

# **CHAPTER 3 PROJECT PURPOSE, NEED, AND DEVELOPMENT**

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## **3.1 PROJECT PURPOSE AND OBJECTIVES**

The Feather River Levee Repair Project (FRLRP), an element of the Yuba-Feather Supplemental Flood Control Project (Y-FSFCP), is proposed to increase flood protection in the Reclamation District (RD) 784 area of Yuba County. RD 784 is bounded by the Yuba River on the north, the Feather River on the west, the Bear River on the south, and the Western Pacific Interceptor Canal (WPIC) on the east. The proposed project would entail repairing and strengthening the existing Feather River left (east) bank levee from Project Levee Mile (PLM) 13.3 to PLM 17.1 and from PLM 23.6 to PLM 26.1, and repairing and strengthening the existing Yuba River left (south) bank levee from the confluence with the Feather River (PLM 0.0) upstream to PLM 0.3 (see Figure 2-3 in Chapter 2, “Introduction”). The segment of the Feather River left bank levee between PLM 17.1 and PLM 23.6 would either be repaired and strengthened in its current location, or set back following one of two possible alignment scenarios. Land uses in the levee setback area could consist of agricultural operations and/or habitat restoration activities that would be compatible with flood control objectives. However, no specific plans for habitat restoration in the setback area are proposed at this time.

The primary purpose of the proposed project is to correct identified deficiencies in the left bank levees of the Feather and Yuba Rivers, and consequently to improve flood protection for the RD 784 area of Yuba County. To a large extent, levee deficiencies in the project area relate to the potential for water to seep under (underseepage) and through (through-seepage) the levee soils during flood events, potentially leading to levee failure. The project design objectives focus on measures to bring the levees into compliance with Federal Emergency Management Agency (FEMA) geotechnical certification requirements for underseepage or through-seepage, as well as engineering and design standards of the State of California Reclamation Board (The Reclamation Board) and the U.S. Army Corps of Engineers (Corps). The proposed project is also intended to address areas along the Feather River levee where erosion of the levee is a concern. These specific project design objectives are consistent with the following overall project objectives:

- ▶ to secure flood protection for at least a flood event with a 0.5% (or 1-in-200) annual chance of exceedance,
- ▶ to help secure FEMA certification of the subject reaches of levee,
- ▶ to avoid increasing downstream flow and stage during peak-flow conditions,
- ▶ to achieve these objectives as soon as possible, and
- ▶ to incorporate environmental mitigation as appropriate.

The proposed actions to achieve these objectives are the subject of this environmental impact report (EIR). These objectives are consistent with the requirements in Section 15124(a) of the State CEQA Guidelines and were used in the development and assessment of project alternatives.

## 3.2 NEED FOR IMPROVED FLOOD PROTECTION

### 3.2.1 BACKGROUND

Yuba County has a long history of flooding. Several conditions combine to pose unique challenges for flood control operations in the Yuba-Feather River system. These conditions are described in detail in the *Draft Environmental Impact Report for the Yuba-Feather Supplemental Flood Control Project* (Yuba County Water Agency 2003). Historical accounts describe large floods on the Feather and Yuba Rivers in 1839-40, 1847, 1850, 1852, 1853, 1861-62, 1867-68, 1881, 1886, and 1889-90. Despite the construction of a system of flood control levees beginning in the early 20th century, recorded floods occurred in 1907, 1909, 1928, 1937, 1940, 1962, and 1963, and five major floods—in 1950, 1955, 1964, 1986, and 1997—caused substantial property damage and loss of life. (Yuba County Water Agency 2003.) The floods of 1986 and 1997 were especially catastrophic for Yuba County, inundating tens of thousands of acres, destroying thousands of homes and businesses, and causing loss of life. More than 100,000 people were evacuated from the region during the 1997 flood, the largest evacuation in California history.

Two major flood protection efforts resulted from the 1986 Central Valley floods. First, the Corps and California Department of Water Resources (DWR) initiated the System Evaluation Project, which restored federally constructed levees in RD 784 to current design standards and reestablished the 1957 design top-of-levee profile. (In general, on the Feather and Yuba Rivers, the 1957 design level for water surface elevation is greater than the water surface elevation for the FEMA-designated “100-year flood.”) Most of the System Evaluation levee reconstruction work in RD 784 was completed in 1998 at a cost of approximately \$32 million. This work consisted of 5.2 miles of toe drains and stability berms, 6.2 miles of slurry cutoff walls, and 7.5 miles of levee height restoration. Yuba County Water Agency (YCWA) paid an additional \$2.2 million to deepen levee reconstruction slurry cutoff walls from the System Evaluation design to the Yuba River Basin Project design (Yuba County et al. 2004). The 1997 flood resulted in the identification of additional seepage problems, however, leading to the Corps’ \$6 million System Evaluation Site 7 Extension project, which was completed in 2004.

The second effort was YCWA’s initiation in 1988 of the Yuba River Basin Project, which led to a Corps project designed to achieve what was then considered to be a “200-year” level of protection for RD 784 levees. The Yuba River Basin Project was approved by Congress in 1998, and a construction start was authorized in 2002. In 2003, new Corps underseepage guidelines led to reevaluation of the project, which substantially increased the estimated cost. Because of this cost increase, the Yuba River Basin Project must be reauthorized by Congress. A General Reevaluation Report is currently being prepared by the Corps to obtain a new project authorization and to initiate construction.

In general, levee strength and stability remains a significant concern throughout the RD 784 service area.

### 3.2.2 YUBA-FEATHER SUPPLEMENTAL FLOOD CONTROL PROJECT

In response to the catastrophic flood of 1997, YCWA initiated a seven-phase program of flood control studies to identify methods to achieve a higher level of protection, particularly for the areas in RD 784 that had been subject to flooding several times in the past. The goal of this effort was to substantially improve the flood protection that would be provided by the System Evaluation Project and the Yuba River Basin Project. As part of this effort, YCWA identified and evaluated 33 potential elements representing a comprehensive range of available technology that could provide portions or all of the objective flood control protection. These ranged from relatively minor operational changes providing only a small increment of flood volume reduction to large single-purpose and multipurpose dams with substantial flood volume reductions. These elements are described in Chapters 3 and 8 of the Y-FSFCP draft EIR (DEIR) (Yuba County Water Agency 2003).

Following the passage of the Costa-Machado Water Act of 2000 (Water Act of 2000) by California voters, YCWA's flood control study team turned the focus of its seven-phase study to those measures that could be achieved within the budget provisions of the Water Act of 2000, which provided for a total of \$90 million in bond funds targeted for the Yuba-Feather River basin. This ongoing effort, funded through Water Act of 2000 grant monies, is the Y-FSFCP. Of the \$90 million, \$70 million was targeted for planning, design, and construction work and \$20 million was targeted for environmental mitigation and enhancement.

As part of the Y-FSFCP studies, YCWA prepared a feasibility study, including a DEIR released in October 2003 (Yuba County Water Agency 2003). This study evaluated combinations of three flood control elements:

- ▶ an outlet capacity increase at New Bullards Bar Reservoir,
- ▶ forecast-coordinated operations of New Bullards Bar Reservoir and Lake Oroville, and
- ▶ a setback of the left (east) bank levee of the Feather River between Shanghai Bend and the Bear River.

The Y-FSFCP levee setback was proposed for two segments, which were referred to as the Above Star Bend (ASB) and Below Star Bend (BSB) levee setbacks. The ASB levee setback was proposed to extend approximately 5.2 miles along the Feather River, from southwest of the Yuba County Airport to 1 mile downstream of Star Bend. The BSB levee setback was proposed to extend approximately 3.4 miles, from 1 mile downstream of the ASB levee setback to 2,000 feet upstream of the confluence with the Bear River. It was assumed that the levee setbacks evaluated in the Y-FSFCP would include a habitat restoration component in the expanded floodway area, combined with some continuing agricultural uses. The final EIR (FEIR) for the Y-FSFCP was certified and the program of elements approved by the YCWA Board in March 2004.

### 3.2.3 FLOOD RISKS ALONG THE BEAR RIVER AND WESTERN PACIFIC INTERCEPTOR CANAL

In May 2003, while YCWA was completing this first level of Y-FSFCP studies, the Corps, in a separate draft floodplain mapping study for DWR on the Feather River and its tributaries, identified several deficiencies in freeboard on the Bear River and WPIC levees that prevent these

levees from meeting the FEMA criteria for protecting RD 784 from a “100-year” flood event. (The top of the levee must be at least 3 feet higher than the 100-year event.) This information was unexpected by Yuba County officials because the 1998 Corps Yuba River Basin study did not recommend any work for the Bear River and WPIC levees to achieve a 200-year level of protection for the RD 784 area. In addition, it was found that a 2,800-foot stretch of the Yuba River levee on the upstream side of State Route (SR) 70 did not meet slope stability requirements. These issues were seen as a major setback to the long-term plan to increase the level of flood protection to a 200-year and eventually greater level of protection.

In 1993, following the initiation of the System Evaluation Project and the Yuba River Basin Project, and before the most recent devastating flood (in 1997), Yuba County had approved the Plumas Lake Specific Plan, which provides for a 12,000-home development on 5,200 acres in the southern portion of the RD 784 area. Development was initiated in the Plumas Lake Specific Plan area in 2002. The results of the 2003 Corps floodplain mapping study indicate that the people and property in the RD 784 area, including homes that had already been built in the Plumas Lake Specific Plan area before the release of the Corps study, are subject to a much higher flood risk than previously believed. Without levee improvements that meet FEMA criteria, FEMA may issue new Flood Insurance Rate Maps (FIRMs) for the RD 784 area. Once the FIRMs are issued, flood insurance rates for the area would increase and carrying flood insurance would become mandatory. The ongoing economic development of the county could be jeopardized.

To avoid having RD 784 mapped into the FEMA 100-year floodplain, the RD 784 levees will need to be certified as meeting current FEMA criteria. Consequently, YCWA, RD 784, and Yuba County, in consultation with many landowners and developers in the south county, elected to move aggressively on a program for evaluating options for achieving FEMA certification of the RD 784 levees. One step was the formation of the Three Rivers Levee Improvement Authority (TRLIA), a joint powers authority composed of Yuba County and RD 784 that was formed to address funding and implementation of levee repairs for the RD 784 area.

RD 784 first completed a Problem Identification Study to determine the magnitude of the repair effort necessary to achieve FEMA certification and a higher level of protection on the WPIC and Bear River levees. A geotechnical engineering report was prepared in November 2003 that identified significant geotechnical problems with the levee foundations along most of the Bear River levee and several reaches of the WPIC levee. Areas of concern with regard to erosion were also identified. Subsequently, a more in-depth engineering study was initiated to develop design alternatives to meet the study objectives and develop plans and specifications for some of the selected construction elements that compose the resulting FEMA certification program. These construction elements—which are in different stages of planning and implementation—have been addressed in ongoing studies completed by RD 784, TRLIA, and others. Priority was given to these construction elements, which are all part of the Y-FSFCP:

- ▶ repairs and improvements to the Yuba River levee above SR 70,
- ▶ repairs and improvements to the upper Bear River and WPIC levees (described below),
- ▶ repairs and modification to RD 784 Pump Station No. 6,

- ▶ construction of the Olivehurst detention basin, and
- ▶ construction of a setback levee along the lower Bear River to tie into the Feather River levee below RD 784 Pump Station No. 2 (described below).

TRLIA prepared a study of repairs and improvements to the upper Bear River and WPIC levees and the lower Bear River levee, and issued findings in May 2004 in the EIR for the Bear River and Western Pacific Interceptor Canal Levee Improvements Project (Bear River Project) (Three Rivers Levee Improvement Authority 2004). The Bear River Project proposed implementing flood control improvements along the Bear River and the WPIC, including raising and strengthening the Bear River right (north) bank levee in place and completing various related improvements to provide protection from a 200-year flood event, such as seepage and erosion protection measures.

In September 2004, TRLIA prepared another EIR that evaluated alternatives to address identified levee deficiencies in the right bank levee of the lower Bear River. The Feather-Bear Rivers Levee Setback Project (F-BRLSP) DEIR evaluated two setback levee alternatives that would involve either setting back the left bank levee of the lower Feather River and the right bank levee of the lower Bear River or setting back only the right bank levee of the lower Bear River. The EIR prepared for the F-BRLSP resulted in selection of the lower Bear River levee setback as the preferred alternative. The FEIR for the F-BRLSP was completed and certified by the TRLIA Board in November 2004. As approved, this setback levee project involves setting back the right bank levee of the lower Bear River from the confluence with the Feather River, where the alignment ties in with the existing Feather River levee below RD 784 Pump Station No. 2, to approximately 1,400 feet southwest of SR 70. The Bear River setback levee precludes the need to improve the Feather River levee below Pump Station No. 2. (Other elements of the setback project are habitat restoration in the levee setback area, the removal of the orchard in the lower Bear River floodway and replacement with riparian habitat, and the construction of a detention basin outside the levee setback area.) This project replaces particular elements of the Bear River Project, including raising and strengthening of the lower Bear River levee. In addition to addressing identified deficiencies in the lower Bear River levee, setting back the lower Bear River levee will remove channel constrictions, thereby improving the level of flood protection for the RD 784 area by lowering upstream water surface elevations.

### **3.3 DEVELOPMENT OF THE FEATHER RIVER LEVEE REPAIR PROJECT**

As described above, the proposed FRLRP is an element of the Y-FSFCP that would address the identified deficiencies in the left bank levees of the Yuba and Feather Rivers, and consequently would improve flood protection for the RD 784 area of Yuba County. Flood control elements examined in the feasibility study and the EIR prepared for the Y-FSFCP included a setback of the left bank levee of the Feather River between Shanghai Bend and the Bear River. The levee setback was proposed for two segments, which were referred to as the ASB and BSB levee setback areas. YCWA subsequently altered the BSB setback levee concept described in the Y-FSFCP programmatic EIR to incorporate a setback of the right (north) bank levee of the lower Bear River, which is the major component of the F-BRLSP. The levee setback component of the project that is the subject of this DEIR, the FRLRP, is a modification of the ASB levee setback that was previously proposed and evaluated in the Y-FSFCP EIR.

Ongoing engineering and technical feasibility studies have resulted in development of three project alternatives to meet the project objectives discussed above and to correct levee deficiencies for the Feather and lower Yuba Rivers in Yuba County:

- ▶ *Alternative 1 – The Levee Strengthening Alternative.* Under this alternative, levee repair and strengthening activities would be completed along the entire length of FRLRP project Segments 1, 2, and 3 (Figure 2-3 in Chapter 2, “Introduction”). Establishment of soil borrow areas and construction of a detention basin would be required. Implementation of Alternative 1 would involve removing existing RD 784 Pump Station No. 3 and installing a new pump station east of the Feather River levee, which would correct seepage deficiencies related to the existing pump station.
- ▶ *Alternative 2 – The Levee Strengthening and ASB Setback Levee Alternative.* Under this alternative, levee repair and strengthening activities would be completed along project Segments 1 and 3. Repair and strengthening activities in these segments would be the same as for Alternative 1. In project Segment 2, a setback levee would be constructed roughly following the ASB setback levee alignment identified in the Y-FSFCP EIR. Establishment of soil borrow areas and construction of a detention basin would be required. Similar to Alternative 1, a pump station to replace Pump Station No. 3 would be installed.
- ▶ *Alternative 3 – The Levee Strengthening and Intermediate Setback Levee Alternative.* Under this alternative, the same levee repair and strengthening activities described for Alternatives 1 and 2 would be conducted in project Segments 1 and 3. In Segment 2 a modified setback levee would be constructed that would allow less land to be placed in the new floodway than under Alternative 2. The general design, construction, and operational characteristics of an intermediate setback levee under Alternative 3 would be same as for the ASB setback levee under Alternative 2.

The proposed FRLRP consists of implementation of one of these three potential alternatives, each evaluated at an equal level of detail in this DEIR. These alternatives are described in detail in Chapter 4, “Description of the Proposed Project.”