted Depletion	25	3,077	30.8
Pending Application Depletion	10	2,576	25.8
Sub-total	128	8,495	84.9
Reservation Available for New Applications	N/A	1,505	15.1

3.3.7 Water Supply Agreements

The Restructured Agreement for Water Supply (Restructured Agreement), which was executed in 2006, generally provides for the finance, construction, and operation of existing and new diversion Water Agency facilities, transmission lines, storage tanks, booster pumps, conventional wells, and appurtenant facilities. The Restructured Agreement specifies the contractual relationship between the Water Agency and its eight retail contractors, and specifies the quantities of water that they require and the flow rates that are necessary to meet their peak day's demands, subject to delivery limitations.[14] The water contractors are public agencies that provide retail water service to industrial, commercial, and residential users. The Restructured Agreement also provides funding mechanisms that allow the Water Agency and its water contractors to plan for and implement watershed enhancement and restoration, fisheries enhancement, water conservation, regional planning, local supply, and recycled water projects and activities, and that encourage water contractors to institute aggressive water conservation programs.

The Water Agency has agreements that allow specific entities to divert water from the Russian River under the Water Agency's water rights using their own diversion facilities. These entities are the City of Healdsburg, Town of Windsor, Camp Meeker Recreation and Park District, and Occidental Community Services District (Occidental CSD).[15] The Water Agency's agreements with these customers require them to use any water right they may have before using the Water Agency's water rights. The agreements with Town of Windsor and Occidental CSD require the Water Agency to file petitions with the SWRCB for changes in the Water Agency's water right permits that will allow these customers to divert water at specific points of diversion on the Russian River under the Water Agency's permits. The Water Agency filed petitions with the SWRCB for these changed in October 2002 and May 2004, respectively. The Water Agency's petition to add an authorized point of diversion for Occidental CSD included requested limits on total diversions and re-diversions of 0.16 cfs (average during any month) and 65 AFY. Water diverted under this agreement may only be used within the boundaries of the Occidental CSD. The Water Agency's water right permits currently include three Town of Windsor wells as authorized points of diversion. The Water Agency's petition to add additional authorized points

[14] The Restructured Agreement also includes an aggregate maximum allocation for "other Agency customers." The Water Agency's deliveries to Marin Municipal Water District are authorized by the Restructured Agreement and are subject to the terms of a Supplemental Water Supply Agreement, dated July 1, 2015, between the Water Agency and the Marin Municipal Water District, which amended two existing agreements (the "Offpeak Water Supply Agreement" and the "Agreement for the Sale of Water").
[15] Occidental Community Services District is prohibited from diverting under the Water Agency's water right permits because the District's wells are not currently authorized points of diversion in the Water Agency's permits.

of diversion for the Town of Windsor requested limits on total diversions and re-diversions of 14.26 cfs and 4,725 AFY. Water diverted under this agreement may be used only within the boundaries of the Windsor Water District. Both petitions are still pending before the SWRCB. The agreement with the Occidental CSD is executed but will not become effective until the SWRCB approves the petition authorizing diversion at the Occidental CSD point of diversion.

"Other transmission system customers" are customers that have contracts with the Water Agency authorizing them to receive water through connections to the Water Agency's transmission system. These customers include the Forestville Water District, California-American Water Company (in the Larkfield-Wikiup area), the Kenwood Village Water Company, Lawndale Mutual Water Company, Penngrove Water Company, the County of Sonoma, the State of California, and Santa Rosa Junior College. The Water Agency also supplies small quantities of water, when available, from its transmission system to several surplus water customers.

3.3.8 Water Rights Application

The Water Agency filed an application with the SWRCB for a new appropriative water right permit for the direct diversion of 72 cfs (up to 26,000 AFY) of Russian River water at the Water Agency's Wohler and Mirabel facilities on October 11, 1999. The Water Agency filed petitions at the same time to amend its water right permits to increase the total maximum authorized instantaneous and annual diversion rates in these permits. The Water Agency filed this application and these petitions to implement the Water Agency's Water Supply and Transmission System Project, which had proposed to increase the total maximum authorized diversion rates in the Agency's water rights (including the requested new permit) to 252 cfs and 101,000 AFY. The petitions also requested changes to the deadlines for applying water to full beneficial use in Permits 12949, 12950, and 16596 to December 1, 2020. The Water Agency filed a request to the SWRCB to cancel this application and these petitions in August 2016.

As described in Section 3.3.7, Water Supply Agreement, the Water Agency petitioned the SWRCB to authorize the addition to the authorized points of diversion in the Water Agency's permit of the Occidental CSD and Town of Windsor wells to the authorized points of diversion in the Water Agency's water right permits in 2002 and 2004, respectively. Both petitions are still pending before the SWRCB.

The Water Agency filed a petition with the SWRCB to permanently change Decision 1610 minimum instream flow requirements on September 23, 2009, as required by NMFS' Russian River Biological Opinion. The purpose of that petition is fully described in Section 3.3.12, Russian River Biological Opinion, and Section 3.5, Purpose and Need for Project. In August 2016, the Water Agency filed a request to the SWRCB to cancel that 2009 petition and filed a new petition to change the minimum instream flow requirements and hydrologic index in the Water Agency's water right permits as necessary to implement the Fish Flow Project. The proposed Fish Flow Project is fully described in Section 3.7, Description of the Proposed Project.

3.3.9 Urban Water Management Plan

The Water Agency prepared the wholesaler 2015 Urban Water Management Plan (UWMP), which was adopted by the Water Agency's Board of Directors on June 21, 2016, in accordance with the Urban Water Management Planning Act (UWMPA).[16] The UWMPA requires every urban water supplier that provides water for municipal purposes to more than 3,000 customers, or that supplies more than 3,000 acre-feet of water annually, to adopt a plan every five years and to file it with the California Department of Water Resources (DWR). The UWMP is a long-range planning document for the Water Agency's wholesale water supply (Brown and Caldwell 2016). Included in the UWMP is a description of the water supply system, current and projected water uses, reliability of water supplies, a water shortage contingency plan, and water demand management measures. Based on the water demand projections described in the 2015 UWMP, the Water Agency estimates the existing annual diversion and re-diversion limit of 75,000 AFY will be exceeded in approximately 2035. The Water Agency's projected total annual diversions and re-diversions are estimated to exceed the 75,000 AFY limit be about 117 ac-ft/yr in 2035 and by almost 1,000 AFY in 2040. The potential need to apply to the SWRCB for an increase in the 75,000 AFY limit and the schedule for filing any needed water right application or petitions with the SWRCB for this increase will be reevaluated in the Water Agency's 2020 UWMP and in each subsequent UWMP as necessary.

3.3.10 Water Conservation and Education

The Water Agency is a member of the California Urban Water Conservation Council (CUWCC). The CUWCC assists water purveyors in increasing water conservation statewide under a Memorandum of Understanding (MOU). The Water Agency is a signatory to the MOU and has pledged to make good faith efforts towards implementing Best Management Practices (BMPs) regarding urban water conservation that are described in the CUWCC MOU. The two primary purposes of the MOU are: 1) to expedite implementation of reasonable water conservation measures in urban areas; and 2) to establish assumptions for use in calculating estimates of reliable future water conservation savings resulting from proven and reasonable conservation measures.

The Water Agency is the first wholesale water agency in the state to have all its water contractors sign the CUWCC MOU. The Water Agency signed the CUWCC MOU on June 1, 1998, and submits annual BMP reports to the CUWCC in accordance with the MOU. The MOU only requires that water utilities implement BMPs that are economically feasible. If a BMP is not economically feasible or has legal barriers to implementation, the utility may request an economic exemption for that BMP. The Water Agency has not requested an exemption from any BMP at this time.

As a wholesaler MOU signatory, the Water Agency assists its retailers with BMP implementation where appropriate. The Water Agency is responsible for the implementation of a subset of the BMPs.

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

The Water Agency is also involved with regional programs and partnerships to provide help and information for water conservation. The Sonoma Marin Saving Water Partnership (Partnership) was formed in 2010 by the cities of Santa Rosa, Rohnert Park, Sonoma, Cotati, and Petaluma, the Town of Windsor, the North Marin and Valley of the Moon Water Districts, the California-American Water Company and the Water Agency to maximize the cost effectiveness of implementing water conservation programs. The Partnership offers customers information about appliance rebates, gardening programs, and drought drive-up events that give away household items for water conservation. The Partnership coordinates water use efficiency-focused media actions in the region and provides support to members that need additional assistance meeting conservation targets.

Water Education Program

The Water Agency's Water Education Program is a comprehensive approach to helping educators teach students the value of water as an important natural resource. The Water Agency's service area covers over 200 schools throughout Sonoma and northern Marin counties. The total number of students receiving direct instruction from 1999 to 2015 ranged from 1,797 in school year 2001-2002 to 10,520 in 2014-2015. Water conservation and stewardship of local watersheds is promoted as part of the program. Students are encouraged to use water wisely and make environmentally sustainable choices to help secure a reliable source of water now and in the future. The program includes classroom instructional presentations, field study opportunities, free curriculum materials aligned with the Next Generation Science Standards and the California Science Standards, a lending library of videos, interactive models and printed materials, production of a newsletter for teachers and endorsement, participation and financial sponsorship of events, assemblies and workshops. All of the Water Education programs and materials are free to teachers in the Water Agency's service area.

3.3.11 Water Supply Strategies Action Plan

To support the Water Agency's commitment to providing a safe, reliable water supply in the future, the Water Agency's Board of Directors approved the Water Supply Strategies Action Plan (Action Plan) in 2010. The plan was approved followed 16 months of community outreach and involvement to develop strategies that would increase water supply system reliability, resiliency and efficiency. The Action Plan was updated in 2011 and 2013. The Action Plan identified the following nine strategies (SCWA 2013): 1) ensure adequate summertime water flow through Dry Creek Valley; 2) improve management of Russian River System to protect fisheries and meet water demands; 3) plan for the impact of climate change on water supply and flood protection; 4) identify and implement projects that integrate stormwater recharge and flood protection; 5) build partnerships with stakeholders to facilitate information based water supply planning; 6) implement projects to improve transmission system reliability; 7) improve the energy efficiency of the water transmission system and increase renewable power use; 8) implement projects that improve integration of water management; and 9) improve internal and external processes, data exchange and analysis to promote organizational efficiency.

3.3.12 Russian River Biological Opinion

The National Marine Fisheries Service issued its *Biological Opinion for Water Supply, Flood Control Operations, and Channel Maintenance conducted by the U.S. Army Corps of Engineers, the Sonoma County Water Agency, and the Mendocino County Russian River Flood Control and Water Conservation Improvement District in the Russian River Watershed* (Russian River Biological Opinion) on September 24, 2008 (NMFS 2008). The Russian River Biological Opinion is a culmination of more than a decade of consultation among the Water Agency, the USACE, and NMFS regarding the impacts of Water Agency and USACE water supply and flood control activities on three fish species listed under the federal Endangered Species Act: Central California coast steelhead (*Oncorhynchus mykiss*); Central California Coast coho salmon (*O. kisutch*); and California Coast Chinook salmon (*O. tshawytscha*). Coho salmon are also listed under the California Endangered Species Act (CESA). The 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 in the Russian River Biological Opinion that the continued operations of Coyote Valley Dam and Warm Springs Dam by the USACE and the Water Agency in a manner similar to recent historic practices, together with the Water Agency's stream channel maintenance activities and estuary management, 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, identified as Reasonable and Prudent Alternatives (RPAs), for the Water Agency's and USACE's operations evaluated in the Russian River Biological Opinion. The Water Agency is responsible for taking the following actions under the Russian River Biological Opinion: 1) reducing minimum instream flow requirements in the Russian River and Dry Creek; 2) enhancing salmon habitat in Dry Creek and its tributaries; 3) developing a bypass pipeline around Dry Creek if habitat enhancement in the creek is unsuccessful; 4) modifying Russian River Estuary management; 5) improving water diversion infrastructure at the Water Agency's Wohler and Mirabel diversion facilities; 6) modifying flood control maintenance activities on the mainstem Russian River and its tributaries; and 7) continuing to participate in the Coho Broodstock program.

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

USACE's water supply and flood control activities and RPAs (NMFS 2008). Key measures required by the Incidental Take Statement to be implemented by the Water Agency include: 1) limiting water supply releases from Coyote Valley Dam and Warm Springs Dam to monthly median flow criteria to avoid take of juvenile steelhead and coho salmon associated with high flow releases; 2) limiting the number of times artificial breaching of the barrier beach at the Russian River Estuary may occur during the term of the Biological Opinion from May 15 to October 15; 3) design of a new and replacement of a fish screen at the Mirabel diversion facility; and 4) methods of monitoring and handling salmonids by measures that ensure low injury and mortality to listed salmonids.

3.4 Project Objective

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

3.5 Purpose and Need for Project

The Water Agency holds water right permits,[17] issued by the SWRCB, that authorize the Water Agency to divert Russian River and Dry Creek flows and to re-divert water released from Lake Mendocino and Lake Sonoma storage. The Water Agency releases water from storage in these reservoirs for re-diversion and subsequent delivery to retail water suppliers, where the water is used primarily for residential, governmental, commercial, and industrial purposes. The primary points of diversion and re-diversion are the Water Agency's facilities at Wohler and Mirabel (near Forestville). The Water Agency also releases water to satisfy the needs of other water users who directly divert streamflow and to replace streamflow lost to the underlying aquifer and to contribute to the maintenance of minimum instream flow requirements in the Russian River and Dry Creek established in 1986 by the SWRCB's Decision 1610. These minimum instream flow requirements vary based on defined hydrologic conditions (*Normal*, *Dry*, and *Critical*) that are based primarily on cumulative inflows into PG&E's Lake Pillsbury in the Eel River watershed.

Unimpaired drainage and stream flow (as opposed to reservoir releases) contribute the majority of the Russian River flows downstream of Coyote Valley Dam and Warm Springs Dam during the rainy season (November through April) except in the driest years. In contrast, during the drier months of May through October, water released from Lake Mendocino storage contributes most of the water in the Russian River upstream of Dry Creek. Similarly, water released from Warm Springs Dam storage contributes most of the water in Dry Creek during the dry season (May through October). Most of the water in the Russian River between Dry Creek and the Pacific Ocean in the dry season is from releases of water stored in Lake Mendocino and Lake Sonoma, except at the Russian River Estuary, which also receives input from the Pacific Ocean.

[17] Waterwater-right Permits 12947A, 12949, 12950 and 16596.

During most months, some of the flows in the Russian River are composed of releases from Lake Mendocino storage, which includes water imported from the Eel River via PG&E's Potter Valley Project.

The Russian River and Dry Creek minimum instream flow requirements established by Decision 1610 and the hydrologic index that is based on Eel River flows to Lake Pillsbury are no longer appropriate. Decision 1610 was adopted before the listings of three salmonid species in the Russian River watershed under the federal Endangered Species Act (ESA),[18] was based on much higher PVP flows to Lake Mendocino than occur today, and did not specifically address the importance of fall storage in Lake Mendocino to the Chinook salmon migration. Also Decision 1610 assumed that higher instream flows were better for fishery resources, and information developed since Decision 1610 was adopted indicates this is not the case for salmonid species in the Russian River and Dry Creek. Decision 1610 expressly recognized that later fishery studies might identify a need to change the minimum instream flow requirements. Decision 1610 also expressly contemplated that changes might be needed if the amounts of water diverted into the East Fork Russian River by PG&E's PVP changed, as it has.

As described in Section 3.3.12, NMFS issued its Russian River Biological Opinion on September 24, 2008. NMFS concluded in the Russian River Biological Opinion that the continued operations of Coyote Valley Dam and Warm Springs Dam by the USACE and the Water Agency in a manner similar to recent historic practices are likely to jeopardize and adversely modify the critical habitats of endangered Central California Coast coho salmon and threatened Central California Coast steelhead. Specifically, NMFS concluded that the artificially elevated summertime minimum flows in the Russian River and Dry Creek that are currently required by the Decision 1610 minimum flow requirements result in high water velocities that reduce the quality and quantity of rearing habitat for coho salmon and steelhead. Additionally, NMFS concluded that maintaining these flows disrupts lagoon formation and retention in the Russian River estuary and that allowing a lagoon to develop and remain during the summer would likely enhance juvenile steelhead and salmon habitat.

NMFS's Russian River Biological Opinion concludes that reducing the Decision 1610 minimum instream flow requirements will enable alternative flow management scenarios that will increase available salmonid rearing habitat in Dry Creek and the upper Russian River, and provide lower, closer-to-natural inflows into the estuary between late spring and early fall, thereby enhancing the potential for maintaining a seasonal freshwater lagoon that would likely support increased production of juvenile steelhead and salmon. (NMFS 2008, 243)

As required by the Russian River Biological Opinion, in September 2009 the Water Agency filed a petition with the SWRCB, asking the SWRCB to permanently change the Decision 1610 minimum instream flow requirements. As discussed above, the Water Agency asked the SWRCB to cancel this petition and instead to process the Water Agency's new petition to change these requirements.

[18] Central California coast coho salmon are also listed as endangered under the California Endangered Species Act.

Until the SWRCB changes the Decision 1610 minimum instream flow requirements, these requirements and the resulting adverse impacts to listed salmonids will remain in effect, except during times when temporary changes to these requirements are made by the SWRCB. The Russian River Biological Opinion requires that the Water Agency annually petition the SWRCB for certain temporary changes to the Decision 1610 minimum instream flow requirements during the summer months until the SWRCB issues an order permanently changing these requirements. 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. The Water Agency petitioned the SWRCB for the Russian River Biological Opinion-specified temporary changes for the first time in 2010, which the SWRCB approved.[19] The Water Agency filed temporary urgency change petitions to comply with the Russian River Biological Opinion in 2011, 2012, and 2016, and the SWRCB approved these petitions.[20] The temporary changes approved by the SWRCB reduced the minimum instream flow requirement to 70 cubic feet per second (cfs) for the Lower Russian River between approximately May 1 and October 15. Additionally, to enhance steelhead rearing habitat in the Russian River between the East Fork and Hopland, the temporary changes reduced the minimum instream flow requirement to 125 cfs for the Upper Russian River between May 1 and October 15 (NMFS 2008, 247).

The permanent and temporary changes to Decision 1610 minimum instream flow requirements specified by NMFS in the Russian River Biological Opinion are summarized in Figure 3-6. The Russian River Biological Opinion concluded that, in addition to providing fishery benefits, the lower instream flow requirements "should promote water conservation and limit effects on in-stream river recreation. (NMFS 2008, 244) The Russian River Biological Opinion concluded that the following permanent changes to the Decision 1610 minimum instream flow requirements may achieve these goals:

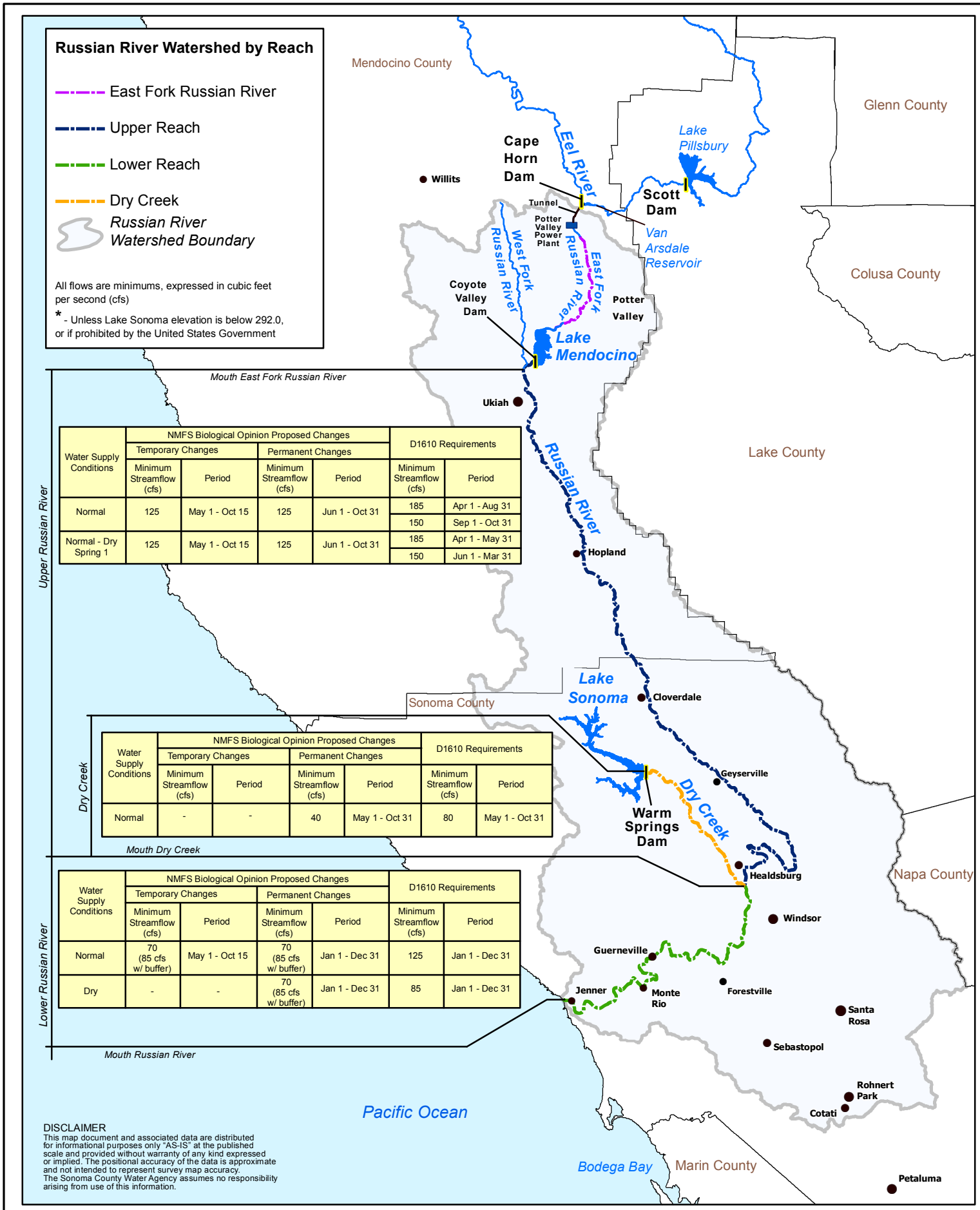
During Normal Years:

1. Reduce the minimum flow requirement for the Russian River from the East Fork to Dry Creek from 185 cfs to 125 cfs between June 1 and August 31; and from 150 cfs to 125 cfs between September 1 and October 31.
2. Reduce the minimum flow requirement for the Russian River between the mouth of Dry Creek and the mouth of the Russian River from 125 cfs to 70 cfs.
3. Reduce the minimum flow requirement for Dry Creek from Warm Springs Dam to the Russian River from 80 cfs to 40 cfs from May 1 to October 31.

During Dry Years:

1. Reduce the minimum flow requirement for the Russian River between the mouth of Dry Creek and the mouth of the Russian River from 85 cfs to 70 cfs.

[19] The SWRCB approved the 2010 petition for temporary urgency change in its Order WR 2010-0018-DWR.
[20] The SWRCB approved the 2011 petition for temporary urgency change in its Order dated June 1, 2011. The 2012 petition was approved in the SWRCB's Order dated May 2, 2012. The 2016 petition for temporary urgency change was approved by the SWRCB in its Order dated May 4, 2016.



Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - Aug 31
					150	Sep 1 - Oct 31
Normal - Dry Spring 1	125	May 1 - Oct 15	125	Jun 1 - Oct 31	185	Apr 1 - May 31
					150	Jun 1 - Mar 31

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	-	-	40	May 1 - Oct 31	80	May 1 - Oct 31

Water Supply Conditions	NMFS Biological Opinion Proposed Changes				D1610 Requirements	
	Temporary Changes		Permanent Changes			
	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period	Minimum Streamflow (cfs)	Period
Normal	70 (85 cfs w/ buffer)	May 1 - Oct 15	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	125	Jan 1 - Dec 31
Dry	-	-	70 (85 cfs w/ buffer)	Jan 1 - Dec 31	85	Jan 1 - Dec 31

SONOMA COUNTY WATER AGENCY

Fish Habitat Flows and Water Rights Project

Russian River Biological Opinion Recommendations

N

0 5 10 Miles

Figure 3-6

During the periods when the temporary changes have been in effect, the Water Agency has monitored water quality and fish, and collected and reported monitoring information as required by the Russian River Biological Opinion. This information has been used to develop the proposed Fish Flow Project and analyze its potential environmental impacts.

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.[21] 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.

The Water Agency also petitioned for and the SWRCB approved temporary urgency changes in April and December 2013, 2014, and 2015, in response to ongoing, prolonged drought conditions resulting in low inflows into Lake Mendocino and declining water supply reliability in the reservoir. In May and December 2013, the temporary urgency change petition orders issued by the SWRCB specified minimum instream flow requirements for the Upper Russian River that were based on an index calculated from water storage in Lake Mendocino, rather than the Decision 1610 Hydrologic Index, which is calculated from cumulative inflow into Lake Pillsbury.

The Fish Flow Project is proposed and is necessary to change the Water Agency's management of water supply releases from Lake Mendocino and Lake Sonoma to provide minimum instream flows that will improve rearing habitat for threatened and endangered salmon, as required by the NMFS's Russian River Biological Opinion and CDFW's Consistency Determination, and to update the Water Agency's existing water rights to reflect current conditions.

[21] The SWRCB approved the 2004 petition for temporary urgency change in its Order WRO 2004-0035. The 2007 temporary urgency change petition was approved in Order WRO 2007-0022. The 2009 temporary urgency change petition was approved in Order WRO 2009-0034-EXEC.

3.6 Description of the Proposed Project

The Proposed Project is the project that will best meet the project objective, taking into consideration comments and concerns of the public and regulatory agencies, engineering and operational feasibility, potential environmental effects, and legal and regulatory requirements. The Proposed Project is the "preferred or proposed alternative." Several alternatives were considered while the Water Agency developed the Fish Flow Project, as discussed in detail in Chapter 7, "Alternatives."

Under the Proposed Project, the Water Agency would manage water supply releases from Lake Mendocino and Lake Sonoma to provide minimum instream flows in the Russian River and Dry Creek that would improve habitat for listed salmonids and meet the requirements of the Russian River Biological Opinion. To implement the Fish Flow Project, changes to the Water Agency's existing water right permits from the SWRCB are required, as described below.

Water right Permit 12947A authorizes the Water Agency to store up to 122,500 AFY of water in Lake Mendocino and Permit 16596 authorizes the Water Agency to store up to 245,000 AFY of water in Lake Sonoma. The combined amount of direct diversion and re-diversion authorized under Permits 12947A, 12949, 12950, and 16596 is limited to a maximum instantaneous rate of 180 cfs and to a maximum annual rate of 75,000 acre-feet per water year. The Proposed Project does not include any changes to either of these limits.

The Proposed Project includes the following components:

- amendments of the Water Agency's water right permits to replace the existing hydrologic index (which is based primarily on Lake Pillsbury inflows) with the new Russian River Hydrologic Index;
- changes to the minimum instream flow requirements in these permits to improve rearing habitat conditions for juvenile steelhead and coho salmon;
- changes to these minimum instream flow requirements to improve conditions for fall-run Chinook salmon migration;
- extending the deadlines for completing full beneficial use in these permits to December 31, 2040, and
- adding the Occidental Community Services District and Town of Windsor existing points of diversion and re-diversion to the authorized points of diversion in these permits.

The Proposed Project does not propose to increase or otherwise change the quantities of water that the Water Agency diverts from the Russian River and Dry Creek and re-diverts from Lake Mendocino and Lake Sonoma under its water right permits, obtain any new authorizations for new rights, or construct new facilities.

3.6.1 Russian River Hydrologic Index

The Water Agency filed a petition to the SWRCB in August 2016 to change the hydrologic index in the Water Agency's water right permits that is used to establish the water-year classifications that determine minimum instream flow requirements for the Russian River and Dry Creek to an index that more accurately reflects actual hydrologic conditions within the Russian River

watershed. The Decision 1610 Hydrologic Index as defined in the Water Agency's water right permits is a metric that establishes the water supply condition, which then is used to determine the applicable minimum instream flow schedule for the Upper Russian River, Lower Russian River, and Dry Creek. The Decision 1610 Hydrologic Index is comprised of schedules designated as *Normal*, *Dry*, and *Critical*. The Decision 1610 Hydrologic Index is based on cumulative inflow into Lake Pillsbury in the Eel River watershed beginning on October 1, with hydrologic conditions for the Russian River system evaluated on the first of the month from January 1 to June 1. There are three variations of the *Normal* water supply condition based on combined storage in Lake Pillsbury and Lake Mendocino on May 31. These three variations of the *Normal* water supply condition determine the required minimum instream flows for the Upper Russian River beginning on June 1. The thresholds of the Decision 1610 Hydrologic Index are described in Section 3.3.4.

Under the Proposed Project, the Decision 1610 Hydrologic Index would be replaced with the Russian River Hydrologic Index, which is comprised of five schedules of minimum instream flow requirements. The use of five new schedules rather than the current three schedules would allow for more responsive management of reservoir water supply storage, particularly for Lake Mendocino during the summer and fall months when preserving cold water in Lake Mendocino for later releases to benefit rearing steelhead and the fall-run Chinook salmon migration and other beneficial uses in the Upper Russian River is most crucial. The proposed five schedules would also allow for additional, smaller, incremental reductions in minimum instream flows, particularly in the Upper Russian River, if reservoir storage amounts are lower due to lower inflows. This allows the Russian River Hydrologic Index to better match minimum instream flow requirements to available water supply and to prevent large changes in minimum instream flows, which could impact habitat and other beneficial uses. This proposed index is summarized in Table 3-2. The petition filed with the SWRCB for the Proposed Project describes the specific changes to terms in the Water Agency's water right Permits 16596, 12947A, 12949, and 12950. These changes also are described in Appendix B.

Minimum Instream Flow Schedules

The proposed Russian River Hydrologic Index is comprised of five minimum instream flow schedules (Flow Schedules): Schedule 1, Schedule 2, Schedule 3, Schedule 4, and Schedule 5. Flow Schedule 1 being the wettest hydrology and Schedule 5 being the driest hydrology. The Upper Russian River, Lower Russian River, and Dry Creek each have a set of five Flow Schedules (Figure 3-7).

The proposed Flow Schedules for the East Fork Russian River from Coyote Valley Dam to the confluence with the Russian River, the Upper Russian River between the East Fork Russian River and Dry Creek, the Lower Russian River from the Russian River confluence with Dry Creek to the Pacific Ocean, and Dry Creek from Warm Springs Dam to its confluence with the Russian River are as follows:

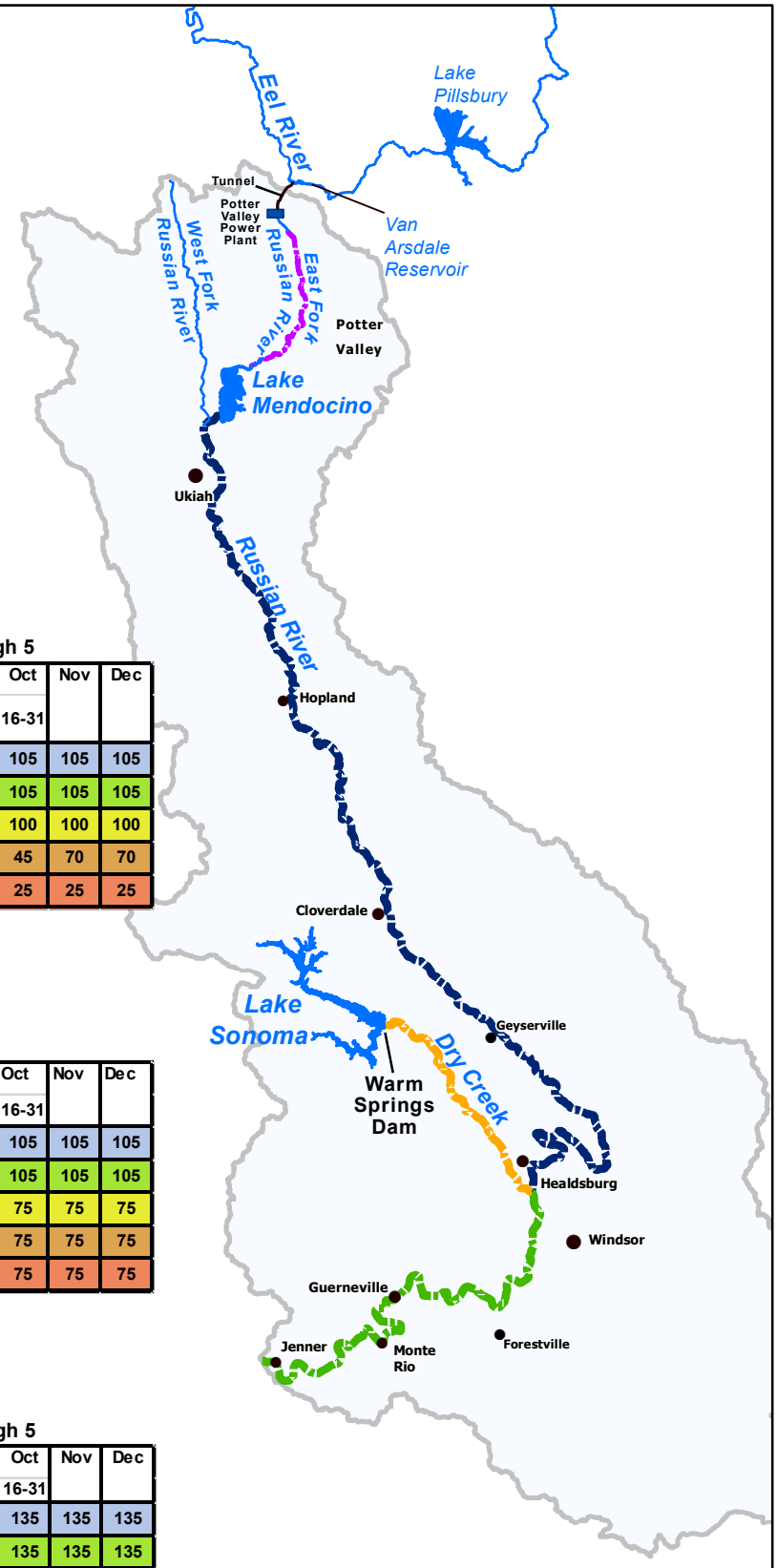
Russian River Watershed by Reach

- East Fork Russian River
- Upper Reach
- Lower Reach
- Dry Creek
- Russian River Watershed Boundary

All flows are minimums, expressed in cubic feet per second (cfs)

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

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



Upper Russian River Minimum Instream Flow Schedules 1 through 5

Flow Schedule	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
1 (Wettest)	105	105	105	105	105	105	105	105	105	105	105	105	105
2	105	105	105	105	85	85	85	85	85	85	105	105	105
3	100	100	100	100	65	65	65	65	65	65	100	100	100
4	70	70	70	70	45	45	45	45	45	45	45	70	70
5 (Driest)	25	25	25	25	25	25	25	25	25	25	25	25	25

Dry Creek Minimum Instream Flow Schedules 1 through 5

Flow Schedule	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
1 (Wettest)	75	75	75	75	50	50	50	50	50	50	105	105	105
2	75	75	75	75	50	50	50	50	50	50	105	105	105
3	75	75	75	50	50	50	50	50	50	50	75	75	75
4	75	75	75	50	50	50	50	50	50	50	75	75	75
5 (Driest)	75	75	75	50	50	50	50	50	50	50	75	75	75

Lower Russian River Minimum Instream Flow Schedules 1 through 5

Flow Schedule	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
1 (Wettest)	135	135	135	135	70	70	70	70	70	70	135	135	135
2	135	135	135	135	70	70	70	70	70	70	135	135	135
3	135	135	135	135	70	70	70	70	70	70	135	135	135
4	85	85	85	85	50	50	50	50	50	50	85	85	85
5 (Driest)	35	35	35	35	35	35	35	35	35	35	35	35	35

SONOMA COUNTY WATER AGENCY

Fish Habitat Flows and Water Rights Project

Proposed Russian River Hydrologic Index Minimum Instream Flow Schedules

N

0 5 10 Miles

Figure 3-7

- Continuous streamflow in the East Fork Russian River from Coyote Valley Dam to its confluence with the Russian River of 25 cfs at all times.
- Upper Russian River
  - Flow Schedule 1: 105 cfs
  - Flow Schedule 2:
    - 85 cfs from May 1 through October 15
    - 105 cfs fom October 16 through April 30
  - Flow Schedule 3
    - 65 cfs from May 1 through October 15
    - 100 cfs from October 16 through April 30
  - Flow Schedule 4
    - 45 cfs from May 1 through October 31
    - 70 cfs from November 1 through April 30
  - Flow Schedule 5: 25 cfs
- Lower Russian River
  - Flow Schedule 1:
    - 70 cfs from May 1 through October 15
    - 135 cfs from October 16 through April 30
  - Flow Schedule 2
    - 70 cfs from May 1 through October 15
    - 135 cfs from October 16 through April 30
  - Flow Schedule 3
    - 70 cfs from May 1 through October 15
    - 135 cfs from October 16 through April 31
  - Flow Schedule 4
    - 50 cfs from May 1 through October 15
    - 85 cfs from October 16 through April 30
  - Flow Schedule 5: 35 cfs
- Dry Creek
  - Flow Schedule 1
    - 75 cfs from January 1 through April 30
    - 50 cfs from May 1 through October 15
    - 105 cfs from October 16 through December 31
  - Flow Schedule 2
    - 75 cfs from January 1 through April 30
    - 50 cfs from May 1 through October 15
    - 105 cfs from October 16 through December 31
  - Flow Schedule 3
    - 50 cfs from April 1 through October 15
    - 75 cfs from November 1 through March 31
  - Flow Schedule 4
    - 50 cfs from April 1 through October 15
    - 75 cfs from November 1 through March 31
  - Flow Schedule 5

- 50 cfs from April 1 through October 15
- 75 cfs from November 1 through March 31

The Flow Schedules would be determined based on Lake Mendocino Cumulative Inflow Condition beginning January 1 and continuing to October 1. For example, if the Lake Mendocino Cumulative Inflow Condition is at Condition 1, the Upper Russian River, Lower Russian River, and Dry Creek minimum instream flow requirements would be at Flow Schedule 1. Beginning June 1, the Flow Schedule for the Upper Russian River would be determined by both the Lake Mendocino Cumulative Inflow Condition and the Lake Mendocino Storage Condition as described in the following sections. Figure 3-8 provides a summary of the procedure to determine Flow Schedules under the Proposed Project's Russian River Hydrologic Index.

Lake Mendocino Cumulative Inflow Condition

On the first day of each month starting January 1, cumulative inflow into Lake Mendocino would be evaluated monthly through October 1 for a total of ten condition evaluation dates each year determining the Flow Schedule for each reach. Cumulative inflow into Lake Mendocino is the calculated algebraic sum of releases from Lake Mendocino, increases in the storage in Lake Mendocino, and evaporation from Lake Mendocino beginning October 1 of the previous year. The Lake Mendocino Inflow Condition (Inflow Condition) determined at each evaluation date sets the Flow Schedule for the Upper Russian River, Lower Russian River, and Dry Creek. The Inflow Condition is evaluated based on cumulative inflow thresholds. For the cumulative inflow condition evaluations that occur January 1 through March 1, cumulative inflow into Lake Mendocino beginning October 1 of the previous year would be compared to a maximum inflow limit (Cumulative Inflow Limit). If the cumulative inflow is greater than the Cumulative Inflow Limit, then the cumulative inflow calculation is set equal to the Cumulative Inflow Limit. The Cumulative Inflow Limit was developed to discount inflow that is not usable. Usable inflow is defined as inflow that would be stored for more than 30 days or released for beneficial use. Inflow that is not usable is inflow that would be stored in the reservoir for a short period, but due to flood control operations of Lake Mendocino would be released downstream to maintain flood space in the reservoir.

As described in the "Development of the Russian River Hydrologic Index for the Fish Habitat Flows and Water Rights Project" included in Appendix C, the Cumulative Inflow Limit is a critical feature of the Russian River Hydrologic Index. Due to requirements of the flood operations at Lake Mendocino defined in the CVD Water Control Manual (USACE 1986a) and (USACE 2004), the maximum reservoir storage level for water supply is 68,400 acre-feet from November 1 to March 1, approximately 60 percent of the total reservoir storage capacity of 116,500 acre-feet. Storage increases to 111,000 acre-feet from May 10 to October 1 during the dry season months based on reduced risk of flooding during this period. The water supply storage limit for the wet season months can mean that for certain wet winters much of the inflow into the Lake Mendocino cannot be stored for water supply purposes, but instead is released during flood operations. This can be problematic if a wet winter is followed by a dry spring with very little rainfall and therefore low inflow into Lake Mendocino past March 1. This would create reservoir storage levels more consistent with dry year patterns. Due to these operational constraints, the

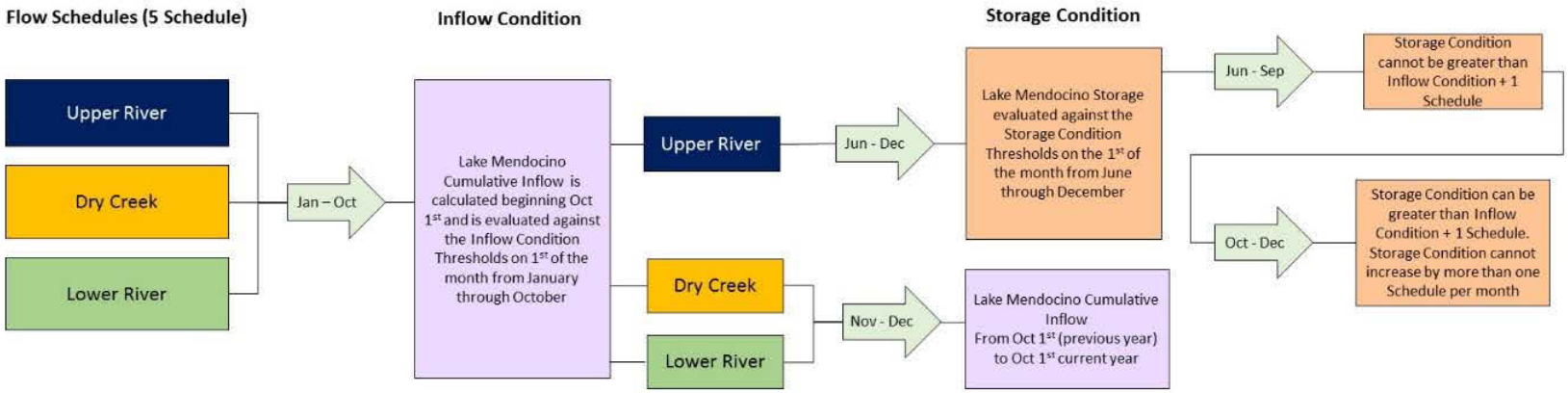


Figure 3-8. Russian River Hydrologic Index. Minimum instream flow schedules in Upper Russian River, Lower Russian River, and Dry Creek are determined by Lake Mendocino Cumulative Inflow Condition beginning January 1 and continuing to October 1. Beginning June 1, the Upper Russian River Flow Schedule is determined by both Lake Mendocino Cumulative Inflow Condition and Lake Mendocino Storage Condition.

Cumulative Inflow Limit is designed to cap the calculation of cumulative inflow to Lake Mendocino to a maximum level that better represents actual usable inflow into the reservoir. Without the maximum limit, the calculation of Lake Mendocino cumulative inflow could reach very high levels during wet winters, triggering Schedule 1 minimum instream flow requirements that cannot be sustained if an extended dry period persists after March 1 of that year.

To determine the appropriate Inflow Condition, the cumulative inflow into Lake Mendocino first must be calculated. Cumulative inflow into Lake Mendocino would be calculated as the daily accumulation beginning on October 1 of the sum for each day of the releases from Lake Mendocino, increases in storage in Lake Mendocino and evaporation from Lake Mendocino that occurred on that day. Under certain circumstances, the calculation of cumulative inflow would be adjusted on January 1, February 1 or March 1 of each year. Such adjustments would be made if the calculated cumulative inflow into Lake Mendocino exceeds the Cumulative Inflow Limit value listed below for the applicable date:

- 22,100 acre-feet as of January 1
- 37,500 acre-feet as of February 1
- 54,500 acre-feet as of March 1

If any such exceedance occurs, then cumulative inflow into Lake Mendocino for that date that would be used to determine the appropriate Inflow Condition number would be set to equal the Cumulative Inflow Limit value listed above for that date.

- The Lake Mendocino Cumulative Inflow Condition would be determined by the following thresholds:*Inflow Condition 1* exists whenever Inflow Conditions 2, 3, 4, or 5 do not exist, except in the months of January, February, and March, when it only exists if cumulative inflow to Lake Mendocino beginning on October 1 of each year, exceeds or is equal to the following cumulative inflow limit value:
  - 22,100 acre-feet as of January 1
  - 37,500 acre-feet as of February 1
  - 54,500 acre-feet as of March 1
- *Inflow Condition 2* exists when cumulative inflow to Lake Mendocino beginning on October 1 of each year is less than the following amount for the applicable month and greater than the applicable amount for Inflow Condition 3:
  - 22,100 acre-feet as of January 1
  - 37,500 acre-feet as of February 1
  - 54,500 acre-feet as of March 1
  - 64,100 acre-feet as of April 1
  - 73,200 acre-feet as of May 1
  - 80,600 acre-feet as of June 1
  - 87,100 acre-feet as of July 1
  - 93,500 acre-feet as of August 1
  - 99,800 acre-feet as of September 1
  - 105,000 acre-feet as of October 1

- *Inflow Condition 3* exists when cumulative inflow to Lake Mendocino beginning on October 1 of each year is less than the following amount for the applicable month and greater than the applicable amount for Inflow Condition 4:
  - 13,000 acre-feet as of January 1
  - 24,900 acre-feet as of February 1
  - 42,100 acre-feet as of March 1
  - 56,400 acre-feet as of April 1
  - 63,200 acre-feet as of May 1
  - 70,200 acre-feet as of June 1
  - 74,600 acre-feet as of July 1
  - 79,400 acre-feet as of August 1
  - 82,600 acre-feet as of September 1
  - 86,700 acre-feet as of October 1
- *Inflow Condition 4* exists when cumulative inflow to Lake Mendocino beginning on October 1 of each year is less than the following amount for the applicable month and greater than the applicable amount for Inflow Condition 5:
  - 10,800 acre-feet as of January 1
  - 18,000 acre-feet as of February 1
  - 31,900 acre-feet as of March 1
  - 50,200 acre-feet as of April 1
  - 55,700 acre-feet as of May 1
  - 62,200 acre-feet as of June 1
  - 66,600 acre-feet as of July 1
  - 70,700 acre-feet as of August 1
  - 74,900 acre-feet as of September 1
  - 78,600 acre-feet as of October 1
- *Inflow Condition 5* exists when cumulative inflow to Lake Mendocino beginning on October 1 of each year is less than the following amount for the applicable month:
  - 10,500 acre-feet as of January 1
  - 13,700 acre-feet as of February 1
  - 19,500 acre-feet as of March 1
  - 23,900 acre-feet as of April 1
  - 32,700 acre-feet as of May 1
  - 37,700 acre-feet as of June 1
  - 40,000 acre-feet as of July 1
  - 42,000 acre-feet as of August 1
  - 44,000 acre-feet as of September 1
  - 44,000 acre-feet as of October 1
- The Inflow Condition would be determined on the first day of each month from January through October. The Inflow Condition for November and December shall be the same as the Inflow Condition for the preceding October.

Lake Mendocino Storage Condition

As described previously, beginning June 1, the Upper Russian River Flow Schedule would be determined by both the Inflow Condition and the Lake Mendocino Storage Condition (Storage Condition). On the first day of each month from June 1 through December 1, the Storage Condition would be determined by evaluating storage in Lake Mendocino against storage condition thresholds. The storage condition thresholds would be used to set the Upper Russian River Flow Schedule if the flow schedule determined by the Storage Condition alone is greater (is drier) than the schedule determined by Inflow Condition. For the evaluation dates from June 1 through September 1, the Storage Condition can adjust the Upper Russian River Flow Schedule only one schedule higher (drier) than the value of the Inflow Condition. The evaluation of Lake Mendocino storage from June 1 to October 1 would allow for changes in Upper Russian River Flow Schedules to respond to variability in downstream demands. The evaluation of storage from November 1 to December 1 would allow for changes in Upper Russian River Flow Schedules to respond to years with low fall/early winter rainfall.

The Storage Condition could only increase the Upper Russian River Flow Schedule by one schedule over that determined by the Inflow Condition from June 1 to September 1. For example, if on June 1 the Inflow Condition is level 1 and the Storage Condition is level 3, the Flow Schedule for the Upper Russian River would be set to Schedule 2 for June 1. This schedule restriction is to ensure that the flow schedules for the Upper Russian River, the Lower Russian River and Dry Creek stay aligned to prevent and limit excessive releases from Warm Springs Dam that could result in violation of the Incidental Take Statement for dam releases established in the Russian River Biological Opinion.

As described in the “Development of the Russian River Hydrologic Index for the Fish Habitat Flows and Water Rights Project” included in Appendix C, from October 1 to December 1, Storage Condition could set the Flow Schedule for the Upper Russian River multiple schedules above the Inflow Condition, but can only do so at a rate of one schedule per month. For example, if Inflow Condition is level 1 on October 1, Storage Condition is level 4 and the September 1 Upper Russian River Flow Schedule was a Schedule 2, then the October 1 Flow Schedule would be set to Schedule 3. Moving on to the next month for this example, if the November 1 Storage Condition remained at a level 4 or higher, then the November 1 Flow Schedule would be Schedule 4. This change in restriction for this period is to respond to those years with late rainfall to allow increases in flow schedule (reductions in minimum instream flow requirements) in the Upper Russian River to reduce releases from Coyote Valley Dam and conserve storage in Lake Mendocino. This component is especially important should the late onset of rainfall actually be the beginning of a long-period drought when conservation of storage in Lake Mendocino would become critically important.

The Lake Mendocino Storage Condition would be determined by the following thresholds:

- *Storage Condition 1* exists whenever Storage Conditions 2, 3, 4, or 5 do not exist.
- *Storage Condition 2* exists when water in storage in Lake Mendocino is less than the following amount for the applicable month and greater than the applicable amount for Storage Condition 3:

  - 78,900 acre-feet on June 1
  - 76,100 acre-feet on July 1
  - 70,400 acre-feet on August 1
  - 64,600 acre-feet on September 1
  - 58,500 acre-feet on November 1
  - 54,500 acre-feet on October 1
  - 54,400 acre-feet on December 1
- *Storage Condition 3* exists when water in storage in Lake Mendocino is less than the following amount for the applicable month and greater than the applicable amount for Storage Condition 4:
  - 73,500 acre-feet on June 1
  - 70,700 acre-feet on July 1
  - 65,100 acre-feet on August 1
  - 60,200 acre-feet on September 1
  - 54,200 acre-feet on October 1
  - 50,000 acre-feet on November 1
  - 51,550 acre-feet on December 1
- *Storage Condition 4* exists when water in storage in Lake Mendocino is less than the following amount for the applicable month and greater than the applicable amount for Storage Condition 5:
  - 70,000 acre-feet on June 1
  - 66,800 acre-feet on July 1
  - 61,200 acre-feet on August 1
  - 55,500 acre-feet on September 1
  - 49,100 acre-feet on October 1
  - 45,700 acre-feet on November 1
  - 45,600 acre-feet on December 1
- *Storage Condition 5* exists when water in storage in Lake Mendocino is less than the following amount for the applicable month:
  - 67,100 acre-feet on June 1
  - 62,800 acre-feet on July 1
  - 57,000 acre-feet on August 1
  - 50,600 acre-feet on September 1
  - 45,700 acre-feet on October 1
  - 40,800 acre-feet on November 1
  - 41,700 acre-feet on December 1
- Water in Lake Mendocino storage is the calculated total volume of water in storage below elevation 749.0 feet in Lake Mendocino, including dead storage.[22] This elevation refers to the National Geodetic Vertical Datum of 1929. The calculation of the amount of water in Lake Mendocino storage would use the most recent reservoir volume survey made by the U. S. Geological Survey, U. S. Army Corps of Engineers, or other responsible agency.

[22] Dead storage is capacity in a reservoir from which stored water cannot be evacuated by gravity.

- The Storage Condition for each month during January through May would be the same as the Inflow Condition for the same month and that condition would be used to set the applicable Flow Schedule.
- The Storage Condition for June through December would be determined on the first day of each of those months.
- For June through September, if the Storage Condition number is greater than the Inflow Condition number for the same month, then the applicable Flow Schedule number would be set equal to the Inflow Condition number plus one; otherwise, the applicable Flow Schedule number would be set equal to the Inflow Condition number.
- For October through December, if the Storage Condition number is greater than Inflow Condition number, then the applicable Flow Schedule number would be set equal to the Storage Condition number for that month, but no greater than the Flow Schedule number for the previous month plus one; otherwise, the applicable Flow Schedule number would be set equal to the Inflow Condition number.

The proposed Russian River Hydrologic Index was developed to maximize the occurrence of instream flow conditions favored for salmonid habitat and other beneficial uses; and to reliably provide releases from Lake Mendocino and Lake Sonoma for a 1-in-100 year drought scenario. The Lake Mendocino Inflow Condition thresholds and Lake Mendocino Storage Condition thresholds were developed to maximize the occurrence of Flow Schedule 1 and minimize the occurrence of Flow Schedule 5. Schedule 1 flows are considered to provide the range of flows that would improve conditions for juvenile steelhead and coho salmon rearing habitat in the dry season and spawning and migration habitat for the remainder of the year, as well as to improve conditions for fall-run Chinook salmon migration. Schedule 5 flows are the least favorable for aquatic habitat and other beneficial uses and were designed to only occur during the most critically dry periods. The “Development of the Russian River Hydrologic Index for the Fish Habitat Flows and Water Rights Project” included in Appendix C provides details regarding the development of the Russian River Hydrologic Index, including the occurrence of minimum instream flow schedules under the Proposed Project and resiliency to drought conditions.

Determination of the watershed’s hydrologic condition through the use of a hydrologic index that schedules minimum instream flow requirements establishes the percentage of occurrence of the various minimum instream flow schedules across the full range of expected hydrology. The intent of a hydrologic-based index is to characterize the water supply conditions for meeting minimum instream flow requirements. If the hydrologic index triggers flow schedules that are not matched with the water supply system’s ability to meet the required flows, the system will run out of water and the flows will not be met or temporary reductions in the required flows must be made.

3.6.2 Minimum Instream Flows for Steelhead and Salmon

The Russian River Biological Opinion determined that reducing minimum instream flows in the Upper Russian River during *Normal* years would enhance the quantity and quality of rearing habitat for steelhead in the Russian River between the confluence of the East Fork Russian River and Cloverdale, the reach that typically supports suitable summer water temperatures for

rearing juvenile steelhead (NMFS 2008). The Russian River Biological Opinion also concluded that conservation of the cold water pool in Lake Mendocino would increase the likelihood that water released from the reservoir would remain suitably cool for rearing steelhead through the summer and help ensure that sufficient flow could be released to facilitate upstream migration of fall run Chinook salmon (NMFS 2008). The Russian River Biological Opinion also determined that artificially high inflows into the Russian River estuary interfere with the normal processes that discharge river flow through or over the barrier beach to the ocean and that changing minimum instream flow requirements would enhance the prospects of enhancing salmonid estuarine rearing habitat.

These objectives were incorporated in the evaluation of a range of minimum instream flow alternatives and development of the proposed hydrologic index (see Chapter 7, “Alternatives”). Meeting these objectives requires balancing reservoir operations and water supply releases (operational feasibility) that meet demands downstream while meeting objectives for rearing habitat in the summer months, spawning habitat, particularly for Chinook salmon, in the fall, and reservoir and flow reliability.

3.6.4 Other Requested Changes to Water Right Permits

Petitions for Extensions of Time to Complete Full Beneficial Use of Water

The Water Agency’s existing water right Permits 12947A, 16596, 12949, and 12950 specify a deadline of December 1, 1999, for the full application of water to beneficial use. In 1999, the Water Agency filed a petition to extend this deadline to December 1, 2020. The highest diversion and use prior to 1999 was 65,110 AFY for Water Year 1997, and the overall highest diversion and use historically occurred in Water Year 2004 and totaled 68,994 AFY. The Water Agency’s significantly lower Russian River diversions during recent years is because of the Water Agency’s and its contractors’ successful water conservation, recycled water use, and groundwater conjunctive use programs and the downturn in the economy. Further details on this topic are provided in Chapter 4, Environmental Setting.

Table 3-2. Russian River Hydrologic Index with Upper Russian River, Lower Russian River, and Dry Creek Minimum Instream Flow Schedules [cubic feet per second (cfs)], Lake Mendocino Cumulative Inflow Condition [cumulative inflows into Lake Mendocino (acre-feet)], and Lake Mendocino Storage Condition [storage condition thresholds (acre-feet)]. Upper Russian River, Lower Russian River, and Dry Creek Flow Schedules determined by Lake Mendocino Cumulative Inflow Condition beginning January 1 and continuing to October 1. Beginning June 1 to December 1, the Upper Russian River Flow Schedule determined by both Lake Mendocino Cumulative Inflow Condition and the Lake Mendocino Storage Condition.

Minimum Instream Flow Schedules

East Fork Russian River (from Coyote Valley Dam to its confluence with the Russian River)
The minimum instream flow shall be 25 cfs at all times.

Upper Russian River (between the East Fork Russian River and confluence with Dry Creek) Minimum Instream Flow Schedules 1 through 5 (cfs)													
Flow Schedule	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
1 (Wettest)	105	105	105	105	105	105	105	105	105	105	105	105	105
2	105	105	105	105	85	85	85	85	85	85	105	105	105
3	100	100	100	100	65	65	65	65	65	65	100	100	100
4	70	70	70	70	45	45	45	45	45	45	45	70	70
5 (Driest)	25	25	25	25	25	25	25	25	25	25	25	25	25

Lower Russian River (from the Russian River confluence with Dry Creek to the Pacific Ocean) Minimum Instream Flow Schedules 1 through 5 (cfs)													
Flow Schedule	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
1 (Wettest)	135	135	135	135	70	70	70	70	70	70	135	135	135
2	135	135	135	135	70	70	70	70	70	70	135	135	135
3	135	135	135	135	70	70	70	70	70	70	135	135	135
4	85	85	85	85	50	50	50	50	50	50	85	85	85
5 (Driest)	35	35	35	35	35	35	35	35	35	35	35	35	35

Dry Creek (from Warm Springs Dam to its confluence with the Russian River) Minimum Instream Flow Schedules 1 through 5 (cfs)													
Flow Schedule	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct 1-15	Oct 16-31	Nov	Dec
1 (Wettest)	75	75	75	75	50	50	50	50	50	50	105	105	105
2	75	75	75	75	50	50	50	50	50	50	105	105	105
3	75	75	75	50	50	50	50	50	50	50	75	75	75
4	75	75	75	50	50	50	50	50	50	50	75	75	75
5 (Driest)	75	75	75	50	50	50	50	50	50	50	75	75	75

Table 3-2 (continued).

Lake Mendocino Cumulative Inflow Condition[1] - Cumulative Inflow to Lake Mendocino Thresholds (acre-feet)

Inflow Condition	Jan 1	Feb 1	Mar 1	Apr 1	May 1	Jun 1	Jul 1	Aug 1	Sep 1	Oct 1	Conditions prevailing on Oct 1 apply through Dec 31
1 (Cumulative Inflow Limit, Wettest)	22,100	37,500	54,500								
2	22,100	37,500	54,500	64,100	73,200	80,600	87,100	93,500	99,980	105,000	
3	13,000	24,900	42,100	56,400	63,200	70,200	74,600	79,400	82,600	86,700	
4	10,800	18,000	31,900	50,200	55,700	62,200	66,600	70,700	74,900	78,600	
5 (Driest)	10,500	13,700	19,500	23,900	32,700	37,700	40,000	42,000	44,000	44,000	

[1] The Inflow Condition would be determined on the first day of each month from January through October. Cumulative inflow to Lake Mendocino is the calculated algebraic sum of releases from Lake Mendocino, increases in the storage in Lake Mendocino, and evaporation from Lake Mendocino beginning on October 1 through the evaluation date. Inflow Condition 1 exists whenever Inflow Conditions 2, 3, 4, or 5 do not exist, except in the months of January 1, February 1, and March 1 when it only exists if cumulative inflow exceeds or is equal to the cumulative inflow limit. Inflow Condition 2, 3, 4, or 5 exists if cumulative inflow is less than the identified value on the first day of each month. The Inflow Condition for November and December shall be the same as the Inflow Condition for the preceding October.

Storage Condition[2] - Lake Mendocino Storage Thresholds (acre-feet)[3]

Storage Condition	Jun 1	Jul 1	Aug 1	Sep 1	Oct 1	Nov 1	Dec 1
1 (Wettest)							
2	78,900	76,100	70,400	64,600	58,500	54,500	54,400
3	73,500	70,700	65,100	60,200	54,200	50,000	51,550
4	70,000	66,800	61,200	55,500	49,100	45,700	45,600
5 (Driest)	67,100	62,800	57,000	50,600	45,700	40,800	41,700

[2] Sets minimum instream flow requirement on the Upper Russian River only. Storage condition is evaluated on the first day of each month from June 1 to December 1. Flow schedule determined by Storage Condition cannot be less than that determined by Inflow Condition. If the Storage Condition designation is less than the Inflow Condition, then the Upper Russian River Flow Schedule shall be set equal to the Inflow Condition. Flow Schedule determined by Storage Condition cannot be greater than one schedule above Inflow Condition from June 1 through September 1. If Storage Condition is greater than the Inflow Condition for the evaluation months of June 1 through September 1, then the Upper Russian River Flow Schedule shall be set equal to one schedule greater than the Inflow Condition. For October through December, if the Storage Condition number is greater than Inflow Condition number, then the applicable Flow Schedule number would be set equal to the Storage Condition number for that month, but no greater than the Flow Schedule number for the previous month plus one; otherwise, the applicable Flow Schedule number would be set equal to the Inflow Condition number.

[3] Estimated water supply storage space is the calculated reservoir volume below elevation 749.0 feet in Lake Mendocino. The elevation refers to the National Geodetic Vertical Datum of 1929. The calculation shall use the most recent reservoir volume survey made by the U.S. Geological Survey, U.S. Army Corps of Engineers, or other responsible agency.

The Water Agency anticipates that total diversions under its water right permits will increase over time, even with water conservation, recycled water use, and groundwater conjunctive use, because of population and economic growth in Water Agency's service area. The Water Agency therefore has filed a petition to extend the current the beneficial use deadline to 2040.

The Water Agency's wholesaler 2015 UWMP (Brown and Caldwell 2016) concluded that, with the savings expected from water conservation, recycled water and groundwater conjunctive use, and based on the water demand projections described in the 2015 UWMP, the annual diversion and re-diversion limit of 75,000 AFY in the Water Agency's water right permits may be exceeded in 2035 (Brown and Caldwell 2016). The Water Agency estimates that this limit will be exceed by about 117 AFY in 2035 and by almost 1,000 AFY in 2040.

Demand Analysis

The 2015 UWMP includes a detailed projection of future water demand through 2040. The demand analysis used to make this projection considered projected future demographics, historical water use characteristics, contractor use of recycled water and local water supplies, alternative levels of water conservation efforts, and resulting water demand projections. The projections were made considering the effects of the reductions in water use that would result from new plumbing code requirements, current and future water conservation efforts, and future recycled water projects. The Water Agency coordinated with its water contractors and MMWD as they developed population and water demand projections through 2040 as part of their urban water management plans.[23] The projections of water demands presented in the Water Agency's 2015 UWMP include the combined results of these individual evaluations. Population and employment forecasts were developed by each of the Water Agency's contractors and transmission system customers and provided to the Agency. The Water Agency developed population and water demand projections for other water transmission system customers and Russian River customers that are not required to prepare urban water management plans. With the exception of the City of Healdsburg, the projected demands for these customers were evaluated by considering the historical total demands and Water Agency deliveries to each customer and developing projected deliveries through 2040 based on changes in projected service population. Using the 'ABAG Projections 2009 by Census Tract' dataset, the population growth rates for the customer service areas were estimated based on analyses of the overlapping census tracts. The estimated future annual diversions by the City of Healdsburg under the Water Agency's water rights were based on discussions with the City of Healdsburg and the fact that the Water Agency's water supply contract with the City primarily is to provide a backup water supply.

Future Demands

The modeled estimated future demands of the Water Agency's water contractors and other Water Agency customers from the Russian River are estimated to be approximately 75,565 AFY through 2040 (Brown and Caldwell 2016). Table 3-7 provides a summary of projected future demands through 2040.

[23] Water contractors that provided population and water demand projections to the Water Agency include the Cities of Santa Rosa, Petaluma, Rohnert Park, Cotati, and Sonoma, the Town of Windsor, and the North Marin and Valley of the Moon Water Districts.

Table 3-3. Future Water Agency Russian River Demands modeled in 2015 Urban Water Management Plan.

Year	Demand (acre-feet)
2020	66,260
2025	70,309
2030	73,011
2035	75,117
2040	75,987

The 2015 UWMP states that additional water supply projects will be needed to meet projected future demands. Additional projects could include obtaining additional water right permits or petitioning to modify terms of existing water right permits, new water supply diversion facilities, and transmission system projects necessary to convey additional amounts of water. The UWMP states that the near-term demand projections are conservative estimates and the growth rate of water demand may be lower. The potential need to increase the 75,000 AFY diversion and re-diversion limit in the Water Agency's water right permits and the need for future projects will be reevaluated in the Water Agency's 2020 UWMP and in each subsequent UWMP as necessary. See Chapter 6, "Other Statutory Requirements" for additional discussion of the potential effects of extending the deadline for beneficial use.

Petition to Add Additional Authorized Points of Diversion

The Water Agency has agreements with specific entities that authorize them to divert water from the Russian River under the Water Agency's water right permits using their own facilities. These entities are the City of Healdsburg, Town of Windsor/Windsor Water District, Camp Meeker Recreation and Park District, and Occidental Community Services District. These agreements are described in Section 3.3.7, Water Supply Agreements. The Water Agency's agreements with these customers require them to use any water right they have before using the Water Agency's water rights. The agreements with Town of Windsor and Occidental CSD require the Water Agency to file petitions with the SWRCB for changes to the Water Agency's water right permit that will allow these Russian River customers to divert water from the Russian River at specific points of diversion under the Water Agency's permits. The Water Agency petitioned the SWRCB to authorize the addition of the Occidental CSD and Town of Windsor points of diversion in October 2002 and May 2004, respectively. Both petitions are still pending before the SWRCB. The Water Agency's agreement with the Occidental CSD will become effective when the SWRCB approves the petition to add the Occidental CSD point of diversion.

The addition of the Occidental CSD's point of diversion would add one new point of diversion and re-diversion to the Water Agency's water right permits. This is an existing point of diversion and re-diversion that is located at California Coordinate System, Zone 2, North 292,580 and East 1,711,590. The existing point of diversion is located adjacent to the Camp Meeker Recreation and Park District well in the town of Monte Rio, Sonoma County. Occidental CSD is currently provided water through an agreement with Camp Meeker Recreation and Park District. The SWRCB authorization of the petition would result in the Water Agency's agreement with Occidental CSD becoming effective and would allow Occidental CSD to take and the Water Agency to provide water to the Occidental CSD under the Water Agency's Permits 16596,

12947A, 12949, and 12950. The point of diversion is an existing offset well (Occidental Town Well No. 1), which diverts underflow of the Russian River. The well is approximately 90 feet deep. Water would be delivered to the Occidental CSD's existing distribution system through Camp Meeker Recreation and Park District's existing system. The Occidental CSD prepared an Initial Study and Mitigated Negative Declaration for the point of diversion and associated construction on April 12, 2002. The Water Agency filed a Notice of Determination as a responsible agency on April 23, 2002, for its agreement with Occidental CSD and the point of diversion. The Occidental CSD Initial Study and Mitigated Negative Declaration approved on April 18, 2002, is hereby incorporated by reference into the Fish Flow Project EIR (Pacific Municipal Consultants 2002).

The addition of the Town of Windsor points of diversion would add two existing points of diversion and re-diversion at Town of Windsor Well No. 10 and Well No. 11 to the authorized points of diversion in the Water Agency's water right permits. The existing Windsor Well No. 10 is located at California Coordinate System, Zone 2, North 324,968 East 1,755,519. The existing Windsor Well No. 11 is located at California Coordinate System, Zone 2, North 324,878 East 1,755,480. The petition filed in 2004 also requested renaming Windsor Well No. 6 to Windsor Well No. 9 and to correct the coordinates of Windsor Well Nos. 7, 8, and 9 that are listed in the Water Agency's permits.

The two points of diversion and re-diversion are located adjacent to the Town of Windsor's well field near Eastside Road in Sonoma County. Approval of this petition would allow the Town of Windsor to take, and the Water Agency to provide, water under the Water Agency's Permits 16596, 12947A, 12949, and 12950. The Town of Windsor prepared two CEQA documents for the construction and operation of these wells: Mitigated Negative Declaration, Russian River Water Supply Facility Improvements: Well 10 and Emergency Generator (approved April 11, 2011), and Mitigated Negative Declaration, Russian River Water Supply Facility Improvements: Well 11 (approved March 17, 2004). The Town of Windsor's Mitigated Negative Declaration, Russian River Water Supply Facility Improvements: Well 10 and Emergency Generator (approved April 11, 2011) (Brelje and Race Engineers 2001), and Mitigated Negative Declaration, Russian River Water Supply Facility Improvements: Well 11 (approved March 17, 2004) (Brelje and Race Engineers 2004) are hereby incorporated by reference.

3.7 Project Alternatives to be Considered

This EIR considers the Proposed Project, as well as the No Project 1 Alternative and No Project 2 Alternative.

The No Project 1 Alternative is comprised of the hydrologic index and minimum instream flow requirements required by the Water Agency's existing water right permits as approved by the SWRCB's Decision 1610 and the 75,000 acre-foot per year water right demand. These are described in Section 3.3.4 and shown in Figure 3-4.

The No Project 2 Alternative is comprised of the hydrologic index and minimum instream flow requirements included in the Water Agency's existing water right permits as approved by the SWRCB's Decision 1610 and the 75,000 acre-foot per year water right demand. This alternative

incorporates the Russian River Biological Opinion's temporary changes to minimum instream flow requirements as described in Section 3.5 and shown in Figure 3-6. These minimum instream flow requirements would apply from May 1 to October 15 and are 125 cfs in the Upper Russian River under *Normal* and *Normal-Dry Spring 1* conditions and 70 cfs in the Lower Russian River under *Normal* conditions. The hydrologic index and all other minimum instream flow requirements would be the same as the Water Agency's existing water right permits as approved by the SWRCB's Decision 1610.

These alternatives, and a comparison of advantages and disadvantages, are described in detail in Chapter 7, "Alternatives."

3.8 References

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