

8.1 CEQA REQUIREMENTS

The guiding principles for the selection of alternatives for analysis in an environmental impact report (EIR) are provided by the California Environmental Quality Act Guidelines (State CEQA Guidelines). Section 15126.6 of the State CEQA Guidelines indicates that the alternatives analysis must:

- ▶ describe a range of reasonable alternatives to the project that could feasibly attain the basic objectives of the project;
- ▶ consider alternatives that could reduce or eliminate any significant environmental impacts of the proposed project, including alternatives that may be more costly or could otherwise impede the project’s objectives; and
- ▶ evaluate the comparative merits of the alternatives.

The range of reasonable alternatives must be selected and discussed in a manner that fosters meaningful public participation and informed decision making (State CEQA Guidelines Section 15126.6[f]).

The alternatives analysis in this EIR is governed by the “rule of reason” in accordance with Section 15126.6(f) of the State CEQA Guidelines. That is, the range of alternatives presented in this EIR is limited to ones that will inform a reasoned choice by Three Rivers Levee Improvement Authority’s (TRLIA’s) decision makers. In addition to the guiding principles for the selection of alternatives as set forth above, Section 15126.6 of the State CEQA Guidelines requires that an EIR (1) evaluate a “No Project Alternative,” (2) identify alternatives that were initially considered but then rejected from further evaluation, and (3) identify the “environmentally superior alternative.”

Alternatives may be eliminated from detailed consideration in the EIR if they fail to meet most of the basic project objectives, are infeasible, or could not avoid any significant environmental effects (State CEQA Guidelines Section 15126.6[c]). Lead agencies are guided by the general definition of feasibility found in CEQA: “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors” (State CEQA Guidelines Section 15364).

In addition to CEQA, the National Environmental Policy Act and Section 404 of the Clean Water Act provide guidance on alternatives. These guidelines, as well as those of CEQA, have been considered in the identification, evaluation, screening, and finalizing of alternatives for the Feather River Levee Repair Project (FRLRP) to support future decision making in compliance with these acts.

Section 8.2 provides an overview of the alternatives selection process for the FRLRP. Section 8.3 describes the alternatives evaluated in this EIR. Section 8.4 compares the environmental effects of the alternatives, and Section 8.5 discusses the environmentally superior alternative.

8.2 ALTERNATIVES SCREENING PROCESS

As described in Chapter 3, “Project Purpose, Need, and Development,” the proposed FRLRP is an expansion and modification of the Above Star Bend (ASB) levee setback previously evaluated in the programmatic EIR for the Yuba-Feather Supplemental Flood Control Project (Y-FSFCP) (Yuba County Water Agency 2003). The following discussion briefly summarizes the development of the FRLRP. See Section 3.3, “Development of the Feather River Levee Repair Project,” for additional information.

8.2.1 YUBA-FEATHER SUPPLEMENTAL FLOOD CONTROL PROJECT—FEATHER RIVER LEVEE SETBACK

The Y-FSFCP programmatic EIR contains a substantial amount of background information provided to assist reviewers in understanding both the alternatives development process and the rational basis for the selection of three elements, including a Feather River levee setback, for detailed feasibility analysis. Section 3.2, “Need for Supplemental Flood Control,” of the Y-FSFCP programmatic EIR describes the combination of environmental conditions, institutional factors, and physical and operational characteristics of the flood control system that were factored into the selection of alternative flood control elements for detailed evaluation by Yuba County Water Agency (YCWA) and its flood control study team. Section 3.3, “Formulation of the Proposed Project,” of the Y-FSFCP programmatic EIR summarizes the lengthy screening process that led to the selection of the alternatives evaluated in the EIR.

The selection of the alternatives evaluated previously in the Y-FSFCP programmatic EIR was based largely on findings of previous studies by the flood control study team. In these studies, more than 30 potential elements of a flood control program were identified and screened separately and in combination. The basic project purpose of the Y-FSFCP was to define and implement cost-effective and practicable measures as soon as possible within the budget provisions of the Costa-Machado Water Act of 2000 (Water Act of 2000) to provide the greatest possible increment of flood protection from the Yuba and Feather Rivers. The focus of the study, like the focus of the FRLRP, was primarily on providing benefits for Yuba County and secondarily on providing benefits for other areas that might also contribute to project implementation.

The Feather River levee setback element was developed to provide flood protection by lowering channel water levels. The other flood control elements that would also have the potential to lower Feather River water levels are new storage in existing, upstream flood control reservoirs; more efficient operation of these reservoirs; and dredging of the Feather River channel. The studies determined that new reservoir storage would be effective in increasing flood protection; however, the construction of new dams is not authorized as part of the Water Act of 2000. The Y-FSFCP efforts completed to date have been funded in large part through this act; therefore, new reservoir storage was eliminated from further consideration as a viable project alternative because it would entail the construction of new dams.

More efficient operation of existing flood control reservoirs was investigated and recommended as a project feature in the form of two elements: Forecast-Coordinated Operations of Lake Oroville and New Bullards Bar Reservoir for Major Storms (F-CO), which is being implemented, as described in Chapter 6, “Cumulative Impacts,” and New Bullards Bar Outlet Capacity Increase.

Dredging of the Feather River channel was screened as a potential flood control improvement measure. This option was rejected because it was concluded that dredging would not be effective in reducing flood stages. The channel area that could be dredged represents a small portion of the entire floodway (levee to levee); as a result, it was determined that lowering the main channel would not provide significant reductions in flood levels. Dredging would also have the potential to break through geologic controls (hard points) in the channel and create a dangerous condition of channel movement.

Selection of specific levee setback options was based on several considerations: improvement to the hydraulic characteristics of the Feather River, levee stability and performance, costs, and impacts on land users. Hydraulic evaluations focused on increasing the width of constricted river reaches. It was determined that the two previously considered setback options, Above Star Bend and Below Star Bend, would provide both significant hydraulic benefits for Yuba and Sutter Counties and important levee stability/performance benefits for Yuba County. (As described below, the Below Star Bend levee setback has been eliminated from consideration because of improvements that have subsequently been made to the southernmost portion of the Feather River levee between Star Bend and the Bear River.) Comparable channel widening on the Sutter County side of the Feather River would be as long, or longer, depending on the selected alignment and would not provide stability/performance benefits for Yuba County. It was found that the possible levee setback in Sutter County near the airport at Yuba City would not provide any significant flood reduction benefit. The possible setback on the wide bend where State Route (SR) 99 crosses the Feather River was determined to be cost-prohibitive and to entail substantial implementation complications because of the need to modify the SR 99 crossing itself.

In summary, the previous flood control studies and alternatives screening entailed careful consideration of a wide range of potential flood control elements in the context of a complex set of factors affecting performance of the existing flood protection system. See *Alternatives Analysis Report for the Yuba-Feather Supplemental Flood Control Project* (Yuba County Water Agency 2002) and Chapter 8 of the Y-FSFCP draft environmental impact report (DEIR) (Yuba County Water Agency 2003) for complete descriptions of the previous alternatives selection process.

8.2.2 FEATHER RIVER LEVEE REPAIR PROJECT

Recent studies by the U.S. Army Corps of Engineers (Corps) and TRLIA indicate that several reaches of the Feather River left (east) bank levee between the mouth of the Yuba River and the mouth of the Bear River, as well as reaches of the lower Yuba River left (south) bank levee, do not satisfy geotechnical criteria for seepage for the 1-in-100 annual exceedance probability (AEP) flood (i.e., the “100-year flood”). For example, the Corps prepared the Lower Feather River Floodplain Mapping Study, dated Feb. 17, 2005. The report identified various deficiencies

with the Feather River, Yuba River, Bear River, and Western Pacific Interceptor Canal levees in the Reclamation District (RD) 784 area.

More recently, a Problem Identification Report (PIR) prepared for TRLIA (Kleinfelder 2006) addressed the condition of the Feather River left bank levee from Project Levee Mile (PLM) 13.3 (just south of Pump Station No. 2) to the beginning of the Yuba River left bank levee at PLM 26.1, and the Yuba River left bank levee from PLM 0.0 (beginning of the levee) to PLM 0.3, and from PLM 2.2 to PLM 6.1. The purpose of the PIR was to perform a feasibility-level evaluation of subsurface geotechnical conditions and levee conditions in accordance with the requirements of the Federal Emergency Management Agency (FEMA). The PIR concluded that portions of the subject levees do not currently meet FEMA's geotechnical certification requirements for through-seepage (water seeping through levee soils) and underseepage (water seeping under levee soils) during flood events.

In addition, the *Phase 4 Erosion Investigation Report* prepared for TRLIA (MBK Engineers 2006) assessed existing levee erosion issues on the left bank levees of the Feather River and lower Yuba River. The investigation report identified several areas of concern regarding erosion along the levee embankment slope in the area identified in this DEIR as project Segment 2 (see Figure 4-1, "FRLRP Project Features," in Chapter 4 of this DEIR). The report identified the need for ongoing assessment, monitoring, and corrective action at these locations.

Development of the FRLRP was initiated in response to levee deficiencies identified in the various available studies. The primary purpose of the FRLRP 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. The project design objectives focus on measures to bring the levees into compliance with FEMA's geotechnical certification requirements for underseepage and through-seepage, as well as engineering standards for the State of California Reclamation Board (The Reclamation Board) and the Corps.

The objectives of the FRLRP, as identified previously in Section 3.1, "Project Purpose and Objectives," are:

- ▶ 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.

Various approaches to achieve these objectives were considered for each of the three project segments identified in this DEIR (see Figure 4-1). The alternatives screening process for each segment is described below.

Segment 1

Project Segment 1 extends from Feather River PLM 13.3 (approximately 0.5 mile north of the confluence with the Bear River) to PLM 17.1 at Star Bend. This area was considered for the Below Star Bend levee setback in the Y-FSFCP programmatic EIR. However, the October 2004 feasibility study for the Bear River setback levee found that a setback levee at the confluence of the Feather and Bear Rivers would provide some of the hydraulic and flood control benefits that would be provided by setting back the existing Feather River left bank levee below Star Bend. Further study conducted in support of the EIR prepared for the Feather-Bear Rivers Levee Setback Project (F-BRLSP) found that the hydraulic and flood control benefits resulting from this project preclude the need to improve the Feather River left bank levee below Pump Station No. 2 (approximately PLM 13.4). The EIR for the F-BRLSP was certified in November 2004 and project construction began in 2005.

Because of the presence of the F-BRLSP setback levee, a setback levee in FRLRP Segment 1 would provide few flood control benefits, yet it would result in impacts on property, facilities, and landowners associated with placing new lands in the floodplain. Therefore, a setback levee in Segment 1 was not considered further and levee strengthening was adopted as the preferred approach to addressing levee deficiencies in this area. As described in Chapter 4, "Description of the Proposed Project," all three project alternatives include the same levee strengthening approach in Segment 1.

Segment 2

Project Segment 2 extends from Feather River PLM 17.1 to PLM 23.6. This area includes the ASB levee setback described in the Y-FSFCP programmatic EIR. A levee setback was considered in this area for several reasons:

- ▶ a setback levee would replace the existing levee, thereby "correcting" any deficiencies in the existing levee;
- ▶ hydraulic and flood control benefits would be achieved by widening an existing narrow point in the river;
- ▶ a new setback levee would be constructed using materials and methods consistent with modern standards; and
- ▶ a setback levee placed sufficiently eastward of the existing levee could be placed on soils more suitable for supporting a levee foundation.

The ASB setback levee alignment included in the Y-FSFCP programmatic EIR provided a starting point for identifying alternatives for Segment 2 in the FRLRP. TRLIA staff members, project engineers, hydrologists, and others conducted various studies, meetings, and workshops to further develop and refine project alternatives.

Abandoning the setback levee concept and strengthening the existing levee in place was considered as an alternative approach for Segment 2. This approach was considered to allow evaluation of the effects of correcting the levee deficiencies without obtaining the hydraulic and

flood control benefits of a setback levee. As in Segment 1, strengthening the existing levee in Segment 2 would avoid any impacts on property, facilities, and landowners associated with placing new lands in the floodplain. This approach is reflected in this EIR in Alternative 1, The Levee Strengthening Alternative.

Alternative 2 in this EIR, The Levee Strengthening and ASB Setback Levee Alternative, includes a setback levee in Segment 2 that generally follows the alignment of the ASB setback levee included in the Y-FSFCP programmatic EIR. However, as part of the alternatives development process, the northern portion of the setback levee alignment was extended to encompass an area of seepage concerns identified in the PIR. The Levee Strengthening and ASB Setback Levee Alternative was selected for analysis in this EIR because it allows decision makers to evaluate an alternative that provides the benefits of the ASB setback levee listed above, while weighing these benefits against impacts on property, facilities, and landowners associated with placing new lands in the floodplain.

Several other potential setback levee alignments were considered during the alternatives development process. Almost all of these alignments were located to the west of the ASB setback levee alignment. Evaluation of a setback levee alignment between the ASB levee alignment and the existing Feather River levee was considered desirable because it would allow consideration of an intermediate condition, or a balance of benefits and impacts: because of the smaller setback area, hydraulic and flood control benefits could be reduced, but impacts on property, facilities, and landowners associated with placing new lands in the floodplain would also be reduced. Factors considered when potential intermediate setback alignments were developed and evaluated included the suitability of underlying soil conditions to support a levee foundation, the goal of minimizing the splitting of landowner parcels, and effects on potential upstream hydraulic benefits.

The setback levee alignment reflected in this EIR in Alternative 3, The Levee Strengthening and Intermediate Setback Levee Alternative, was considered an appropriate representation of the intermediate setback levee scenario to allow decision makers to evaluate the competing interests of increasing flood control benefits through construction of a setback levee while reducing the placement of property and facilities in the floodplain. The intermediate setback levee alignment shown in Alternative 3 (see Figure 4-1 in Chapter 4) is considered a general representation of the various intermediate setback alignments considered in the alternatives development process. If Alternative 3 is selected for implementation, the ultimate alignment of an intermediate setback levee may be shifted east or west during the final design process based on soil conditions, to avoid structures or utilities, and based on other factors. The analysis of Alternative 3 in this EIR could be used to support a range of intermediate setback levee alignments between the existing levee and the ASB setback levee alignment.

Segment 3

Project Segment 3 includes the Feather River left bank levee from PLM 23.6 to PLM 26.1 (the confluence with the Yuba River) and the Yuba River left bank levee from PLM 0.0 to PLM 0.3. Unlike Segments 1 and 2, in Segment 3 substantial development is located adjacent to the existing Feather River levee, including the Linda County Water District Wastewater Treatment Plant and multiple homes and other structures in the community of Linda. It would not be

feasible to relocate such a large number of residences, structures, and facilities to allow creation of a setback levee in this area. Therefore, a setback levee in Segment 3 was not considered further and levee strengthening was adopted as the preferred approach to addressing levee deficiencies in this area. As described in Chapter 4, “Description of the Proposed Project,” all three project alternatives include the same levee strengthening approach in Segment 3.

8.2.3 ALTERNATIVES CONSIDERED AND REJECTED

As discussed previously, a setback levee in project Segment 1 was considered in the Y-FSFCP programmatic EIR (i.e., the Below Star Bend setback levee), but was rejected for further analysis because development of the F-BRLSP precludes the need for a setback levee in Segment 1. Also as discussed above, a setback levee in Segment 3 was excluded from further consideration because of the infeasibility of relocating the large numbers of residences, structures, and facilities in this area.

The concept of placing a setback levee east of the ASB setback levee alignment was considered. However, a preliminary hydraulic evaluation found that flood control benefits relative to the ASB setback levee alignment would not be significant. It was determined that any minor flood control benefits would be outweighed by impacts on property, facilities, and landowners by placing additional land in the floodplain. Therefore, alternatives related to placing setback levees east of the ASB levee setback alignment were not evaluated further.

8.3 PROJECT ALTERNATIVES EVALUATED IN THIS EIR

The following alternatives are considered in this EIR:

- ▶ Alternative 1 – The Levee Strengthening Alternative,
- ▶ Alternative 2 – The Levee Strengthening and ASB Setback Levee Alternative,
- ▶ Alternative 3 – The Levee Strengthening and Intermediate Setback Levee Alternative, and
- ▶ the No-Project Alternative.

Descriptions of the alternatives are provided below.

8.3.1 PROJECT ALTERNATIVES

The FRLRP consists of implementation of one of three potential alternatives. Each alternative includes actions in the three project segments that are used to define the project area (see Figure 4-1):

- ▶ Project Segment 1 consists of the existing Feather River left bank levee from PLM 13.3 to PLM 17.1 (from approximately RD 784 Pump Station No. 2 upstream to Star Bend).
- ▶ Project Segment 2 consists of the existing Feather River left bank levee from PLM 17.1 to PLM 23.6 (from approximately Star Bend upstream to west of the Yuba County Airport).
- ▶ Project Segment 3 consists of the existing Feather River left bank levee from PLM 23.6 to PLM 26.1, and the Yuba River left bank levee from PLM 0.0 to PLM 0.3 (west of the Yuba County Airport to the railroad crossing adjacent to the SR 70 bridge).

Alternative 1 – The Levee Strengthening Alternative

Under this alternative, levee repair and strengthening activities would be completed along the entire length of project Segments 1, 2, and 3. Levee repairs and strengthening would consist of various activities, including installation of slurry cutoff walls, relief wells, and seepage/stability berms, and placement of buried cobble in areas where erosion of the levee embankment has been identified as a problem. RD 784 Pump Station No. 3 is located next to the existing Feather River levee. Implementation of Alternative 1 would involve removing Pump Station No. 3 and installing a new pump station farther east of the levee, which would correct seepage deficiencies related to the existing pump station. Because discharges from new relief wells could exceed the capacity of the new Pump Station No. 3 during peak-flow periods, implementation of this project alternative would require construction of a detention basin to temporarily hold these peak flows. Soil taken from the detention basin could be used as borrow material for levee repair and strengthening activities. Additional borrow material could also be used from other sources.

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 under 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. Because of unfavorable soil conditions, implementation of various seepage control measures would be required along the setback levee. These measures could include zoned embankments, slurry cutoff walls, seepage berms, and relief wells. Portions of the existing Feather River levee along the setback levee alignment would be removed to allow water to flow into and out of the new floodway/setback area (i.e., the area between the existing levee and the setback levee) during high river stages. The setback levee footprint and associated floodway/setback area would occupy approximately 1,600 acres. This acreage includes residences and other structures; appropriate compensation would be negotiated with affected landowners and relocation assistance would be provided consistent with applicable federal and state statutes. With removal of portions of the existing levee, removal or protection of utilities and wells in the setback area would also be required, and lands in the floodway would be contoured and managed to prevent fish stranding as high flows recede.

Because local drainage patterns would be changed by the setback levee, implementation of this project alternative would require construction of a detention basin to prevent adverse flooding effects on nearby properties. Soil taken from the detention basin site could be used to construct the setback levee embankment. Additional soil borrow areas would be established to provide sufficient material to construct the setback levee embankment. As under Alternative 1, a pump station to replace Pump Station No. 3 would be installed. The new pump station would be located immediately east of the new setback levee. Land uses in the levee setback area (i.e., the area between the existing levee and the new setback levee) could consist of agricultural operations and/or habitat restoration activities that do not impede the flood flow function of the setback area. No specific plans for habitat restoration in the levee setback area are proposed at this time, although this is considered a potential future use.

Alternative 3 – The Levee Strengthening and Intermediate Setback Levee Alternative

FRLRP Alternative 3 is very similar to Alternative 2. 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 setback levee would be constructed. Approximately the southern one-third of this setback levee alignment would follow the ASB setback levee alignment identified in Alternative 2. However, in the vicinity of Anderson Avenue the setback levee would shift to the west of the alignment proposed under Alternative 2 (see Figure 4-1 as well as Figure 2-3, “FRLRP Project Area,” in Chapter 2). This westward shift would allow less land to be placed in the new floodway under Alternative 3 than under Alternative 2. Fewer houses, structures, and other facilities would be affected by levee construction or would need to be removed from the floodway/levee setback area. The setback levee footprint and associated floodway/setback area would occupy approximately 1,300 acres under Alternative 3 if the alignment shown in Figure 4-1 is used. However, the intermediate setback levee alignment is representative of a range of potential setback levee locations between the existing levee and the ASB setback levee alignment. It is acknowledged that during detailed project design, various factors may influence the specific location of the intermediate setback levee if this alternative is adopted.

The general design, construction, and operational characteristics of an intermediate setback levee under Alternative 3 (land uses in the levee setback area, the relocation/replacement of Pump Station No. 3, and creation of detention basins and soil borrow areas) would be the same as those for the ASB setback levee under Alternative 2.

8.3.2 NO-PROJECT ALTERNATIVE

The No-Project Alternative represents conditions that “would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services” (State CEQA Guidelines Section 15126.6[e][2]). As required by CEQA, a No-Project Alternative has been included to allow TRLIA to compare the impacts of approving the proposed project (either Alternative 1, Alternative 2, or Alternative 3) with the impacts of not approving the proposed project.

The No-Project Alternative would consist of retaining the Feather River and lower Yuba River left bank levees in the project area in their current condition. No action would be taken. No levee repairs or strengthening would be implemented. Erosion problem areas identified in project Segment 2 would not be addressed. Pump Station No. 3 would be retained in its current condition at its current location.

If the FRLRP were not implemented, it is reasonable to expect that the deficiencies in the subject levees would ultimately be addressed some time in the future because of the need to increase flood protection in the RD 784 area. However, other than the FRLRP, there are no other near-term plans to comprehensively repair or improve the subject levees. If TRLIA were not to implement the FRLRP, there are no other current plans available for TRLIA, the Corps, the California Department of Water Resources, or other agencies with jurisdiction over the levees to implement.

8.4 COMPARISON OF THE ENVIRONMENTAL EFFECTS OF THE ALTERNATIVES

8.4.1 ENVIRONMENTAL EFFECTS OF THE PROJECT ALTERNATIVES

The environmental effects of Alternatives 1, 2, and 3 are described in Chapter 5, “Environmental Analysis.” See Sections 5.1 through 5.13 for detailed descriptions of potential effects of these individual project alternatives.

8.4.2 ENVIRONMENTAL EFFECTS OF THE NO-PROJECT ALTERNATIVE

Consistent with Section 15126.6(d) of the State CEQA Guidelines, the No-Project Alternative is evaluated in less detail in this EIR than the FRLRP alternatives. Sufficient information is provided about the No-Project Alternative to allow for a meaningful evaluation, analysis, and comparison of this alternative with the other alternatives evaluated previously in this EIR.

Land Use: There would be no direct changes in land use or conversion of farmland to other uses under the No-Project Alternative. No existing structures or residences would need to be removed or relocated. Therefore, there would be no direct land use impacts. However, indefinite postponement of levee strengthening actions needed to remedy identified underseepage and through-seepage conditions could result in levee failures during future high-flow conditions, with corresponding flooding and associated damage to farmland, agriculture-related structures, and residences and potential for injury and loss of life.

Geology, Soils, and Mineral Resources: There would be no ground-disturbing activities under the No-Project Alternative, nor would any new areas be exposed to erosive forces (i.e., exposure of the new levee setback area to floodwaters). Therefore, there would be no impacts on geology, soils, and mineral resources. The beneficial effect of reduced risks from geological hazards associated with strengthening the levees under the three project alternatives would not occur under the No-Project Alternative.

Water Resources and River Geomorphology: Under the No-Project Alternative surface water or groundwater conditions, hydrology, geomorphology, or water quality would not change relative to existing conditions. Therefore, there would be no impacts related to water resources and geomorphology. Beneficial effects related to improved flood hydrology under Alternatives 2 and 3 would not occur under the No-Project Alternative, and the lack of a comprehensive program of levee strengthening in the short term would perpetuate the risk to lives and property in the RD 784 area that is associated with potential levee failure. In addition, potential benefits associated with decreases in water demand under Alternatives 2 and 3 resulting from possible conversion of agricultural land to habitat would not occur under the No-Project Alternative.

Fisheries: There would be no ground-disturbing activities or vegetation removal that might affect fish habitat under the No Project Alternative, and this alternative does not have the potential to create areas where fish might be stranded. Therefore, there would be no impacts related to fisheries. Beneficial effects related to increased fish habitat in the levee setback area under Alternatives 2 and 3 would not occur under the No-Project Alternative.

Terrestrial Biological Resources: Existing habitat conditions would not be modified under the No-Project Alternative, and no construction activities that could directly or indirectly affect vegetation or wildlife would occur. Therefore, there would be no impacts related to terrestrial biological resources. Potential benefits to biological resources under Alternatives 2 and 3 associated with possible conversions of agricultural land to habitat would not occur under the No-Project Alternative.

Recreation: No construction activities that could temporarily affect recreational opportunities would occur under the No-Project Alternative, nor would any changes be made to facilities or land use conditions that could affect recreational facilities. Therefore, there would be no impacts related to recreational resources.

Aesthetic Resources: Existing views would not change under the No-Project Alternative and there would be no potential for new sources of light and glare. Therefore, there would be no impacts related to aesthetic resources.

Cultural Resources: Under the No-Project Alternative there would be no ground-disturbing activities that might adversely affect known or currently undiscovered cultural resources. There would be no impacts on cultural resources.

Air Quality: Under the No-Project Alternative there would be no use of construction equipment, no ground-disturbing activities, or modifications in current maintenance and operations activities that could result in increased emissions of pollutants or toxic air contaminants (TACs). Therefore, there would be no impacts related to air quality. Potential beneficial effects related to decreased agricultural emissions if agricultural lands are converted to habitat in the levee setback area under Alternatives 2 and 3 would not occur under the No-Project Alternative.

Noise: No activities that would increase noise or groundborne vibration levels above existing conditions would occur under the No-Project Alternative. Therefore, there would be no impacts related to noise and vibration.

Transportation and Circulation: No new vehicle trips would be generated under the No-Project Alternative and there would be no new traffic hazards. Therefore, there would be no impacts related to traffic and circulation.

Public Services, Utilities, and Service Systems: There would be no ground-disturbing activities under the No-Project Alternative that could damage existing utilities or would require their removal or relocation. There would also be no changes to transportation systems or increases in traffic that could affect the ability of emergency responders to move through the project area. Therefore, there would be no direct impacts related to public services, utilities, or service systems. However, the lack of increased flood protection associated with the No-Project Alternative would continue to limit the construction of schools and other public services facilities needed to serve existing development in the RD 784 area. Therefore, the No-Project Alternative would contribute to a situation in which portions of the RD 784 area could continue to be underserved.

Paleontological Resources: There would be no ground-disturbing activities under the No-Project Alternative that might adversely affect paleontological resources. Therefore, there would be no impacts on paleontological resources.

8.4.3 COMPARISON OF THE ALTERNATIVES

Table 8-1, “Summary of the Environmental Effects of the Alternatives,” summarizes the potential environmental effects of the project alternatives and the No-Project Alternative.

**Table 8-1
Summary of the Environmental Effects of the Alternatives**

Environmental Effect	No-Project Alternative	The Levee Strengthening Alternative (Alternative 1)	The Levee Strengthening and ASB Setback Levee Alternative (Alternative 2)	The Levee Strengthening and Intermediate Setback Levee Alternative (Alternative 3)
Land Use				
Conflicts with land use planning	–	LTS	SU	SU
Prime Farmland conversion	–	SU	SU	SU
Displacement of housing	–	–	LTS	LTS
Geology, Soils, and Mineral Resources				
Risk of geologic hazards	–	B	B	B
Construction-related erosion hazards	–	LTS	LTS	LTS
Setback area erosion	–	–	LTS	LTS
Water Resources and River Geomorphology				
Construction effects on water quality	–	LTS (m)	LTS (m)	LTS (m)
Local drainage changes	–	–	LTS (m)	LTS (m)
Changes in local flood hydrology	–	–	B	B
Changes in downstream flood hydrology	–	–	LTS	LTS
Changes in water demand and supply	–	–	B	B
Effects on groundwater levels	–	LTS	LTS	LTS
Effects of flood operations on water quality	–	–	LTS (m)	LTS (m)
Sediment deposition in setback area	–	–	LTS	LTS
Geomorphic processes/erosion	–	–	LTS	LTS
Fisheries				
Loss of fish habitat during construction	–	LTS (m)	LTS (m)	LTS (m)
Loss of overhead cover/instream woody material	–	LTS	LTS	LTS
Habitat effects from borrow material contaminants	–	–	LTS (m)	LTS (m)
Stranding	–	–	LTS (m)	LTS (m)

**Table 8-1
Summary of the Environmental Effects of the Alternatives**

Environmental Effect	No-Project Alternative	The Levee Strengthening Alternative (Alternative 1)	The Levee Strengthening and ASB Setback Levee Alternative (Alternative 2)	The Levee Strengthening and Intermediate Setback Levee Alternative (Alternative 3)
Increased habitat in floodplain area	–	–	B	B
Terrestrial Biological Resources				
Effects on general biological resources	–	LTS	LTS	LTS
Effects on sensitive habitats (e.g., jurisdictional waters, riparian habitat)	–	LTS (m)	LTS (m)	LTS (m)
Effects on special-status plants	–	LTS (m)	LTS (m)	LTS (m)
Effects on valley elderberry longhorn beetle	–	LTS (m)	LTS (m)	LTS (m)
Effects on northwestern pond turtle	–	LTS (m)	LTS (m)	LTS (m)
Effects on giant garter snake	–	LTS (m)	LTS (m)	LTS (m)
Effects on Swainson's hawk and other nesting raptors	–	LTS (m)	LTS (m)	LTS (m)
Effects on other special-status birds	–	LTS	LTS	LTS
Effects on Pacific western big-eared bat	–	LTS	LTS	LTS
Effects on wildlife corridors	–	LTS	LTS	LTS
Recreation				
Short- or long-term recreation effects	–	LTS	LTS	LTS
Aesthetic Resources				
Short- or long-term effects on views	–	LTS	LTS	LTS
Light and glare	–	LTS	LTS	LTS
Cultural Resources				
Disturbance of unknown resources or human remains	–	LTS (m)	LTS (m)	LTS (m)
Disturbance of known resources	–	LTS (m)	LTS (m)	LTS (m)
Air Quality				
Temporary effects on air quality	–	SU	SU	SU
Long-term effects on air quality	–	LTS	B	B
TAC emissions	–	LTS	LTS	LTS
Noise				
Temporary noise disturbance	–	SU	SU	SU
Groundborne vibration during construction	–	LTS	LTS	LTS
Transportation and Circulation				
Increase in traffic during construction	–	LTS	LTS	LTS

**Table 8-1
Summary of the Environmental Effects of the Alternatives**

Environmental Effect	No-Project Alternative	The Levee Strengthening Alternative (Alternative 1)	The Levee Strengthening and ASB Setback Levee Alternative (Alternative 2)	The Levee Strengthening and Intermediate Setback Levee Alternative (Alternative 3)
Traffic hazards during construction	–	LTS (m)	LTS (m)	LTS (m)
Public Services, Utilities, and Service Systems				
Effects on utility infrastructure	–	LTS	LTS (m)	LTS (m)
Effects on water supply and drainage	–	LTS	LTS	LTS
Effects on emergency response during construction	–	LTS (m)	LTS (m)	LTS (m)
Paleontological Resources				
Disturbance of unknown resources	–	LTS (m)	LTS (m)	LTS (m)

Notes: – = no impact; B = beneficial or potentially beneficial effect; LTS = less-than-significant impact; LTS (m) = significant or potentially significant impact that would be less than significant with mitigation; SU = significant impact, despite mitigation (i.e., significant and unavoidable)

Many of the impacts identified as less than significant or as less than significant with mitigation cannot be predicted with certainty to occur. For example, whether construction activity would affect various special-status wildlife species would depend on the presence (or absence) of individuals of these species at the project site at the time of construction; nevertheless, because there is the potential for various species to be adversely affected by construction under any of the alternatives, the potential for significant effects is identified and appropriate actions have been included as required mitigation to ensure that any such effects are reduced to a less-than-significant level.

For purposes of this comparison, the following levels of effect are generally considered to be equivalent: potentially significant and significant impacts that would be less than significant with the required mitigation, which are identified in Table 8-1 as LTS (m), and impacts that would be less than significant even without mitigation, which are identified as LTS. In addition, where effects are identified in the impact analysis as less than significant but are considered to be minimal, they are considered for purposes of this comparison to be negligible.

The potential adverse and beneficial effects of the proposed Levee Strengthening and ASB Setback Levee Alternative (Alternative 2) and Levee Strengthening and Intermediate Setback Levee Alternative (Alternative 3) are generally the same. Therefore, the number and magnitude of potential environmental impacts as shown in Table 8-1 are the same for both alternatives. However, the potential adverse effects of Alternative 2 would be somewhat greater because this alternative includes a larger levee setback area and would therefore entail more land disturbance and more construction activity. The potential environmental benefits, including flood control benefits, are also greatest with Alternative 2. Several impacts related to water resources and river geomorphology and to fisheries, and one impact related to land use and one related to geology,

soils, and mineral resources, would specifically result from construction of a setback levee and creation of a levee setback area. These include beneficial impacts and impacts in the LTS and LTS (m) categories in Table 8-1. These impacts would not occur under The Levee Strengthening Alternative (Alternative 1), where no setback levee is proposed. Most of the adverse impacts associated with any of the three project alternatives are short-term, temporary construction-related impacts, whereas the environmental benefits would be long-term.

Following is a summary of the main points of comparison between the environmental effects of the alternatives for each resource area:

Land Use: Alternatives 2 and 3 would have significant unavoidable effects related to land use planning conflicts. All three alternatives would have significant unavoidable impacts related to the conversion of Prime Farmland to nonagricultural uses. The No-Project Alternative would not have any direct effects on land use, although lack of levee strengthening under the FRLRP could lead to future levee failure, flooding of the RD 784 area, and related adverse effects on Prime Farmland and other productive agricultural land, homes, and individuals.

Geology, Soils, and Mineral Resources: All three project alternatives would enhance the stability of levees in the project area and reduce the risk of catastrophic levee failure. Construction erosion hazards would be less than significant under all three alternatives. Impacts associated with erosion in the levee setback area would also be less than significant, but would occur only under Alternatives 2 and 3. The No-Project Alternative would not have any effects (either beneficial or adverse impacts) related to geology, soils, and mineral resources.

Water Resources and River Geomorphology: Construction activities under any of the three project alternatives could potentially result in significant adverse effects on water quality. However, implementation of mitigation measures would reduce these impacts to less-than-significant levels. All three alternatives could also affect groundwater levels; however, impacts would be less than significant. Remaining impacts on water resources and river geomorphology relate to the presence of a setback levee and/or related levee setback area and would not apply to Alternative 1. For each of these impacts, whether beneficial or adverse, the effects would be somewhat less under Alternative 3 than under Alternative 2 because of the smaller size of the levee setback area. Alternatives 2 and 3 would result in a beneficial effect by reducing flood stage elevations upstream of the levee setback area. These alternatives would also have a hydraulic impact that would increase downstream flood flows by relatively minor amounts, resulting in less-than-significant potential increases in flood risk. A small benefit in water supply may be associated with Alternatives 2 and 3, depending on changes in land use that could accompany the levee setback. Alternatives 2 and 3 would also result in impacts related to changes in local drainage systems, changes in water quality during flooding of the levee setback area, sediment deposition in the levee setback area, and erosion potential resulting from changes in geomorphic processes. Depending on the impact, these impacts would be less than significant either before or after mitigation. The No-Project Alternative would not have any effects (either beneficial or adverse impacts) related to water resources and river geomorphology.

Fisheries: All three project alternatives could potentially affect fish habitat during construction. Implementation of mitigation measures would reduce these construction-related impacts to less-than-significant levels. All three project alternatives could also result in the loss of overhead

cover/instream woody material. However, this impact would be less than significant under all alternatives. Remaining fisheries impacts relate to the presence of a setback levee and/or related levee setback area and would not apply to Alternative 1. For each of these impacts, whether beneficial or adverse, the effects would be somewhat less under Alternative 3 than under Alternative 2 because of the smaller size of the levee setback area. Alternatives 2 and 3 could both result in fish stranding and adverse effects on water quality when floodwaters come in contact with soils in the levee setback area. Both of these impacts would be mitigated to less-than-significant levels. Inundation of the levee setback area and potential habitat restoration under Alternatives 2 and 3 would provide benefits to fish species. The No-Project Alternative would not have any effects (either beneficial or adverse impacts) on fisheries.

Terrestrial Biological Resources: All three project alternatives would have less-than-significant effects on general biological resources, special-status birds, Pacific western big-eared bats, and wildlife corridors. All three alternatives would have significant impacts on sensitive habitats, special-status plants, valley elderberry longhorn beetle, northwestern pond turtle, giant garter snake, and Swainson's hawk and other raptors. However, each of these impacts would be reduced to a less-than-significant level with mitigation. The No-Project Alternative would not have any effects on terrestrial biological resources.

Recreation: None of the project alternatives would have a significant effect on recreation. The No-Project Alternative would not have any effects related to recreation.

Aesthetic Resources: None of the project alternatives would have a significant effect on aesthetic resources. The No-Project Alternative would not have any effects on aesthetic resources.

Cultural Resources: All three project alternatives have the potential to adversely affect sites that may contain significant cultural resources. Each of the project alternatives could also potentially affect an unknown/subsurface cultural resource site or human remains. However, implementation of required mitigation would ensure that any effect on known or unknown cultural resources would be less than significant. The No-Project Alternative would not have any effects on cultural resources.

Air Quality: All three project alternatives are expected to contribute to exceedances of relevant air quality standards during construction. Construction emissions would be less under Alternative 1 than under Alternatives 2 and 3 because of the reduced disturbance area and the need for fewer haul trips to carry borrow material. Implementation of mitigation measures would reduce construction emission impacts for each alternative, but not to less-than-significant levels. All three alternatives would result in less-than-significant impacts related to the emission of TACs. Alternatives 2 and 3 could have a small long-term beneficial effect on air quality because of the potential reduction in agricultural use of some lands associated with the levee setback area. This beneficial effect would not occur under Alternative 1 because this alternative does not include a levee setback area. The No-Project Alternative would not have any effects (either beneficial or adverse impacts) related to air quality.

Noise: Construction activities associated with all three project alternatives would result in noise levels that exceed Yuba County noise standards at sensitive receptors. Noise associated with

construction activities would not be mitigated to less-than-significant levels, although the significant and unavoidable noise effect would likely last only a few weeks. All three project alternatives would result in less-than-significant impacts related to construction-generated groundborne vibration. The No-Project Alternative would not have any effects related to noise and vibration.

Transportation and Circulation: All three project alternatives would have less-than-significant impacts related to increases in traffic during construction. Each alternative would result in significant impacts related to the generation of traffic hazards during construction. However, this impact would be reduced to a less-than-significant level with mitigation. Although none of the three alternatives would result in significant traffic impacts after mitigation, construction traffic would be less under Alternative 1 than under Alternatives 2 and 3 because of the smaller number of haul trips to carry borrow material. The No-Project Alternative would not have any effects on traffic and circulation.

Public Services, Utilities, and Service Systems: With implementation of the required mitigation, the three project alternatives would not significantly affect emergency response services during construction. Although each alternative would have some effect on existing water supply and drainage infrastructure in the project area, these effects would be less than significant. Under Alternatives 2 and 3 utilities retained in the levee setback area could be damaged when the levee setback area is inundated, resulting in interruptions in service. This impact would be reduced to a less-than-significant level with mitigation. Alternative 1 does not include a levee setback area and impacts on existing utilities would be less than significant. The No-Project Alternative would not have any effects on public services, utilities, and service systems.

Paleontological Resources: All three project alternatives could potentially affect an unknown paleontological resource site. However, implementation of the required mitigation would ensure that any effect on paleontological resources would be less than significant. The No-Project Alternative would not have any effects on paleontological resources.

8.5 ENVIRONMENTALLY SUPERIOR ALTERNATIVE

The State CEQA Guidelines call for identification of an environmentally superior alternative and specify that “if the environmentally superior alternative is the ‘no project’ alternative, the EIR shall also identify an environmentally superior alternative among other alternatives.”

However, there are a number of interconnected as well as opposing factors to consider when evaluating the various FRLRP alternatives that result in no clear environmentally superior alternative. These factors include:

- ▶ minimizing environmental effects,
- ▶ providing flood protection to the RD 784 area,
- ▶ the potential for providing more regional flood protection benefits,
- ▶ effects on lands and landowners that might be included in a levee setback area, and
- ▶ potential beneficial environmental effects associated with creating a levee setback area.

From the perspective of purely minimizing effects on the existing environment, the No-Project Alternative would be the superior alternative because it would result in no changes in the existing condition. However, the No-Project Alternative would result in no improvements to flood protection facilities in the project area and would perpetuate the existing risks for levee failure, flooding, and related adverse effects on the environment, people, and property. The No-Project Alternative would not meet key project objectives of securing flood protection for at least the 1-in-200 year event and securing FEMA certification of the subject levee reaches (see Section 8.2.2, “Feather River Levee Repair Project”). This alternative would have no direct effects on property owners in the area, but also would not provide them the flood protection benefits inherent in Alternatives 1, 2, and 3. The No-Project Alternative also would not provide potential beneficial effects related to fisheries, biological resources, water resources, and air quality associated with Alternatives 2 and 3.

Alternative 1, The Levee Strengthening Alternative, would meet all project objectives related to increasing flood protection and would not affect lands and residences that might be included within a levee setback area as would occur under Alternatives 2 and 3. Compared to Alternatives 2 and 3, Alternative 1 would also have fewer direct effects on the environment, primarily because it does not include a setback levee (see Table 8-1). However, because Alternative 1 does not include a setback levee, potential beneficial effects related to fisheries, biological resources, water resources, and air quality associated with Alternatives 2 and 3 would not occur. In particular, Alternative 1 would not provide regional flood control benefits (i.e., decreases in upstream flood stage elevations, including through the urbanized areas of Marysville and Yuba City) associated with creation of a setback levee. In addition, as past levee repair efforts would indicate, based on the condition of soils in levee foundations and embankments, the success of repairs to the existing levee is not assured. Additional repairs or other remedial actions may be required after initial repairs are complete. These conditions are less likely to occur where a new levee (e.g., a setback levee) is constructed using modern methods on stable foundation soils.

From the perspective of maximizing flood protection benefits, Alternative 2, The Levee Strengthening and ASB Setback Levee Alternative, would be the superior alternative. Flood protection benefits under Alternative 2 would derive from:

- ▶ addressing deficiencies associated with the existing levees,
- ▶ providing increased flood protection designed to withstand the 1-in-200 AEP event,
- ▶ providing a new setback levee in project Segment 2 constructed on a more stable foundation using modern engineering methods, and
- ▶ reducing flood stage elevations upstream of the setback levee area by more than 1 foot depending on the location and size of the flood event. Reductions in flood stage elevations would extend upstream on the Feather and Yuba Rivers into river reaches adjacent to Marysville and Yuba City.

As identified above, the last two of these benefits are directly associated with the construction of a setback levee and would not occur under Alternative 1. Because these two benefits are associated with a setback levee, they would also occur under Alternative 3, The Levee Strengthening and Intermediate Setback Levee Alternative; however, the level of benefit would

be less because soil conditions in the area considered for the intermediate setback levee alignment are not as favorable for levee construction and operation as those found along the ASB setback levee alignment (i.e., the soil is more porous and susceptible to underseepage) and the smaller setback area would provide reduced upstream benefits.

If maximizing flood protection is a priority, the flood protection benefits associated with Alternative 2 could be considered to outweigh this alternative's additional direct impacts on the environment relative to Alternative 1, and effects on property and property owners from placing lands in a levee setback area. In addition, Alternative 2 provides the potential for substantial long-term benefits associated with possible habitat improvement and/or restoration in the levee setback area, such as increases in fish and wildlife habitat, riparian corridor width, ecosystem complexity, and recreation opportunities.

Alternative 3 would provide flood control and environmental benefits similar to those of Alternative 2, but to a lesser degree because of the smaller levee setback area in Segment 2. Because of the smaller setback area, Alternative 3 would have a lesser effect related to placing property in the levee setback area, although approximately the same number of residences would be affected.

As stated at the beginning of this discussion, because there are a number of interconnected as well as opposing factors to consider when evaluating the various FRLRP alternatives, there is no clear environmentally superior alternative. If strictly minimizing direct environmental effects is the top priority, then the No-Project Alternative and Alternative 1 would be superior. If providing flood protection to the RD 784 area is the discriminating factor, then Alternatives 1, 2, and 3 are almost equal, although Alternative 2 would be somewhat superior. If providing regional flood protection benefits is desired, then Alternative 2 would be superior, with Alternative 3 providing similar benefits, but to a lesser degree. If effects on lands and landowners are to be minimized, then Alternative 1 would be superior because it does not include a setback levee, yet provides flood control benefits. If the focus is on potential beneficial environmental effects associated with creating a levee setback area (mostly related to the possible creation/restoration of native habitat), then Alternative 2 provides the greatest potential for these benefits, with Alternative 3 allowing for similar benefits to a lesser degree.

When evaluating these factors, it is difficult to weigh such things as the various gradients of flood protection and associated increased or decreased risks to life and property against the variety of types and extents of environmental effects associated with each alternative. Although the No-Project Alternative can be removed from consideration as the environmentally superior alternative because it does not meet the basic project objective, a distinct environmentally superior alternative is not identified among Alternatives 1, 2, and 3.