

# **Summary of Lake Mendocino Water Management Issues**

## **Forecast Informed Reservoir Operations Workshop**

**August, 2014**

This document summarizes the significant water supply, flood control, and environmental resource management issues associated with the operation of Coyote Valley Dam.

### **1.0 General Background**

Lake Mendocino is located on the East Fork of the Russian River, about 5 miles northeast of Ukiah in Mendocino County, California (Figure 1). The Coyote Valley Dam project was authorized by the Flood Control Act of 1944 and completed in 1958 for purposes of flood control, water supply, recreation and stream flow regulation. Lake Mendocino has a total storage capacity of 122,500 acre-feet, of which the water conservation pool comprises between 68,500 acre-feet to 111,000 acre-feet, depending on the time of year. The United States Army Corps of Engineers owns the project and coordinates flood control releases in accordance with the Water Control Manual. The original manual was issued in April 1959 with the most recent revision issued in August 1986. The Russian River watershed has three species of salmonids listed under the federal and state Endangered Species Act. The National Marine Fisheries Service issued a biological opinion in September 2008 specifying several projects and actions required to improve habitat for salmonids.

### **2.0 Water Supply Management**

The Sonoma County Water Agency (Water Agency) is the local sponsor for the project and controls and coordinates water supply releases from the Coyote Valley Dam project in accordance with its water rights permits and provisions of Decision 1610 (Table A-1), which the State Water Resources Control Board (State Water Board) adopted on April 17, 1986. The Water Agency's permits authorize diversions to storage in Lake Mendocino and rediversions of water released from storage and direct diversions at points downstream. The Water Agency makes releases from Coyote Valley Dam to: (1) meet downstream demands from hundreds of agricultural and residential water users and several public and municipal systems; and (2) maintain minimum in-stream flows in the upper river down to its confluence with Dry Creek. These minimum flow requirements vary based on the hydrologic year type, which are also prescribed as a hydrologic index specified by Decision 1610. There is little to no coordination between water diverters below Lake Mendocino, nor between water diverters and the Water Agency. The Water Agency's operations are also subject to the Russian River Biological Opinion issued by the National Marine Fisheries Service on September 24, 2008.

The hydrologic year type for the Russian River system is based on cumulative inflow into Lake Pillsbury. Lake Pillsbury, located on the upper Eel River, was formed in 1921 by the construction of Scott Dam (Figure 1). Lake Pillsbury is part of the Potter Valley Hydroelectric Project (PVP), a 9.4 megawatt storage and diversion project, that has been in operation for more than 100 years. PVP is owned and operated by Pacific Gas & Electric Company (PG&E). Operation of the project results in an inter-basin transfer of water from the upper Eel River into the East Branch Russian River across a natural divide. PVP consists of Lake Pillsbury formed by Scott Dam, Lake Van Arsdale formed by Cape Horn Dam, the trans-mountain diversion tunnel and the powerhouse located on the East Branch Russian River.

PG&E schedules releases from Lake Pillsbury to: (1) meet minimum in-stream flow requirements in the Eel River; and (2) divert water at the intake located at Lake Van Arsdale through the trans-mountain tunnel to the PVP Powerhouse. The maximum reported capacity through the diversion tunnel is approximately 300 cfs. Eel River flows diverted through the PVP powerhouse are released into the East Branch Russian River. A portion of the released water is diverted by the Potter Valley Irrigation District at two canals located just below the powerhouse. The Irrigation District has a contract with PG&E for use of up to 50 cfs, for which PG&E holds several water rights. The remaining diverted Eel River water is abandoned into the East Branch Russian River resulting as inflow into Lake Mendocino.

At the time that: (1) the Coyote Valley Dam/Lake Mendocino project was designed; (2) the Water Control Manual was developed for Lake Mendocino; and (3) the State Water Resources Control Board approved Decision 1610, diversions from the Eel River through PVP averaged 172,000 acre-feet annually. In November 2002, National Marine Fisheries Service issued a Biological Opinion for a licensing amendment that was being proposed by FERC for the PVP due to the listing of coho salmon, Chinook salmon and steelhead as either threatened or endangered in the Eel River. Based on the findings of the Biological Opinion, FERC amended PG&E's license to Operate PVP in January 2004. Although the amended license was issued in 2004, it was not correctly implemented until 2006 due to a misinterpretation of the license terms by PG&E. Since 2006, the diversion through PVP has averaged 72,000 acre-feet annually, representing a significant reduction of inflow into Lake Mendocino. Furthermore, much of the reduction in PVP diversions since 2006 is a result of the amended license significantly constraining PVP operations during the spring. Reduced inflow from PVP during the spring directly conflicts with Lake Mendocino's design as a smaller reservoir with an increasing water supply pool in the spring as flood risks decrease.

As mentioned above, the most recent revision of the Flood Control Manual was issued in August 1986 and Decision 1610 was adopted by the State Water Board in April 1986. Since the preparation of the manual and adoption of Decision 1610, significant changes have occurred throughout the Russian River system. Several of these changes include:

(1) listing of Chinook, coho and steelhead as threatened or endangered; (2) significant reductions in releases from Pacific, Gas & Electric's Potter Valley Project; and (3) less understood changes that may be occurring due to climate change. These and other changes have resulted in greater challenges for managing the Russian River system. Consequently, there is a critical need to manage the Russian River system differently to address these challenges. To accomplish this, it will be necessary to: (1) evaluate modifying Lake Mendocino's Water Control Manual to incorporate Forecast Informed Reservoir Operations; and (2) changing the index for how the hydrologic year type (i.e., hydrologic index) is determined to a metric that is more reflective of actual water supply conditions in the Russian River watershed.

### **3.0 Flood Control Management**

Coyote operations are governed by a water control manual that dictates ranges of release flows depending on pool level, non-regulated flows in the Russian, damaging flood stages downstream of the dam and on current releases. The rate of change standards were developed as part of consultations with NMFS and from geotechnical considerations to prevent stranding fish and to minimize bank damage. In general, the operation is designed to store water during a flood event, then release soon thereafter to create storage space for another potential event. Seasonal differences in flood space required result from nearly 100 years of hydromet data, and are based on typical weather patterns - wet during the winter, dry otherwise. Since much of the basin is not regulated by dam operations, the water control manual is designed to prevent flooding when possible in the Hopland and Guerneville areas, and in concert with Warm Springs dam operations. See the attached water control diagram for specifics (Figure 2).

### **4.0 Environmental Resource Management**

The National Marine Fisheries Service (NMFS) has issued two biological opinions that pertain to water storage in the Russian River: (1) the Potter Valley Project Biological Opinion in 2002 (Eel and Russian rivers transbasin diversion); and (2) the Russian River Biological Opinion in 2008. Project elements addressed in the Russian River BiOp include operations and water supply releases at Warm Springs and Coyote Valley dams, flood control operations, channel maintenance (SCWA and MCRRFCD), estuary/lagoon management, fish hatchery operations at Don Clausen Fish Hatchery (WSD) and Coyote Valley Fish Facility (CVD), and other SCWA water diversion facilities and operations (Wohler). Specific to Lake Mendocino and CVD operations, the Russian River BiOp identifies three primary project elements impacting fisheries: (1) higher summer flows/velocity from CVD releases effecting juvenile steelhead rearing habitat in the upper mainstem Russian River (modify Decision 1610); (2) chronic turbidity issues associated with Lake Mendocino discharge; and (3) water discharge ramping rates (up/down) and annual dam inspections (suspended releases to the East Branch

Russian River). Other environmental resource management (fisheries) consideration regarding future operations at CVD include; coldwater pool management for juvenile steelhead rearing and fall-run adult Chinook salmon within the upper mainstem Russian River, fall release flows for upstream migrating adult Chinook salmon during dry and critically dry fall/early winter periods, combined release strategies with Warm Springs Dam influencing estuary and lower river flow conditions, and blockwater allocations for critical and/or emergency fisheries management situations. NMFS believes that improved reservoir water storage reliability within Lake Mendocino will afford more operational flexibility that can aid and enhance fisheries management. Additionally, with improved forecast reliability, fisheries managers can better prepare for drought scenarios that impact hatchery operations and recreational fishing opportunities within the mainstem Russian River.

**Attachments**



**Figure 1: Upper Russian River System**

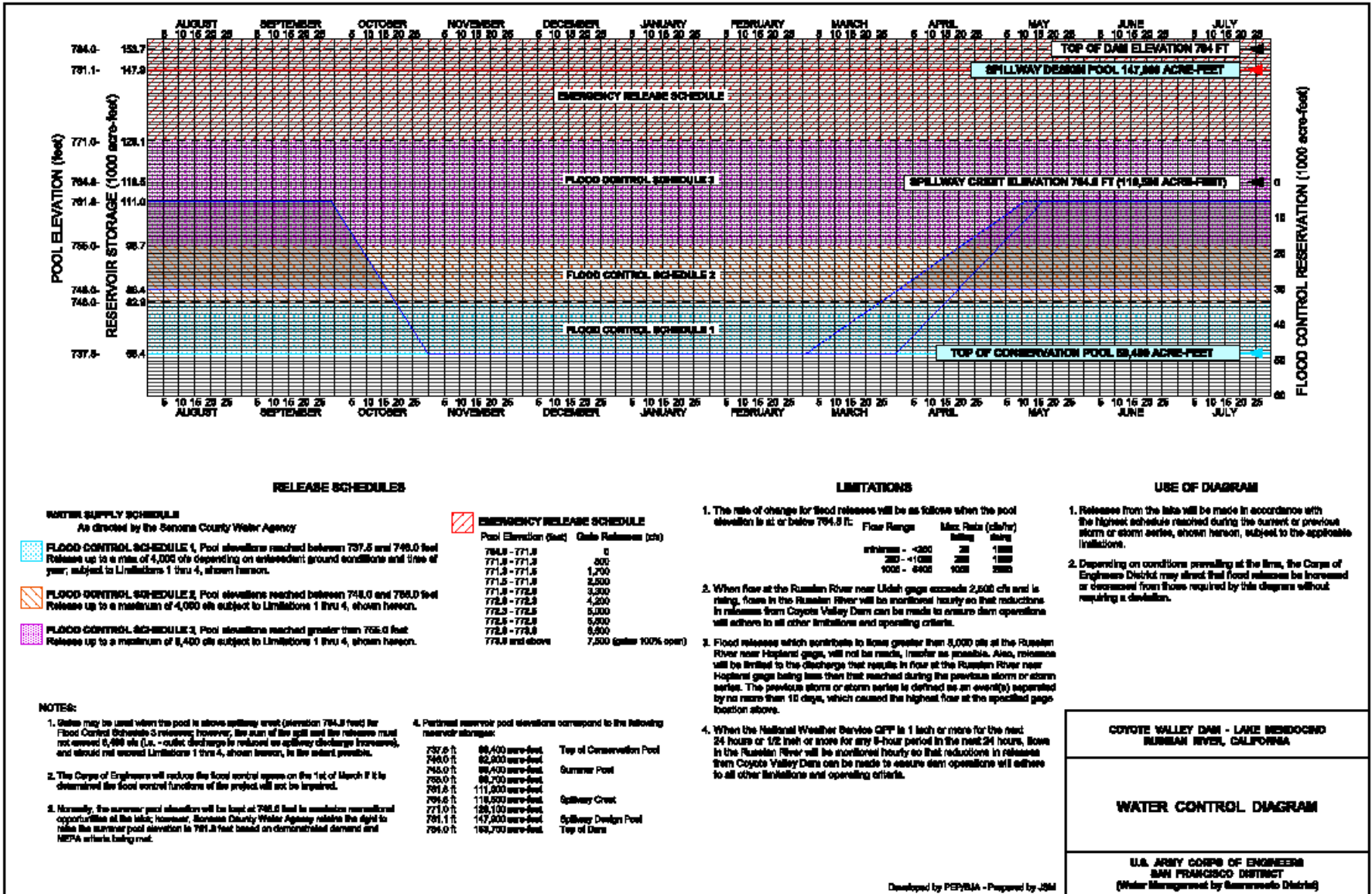
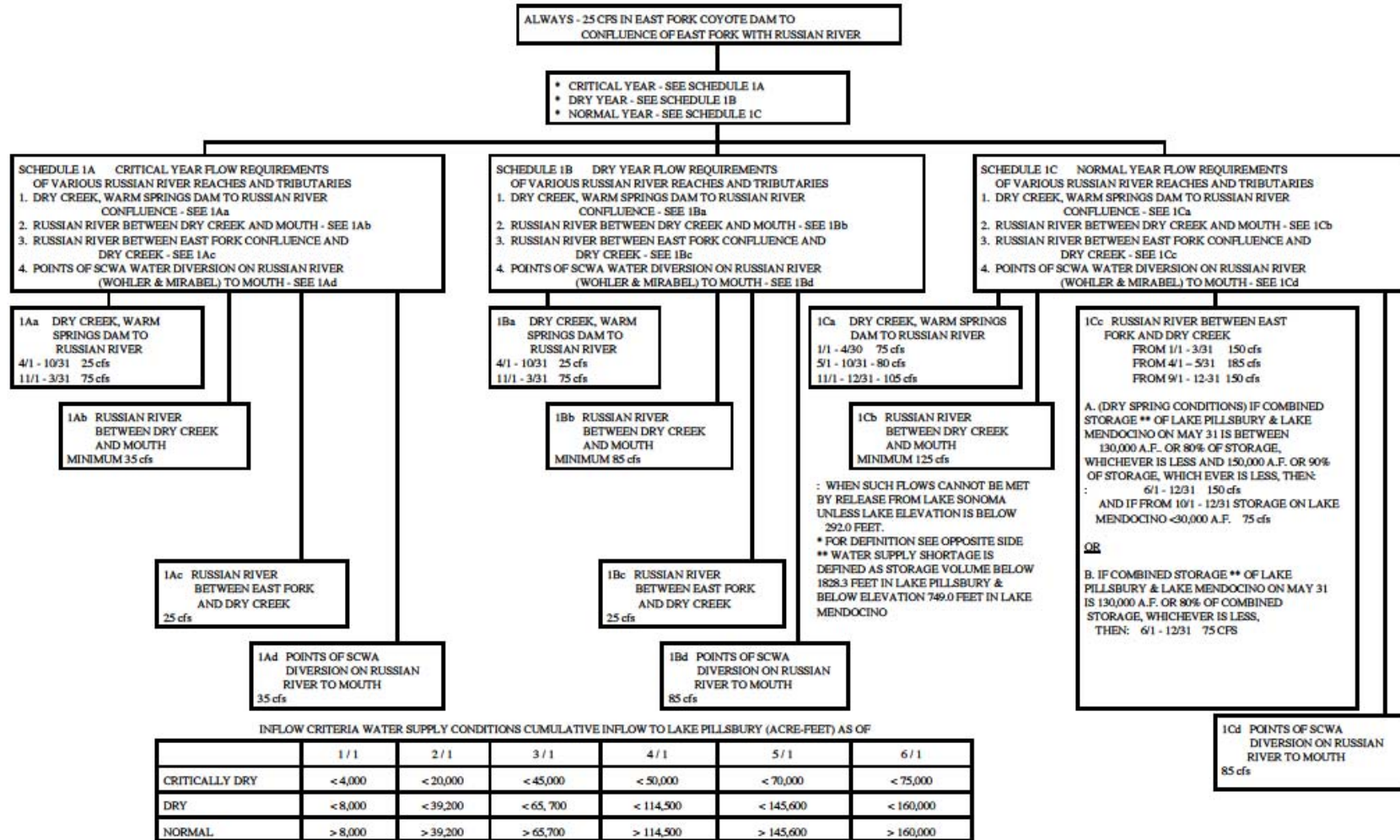


Figure 2: Water Control Diagram, Coyote Valley Dam

**TABLE A-1**  
**RUSSIAN RIVER BASIN STREAMFLOW REQUIREMENTS**  
 PER STATE WATER RESOURCES CONTROL BOARD DECISION 1610, APRIL 1986



**Table A-1: Decision 1610 Russian River Basin Streamflow Requirements**