Impact 2A–BR9: Valley Elderberry Longhorn Beetle. VELB are entirely dependent on the elderberry shrub. Impacts to elderberry shrubs under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–BR9). Removal of elderberry shrubs under this alternative has the potential to adversely affect the federal-listed VELB and is therefore, considered a significant impact.

The impacts from construction and operations on VELB would be significant.

Impact 2A–BR10: Peregrine Falcon. The impacts on the peregrine falcon under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–BR10).

The impacts from construction and operations on peregrine falcons would be less than significant; therefore, no mitigation is required.

Impacts on Other Special-status Species.

Impact 2A–BR11: Osprey. The impacts on osprey under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–BR11 and Figures 3.4-4 and 3.4-11).

The impacts from construction and operations on osprey would be significant.

Impact 2A–BR12: Bats. The impacts on bats under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–BR12).

The impacts from construction and operations on bats would be less than significant; therefore, no mitigation is required.

2B: 2-month with Existing Ladders Alternative

Impacts on Wildlife Habitat and Wildlife.

Impact 2B–BR1: Riparian Habitat. Up to 6.81 acres of riparian habitat would be impacted under this alternative (Figure 3.4-12). The permanent loss of 2.05 acres of riparian habitat would occur with the permanent land conversion from installation of the access bridge, the conveyance pipeline, and the fish screen and forebay, all on the south side of the river. Up to an additional 4.76 acres of riparian habitat could be removed to accommodate construction activities. Following completion of construction, temporarily impacted areas of riparian habitat would be planted with native riparian trees and shrubs to restore the habitat.

Under this alternative, the gates would be in the river for a reduced period of time (2 months) relative to the No Action Alternative. The gates would be in for July and August of each year. The areal extent of inundation by Lake Red Bluff would be the same as under the No Action Alternative. Because of the annual inundation, vegetation would not become established, and the inundation area would remain devoid

of vegetation. Cottonwoods along the margins of Lake Red Bluff likely are tapped into groundwater and therefore not dependent on water from the lake. Therefore, no change in the extent of riparian habitat would be expected with gates in for 2 months.

Riparian habitat that would be impacted under this alternative is predominantly located along Red Bank Creek, with small amounts on the south side of the Sacramento River. The riparian habitat on the south side of the river that would be removed for construction of the screen and forebay consists of a narrow band of scattered oak trees, shrubs, and non-native plants. This riparian habitat provides very limited habitat for wildlife. Riparian habitat on both sides of Red Bank Creek would be impacted by construction of the access bridge, the conveyance facility, and the screen and forebay. The larger area and greater plant and structural diversity of this riparian habitat provide moderate habitat value for riparian-associated wildlife.

In total this alternative would permanently or temporarily remove about 6.81 acres of riparian habitat. This loss of riparian habitat under this alternative would constitute a significant impact because riparian habitat is considered a sensitive natural community. For riparian-associated wildlife, the habitat that would be impacted provides low- to moderate-quality habitat. Because of the small amount of habitat that would be lost and its modest habitat value, the loss of the riparian habitat under this alternative would not significantly impact wildlife populations, migratory corridors, or nursery sites.

There would be no significant impacts on wildlife under Alternative 2B; however, under the criterion used, construction and operations of Alternative 2B would result in a significant impact to riparian habitat.

Impact 2B–BR2: Freshwater Marsh Habitat. The impacts on freshwater marsh habitat under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–BR2).

The impacts from construction and operations on freshwater marsh habit would be significant.

Impact 2B–BR3: Disturbed Habitat. The impacts on disturbed habitat under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–BR3).

The impacts from construction and operations on disturbed habitat would be less than significant; therefore, no mitigation is required.

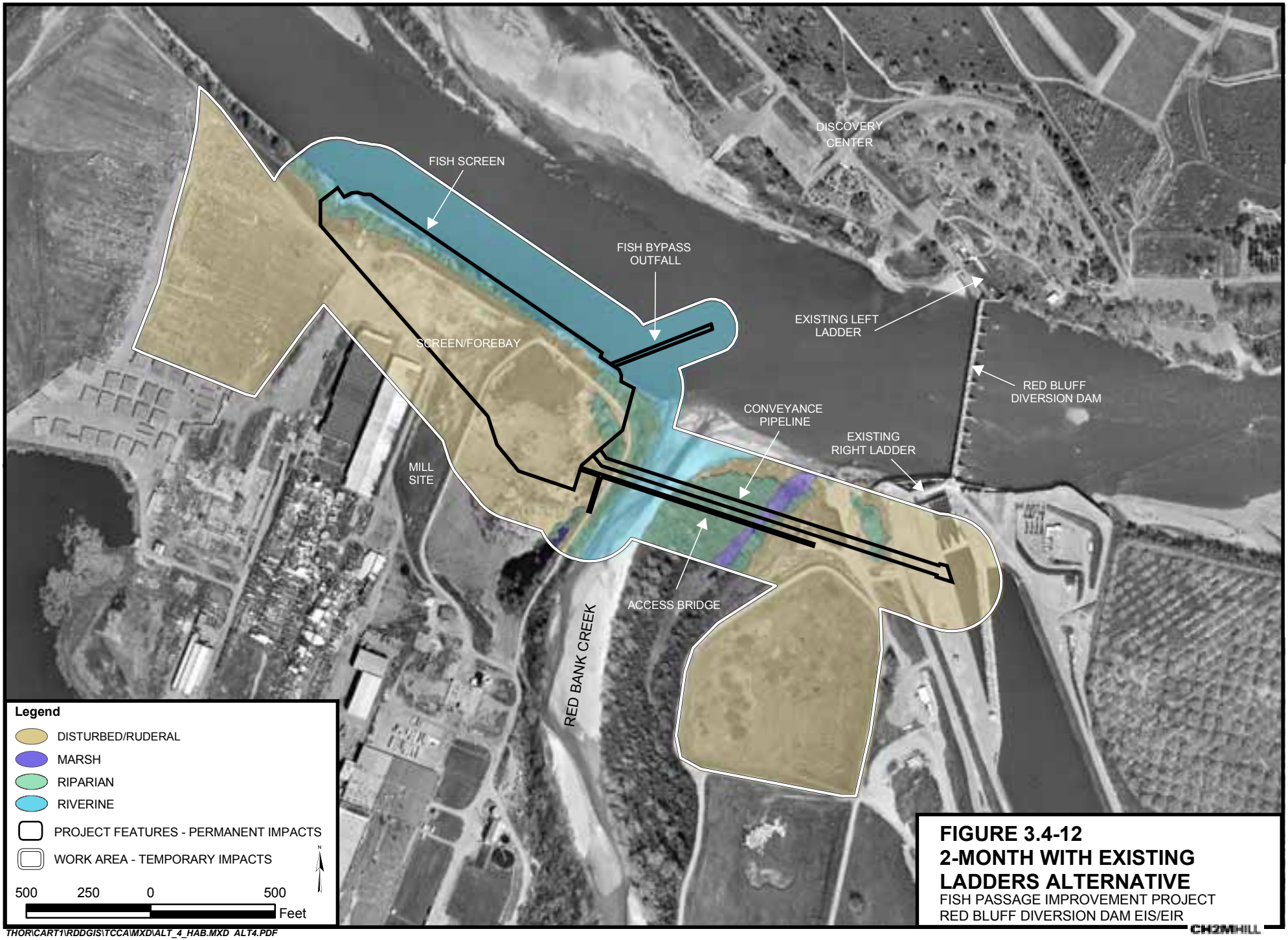

FIGURE 3.4-12
2-MONTH WITH EXISTING LADDERS ALTERNATIVE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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Impacts on Special-status Species. As described above, this alternative would result in only minor reductions in riparian and freshwater marsh habitat. Special-status species associated with riparian and freshwater marsh habitat and with the potential to occur in the project area are listed in Table 3.4-1. Because of the low quality and small amount of the habitat that would be impacted, the only significant impacts to special-status species from changes in habitat quality or amount would be to VELB, osprey, and special-status bats. The following information further describes the potential for impacts to federal- and state-listed species and evaluates other potential impacts to special-status species not captured by consideration of vegetation changes alone.

Impact 2B–BR4: Little Willow Flycatcher. Little willow flycatchers would only be expected to occur in the project area during spring and fall migrations. If they migrate through the project area, they would most likely use riparian habitat and potentially the mixed woodland habitat. Under this alternative, a small amount of riparian habitat would be impacted (2.05 acres permanently lost and 4.76 acres temporarily affected). Because of the small amount of riparian habitat that would be affected, its low quality for little willow flycatchers, and the low potential for use of the project area by little willow flycatchers, no significant impacts to little willow flycatchers would occur under this alternative.

The impacts from construction and operations on little willow flycatchers would be less than significant; therefore, no mitigation is required.

Impact 2B–BR5: Western Yellow-billed Cuckoo. Under this alternative, a small amount of riparian habitat would be impacted (2.05 acres permanently lost and 4.76 acres temporarily affected). This habitat is not suitable for nesting by western yellow-billed cuckoos but could be used sporadically by cuckoos during spring and fall migrations. Because of the small amount of riparian habitat that would be affected, its low quality for western yellow-billed cuckoos, and the low potential for use of the project area by western yellow-billed cuckoos, no significant impacts to western yellow-billed cuckoos would occur under this alternative.

The impacts from construction and operations on western yellow-billed cuckoos would be less than significant; therefore, no mitigation is required.

Impact 2B–BR6: Bald Eagle. The impacts on bald eagles under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–BR7).

The impacts from construction and operations on bald eagles would be less than significant; therefore, no mitigation is required.

Impact 2B–BR7: Swainson's Hawk. The impacts on Swainson's hawk under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–BR8).

The impacts from construction and operations on Swainson's hawks would be less than significant; therefore, no mitigation is required.

Impact 2B–BR8: Valley Elderberry Longhorn Beetle. VELB are entirely dependent on the elderberry shrub. Elderberry shrub surveys conducted in 2002, reported two shrubs in riparian and eight shrubs in ruderal habitat that would be affected by the impacts resulting from this alternative. Project impacts would occur to elderberry shrubs on the south side (river right) of the Sacramento River. Elderberry Shrubs E34 and E35 occur in riparian habitat near the Sacramento River within the 200-foot construction buffer zone of the proposed conveyance pipeline and the access bridge. No exit holes were observed in either plant. Shrubs E25, E28, E29, E30, E31, E32, and E33 occur in ruderal habitat. Shrub E25 occurs in the 200-foot construction buffer zone of the proposed screen/forebay. No exit holes were observed in the shrub. Shrubs E28 through E33 occur in the staging area south of the proposed conveyance pipeline. Multiple exit holes were observed in the shrubs in this area (refer to Table 3.4-2 and Figure 3.4-2). The elderberry shrubs identified in the project area are within the 200-foot buffer area considered to be temporarily impacted in this analysis. Because the shrubs do not occur in the footprint of the new facility, it could be possible to avoid them during construction activities. However, for this analysis, the worst-case scenario that the shrubs could not be avoided is assumed. Removal of the elderberry shrubs under this alternative has the potential to adversely affect the federal-listed VELB and is therefore, considered a significant impact.

The impacts from construction and operations on VELB would be significant.

Impact 2B–BR9: Peregrine Falcon. The impacts on peregrine falcon under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–BR10).

The impacts from construction and operations on peregrine falcons would be less than significant; therefore, no mitigation is required.


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Impacts on Other Special-status Species.

Impact 2B–BR10: Osprey. The impacts on osprey under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–BR11 and Figures 3.4-4 and 3.4-12).

The impacts from construction and operations on osprey would be significant.

Impact 2B–BR11: Bats. The impacts on bats under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–BR12).

The impacts from construction and operations on bats would be less than significant; therefore, no mitigation is required.

3: Gates-out Alternative

Impacts on Wildlife Habitat and Wildlife.

Impact 3–BR1: Riparian Habitat. Up to 6.81 acres of riparian habitat would be impacted under this alternative (Figure 3.4-13). The permanent loss of 2.05 acres of riparian habitat would occur with the permanent land conversion from installation of the access bridge, the conveyance pipeline, and the fish screen and forebay, all on the south side of the river. Up to an additional 4.76 acres of riparian habitat could be removed to accommodate construction activities. Following completion of construction, temporarily impacted areas of riparian habitat would be planted with native riparian trees and shrubs to restore the habitat.

Under this alternative, Lake Red Bluff would never be inundated. Over time, the areas currently seasonally inundated would become vegetated as plants colonize the areas. Where sufficient soil moisture is present, riparian vegetation would be expected to become established. In drier portions, annual grasses and forbs and more drought-tolerant shrubs would be expected to become established. Invasion by star thistle also is likely given the proximity of areas dominated by this species. Overall, with vegetation of the inundation zone, the amount of wildlife habitat would increase under this alternative. The ultimate value of the habitat would depend on the plant species composition as well as the type and magnitude of human activity in the area. No significant adverse impacts to wildlife habitat or wildlife associated with riparian vegetation adjacent to Lake Red Bluff and potential beneficial effects could result.

Riparian habitat that would be impacted under this alternative is predominantly located along Red Bank Creek, with small amounts on the south side of the Sacramento River. The riparian habitat on the south side of the river that would be removed for construction of the screen and forebay consists of a narrow band of scattered oak trees, shrubs, and non-native plants. This riparian habitat provides very limited habitat for wildlife. Riparian habitat on both sides of Red Bank Creek would be impacted by construction of the access bridge, the conveyance facility, and the screen and forebay. The larger area and greater plant and structural diversity of this riparian habitat provides moderate habitat value for riparian-associated wildlife.

In total, this alternative would permanently or temporarily remove about 6.81 acres of riparian habitat. This loss of riparian habitat under this alternative would constitute a significant impact because riparian

habitat is considered a sensitive natural community. For riparian-associated wildlife, the habitat that would be impacted provides low- to moderate-quality habitat. Because of the small amount of habitat that would be lost and its modest habitat value, the loss of the riparian habitat under this alternative would not significantly impact wildlife populations, migratory corridors, or nursery sites.

There would be no significant impacts on wildlife under Alternative 3; however, under the criterion used, construction and operations of Alternative 3 would result in a significant impact to riparian habitat.

Impact 3–BR2: Freshwater Marsh Habitat. The impacts on freshwater marsh habitat under Alternative 3 would be the same as under those identified for Alternative 1A (see Impact 1A–BR2).

The impacts from construction and operations on freshwater marsh habit would be significant.

Impact 3–BR3: Disturbed Habitat. The impacts on disturbed habitat under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–BR3).

The impacts from construction and operations on disturbed habitat would be less than significant; therefore, no mitigation is required.

Impacts on Special-status Species. As described above, this alternative would result in only minor reductions in riparian and freshwater marsh habitat. Special-status species associated with riparian and freshwater marsh habitat and with the potential to occur in the project area are listed in Table 3.4-1. Because of the low quality and small amount of the habitat that would be impacted, the only significant impacts to special-status species from changes in habitat quality or amount would be to VELB, osprey, and special-status bats. The following information further describes the potential for impacts to federal- and state-listed species and evaluates other potential impacts to special-status species not captured by consideration of vegetation changes alone.

Impact 3–BR4: Little Willow Flycatcher. The impacts on little willow flycatchers under Alternative 3 would be the same as those identified for Alternative 2B (see Impact 2B–BR4).

The impacts from construction and operations on little willow flycatchers would be less than significant; therefore, no mitigation is required.

Impact 3–BR5: Western Yellow-billed Cuckoo. The impacts on the western yellow-billed cuckoo under Alternative 3 would be the same as those identified for Alternative 2B (see Impact 2B–BR5).

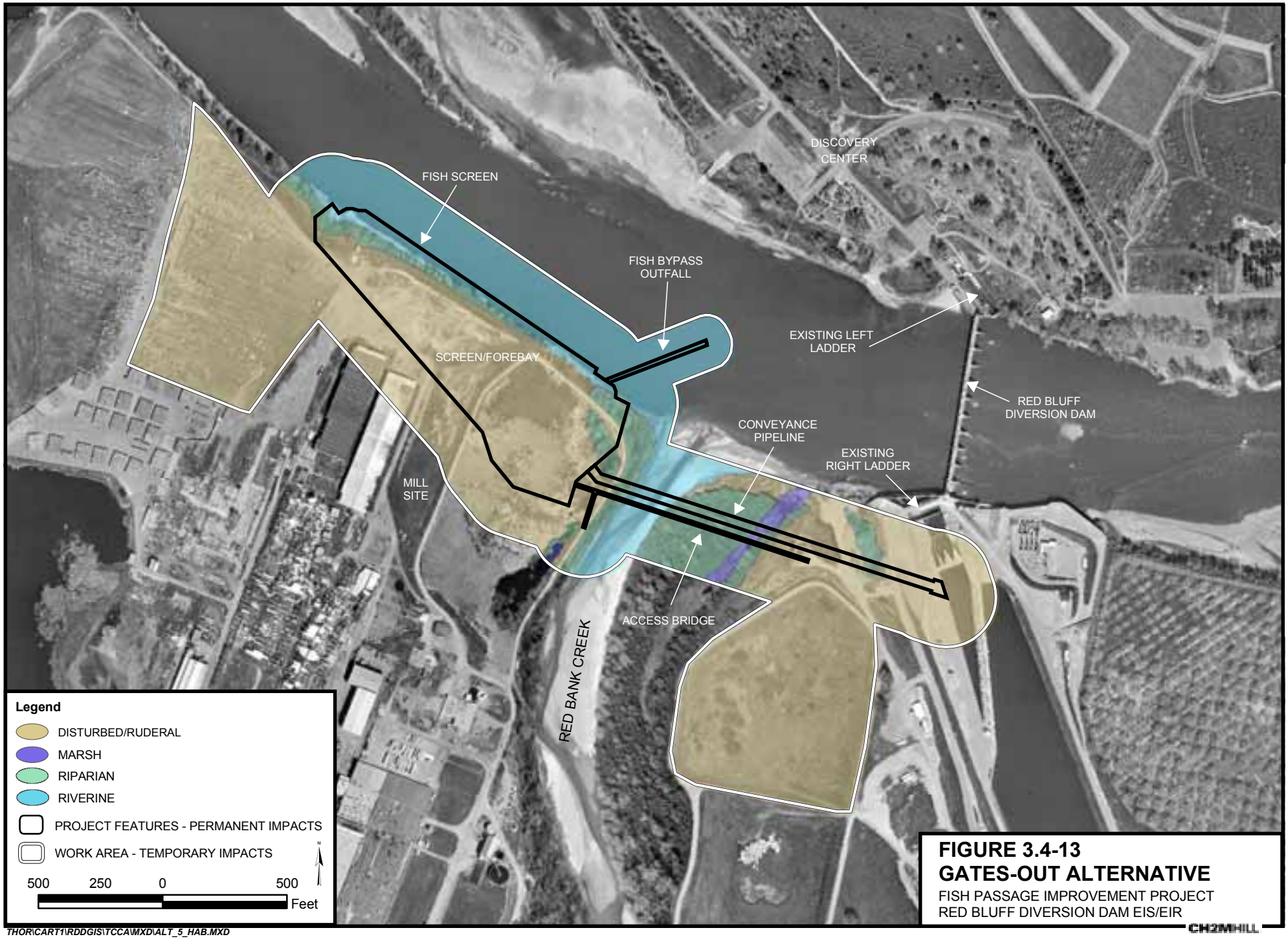

FIGURE 3.4-13
GATES-OUT ALTERNATIVE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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The impacts from construction and operations on western yellow-billed cuckoos would be less than significant; therefore, no mitigation is required.

Impact 3–BR6: Bald Eagle. The impacts on bald eagles under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–BR7).

The impacts from construction and operations on bald eagles would be less than significant; therefore, no mitigation is required.

Impact 3–BR7: Swainson's Hawk. The impacts on Swainson's hawk under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–BR8).

The impacts from construction and operations on Swainson's hawks would be less than significant; therefore, no mitigation is required.

Impact 3–BR8: Valley Elderberry Longhorn Beetle. VELB are entirely dependent on the elderberry shrub. Impacts occurring to elderberry shrubs under Alternative 3 would be the same as those identified for Alternative 2B (see Impact 2B–BR8).

The impacts from construction and operations on VELB would be significant.

Impact 3–BR9: Peregrine Falcon. The impacts on peregrine falcon under Alternative 3 would be the same as Alternative 1A (see Impact 1A-BR10).

The impacts from construction and operations on peregrine falcons would be less than significant; therefore, no mitigation is required.

Impacts on Other Special-status Species.

Impact 3–BR10: Osprey. The impacts on osprey under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–BR11 and Figures 3.4-4 and 3.4-13).

The impacts from construction and operations on osprey would be significant.

Impact 3–BR11: Bats. The impacts on bats under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–BR12).

The impacts from construction and operations on ***bats would be less than significant; therefore, no mitigation is required.***

3.4.3 Mitigation

This section discusses mitigations for each significant impact described in Environmental Consequences.

1A: 4-month Improved Ladder Alternative

Mitigation 1A–BR1: To the extent possible, areas of riparian vegetation temporarily disturbed during construction would be planted with native riparian trees and shrubs to restore the impacted habitat following construction.

The permanent removal of riparian vegetation would be mitigated by creating riparian habitat at a 3:1 ratio for the impacted acreage. The acreage of riparian habitat impacted would be derived from final design drawings. TCCA and USBR would work with CDFG and USFWS to identify appropriate locations for riparian habitat creation. With this mitigation, impacts to riparian habitat would be less than significant.

Mitigation 1A–BR2: To the extent possible, areas of freshwater marsh temporarily disturbed during construction would be planted with native freshwater marsh vegetation species to restore the impacted habitat following construction.

The permanent removal of freshwater marsh would be mitigated by creating freshwater marsh at a 3:1 ratio for the impacted acreage. The acreage of marsh habitat impacted would be determined using final design drawings. TCCA and USBR would work with CDFG and USFWS to identify appropriate locations for freshwater marsh creation. With this mitigation, impacts to freshwater marsh would be less than significant.

Mitigation 1A–BR9: TCCA and USBR would follow the USFWS (1999) Conservation Guidelines for VELB (Conservation Guidelines; see Appendix F) to avoid, minimize, and mitigate impacts to VELB. TCCA and USBR would attempt to avoid elderberry shrubs in locating staging areas, access roads and other construction areas. Shrubs that can be avoided would be fenced and posted, and workers would be educated about VELB in accordance with the Conservation Guidelines. If elderberry shrubs cannot be avoided, they would be transplanted, and additional seedlings would be planted at a secure mitigation site in accordance with the Conservation Guidelines. With this mitigation, impacts to VELB would be less than significant.

Mitigation 1A–BR11: Prior to the start of construction activities, the two platforms supporting osprey nesting would be removed. The platforms would be removed in winter, prior to initiation of nesting activities. TCCA and USBR would work with CDFG to identify nearby location(s) to erect two platforms to serve as replacement nesting sites. The relocated platforms would be installed concurrently with the removal of the existing platforms and be completed prior to the start of the nesting season.

Mitigation 1A–BR12.

Permanent Impacts: Exclusion and Building Removal. If the current project plans are modified and the buildings were to be demolished, impacts would be considered to be permanent and significant. Removal of the abandoned buildings would displace hundreds and possibly thousands of bats and be a significant loss of roosting habitat. Current information on numbers and species of bats present is preliminary; additional special-status species may be present. The species currently identified are colonial, and displacement from the roosts may disrupt colony cohesion. Displaced bats may roost in exposed locations and be at increased risk of predation.

If the buildings are to be removed, prior mitigation in the form of exclusion will be performed. Exclusion is the process of preventing the bats from occupying the roosts. Bat emergence is controlled, and re-entry is prevented by covering the roost entrance with draped netting. The netting is secured on the top and sides, and the bottom is left open. Bats are able to walk down the wall and underneath the netting to escape from the bottom but are usually unable to re-enter in this manner. One-way valves made of plastic pipe may also be used. Exclusion consists of two phases: allowing emergence while temporarily blocking re-entry for 1 week, followed by permanently blocking the roost entrances. Surveys must be conducted to ensure that all bats have exited the roost before the entrances are permanently blocked to avoid direct mortality by entombment. Screening and insulation material such as expanding foam are often used to permanently block roost entrances.

It is vital that exclusion only be performed in the winter (November through February) after any young of the year are mature. A qualified nuisance control professional should perform the exclusion. A qualified biologist should monitor the bats during the procedures to prevent any mortalities from bats becoming entangled in the netting, and to conduct surveys to ensure that bats are successfully excluded. With these mitigation measures, impacts to bats would be less than significant.

Permanent Impacts: Provision of Alternate Roosting Habitat. To mitigate for the loss of roosting habitat, provision of alternate roosting habitat in the form of offsite installation of large bat houses is recommended. Large bat houses (bat condos) may be erected. Bat condos should be constructed so that roosting habitat is replaced at approximately a 1:1 ratio. The Recreation Area would be a good bat house construction site, since the managers are already promoting the presence of bats in recognition of the bat's beneficial role in insect pest management. Bat condos have been successful artificial roosts for large numbers of Mexican free-tail bats.

Bat condos are similar to raised wooden chicken coops with internal partitions to form roost crevices. The overall size should be 8 x 8 x 8 feet,

and the width of the internal partitions should be approximately 0.75 to 1.0 inch for the free-tail bats and also 1.0 to 1.5 inch for the pallid bats. Bat condos should be oriented properly (usually southern or southeastern exposure), and the temperature regime and humidity inside the condo should replicate that found in the original roosts.

It is recommended that the existing exterior wall of the abandoned storage building located at the Mill Site with the plywood-backed louvers be reconstructed in a suitable offsite location to provide for myotis bat roosting habitat. Alternately, bat houses mounted on poles may be erected that simulate the existing roost (the gap under the loose board attached to a pole). Managers at the Recreation Area are currently experimenting with bat house style and placement and may provide a cooperative bat management opportunity. With these mitigation measures, impacts to bats would be less than significant.

1B: 4-month Bypass Alternative

Mitigation 1B–BR1. See Mitigation 1A–BR1.

Mitigation 1B–BR2. See Mitigation 1A–BR2.

Mitigation 1B–BR4. To the extent possible, areas of restored habitat temporarily disturbed during construction would be planted with similar trees and shrubs to restore the impacted habitat following construction.

The permanent removal of restored habitat would be mitigated by creating restored habitat at a 3:1 ratio for the impacted acreage. The acreage of restored habitat impacted would be derived from final design drawings. TCCA and USBR would work with CDFG and USFWS to identify appropriate locations for restored habitat. The created habitat would be protected and maintained in perpetuity. With this mitigation, the impacts to restored habitat would be less than significant.

Mitigation 1B–BR11. See Mitigation 1A–BR9.

Mitigation 1B–BR13. See Mitigation 1A–BR11.

Mitigation 1B–BR14. See Mitigation 1A–BR12.

2A: 2-month Improved Ladder Alternative

Mitigation 2A–BR1. See Mitigation 1A–BR1.

Mitigation 2A–BR2. See Mitigation 1A–BR2.

Mitigation 2A–BR9. See Mitigation 1A–BR9.

Mitigation 2A–BR11. See Mitigation 1A–BR11.

Mitigation 2A–BR12. See Mitigation 1A–BR12.

2B: 2-month with Existing Ladders Alternative

Mitigation 2B–BR1. See Mitigation 1A–BR1.

Mitigation 2B–BR2. See Mitigation 1A–BR2.

Mitigation 2B–BR8. See Mitigation 1A–BR9.

Mitigation 2B–BR10. See Mitigation 1A–BR12.

3: Gates-out Alternatives

Mitigation 3–BR1. See Mitigation 1A–BR1.

Mitigation 3–BR2. See Mitigation 1A–BR2.

Mitigation 3–BR8. See Mitigation 1A–BR9.

Mitigation 3–BR10. See Mitigation 1A–BR11.

Mitigation 3–BR11. See Mitigation 1A–BR12.

3.5 Recreation

Potential project impacts to the recreational opportunities, activities, and facilities of the project area were identified as a key concern of project stakeholders. Changes to recreation opportunities resulting from the proposed project alternatives were analyzed to determine the extent to which impacts may exist. While the project area is limited to RBDD and the Mill Site, the facilities examined in the physical recreational analysis are broader extending along the Sacramento River from RBDD, north to Ide Adobe State Historic Park. Potential impacts beyond physical recreational activities, facilities, and events are analyzed in other sections of this DEIS/EIR.

3.5.1 Affected Environment

Tehama County and the City of Red Bluff are home to a variety of recreational facilities and activities. Popular forms of recreation in the vicinity of the proposed project area include fishing, boating, biking, and hiking.

Popular forms of recreation in the vicinity of the proposed project area include fishing, boating, biking, and hiking.

Recreation activities at area facilities vary depending on the time of year and formal events or holidays. According to a study by California State University, Chico, approximately 64,000 individuals recreated in the project vicinity, in and along the Sacramento River from RBDD to Ide Adobe State Historic Park during 1995. Most used one of three locations: River Park (also known as City Park), Ide Adobe State Historic Park, and the boat launch ramp area at the Recreation Area south of RBDD. Figure 3.5-1 provides a summary of the estimated monthly user days (individuals counted) in the project area during 1995.

More than half the individuals counted in the survey recreated in the area during the summer months between May and September. This time frame also correlates to the current gates-in period of the dam, resulting in the creation of Lake Red Bluff. The lake forms on the north side of RBDD and extends along the Sacramento River and East Sand Slough approximately 4 miles north of the dam. Lake Red Bluff has approximately 15 miles of shoreline. Two public boat launches and boat docks, two private boat launches and boat docks, along with approximately 21 residential boat docks are located along the shore of Lake Red Bluff in the project vicinity.

More than 32,000 individuals surveyed recreated in the area during the summer months between May and September.

Special holidays and well-attended activities result in increased recreation patronage during the summer; these include the annual July 4th fireworks celebration at River Park and the Nitro National Drag Boat Festival on Memorial Day weekend.

Many recreational uses in the project vicinity occur along the east/northeast bank of the Sacramento River in the Recreation Area (Recreation Area). Boat launches, a fish-viewing and educational

facility, camping facilities, picnicking facilities, and the Discovery Center are all located within the Recreation Area. Figure 3.5-2 shows the different recreational facilities adjacent to the project area. The primary activities of those individuals recreating in the project's vicinity follow:

1. Spending time in a park
2. Boating
3. Walking
4. Fishing from shore/boat
5. Swimming
6. Water skiing
7. Parking in lots at the parks/boat ramp
8. Jet skiing

Figures 3.5-3 and 3.5-4 display the estimated user days and estimated percent of user days by activity.

Parks/Recreational Facilities Inventory

In an effort to create a comprehensive setting for the recreational analysis, the following inventory of parks and recreational facilities has been completed.

Lake Red Bluff. Lake Red Bluff is formed during the RBDD gates-in period. The lake and its 15 miles of shoreline provide flat water boating, fishing, water skiing, swimming in East Sand Slough, drag boat racing, and various lake-oriented recreational opportunities.

Public boat access to the lake is available through two public boat launches – one located at the Recreation Area (Discovery Center parking lot) and one at River Park. One private boat launch is located on the north end of the Recreation Area and one at the Red Bluff Elks Club. Numerous private boat docks are located at residences adjacent to the lake and the Red Bluff Elks Club. Public boat docks are also located at River Park and Ide Adobe State Historic Park. Most boat docks are typically unusable during the gates-out period when the lake recedes and the docks are adjacent to dry land.

Sacramento River. The bluffs adjacent to the Sacramento River gave the City of Red Bluff its name. The Sacramento River originates near Mt. Shasta, flowing between the Cascade and Sierra Nevada ranges through the City of Red Bluff and the Central Valley, finally dispersing at the Delta and into northern San Francisco Bay. The Sacramento River provides extensive, year-round recreational opportunities above and below RBDD. In-river and riverbank fly fishing and conventional fishing are popular activities. Steelhead, fall-run salmon, trout, and shad are abundant at various times of the year. Striped bass can be caught downstream of RBDD. The Sacramento River offers year-round boating and jet skiing in the vicinity of RBDD. The Sacramento River is accessible by

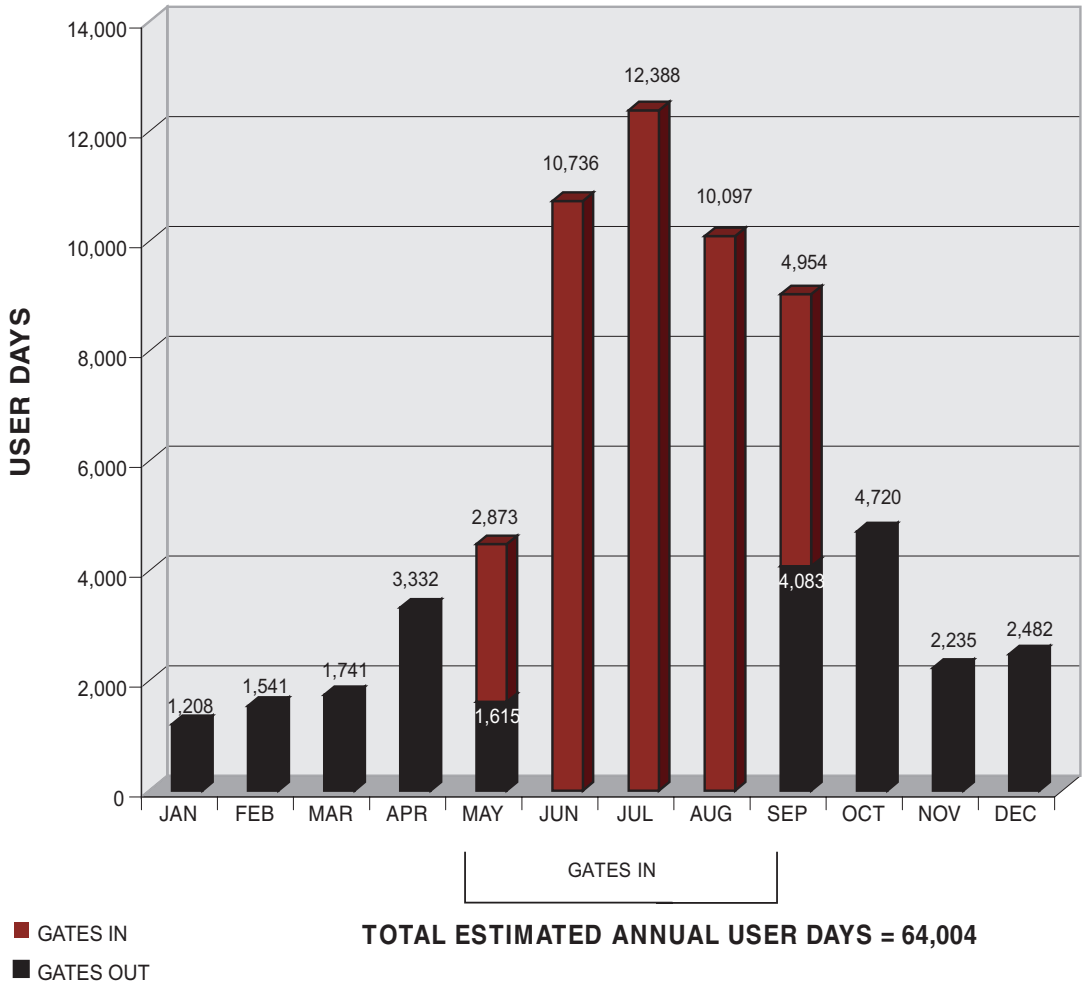

FIGURE 3.5-1
ESTIMATED MONTHLY USER DAYS
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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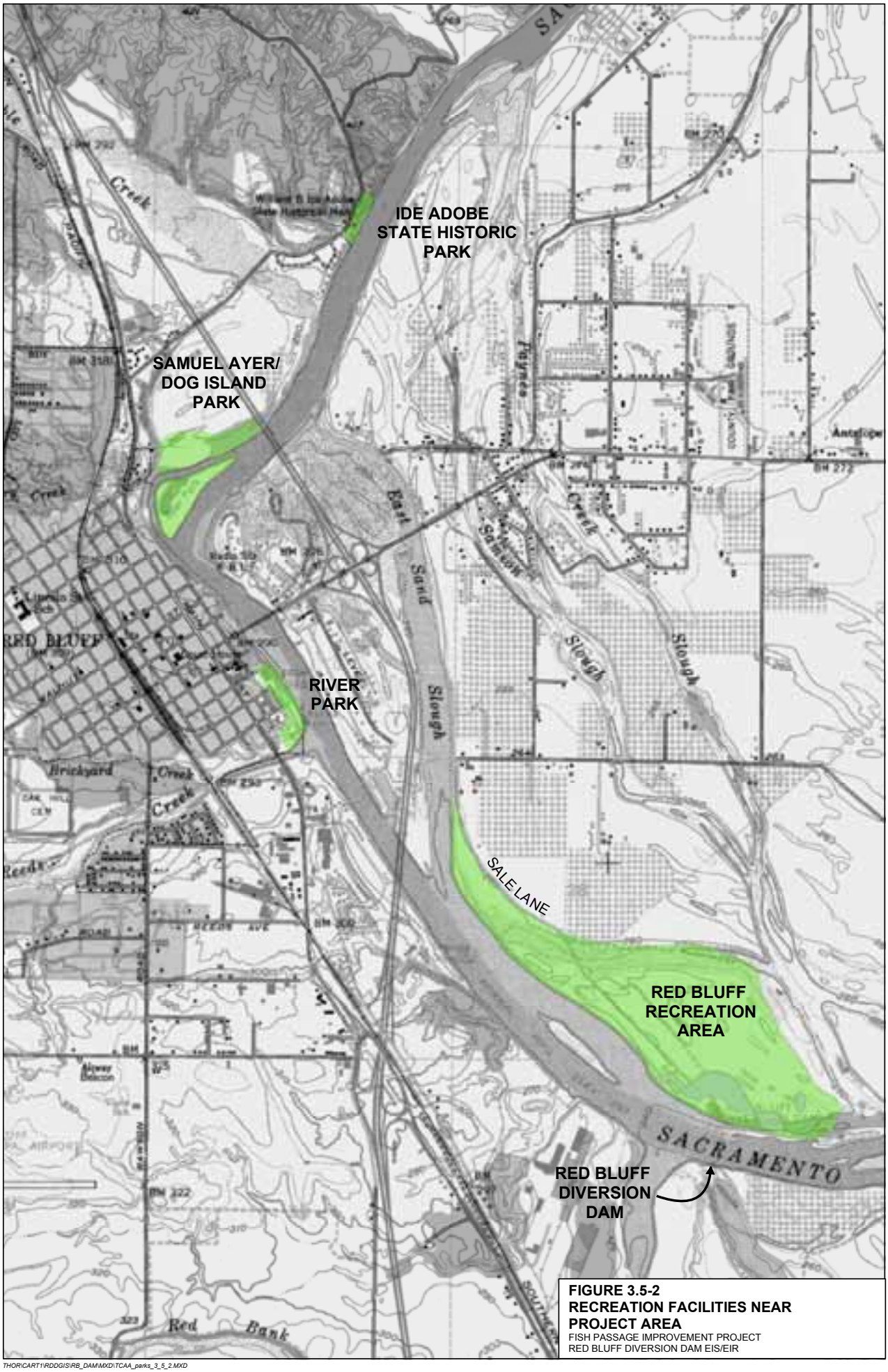

FIGURE 3.5-2
RECREATION FACILITIES NEAR PROJECT AREA
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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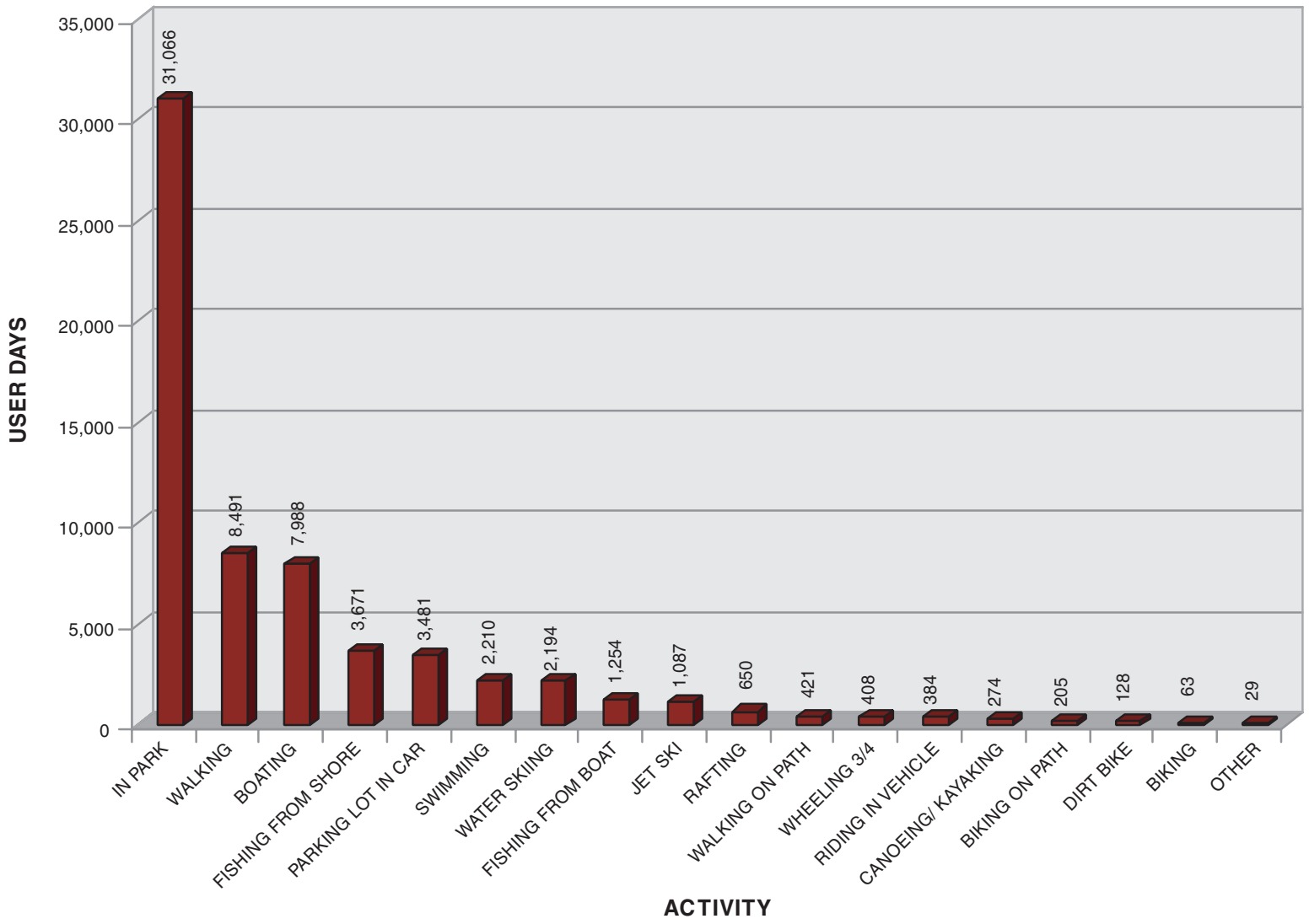

FIGURE 3.5-3
ESTIMATED ANNUAL USER DAYS BY ACTIVITY
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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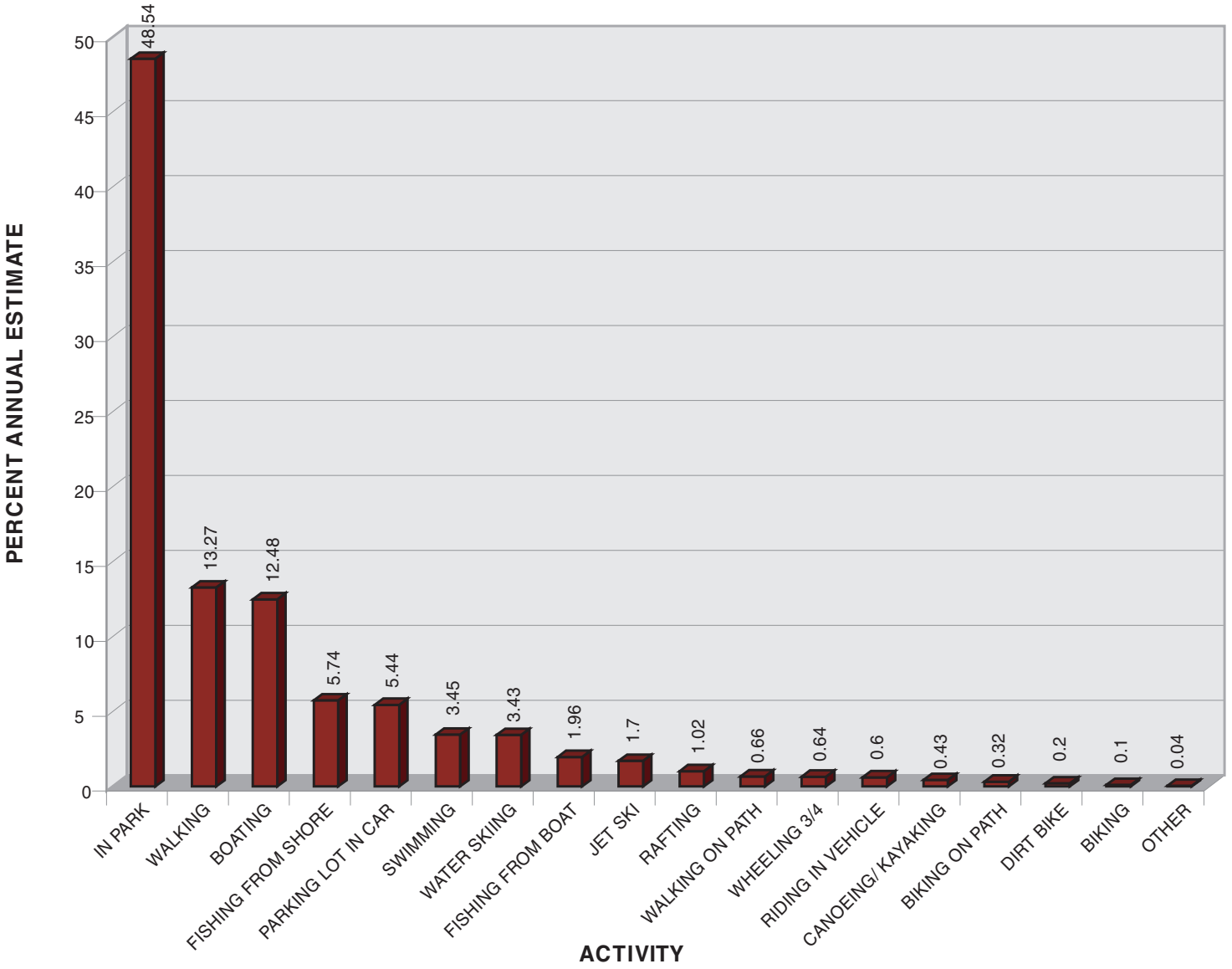

FIGURE 3.5-4
ESTIMATED ANNUAL PERCENTAGE OF USER DAYS BY ACTIVITY
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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two public boat launches in the Recreation Area. Several private residences have adjacent river access as well.

Red Bluff Recreation Area. The Recreation Area comprises 488 acres of public land located east of the dam. The Recreation Area can be accessed by Sale Lane. The Recreation Area provides a wide range of facilities for local and out-of-town users. These facilities include picnic areas with tables, walking and biking trails, camping facilities, nature trails, and wildlife- and fish-viewing areas and facilities. The trails located within the recreation area have been officially designated as a Watchable Wildlife Area. Two public boat launches are located in the Recreation Area: one in the Discovery Center parking lot and one below RBDD on the river's left bank.

Located on the left bank of RBDD within the recreation area is a salmon-viewing plaza. The plaza provides viewing, via TV monitors, of salmon as they work their way through the fish ladders. The plaza is open daily for viewing during the gates-in period.

The Monarch Learning Center is located past the Sycamore Grove parking area. Banquet and gathering facilities are available for day and overnight users. Figure 3.5-5 provides a map of the Recreation Area facilities.

Sycamore Grove Campground. Located in the Recreation Area, this campground includes 30 overnight campsites, eight picnic sites, fire rings, shower/restroom facilities, drinking water, parking for 48 vehicles with boat trailers, Sacramento River boat ramp, and access to the Recreation Area amenities. The campground is open from April to November of each year, with highest use occurring during the summer months.

Camp Discovery at Lake Red Bluff. Located in the Recreation Area, this is a group campground with a maximum capacity of 100 people. The facilities include 30 picnic shelters, grills, shower/vault restroom facilities, six cabins, and an amphitheater with a fire pit. Camp Discovery is available by reservation from April to November of each year.

Sacramento River Discovery Center. The Discovery Center is located in the Recreation Area. This center provides visitors with educational information about the Sacramento River. This center features walking trails through native riparian forests, grasslands, wetlands, and oak woodlands; demonstration agricultural sites; and a temporary modular building that hosts an environmentally focused charter school, as well as scheduled programs and events.

Elks Club Site. The Elks Club Lodge is located on the east shore of the Sacramento River/Lake Red Bluff approximately 1.5 miles north of the

project area. The Elks Club site includes a boat moorage and boat launch.

River Park. The park is located approximately 2 miles north of RBDD, adjacent to the river. The Chamber of Commerce building is situated at the main entrance to the park.

The park is bounded by River Park Way to the south, Riverside Way to the west, and the Sacramento River to the north. Riverside Way extends through the length of the park, providing parking in designated areas. River Park Way provides access to a boat launch and marina area. Reeds Creek empties into the river just south of the park near the boat launch. The River Park contains playground facilities, picnicking facilities, and a boat launch.

Samuel Ayer/Dog Island Park. Samuel Ayer/Dog Island Park is located on the river, just west of Interstate 5. This park exists mainly as an island on the river, with a channel flowing around the outside, and is used primarily for walking and wildlife viewing. A footbridge off of the parking lot allows users to cross over to the park. The channel is empty during gates-out times, and full during the times when the gates are in and during a flood.

Ide Adobe State Historic Park. This 3-acre park and adobe exhibit are bounded by Adobe Road and the Sacramento River. An adobe smoke-house, carriage shed, and a small corral are situated on the park grounds. Access to the river is limited to a wooden deck and platform. Although the river abuts the park, it is not the focal point of the park's existence.

Other Recreation Opportunities

Three lakes/reservoirs are located within approximately 1 hour driving distance of the City of Red Bluff. These facilities offer similar recreational activities and facilities as Lake Red Bluff.

Black Butte Reservoir. Black Butte Reservoir was formed in 1963 upon the completion of Black Butte Dam. Located on Stony Creek west of Orland, the lake is on the west side of the Sacramento Valley. When full, the lake has a surface area of 4,460 acres, is 7 miles long, and has a shoreline of 40 miles. The dam provides flood damage protection for local towns and agricultural lands. The reservoir is approximately 32 miles southwest of Red Bluff. Black Butte provides recreational opportunities for fishing, swimming, motor boating, water skiing, all-terrain vehicle trails, hunting (designated areas), and camping. Black Butte Reservoir has available two camping areas with 100 campsites total.

FIGURE 3.5-5
RED BLUFF RECREATION AREA FACILITIES
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

Shasta Lake. Shasta Lake reservoir, formed by Shasta Dam, is located within the Whiskeytown-Shasta-Trinity National Recreation Area. The reservoir's shoreline extends 370 miles. Shasta Lake is approximately 41 miles driving distance from the City of Red Bluff. Popular recreation activities include boating, lake and shoreline fishing, water skiing, camping, wildlife viewing, hiking, swimming, picnicking, and off-road vehicle use. Nineteen developed camp areas with 259 total campsites are available. Many camp areas include restroom and shower facilities, and four provide boat access. Eleven marinas and seven public boat launches surround Lake Shasta.

Whiskeytown Lake. The Whiskeytown-Shasta-Trinity National Recreation Area encompasses Whiskeytown Lake. Whiskeytown Lake is a human-made reservoir formed by diverting water through tunnels from the Trinity River basin and capturing Clear Creek flow. Whiskeytown Lake is approximately 37 miles driving distance from the City of Red Bluff. The reservoir includes 36 miles of shoreline and 3,200 acres of surface water area. Significant recreation opportunities at Whiskeytown Lake include swimming, fishing, scuba diving, wildlife viewing, and boating. A group picnic area with three available sites and three lakeside camp areas are available with multiple campsites.

River/Lake Recreational Activities

In an effort to create a comprehensive setting for the recreational analysis, an inventory of river/lake recreational activities was completed and is presented below.

Spending Time in a Park – The majority of those who recreate in the project area enjoy spending leisure time at a park or attending a special event hosted in an area park.

River/Lake Fishing – Year-round fly fishing and conventional fishing in and along the Sacramento River is available. Various fish species are abundant at different times during the year including steelhead, fall-run salmon, trout, and shad. Striped bass can be caught downstream of RBDD.

Boating – Non-mechanical boating and motorized boating are available on the river/lake. Motor boating is possible during both the gates-in and gates-out periods; however, water level may be a factor. Motorized boats pass through the open dam gates during the gates-out period, but these boats are typically designed for shallow river conditions. During the gates-in period, boats cannot pass the dam and must take out and be re-launched beyond the dam.

Kayaking and Canoeing – The river/lake is suitable for kayaking and canoeing. When the dam gates are lowered, boaters cannot safely pass RBDD and must walk their boats around this obstacle. Boaters typically

portage approximately 150 feet upstream from the dam using a boat ramp in the Recreation Area.

Walking/Hiking – Formal and informal walking and hiking trails are frequented at the local parks, Recreation Area, and along East Sand Slough during the gates-out period.

Swimming – Swimming is available near RBDD, in the Recreation Area, and East Sand Slough during the gates-in period. However, with the exception of the shallower East Sand Slough, the water temperatures are too cold for most swimmers.

Water Skiing – Water skiing occurs during the summer months gates-in period with the formation of Lake Red Bluff. A local water skiing club primarily operates near RBDD and in the East Sand Slough area.

Parking in Lots at the Parks/Boat Ramp Area – Parking, relaxing, and enjoying the surroundings is a popular activity at area parks and in the lots adjacent to the Discovery Center and River Park.

Picnicking – Picnicking is popular among groups at area parks and the Recreation Area. Picnic areas with grills and fire pits are available at the Recreation Area, Ide Adobe State Historic Park, and River Park.

Jet Skiing – Use of personal watercraft is available during both the gates-out and gates-in periods, with appropriate water levels. During the gates-in period, personal watercraft cannot pass the dam and must take out and be re-launched beyond the dam.

Bird Watching – The trails of the Recreation Area provide viewpoints for bald eagles, golden eagles, and flocks of bandtailed pigeons.

Wildlife/Salmon Viewing – The trails located within the Recreation Area have been officially designated as a Watchable Wildlife Area. A plaza provides viewing, via underwater TV monitors and direct viewing of the left bank ladder, of salmon as they work their way through the fish ladders. The plaza is open daily for viewing during the gates-in period.

Biking – Formal biking trails exist at the Samuel Ayers/Dog Island Park and the Recreation Area.

Camping – Sycamore Grove Campground at the Recreation Area provides tent and RV camping sites with fire pits along the shore of the river/lake.

Special Events

Several special events are held throughout the year at different recreational facilities in the project's vicinity. These events attract a high proportion of the total number of people who use area recreation facilities annually.

Drag Boat Races. Lake Red Bluff annually hosts the Nitro National Drag Boat Festival during Memorial Day weekend. The annual event is sponsored by the Red Bluff Chamber of Commerce in conjunction with various businesses and is organized by A&J Events. The boat drag race is a sanctioned event by the International Hot Boat Association and Columbia Drag Boat Association. The total event purse is $50,000. The event is nationally televised on The Nashville Network (TNN). The event includes over 100 hydro race boats racing short distances through East Sand Slough and Lake Red Bluff, south toward RBDD. Ticketed spectators line the shores and enjoy the event from boats on Lake Red Bluff.

According to a 1999 report completed by A&J Events, a total of 18,780 spectators, participants, and volunteers attended the weekend event (8,610 attendees Saturday; 10,170 attendees Sunday). Local attendees from Red Bluff, Chico, and Redding accounted for an average of 42 percent of the spectators in attendance at the 1999 event, with the remaining 58 percent coming from other locations. The 1999 report estimates that the 1999 drag boat races introduced approximately $1.9 million into the local economy. The event organizer estimated 25,000 spectators would attend the 2002 event.

4th of July - Fireworks. The Red Bluff Fire Department sponsors an annual fireworks event from River Park. This annual event is one of the most well attended events. The Red Bluff Fire Department estimates that approximately 1,500 people congregate in River Park for the annual fireworks display. Other groups gather at various locations throughout the City to view the display.

Ide Adobe Day. Ide Adobe Day occurs in August of each year at the Ide Adobe Historic Park to honor California's history and William B. Ide.

Annual Tour of Tehama Family Bike Ride. The annual tour of Tehama family bike ride begins at River Park; this bike ride supports local charities.

3.5.2 Environmental Consequences

Methodology

The following techniques were used to evaluate impacts on recreational users and facilities:

- Reviewing appropriate sections of the Tehama County General Plan, City of Red Bluff General Plan, and the Lake Red Bluff Recreation Development Final EIS (Lake Red Bluff FEIS) regarding future recreation and recreational facilities.
- Defining and documenting the existing recreational opportunities using information from the following sources:

  - Local citizens, environmental groups, recreational organizations, the project's SWG, the City of Red Bluff, and the Red Bluff Chamber of Commerce.
  - Surveys of recreational use including: The Red Bluff Diversion Dam Area Recreational Use Study (Guthrie et al., 1996) and prior studies conducted by the California Department of Water Resources (Cartier, 1982; Hinton et al., 1979).
  - The Lake Red Bluff FEIS (USDA/USFS, 1991).
  - Extensive literature searches and onsite observations.
- Documenting potential alternative recreational opportunities within the region.
- Analyzing the potential impacts including the long-term loss or displacement of a popular activity or facility without alternate opportunities in the region.
- Determining potential mitigation for all significant impacts.

Significance Criteria

Significance criteria represent the thresholds that were used to identify whether an impact would be potentially significant. These criteria are based on Appendix G of the *CEQA Guidelines* and professional judgment.

Impacts on recreation would be significant if they would result in any of the following:

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated.
- Recreational facilities or construction or expansion of recreational facilities that might have an adverse physical effect on the environment.
- Substantial permanent elimination of established recreational opportunities that are the focus of regional use (i.e., used by a significant portion of the population within an area).

Construction Impacts Common to All "Action/Build" Alternatives. All alternatives requiring construction would generate visual impacts, dust emissions, and noise, which affect the quality of recreational activities. Where possible, these construction impacts would be offset by implementing mitigation measures outlined in the Visual Resources, Air Quality, and Noise sections of this document.

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4–month Improved Ladder Alternative

Construction-related Impacts.

Impact 1A–R1: New Pump Station, Left Bank Fish Ladder, and Right Bank Fish Ladder. Temporary impacts would be limited to construction of the new pump station, left bank fish ladder, and right bank fish ladder. The Mill Site location of the new pump station is unoccupied and not publicly accessible for recreation. Limited impacts to camping, boating, and in-river/lake recreation may occur as a result of temporary pile driving, potential use of a construction barge, and use of a 1,400-LF cofferdam in the pump station and forebay construction. The right bank fish ladder is not publicly accessible and is located adjacent to the USBR offices at RBDD. Construction of the left bank fish ladder would be scheduled during the gates-out period and would thus avoid temporary impacts to the salmon-viewing platform (active only during the gates-in period).

The impacts from construction on recreational resources could be minimal, temporary, and less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1A–R2: Mill Site Pumping Station. Gate operations of the dam would not change compared to existing conditions. The gates-in period from May 15 through September 15 would result in the continued creation of Lake Red Bluff each year. Operation of the newly constructed pumping station at the Mill Site would not impact recreational activities. There is no public access to the Mill Site for recreation purposes.

The impacts from operations on recreational resources would be less than significant; therefore, no mitigation is required.

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impact 1B–R1: New Pump Station, Right Bank Fish Ladder, Conveyance Facility, and Bypass Channel. Temporary impacts would exist with the construction of the new pump station, right bank fish ladder, conveyance facility, and the bypass channel. The construction-related impacts associated with Alternative 1B include all impacts identified for Alternative 1A (Impact 1A–R1) and those noted below.

Temporary impacts from construction of the bypass channel include:

- Extensive excavation and earthmoving equipment within the Recreation Area.
- Limited access to the Discovery Center/Charter School.
- Limited access to the USFS/Sycamore Grove Campground.
- The relocation of Sale Lane and the USFS/Sycamore Grove Campground Road.
- Removal of approximately 10 camping spaces at the Sycamore Grove Campground.
- Construction-related traffic increase on Sale Lane.
- Construction of an access bridge over the bypass channel.
- Construction of security fencing around the bypass channel.
- Loss of restored riparian woodlands for recreation and educational/interpretative uses in the Recreation Area.
- Limited pedestrian and cycling access along the river/lake's edge near the Discovery Center and RBDD.

Overall construction impacts would considerably impact the experience of visitors to the Recreation Area. Those using the Sycamore Grove Campground would be most impacted by construction activities, noise, and general loss of outdoor recreation experience while camping.

The impacts from recreational resources would be significant and unavoidable.

Operations-related Impacts.

Impact 1B–R2: Mill Site Pumping Station and Bypass Channel. Gate operations of the dam would not change compared to the existing conditions. The gates-in period from May 15 through September 15 would result in the continued creation of Lake Red Bluff each year. Operation of the newly constructed pumping station at the Mill Site would not impact recreational activities. There is no public access to the Mill Site for recreation purposes.

The Recreation Area would be directly impacted by the alignment of the bypass channel bisecting a portion of the property. The 1991 Lake Red Bluff FEIS recognized that the use of Lake Red Bluff and RBDD could change (USDA/USFS, 1991). This study states:

> *All development investments will be designed and coordinated considering the possibility of no lake on the site. Any developments which are strictly lake dependent will be scheduled to coincide with the outcome of the fish passage decision.*

From the analyses in the Lake Red Bluff FEIS, it does not appear that a bypass facility on recreation area property was considered at the time of this study. Therefore, development of the recreation area has occurred in the path of the proposed bypass channel. Construction of the bypass channel through this area would significantly change the natural setting and degrade the quality of the outdoor experience desired of visitors to the recreation area, specifically the adjacent Sycamore Grove Campground.

The construction and operations of the bypass channel would result in the following:

- Loss of restored riparian woodlands for recreation and educational/ interpretative uses in the Recreation Area.
- Creation of a physical barrier between the Sacramento River Discovery Center/Charter School, Sycamore Grove Campground, and the remainder of the Recreation Area.
- Loss of 10 camping spaces at Sycamore Grove Campground.
- Construction of security fencing around the bypass channel impacting the experience of visitors to the Recreation Area.
- Pedestrian and cycling access between the portions of the Recreation Area separated by the bypass channel would be limited to two crossings–one adjacent to a new bridge on Sale Lane crossing the channel and the second a footbridge east of the current Sycamore Grove campsites.

Bypass construction would significantly impact the Sycamore Grove Campground and the outdoor recreational experience of campers. The campground would be bisected with a human-made channel structure, eliminating campsites and separating a portion of the recreation area.

Realignment of Sale Lane and the construction of auto, pedestrian, and cyclist access across the bypass channel would help to reduce some impacts. However, the associated loss of riparian woodlands for educational/interpretive uses is in conflict with the Lake Red Bluff FEIS. The Lake Red Bluff FEIS stresses the importance of recreational uses in concert with the restoration of riparian habitat and public education of the area's natural environment.

The impacts from recreational resources would be significant and unavoidable.

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impact 2A–R1: New Pump Station, Left Bank Fish Ladder, and Right Bank Fish Ladder. Temporary impacts would be limited to construction of the new pump station, left bank fish ladder, and right bank fish ladder. The construction-related impacts associated with Alternative 2A include all impacts identified for Alternative 1A (see Impact 1A–R1).

The impacts from construction operations on recreational resources would be minimal, temporary, and less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2A–R2: Adjusted Gates-in Period. Gate operations of the dam would be adjusted to a gates-in period from July 1 to August 31 annually. Therefore, Lake Red Bluff-related recreational activities would be limited to 2 months annually. Many recreational impacts are offset by the fact that the Sacramento River provides various types of recreational opportunities above and below RBDD, such as fishing, boating, camping, bird watching, and kayaking, independent of Lake Red Bluff.

According to a study by California State University, Chico, approximately 48 percent of the people who recreate in the vicinity of the project use parks adjacent to the river/lake and do not use the river/lake directly.

Several other comparable lake facilities exist within the region that may serve to offset operations impacts. From the City of Red Bluff, Black Butte Reservoir is 32 miles; Whiskeytown Lake is 37 miles; and Shasta Lake is 41 miles. These lakes and their surrounding recreation areas provide alternative boating, swimming, water skiing, jet skiing, and other on-lake recreation. These facilities could accommodate those users who can no longer practice lake-dependent recreation activities an additional 2 months of the year, albeit at a distance farther from Red Bluff. Thus, from a regional perspective, the potential loss of Lake Red Bluff is relatively small. On a local level, the loss of Lake Red Bluff is more substantial.

One of the main objectives of the proposed project is to improve the long-term ability to reliably pass anadromous fish and other species of concern past RBDD. It is possible that this project, in conjunction with other restoration projects in the basin, could result in increased populations of fish. If such improvement occurs, increased fish populations could result in enhanced recreational activities including fishing, river guiding, and wildlife/fish viewing. The analysis presented in Section 3.2, Fishery Resources, indicates the greatest improvement in fish passage would be Alternatives 2A, 2B, and 3, with marginal improvement under Alternatives 1A and 1B. Alternatives 2A, 2B, and 3, therefore, have the greatest potential for increasing populations of

sportfish in the vicinity of RBDD. Such increases could improve recreational opportunities in the region.

Other recreational activities would experience limitations associated with the loss of Lake Red Bluff for 2 additional months, including:

- Motor boating
- Jet skiing
- Swimming
- Water skiing
- Boat racing

While recreational motor boating and jet skiing are possible on the Sacramento River during the gates-out period, the available water area is considerably reduced for the two additional gates-out months. Therefore, less time is available for these activities. Swimming is possible but unlikely in the cold Sacramento River water. Boat racing and water skiing are not feasible during the additional 2-month gates-out period.

Table 3.5-1 provides estimates regarding the number of estimated user days lost by adjusting the gate operations to a gates-in period from July 1 to August 31. The data is based on 1995 California State University, Chico, Red Bluff Diversion Dam Recreational Use Study information. The estimate provides a comparison of user days during the gates-in period for May, June, and September compared with the estimated user days if the gates were removed during this same time. The difference in these numbers is the estimated user days lost by implementing this alternative.

Gates-in User Days for May, Jun, & Sep - Estimated Gates-out User Days for May, Jun, & Sep = Estimated User Days Lost

This assumption is very conservative. Boating, jet skiing, and swimming are not eliminated during the gates-out period, but limited. Similar drag boat racing data are not available.

TABLE 3.5-1
Estimated User Days Lost by Adjusting Gate Operations

	Estimated User Days		
Activity	**Gates In May+Jun+Sep**	**Gates Out May+Jun+Sep**	**Estimated User Days Lost**
Boating	3,517	52	(3,465)
Jet Skiing	491	0	(491)
Water Skiing	984	4	(980)
Swimming	982	10	(972)
Total	**5,974**	**66**	**(5,908)**

The activities listed in Table 3.5-1 are characterized as "lake-dependent" activities and would assume the greatest impact as a result of this alternative. A number of other "lake-enhanced" and "non-lake dependent" activities may be impacted, both positively and negatively, including fishing, spending time in the park, and 4-wheeling.

With the change in gate operations, the Nitro National drag boat races could not be held over the Memorial Day holiday weekend. The economic impacts of eliminating or moving the drag boat race event are analyzed in Section 3.10, Socioeconomics. Concerns expressed by individual stakeholders, Stakeholder Working Group members, and Technical Advisory Group members indicated that moving the drag boat races to the July 1 to August 31 time period may be infeasible due to the timing of other drag boat events on the racing circuit. Additionally, the special use permit issued by the Mendocino National Forest to conduct boat racing events and a water skiing competition on Lake Red Bluff is conditioned on a NMFS Biological Opinion issued November 17, 2000. Any changes in dates for these races would require either revision of that Biological Opinion or re-consultation with NMFS (Tucker, 2002, pers. comm.) and/or re-issuance of the special use permit.

Weekends in the July to August period are currently booked with other events, but the race promoters have stated their interest in moving the event to July (Abbassi, pers. comm.). Many stakeholders noted the importance of this high-profile event as a critical recreational event in Red Bluff. In NMFS's Biological Opinion, the language for the Reasonable and Prudent Measure regarding operations of the events in July specify that those events would not be conducted after July 15. Informal discussions with NMFS indicate that moving the race to July would be consistent with conservation goals for winter-run chinook salmon. Therefore, the event could be moved to July and would thereby prevent the loss of this event, avoiding this recreational impact.

Other special events such as 4th of July fireworks, the annual classic car show, and Ide Adobe Day would not be directly impacted by this alternative, although the aesthetics of the sites would be affected (see Section 3.12.1). These activities do not require specific use of the lake.

Operation of the newly constructed pumping station at the Mill Site would not impact recreational activities. The Mill Site has no public access for recreation purposes.

The impacts from operations on recreational resources would be significant and unavoidable.

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impact 2B–R1: New Pump Station. Temporary impacts would be limited to construction of the new pump station. The construction-related impacts associated with Alternative 2B include all impacts identified for Alternative 1A (see Impact 1A–R1) except the fish ladders, which would not be constructed.

The impacts from construction on recreational resources would be minimal, temporary, and less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2B–R2: Adjusted Gates-in Period. Gate operations of the dam would be adjusted to a gates-in period from July 1 to August 31 annually. The operations-related impacts associated with Alternative 2B include all impacts identified for Alternative 2A (see Impact 2A–R2).

The impacts from operations on recreational resources would be significant and unavoidable.

3: Gates-out Alternative

Construction-related Impacts.

Impact 3–R1: New Pump Station. Temporary impacts would be limited to construction of the new pump station. The construction-related impacts associated with Alternative 3 include all impacts identified for Alternative 1A (see Impact 1A–R1, except the fish ladders, which would not be constructed).

The impacts from construction on recreational resources are minimal, temporary, and less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 3–R2: Gates Out Year-round. Gate operations of the dam would be discontinued with the gates out year-round. All Lake Red Bluff-dependent recreational activities would be eliminated. Many recreational impacts are offset by the fact that the Sacramento River provides various types of recreational opportunities such as fishing, boating, camping, bird watching, and kayaking independent of Lake Red Bluff.

As discussed in Impact 2A–R2, one of the main objectives of this project is to improve the long-term ability to reliably pass anadromous fish and other species of concern past RBDD. It is possible that this project, in conjunction with other restoration projects in the basin, could result in increased populations of fish. If such improvement occurs, increased fish populations could result in enhanced recreational activities including fishing, river guiding, and wildlife/fish viewing. The analysis

presented in Section 3.2, Fishery Resources, shows the greatest improvement in fish passage would be Alternatives 2A, 2B, and 3, with marginal improvement under Alternatives 1A and 1B. Alternatives 2A, 2B, and 3, therefore, have the greatest potential for increasing populations of sportfish in the vicinity of RBDD. Such increases could improve recreational opportunities in the region. However, the likelihood of increased fish populations is considered speculative because of the large number of variables affecting fish populations.

Other recreational activities would experience limitations or elimination as a result of the loss of Lake Red Bluff, including:

Limited:

- Swimming
- Jet skiing
- Motor boating

Eliminated:

- Water skiing
- Boat racing

The Nitro National drag boat races, traditionally held on Lake Red Bluff over the Memorial Day holiday weekend, would not be viable at its current location. The economic impacts of eliminating or moving the drag boat race event are analyzed in Section 3.10, Socioeconomics. The drag boat race would either move to another location or be replaced with another race in another location. Many stakeholders have expressed the importance of this high-profile event as a critical recreational opportunity in Red Bluff.

Table 3.5-2 provides potential estimates regarding the number of estimated user days lost by implementing the Gates-out Alternative. The data is based on 1995 California State University, Chico, Red Bluff Diversion Dam Recreational Use Study information. The estimate provides a comparison of user days during the gates-in period and estimated user days if the gates were removed during this same time. The difference in these numbers is the estimated user days lost by implementing the Gates-out Alternative.

Gates-in User Days May 15 to Sep 14 - Estimated Gates-out User Days May 15 to Sep 14 = Estimated User Days Lost

This assumption is very conservative. Boating, jet skiing, and swimming would not be eliminated by the removal of Lake Red Bluff, but would be limited. Drag boat racing data are not available.

The activities listed in Tables 3.5-2 are characterized as lake-dependent activities and would assume the greatest impact as a result of this alternative. A number of other lake-enhanced and non-lake dependent

activities may be impacted, both positively and negatively, including fishing, spending time in the park, and 4-wheeling.

TABLE 3.5-2
Estimated User Days Lost by Implementing the Gates-out Alternative

Activity	Estimated User Days: Gates In May 15 through Sep 15	Estimated User Days: Gates Out September 16 through May 14	Estimated User Days Lost
Boating	7,777	104	(7,673)
Jet Skiing	1,087	0	(1,087)
Water Skiing	2,176	8	(2,168)
Swimming	2,173	20	(2,153)
Total	**13,213**	**132**	**(13,081)**

Other special events such as 4th of July fireworks, the annual classic car show, and Ide Adobe Day would not be directly impacted by this alternative, although the aesthetics of the sites would be affected (see Section 3.12.1). These activities do not require specific use of the lake.

Operation of the newly constructed pumping station at the Mill Site would not impact recreational activities. The Mill Site has no public access for recreation purposes.

The impacts from operations on recreational resources would be significant and unavoidable.

Impact Summary

Figure 3.5-6 provides a graphic matrix of each alternative's impact on recreational activities that have been deemed important by project stakeholders. A summary of construction and operational impacts as well as the estimated number of user days lost/gained by each alternative are provided.

3.5.3 Mitigation

This section discusses mitigations for the potentially significant impacts described in Environmental Consequences.

1A: 4-month Improved Ladder

The impacts from construction and operation on recreational resources under the 4-month Improved Ladder Alternative would be less than significant; therefore, no mitigation is provided.

1B: 4-month Bypass Alternative

Mitigation 1B–R1: Mitigation options to address the temporary construction-related impacts include:

- Use the latest construction techniques to minimize impacts (i.e., noise blankets for pile-driving operations).
- Conduct an ongoing public information campaign targeted at area recreation users. This campaign would provide information on construction activities/impacts as well as information on temporary alternate recreation sites.
- Maintain temporary access for vehicles, pedestrians, and cyclists to all Recreation Area facilities throughout construction.
- Maintain the existing access to the Discovery Center with the construction of a bridge.
- Create a new alignment of Sale Lane to access the boat ramp south of RBDD.
- Design security fencing in conjunction with USFS to be minimally intrusive in size, location, color, and materials. Alternative security measures would be investigated, such as use of rock walls or other natural materials to address safety issues around the bypass channel.
- Develop 10 new campsites at an alternate location to offset those lost during construction.

Sufficient measures are not available to mitigate the construction-related impacts to a less than significant level.

Mitigation 1B–R2: Mitigation options to address the permanent operations-related impacts include:

- Provide permanent access for vehicles, pedestrians, and cyclists to all Recreation Area facilities with an access bridge and pedestrian/cyclist bridge.
- Incorporate extensive natural landscaping into the final construction of the bypass channel to blend the new construction with the surrounding riparian area.

Maintain the existing access to the Discovery Center with the construction of a bridge.

- Create a new alignment of Sale Lane to access the boat ramp south of RBDD.
- Design security fencing in conjunction with USFS to be minimally intrusive in size, location, color, and materials. Alternative security measures would be investigated, such as use of rock walls or other natural materials to address safety issues around the bypass channel.

	NO ACTION ALTERNATIVE		1A: 4-MONTH IMPROVED LADDER ALTERNATIVE		1B: 4-MONTH BYPASS ALTERNATIVE		2A: 2-MONTH IMPROVED LADDER ALTERNATIVE		2B: 2-MONTH WITH EXISTING LADDERS ALTERNATIVE		3: GATES-OUT ALTERNATIVE	
	Construction Impacts	Operations Impacts	Construction Impacts	Operations Impacts	Construction Impacts	Operations Impacts	Construction Impacts	Operations Impacts	Construction Impacts	Operations Impacts	Construction Impacts	Operations Impacts
IMPACTS TO DRAG BOAT RACE EVENT	No impact	No impact	No impact	No impact	No impact	No impact	Event not feasible	Event not feasible	Event not feasible	Event not feasible	Event not feasible	Event not feasible
IMPACTS TO RED BLUFF RECREATION AREA	No impact	No impact	No impact	No impact	Severe impact to recreation experience	Severe impact to recreation experience	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact	Less than significant impact
ESTIMATED USER DAYS LOST/GAINED												
Lake-dependent Recreation Activities[1]	No Change		No Change		No Change		-5,908 User days lost		-5,908 User days lost		-13,081 User days lost	
Lake-enhanced Recreation Activities[2]	No Change		No Change		No Change		-3,658 User days lost		-3,658 User days lost		-7,316 User days lost	
Non-lake Dependent or Improved Recreation without Lake Activities[3]	No Change		No Change		No Change		+400 User days gained		+400 User days gained		+704 User days gained	
TOTAL USER DAYS LOST/GAINED	**NO CHANGE**		**NO CHANGE**		**NO CHANGE**		**-9,166 USER DAYS LOST**		**-9,166 USER DAYS LOST**		**-19,692 USER DAYS LOST**	

[1] Recreation = boating, jet skiing, swimming, and water skiing.
Assumption = All lake-dependent activities are lost during the gates-out period.

[2] Recreation = Biking, biking on path, kayaking, canoeing, fishing from boat, fishing from shore, spending time in a park, rafting, walking, walking on paths, and general "other" category of observed uses.
Assumption = One-half of lake-enhanced activities are lost during the gates-out period.

[3] Recreation = Wheeling 3/4, dirt biking, riding in a vehicle, and parking in lots near the river.
Assumption = All non-lake dependent activities remain, plus additional user days available during the gates-out period.

FIGURE 3.5-6
RECREATIONAL IMPACTS SUMMARY MATRIX
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

- Develop 10 new campsites at an alternate location to offset those lost during construction.
- Use the bypass channel as an educational/interpretive element of the Recreation Area. This may include the development of fish-viewing locations along the bypass channel.

Sufficient measures are not available to mitigate the operation-related impacts to a less than significant level.

2A: 2-month Improved Ladder Alternative

Mitigation 2A–R2: The primary recreation opportunities impacted by this alternative include reduced on-lake recreation such as motor boating, swimming, and boat racing.

Mitigation options to address the permanent operations-related impacts include:

- Facilitate the development and implementation of a plan with the City of Red Bluff, Tehama County, local business organizations, appropriate permitting agencies, and local citizens groups to phase in the gate operations changes over a period of 5 years to:
  - Allow the community to transition lake-dependent recreation activities to other opportunities.
  - Identify specific activities and events through the facilitated planning process with local stakeholders.
- Facilitate the development of non-lake dependent recreational activities as part of the planning process mentioned above. This may include, but is not limited to:
  - Cooperating on the implementation of recreational trail plans.
  - Cooperating on the rehabilitation and expansion of existing area recreational parkland or facilities.
  - Facilitating identification and acquisition of future recreational parkland.
- Facilitate the creation of other recreation-oriented events as part of the planning process mentioned above. This may include, but is not limited to:
  - Facilitating the rescheduling of the Nitro National Drag Boat Festival.
  - Facilitating the development of a land- or river-based festival event (river sports, and fishing) of similar size/impact as the Nitro National Drag Boat Festival.

Sufficient measures are not available to mitigate the operations-related impacts to a less than significant level.

2B: 2-month with Existing Ladders Alternative

Mitigation 2B–R2: The primary recreation opportunities impacted by this alternative include reduced on-lake recreation such as motor boating, swimming, and boat racing. See Mitigation 2A–R2.

3: Gates-out Alternative

Mitigation 3-R2: On-lake recreation opportunities such as motor boating, swimming, and water skiing would be significantly reduced. Drag boat racing would be eliminated. See Mitigation 2A–R2.

3.6 Land Use

3.6.1 Affected Environment

The proposed project is located within the limits of Tehama County. The project area is bounded by USBR land on the left and right banks, and privately owned industrial land on the right bank. TCCA delivers CVP water to 17 districts that serve approximately 300,000 acres of farmland in Tehama, Glenn, Colusa, and Yolo counties. The predominant land use along the canal is agriculture. TCCA water primarily serves olives, almond, alfalfa, rice, and tomato crops.

The project area is bounded by USBR land on the left and right banks, and privately owned industrial land on the right bank.

Current Land Uses

Right Bank Facilities. Most of the existing RBDD facilities are located on the right bank of the dam, which marks the beginning of the TC Canal. Existing facilities at RBDD are shown on Figure 2.1-1. These facilities include:

- Intake headworks
- Drum screens with fish bypass pipes
- Settling basin
- Fish ladder
- Research Pumping Plant
- USBR headquarters

USBR's land on the right bank of the river extends upstream, to the mouth of Red Bank Creek. The property north of Red Bank Creek is owned by Pactiv uses a portion of the parcel to house a manufacturing facility, and the remainder of the parcel adjacent to the river corridor is a landfill for its wastewater treatment sludge. Pactiv indicated that the landfill is near capacity, and that they intend to cap it with a geosynthetic membrane. A large segment of the landfill area is along the proposed conveyance pipeline corridor.

The vacant parcel upstream of Pactiv is owned by Meyer-Crest, Ltd. The Meyer Motels property is the site of the former Diamond Lumber Mill. The proposed intake facilities are located on this parcel within the adjacent river channel.

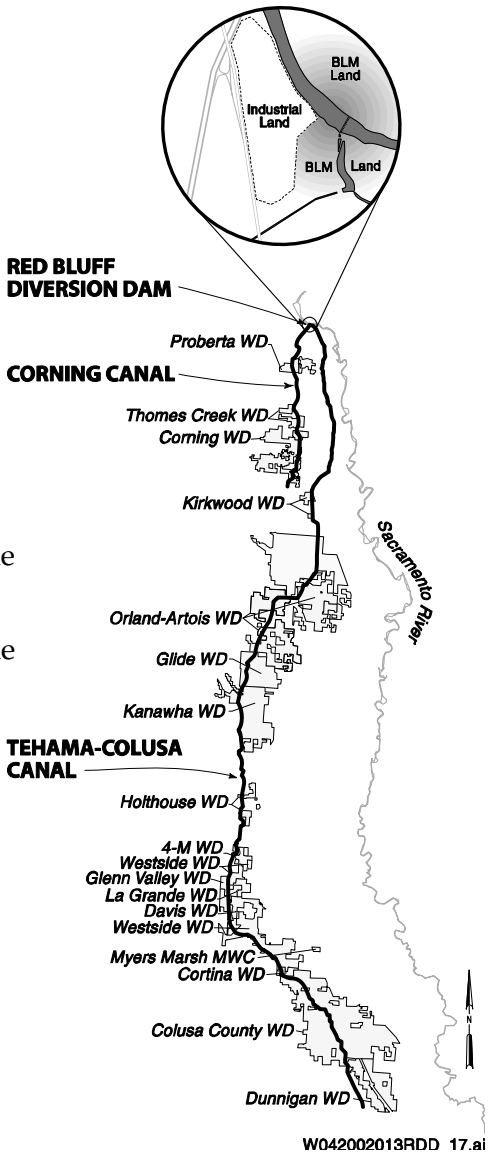
Left Bank Facilities. Existing facilities at RBDD are shown on Figure 2.1-1.

RBDD facilities on the left bank include:

- Fish ladder
- Fish-counting facility/salmon-viewing plaza

Land on the left bank of the Sacramento River across from the facilities for the canal headworks is owned by USFS and contains the Recreation

TCCA-served Districts



Area and Discovery Center. This land is managed by USFS Mendocino National Forest. The facilities are used for many recreational and educational purposes. When the gates are in the "down" position and the left bank fish ladder is in operation, the fish passing through the ladder may be viewed at the salmon-viewing plaza adjacent to the facility. The plaza contains Sacramento River fishery information, as well as a video monitor that provides viewing of salmon as they work their way up the ladder. Two boat launches are located within the park vicinity – one upstream of the dam and one downstream of the dam. In addition, the area offers designated camping spots, bike trails, hiking trails, wildlife viewing areas, and educational facilities. The proposed bypass channel would be located in this area.

Land on the left bank of the Sacramento River (Recreation Area and Discovery Center) is managed by USFS Mendocino National Forest.

Lake Red Bluff. When the diversion dam gates are in the down position, the Sacramento River rises 10 to 12 feet and forms what is known as Lake Red Bluff. The lake extends north of the diversion dam approximately 4 miles and covers approximately 15 miles of shoreline. A portion of East Sand Slough, which parallels the river to the east, makes up a large portion of the lake. Adjacent land is governed by both Tehama County and the City of Red Bluff.

The property adjacent to the river corridor immediately upstream from the dam is within unincorporated Tehama County. Land uses for this area include public parks, industrial facilities, and agricultural lands. Several orchards are located within the vicinity of this land, as well as oak trees and sycamore groves. A portion of the river corridor near central Red Bluff is also unincorporated. These lands include a number of housing tracts and residential parcels.

Lake Red Bluff extends north of the diversion dam approximately 4 miles and covers approximately 15 miles of shoreline.

The remaining land adjacent to Lake Red Bluff is in the City of Red Bluff. Land uses include public parks, neighborhoods, and businesses. River Park (also known as City Park) provides river access via a boat launch near Reeds Creek. Dining and camping facilities are available in central Red Bluff. Many residential yards abut the river and have floating docks providing river access. Currently, approximately 21 private boat docks located in the City of Red Bluff are used to access the river.

Downstream Land Use. In 1989, the Upper Sacramento River Fisheries and Riparian Habitat Management Plan was prepared in accordance with SB 1086. One goal of the management plan was to "*preserve remaining riparian habitat and re-establish a continuous riparian ecosystem along the Sacramento River between the mouth of the Feather River and Keswick Dam.*" Most of the land adjacent to the river south of the diversion dam is rural and is used for farming. Riparian habitat lines the corridor of the river separating the agriculture lands from the river.

Land Use Plans

Tehama County. General plans contain information about current land use conditions and future trends associated with anticipated physical development. Tehama County's General Plan, adopted March 1, 1983, was last amended March 21, 2000. The Tehama County General Plan is based on four fundamental concepts:

- Accommodating growth, but not limiting growth or accepting uncontrolled growth.
- Locating major growth along the Interstate 5 (I-5) transportation corridor.
- Organizing growth according to a range of community types.
- Preserving agricultural land resources.

Agricultural preservation was addressed in the Tehama County General Plan as a priority issue. Agriculture is a key economic and social contributor to Tehama County. Agricultural land occupies approximately 58 percent of the total land area for the County and was reported in 1980 to have contributed approximately $89,400,00 (cost value) to the County's economy. In addition to contributing to the County's economy, agriculture offers direct employment (approximately 12 percent according to the County General Plan) and other employment, which includes providing goods and services to the agriculture industry.

Agriculture is a key economic and social contributor to Tehama County.

Tehama County does not have jurisdiction over lands owned by the federal government.

City of Red Bluff. The City of Red Bluff General Plan applies to those areas along Lake Red Bluff that are within the City limits. Red Bluff's General Plan was first adopted in 1974, and the most recent General Plan amendment occurred November 19, 1993. The following concerns relative to land use were extracted from the applicable General Plan elements.

Land Use Element: "The Land use element identifies the spatial arrangement of existing and proposed uses of the land including public lands and facilities. It lays out the distribution of classes of land use, the intensity of those uses and proposes a strategy of goals, objectives, policies and implementation measures to promote a wise use of land to promote the welfare of the community" (City of Red Bluff, 1993).

Zoning

Tehama County. Tehama County's Zoning Code was "adopted for the purpose of providing for the promotion and protection of the public

health, safety, peace, morals, comfort, convenience and general welfare; and

1. to implement the county general plan and to guide the future growth of the county in accordance with said plan;

2. to protect the character and the social and economic stability of agricultural, residential, commercial, industrial, recreational and other areas within the county, and to assure the orderly and beneficial development of such areas" (Tehama County Zoning Code, 1983).

Tehama County zoning designations are shown on Figure 3.6-1. The following County zoning designations apply to the affected project area:

GOVT – Government jurisdiction.

EA-AP – Exclusive Agriculture – Agriculture Preserve. Purpose is to implement the "croplands" designation of the Agricultural Element of the General Plan by recognizing lands capable of supporting crop production by operators and protecting them from incompatible uses and other detrimental effects. The AP combining district is intended to implement the policies of the "croplands" and "grazing lands" categories of the Agricultural Element of the General Plan.

P-F – Primary Floodplain. Intended to be applied by the County to properties that lie within a primary floodway and the portions of the adjacent floodplain as are required to efficiently carry the flood flow of the stream. On P-F lands, special regulations are necessary for the minimum protection of public health and safety, and of property and improvements, from hazards and damage resulting from floodwaters.

M-2 – General Industrial. Provides opportunities for heavy industrial land uses and support facilities.

R-1 – One-family Residence. Intended to be applied in areas where topography, access, utilities, and public services make the land suitable and desirable for single-family home development, and where the regulations of this classification will supply the necessary protection for such development.

R-3 – Neighborhood Apartment. Intended to be applied where it is reasonable to permit and protect garden-type low-density apartment developments.

C-3-S – General Commercial – Special Highway Frontage. Intended to provide for a wide range of goods and services required by residents and businesses that are inappropriate in community or neighborhood centers due to size or operating characteristics, or are not economically feasible in such centers.

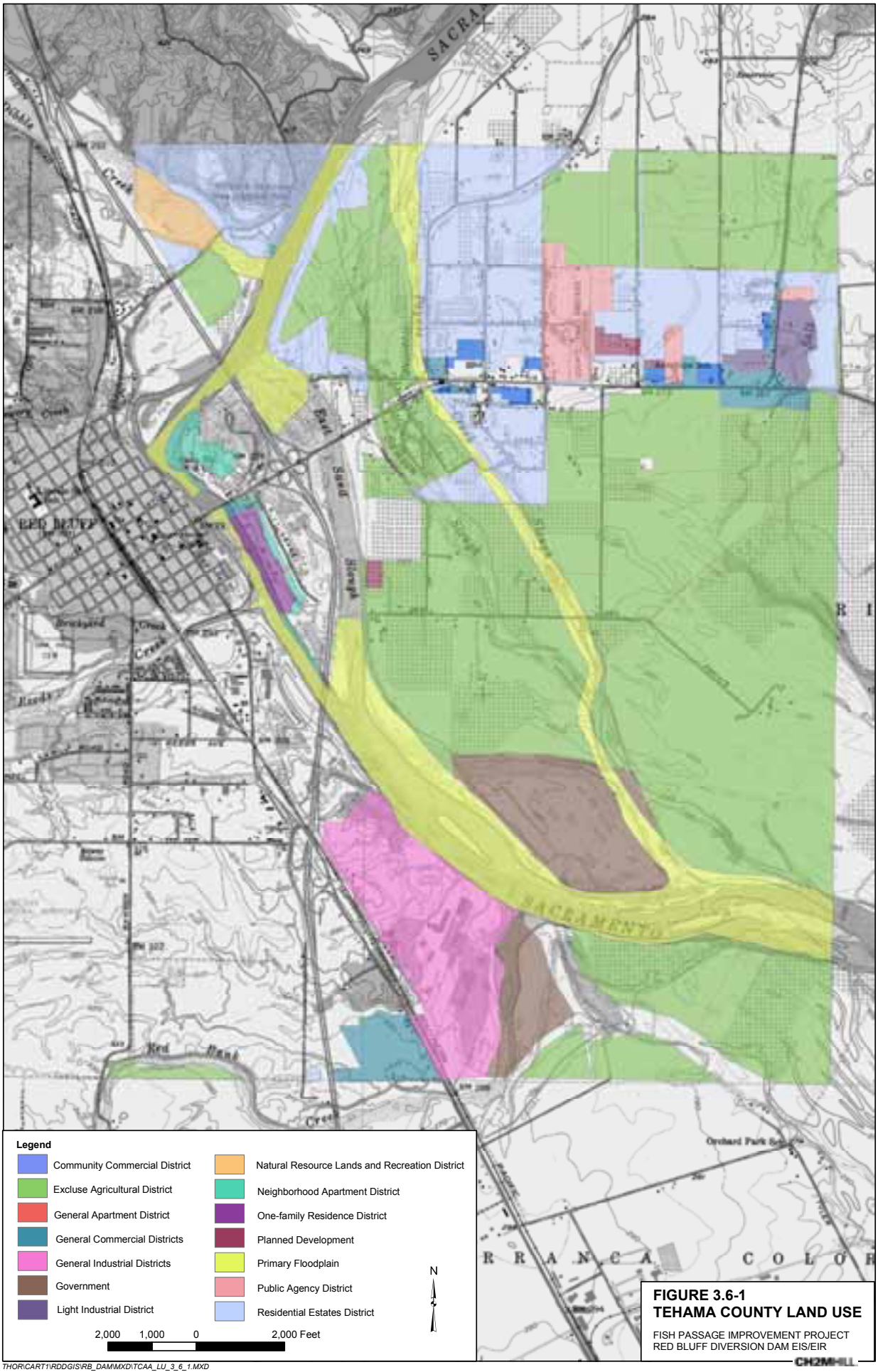


FIGURE 3.6-1
TEHAMA COUNTY LAND USE

FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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City of Red Bluff. City of Red Bluff zoning designations are shown on Figure 3.6-2. The following City zoning designations apply to the affected project area:

R-1 – Single-family Residential. Applied in areas subdivided and used or designed or planned for use as one single-family dwelling per parcel.

R-3 – Neighborhood Apartment. Applied in areas where single- or multiple-dwelling units within one or more buildings are appropriate.

R-4 – General Apartment. Applied in areas where single- or multiple-dwelling units within one or more buildings are appropriate, and where small-scale professional offices may be appropriate.

C-2 – Central Business. Applied in areas suitable for complete retail business and service to serve a residential community.

C-3 – General Commercial. Applied where general commercial facilities are necessary for public service and convenience.

P-A – Public Agency. Applied to properties that are properly used for, or are proposed for use for, public or public service purposes, or for specified public utility purposes.

Lake Red Bluff Recreation Area Development Plan

USFS manages the 488-acre Recreation Area located on the left bank of the Sacramento River. Jurisdiction of the site was transferred from USBR to USFS in 1988 under the assurance that USFS would develop a management plan for the area. The management plan that was developed is the Lake Red Bluff Recreation Area Development Plan (Recreation Area Plan). Development of the Recreation Area Plan began in 1988 under NEPA as an EIS. The FEIS was signed in 1991, which implemented Alternative 4, Modified Recreation. The objective of the FEIS was to analyze the effects of managing and developing the site at Lake Red Bluff for recreational purposes and enhancement of riparian wildlife habitat. The Preferred Alternative emphasized a balance between protecting riparian habitat and providing water-oriented recreation.

Jurisdiction of the site was transferred from USBR to USFS in 1988 under the assurance that USFS would develop a management plan for the area.

The Recreation Area Plan emphasizes interpretation of natural systems through displays, facilities, and programs. Under the Recreation Area Plan, habitat that existed in the 1800s is re-created on the site. Additionally, facilities are provided for interpreting the relationship between the river's aquatic system and its riparian and upland surroundings.

The Recreation Area Plan emphasizes interpretation of natural systems through displays, facilities, and programs.

3.6.2 Environmental Consequences

Methodology

To characterize existing land uses surrounding the project area, City of Red Bluff and Tehama County planning documents were consulted for objectives regarding the level, type, location, density, and intensity of development within City and County jurisdictions. The Recreation Area Plan was also consulted for objectives regarding current and future uses of the Recreation Area, both for recreational purposes and enhancement of riparian wildlife habitat.

Land use maps and zoning maps were consulted with regard to the presence of any prime or unique farmland, as well as current General Plan and zoning land use designations.

Significance Criteria

Significance criteria represent the thresholds that were used to identify whether an impact would be potentially significant. These criteria are based on Appendix G of the *CEQA Guidelines* and professional judgment.

Impacts on land use would be significant if they would result in any of the following:

- Physically divide an established community.
- Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including but not limited to the General Plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.
- Conflict with any applicable habitat conservation plan or natural community conservation plan.
- Conflict with existing zoning for agricultural use, or a Williamson Act contract.
- Involve other changes in the existing environment which, due to their location or nature, could result in conversion of farmland to non-agricultural use.

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

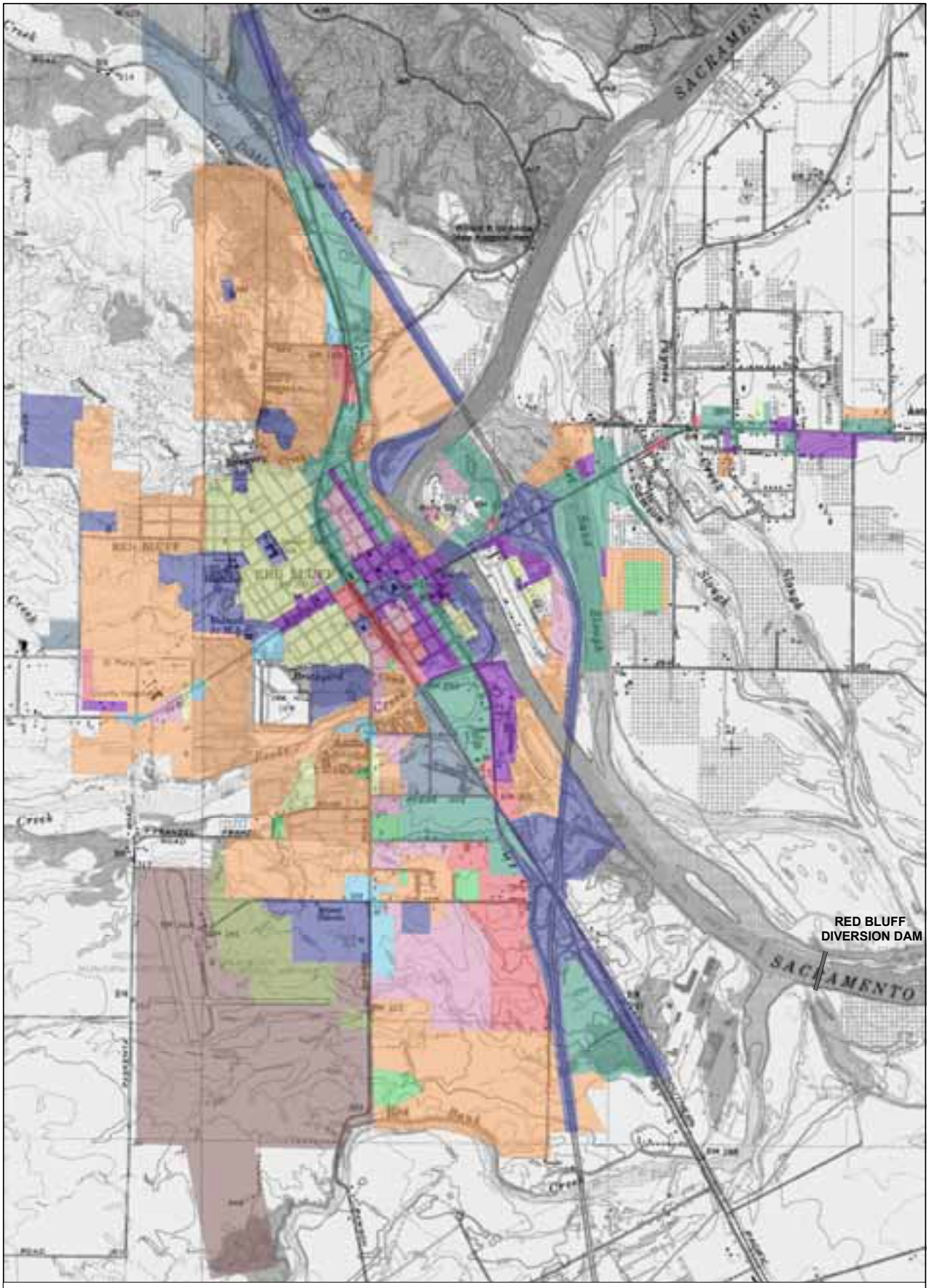


FIGURE 3.6-2
CITY OF RED BLUFF LAND USE

FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

1A: 4-month Improved Ladder Alternative

Construction-related Impacts.

Impact 1A–LU1: Surrounding Land Uses. The majority of existing land uses surrounding the project site would not be precluded during construction. The Mill Site is currently unoccupied. Construction activities would be limited to the easterly portion of the property, near the Sacramento River. Because that area is unoccupied, construction activity would have no impacts to land use in that area. Pactiv intends to close the landfill located behind their packaging plant from use, so there would be no construction impact to land use in the landfill area. There are no established uses associated with Red Bank Creek; therefore, construction activity would not preclude any land use in the creek. Temporary impacts would occur to the left bank fish ladder and salmon-viewing plaza as a result of construction activity; however, the salmon-viewing is only operated during the 4-month gates-in period. Construction for the left bank fish ladder would be phased to have minimal impact on the left bank fish ladder.

The impacts from construction on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 1A–LU2: Existing Agricultural Uses. Existing agricultural land uses within the district would not be precluded during the construction period. The majority of construction on the right bank would occur outside of the irrigation canal facilities on the Mill Site, Pactiv landfill area, and Red Bank Creek. Access to all of the irrigation canal facilities would be maintained for the duration of construction. In-canal construction activities would be phased so that irrigation deliveries to agricultural users would continue uninterrupted.

The impacts from construction on agricultural lands would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1A–LU3: Surrounding Land Uses. Operation of the left bank and right bank fish ladders would not change, preclude, or adversely affect existing land uses in the surrounding area. Operation of the proposed pump station would change the existing land use on the Mill Site. Currently, the Mill Site is unoccupied, and the buildings that are on the property are in a state of disrepair. These buildings would be removed prior to construction of the pump station. In addition, the landfill located on the easterly side of Pactiv property is intended for closure prior to project implementation. There are no established uses on Red

Bank Creek. Therefore, no land uses would be adversely impacted or precluded by operation of the pump station.

The impacts from operation on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 1A–LU4: Existing Agricultural Uses. The operation of the fish ladders and pump station would have no significant impact on existing agricultural uses, nor would the project affect prime agricultural land and/or convert prime agricultural land to a non-agricultural use.

There would be no operations-related impacts on agricultural lands; therefore, no mitigation is required.

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impact 1B–LU1: Surrounding Right Bank Land Uses. The majority of existing land uses surrounding the project site on the right bank would not be precluded during construction of the Mill Site pump station. The Mill Site is currently unoccupied. Construction activity would be limited to the easterly portion of the property, near the Sacramento River. Because that area is unoccupied, construction activity would have no impact to land use in that area. Pactiv intends to close the landfill located behind their packaging plant from use, so there would be no construction impact to land use in the landfill area. There are no established uses associated with Red Bank Creek; therefore, construction activity would not preclude any land use in the creek.

The impacts from construction on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 1B–LU2: Recreation Area Facilities. Temporary land use impacts would occur as a result of the construction of the bypass channel. Construction would temporarily obstruct access to the bike trails associated with the Shasta View Trail in the project area, the access road to the Recreation Area, access to the Sycamore Campground, and the access road to the downstream boat ramp. Alternate routes and temporary access would be constructed to allow access to the Recreation Area, associated facilities, and downstream boat ramp throughout construction of the bypass channel. Additionally, a public restroom, pump house, and a USFS maintenance garage would be removed as part of construction of the channel. Portable restrooms would be made available during construction, and the pump house and maintenance garage would be rebuilt in an area that would be accessible during and after the construction period.

The impacts from construction on the Recreation Area facilities would be less than significant; therefore, no mitigation is required.

Impact 1B–LU3: Sycamore Grove Campground. Temporary and permanent construction-related impacts would also occur to the use of the Sycamore Grove Campground facilities located in the Recreation Area. Construction vehicles would need access to the campground area to construct the lower end of the channel. Approximately 10 camping facilities would be permanently removed as a result of construction of the bypass channel. A new road would need to be constructed to maintain access to the remaining camping facilities.

The impacts from construction on the Sycamore Grove Campground would be significant and unavoidable.

Impact 1B–LU4: Sacramento River Discovery Center. Temporary impacts would occur as a result of construction to the use of the Discovery Center. Schools from the area make daily trips to the center during the spring months. If construction of the bypass channel were to occur during the springtime, access to the valley oak, western red bud, California native sycamore, and Fremont cottonwood plantings would be blocked. This would conflict with the riparian and oak lessons and hikes that occur with the daily trips.

The impacts from construction or on the Discovery Center would be significant and unavoidable.

Impact 1B–LU5: Existing Agricultural Uses. Impacts on existing agricultural uses under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–LU2).

The impacts from construction on agricultural lands would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1B–LU6: Surrounding Land Uses. Operation of the proposed pump station would change the existing land use on the Mill Site. Currently, the Mill Site is unoccupied, and the buildings on the property are in a state of disrepair. These buildings would be removed prior to construction of the pump station. In addition, the landfill located on the easterly side of Pactiv property is intended for closure prior to project implementation. There are no established land uses on Red Bank Creek. Therefore, no land use would be adversely impacted or precluded by operation of the pump station.

The impacts from operations on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 1B–LU7: Red Bluff Recreation Area. The bypass channel lies entirely within the Recreation Area. It begins just above the upstream boat ramp and ends just downstream of the diversion dam. The channel crosses the main road into the Recreation Area, passes through sections of the Recreation Area that have been planted with valley oaks (by

Pacific Gas & Electric Company [PG&E] as mitigation for the pipe crossing near the TC Canal) and mixed riparian habitat, crosses the access road to the downstream boat ramp, and goes through the lower portion of the Sycamore Grove Campground. Access to these areas would be maintained through construction by temporary access roads. Upon completion of the bypass channel, new permanent roads would be constructed that would pass over the channel and maintain access to all of these areas, thereby reducing any impacts to accessing these areas to a less than significant level.

The goal of the Recreation Area Plan is to develop overnight and day-use recreation facilities integrated with the existing riparian woodland and annual grassland-oak area. A large part of this Recreation Area Plan is to develop interpretive displays and programs that illustrate the management of fish, wildlife, and their habitat, and to provide visitors with recreation information for activities and facilities available in Northern California. Several million dollars and thousands of hours of volunteer's time have been invested in restoring riparian habitat and constructing recreation and interpretive facilities under the Recreation Area Plan.

Because of the unique quality of the Recreation Area, the thousands of hours of volunteer time spent on the development of the recreation area, and the education potential for future students and visitors of the interconnected ecosystems of Sacramento River Valley, construction of the bypass channel does not comply with the current management direction in the Mendocino National Forest Land and Resource Management Plan. Amendment of the Mendocino National Forest Land and Resource Management Plan under this alternative would reconcile management direction with the new situation, but would not avoid the impacts.

The impacts from operations on the Recreation Area would be significant and unavoidable.

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impact 2A–LU1: Surrounding Land Uses. Impacts on surrounding land uses under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–LU1).

The impacts from construction on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 2A–LU2: Existing Agricultural Uses. Impacts on existing agricultural uses under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–LU2).

The impacts from construction on agricultural lands would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2A–LU3: Surrounding Land Uses. Impacts on surrounding land uses under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–LU3).

The impacts from operations on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 2A–LU4: Public and Private Boat Docks and Ramps Along the Sacramento River. Permanent impacts would occur to the use of public and private boat docks and ramps located on the Sacramento River. Public and private boat docks and ramps currently existing along the shoreline of the river do not properly function when the gates are in the up position; therefore, they would be unusable for 2 additional months.

The impacts from operations on public and private boat docks and ramps along the Sacramento River would be significant and cannot be mitigated.

Impact 2A–LU5: Existing Agricultural Uses. Impacts on existing agricultural uses under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–LU4).

There would be no operations-related impacts on agricultural lands; therefore, no mitigation is required.

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impact 2B–LU1: Surrounding Land Uses. The majority of existing land uses surrounding the project site would not be precluded during construction. The Mill Site is currently unoccupied. Construction activities would be limited to the easterly portion of the property, near the Sacramento River. Because that area is unoccupied, construction activity would have no impacts to land use in that area. Pactiv intends to close the landfill located behind their packaging plant from use, so there would be no construction impacts to land use in the landfill area. There are no established uses associated with Red Bank Creek; therefore, construction activity would not preclude any land use in the creek.

The impacts from construction on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 2B–LU2: Existing Agricultural Uses. Impacts on existing agricultural uses under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–LU2).

The impacts from construction on agricultural lands would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2B–LU3: Surrounding Land Uses. Impacts on surrounding land uses under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–LU3).

The impacts from construction on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 2B–LU4: Public and Private Boat Docks and Ramps Along the Sacramento River. Impacts on public and private boat docks and ramps along the Sacramento River under Alternative 2B would be the same as those identified for Alternative 2A (see Impact 2A–LU4).

The impacts from operations on public and private boat docks and ramps along the Sacramento River would be significant and cannot be mitigated.

Impact 2B–LU5: Existing Agricultural Uses. Impacts on existing agricultural uses under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–LU4).

There would be no operations-related impacts on agricultural lands; therefore, no mitigation is required.

3: Gates-out Alternative

Construction-related Impacts.

Impact 3–LU1: Surrounding Land Uses. Impacts on surrounding land uses under Alternative 3 would be the same as those identified for Alternative 2B (see Impact 2B–LU1).

The impacts from construction on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 3–LU2: Existing Agricultural Uses. Impacts on existing agricultural uses under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–LU2).

The impacts from construction on agricultural lands would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 3–LU3: Surrounding Land Uses. Impacts on surrounding land uses under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–LU3).

The impacts from construction on surrounding land uses would be less than significant; therefore, no mitigation is required.

Impact 3–LU4: Public and Private Boat Docks and Ramps Along the Sacramento River. Permanent impacts would occur to the use of public and private boat docks and ramps located on Sacramento River. Public and private boat docks and ramps currently existing along the shoreline of the river will not properly function when the gates are in the up position. These boat docks and ramps would no longer access the lower elevations of the river in its natural, free-flowing state.

The impacts from operations on public and private boat docks and ramps along the Sacramento River would be significant and cannot be mitigated.

Impact 3–LU5: Existing Agricultural Uses. The operations of the pump station would have no significant impact on existing agricultural uses, nor would the project affect prime agricultural land and/or convert prime agricultural land to a non-agricultural use.

There would be no operations-related impacts on agricultural lands; therefore, no mitigation is required.

3.6.3 Mitigation

This section discusses mitigations for each significant impact described in Environmental Consequences.

1A: 4-month Improved Ladder Alternative

No impacts are anticipated under implementation of this alternative; therefore, no mitigation is provided.

1B: 4-month Bypass Alternative

Mitigation 1B–LU3. To the extent possible, disturbance to the camping facilities would remain in the footprint and construction easement for the bypass channel. To maintain access to the Sycamore Grove camping facilities, a temporary road would be constructed to allow traffic to and from the facilities to bypass construction. The permanent removal of the camping facilities however, cannot be mitigated, and thus would remain a significant, unavoidable impact.

Mitigation 1B–LU4. Access to the Discovery Center would be maintained during construction via temporary construction roads. However, because of potential access problems and safety reasons, pedestrian access throughout the Discovery Center facilities (i.e., valley oak, western red bud, California native sycamore, and Fremont cottonwood plantings) that are used for lessons may be blocked during construction. This is a significant and unavoidable impact that cannot be mitigated; therefore, no mitigation is provided.

Mitigation 1B–LU7. Construction of the bypass channel does not comply with the Mendocino National Forest Land and Resource Management

Plan. This is a significant, unavoidable impact. A footbridge (illustrated on Figure 2.3-4) would be constructed that would partially mitigate the separation of Sycamore Campground from other camping facilities and the southeast portion of the Recreation Area.

2A: 2-month Improved Ladder Alternative

Significant, unavoidable impacts under Alternative 2A cannot be mitigated; therefore, no mitigation is provided.

2B: 2-month with Existing Ladders Alternative

Significant, unavoidable impacts under Alternative 2B cannot be mitigated, therefore, no mitigation is provided.

3: Gates-out Alternative

Significant, unavoidable impacts under Alternative 3 cannot be mitigated; therefore, no mitigation is provided.

3.7 Geology

3.7.1 Affected Environment

The Red Bluff area is situated in the northern portion of the Sacramento Valley, which functions as a structural trough extending on a northwest trend approximately 149 miles (240 kilometers) north from the Delta. The Sacramento Valley is bounded to the east by the Sierra Nevada and Cascade mountain ranges, to the north by the Klamath Mountains, and to the west by the Coast Range. Rocks underlying the valley and the bordering mountains are Paleozoic and Mesozoic granitic, metamorphic, and marine sediments (DWR, 1978). These rocks are found at considerable depths in the center of the valley and more shallow depths near the margins. Eocene marine and continental sedimentary rocks containing saline or brackish water overlay these deposits. All of these rocks are relatively impermeable and form the bottom of the basin.

Except in the deeper portions of the valley, a series of non-marine deposits that yield fresh water overlie the Eocene and pre-Eocene rocks. Streams flowing from the surrounding mountains into the subsiding trough laid these post-Eocene continental deposits. This assemblage of predominately sedimentary rocks also includes volcanic mudflows, lava flows, and volcanic ash deposits, all associated with the volcanic activity that occurred in the middle- to late-Tertiary period (DWR, 1978). The Sutter Buttes near Yuba City are prominent volcanic features that originated during the late-Tertiary period.

Several formations of post-Eocene age are present in the valley and are important sources of groundwater. They include the Tuscan, Mehrten, Tehama, Laguna, and Victor formations and several unnamed alluvial units, principally alluvial fans and floodplain deposits.

Several formations of post-Eocene age are present in the valley and are important sources of groundwater. They include the Tuscan, Mehrten, Tehama, Laguna, and Victor formations and several unnamed alluvial units, principally alluvial fans and floodplain deposits.

The Tuscan Formation is situated in the northeastern portion of the valley, the Mehrten Formation along the east side, the Tehama Formation on the west side, the Laguna Formation on the southeast side, and the Victor Formation occupies the low alluvial plain on the east side of the valley. On the east side of the valley, north of Chico, a fanglomerate unit, which is an assemblage of partially cemented layers of sand and gravel with thick layers of clay and silt, overlays the Tuscan Formation.

Gravelly deposits belonging to the Red Bluff Formation exist along the east margin near Oroville and in small isolated areas south to Sacramento County and west of Red Bluff, Corning, and Orland. In Sacramento County, these deposits are known as the Arroyo Seco and South Fork gravels. These gravels are surficial deposits that occur mostly above the zone of saturation and have little importance as

sources of groundwater. Collectively, they are known as the Pleistocene gravels. The Red Bluff Formation overlays the Tehama Formation and attains an exposed thickness of 15 meters in the vicinity of Red Bluff (DWR, 1978). Gravel sizes range from small cobbles to pebbles contained in a reddish silty to sandy matrix. The upper surface consists of hardpan soil, and rock fragments are metamorphic and igneous. The formation was deposited during a period when glaciers were active in the North Coast Ranges and Klamath Mountains. Streams draining these glacial areas contained coarse debris and suspended fine-grained material. These fine-grained materials filled the voids after deposition of the gravel so that most Red Bluff gravels are not very permeable.

Alluvial fans, stream channel deposits, and floodplain and flood-basin deposits are the most recently deposited materials. Alluvial fans occur mostly on the west side and are relatively thin, highly permeable materials. Stream channel and floodplain deposits consist of well-sorted sand, gravel, and silt adjacent to major streams. Flood-basin deposits are the finest-grained materials consisting of clay and silt occupying large areas adjacent to the Sacramento River.

Geological Structures

Seven major structural features influence the occurrence and movement of groundwater in the Sacramento Valley:

1. The Chico Monocline extends from the vicinity of Red Bluff southeast to Chico. This structure tends to facilitate groundwater inflow to the valley from areas outside the basin.

2. The Red Bluff Arch forms the northern boundary of the basin and consists of a series of parallel faults and gentle folds. This structure tends to restrict movement of water between the Redding groundwater basin to the north and the Sacramento Valley groundwater basin to the south.

3. The Corning Anticline impedes movement of groundwater eastward between Red Bluff and Corning.

4. The Sutter Buttes, located northwest of Yuba City, are the surface expression of coalescing domes that were thrust from below, tilting, faulting, folding, and exposing at the surface the intruded Cretaceous to Pliocene sediments. The Buttes divert groundwater around their flanks.

5. The Dunnigan Anticline, located west of Dunnigan, has folded the Tehama and Red Bluff formations and diverts groundwater southeast.

6. The Plainfield Ridge, south of the Dunnigan Anticline, may possibly be a southern continuation of the Dunnigan Anticline. This structure impedes the flow of groundwater to the east.

7. The Willows Arch is located east of Artois and extends north in the direction of Orland. This structure appears to be a partial barrier to the southwesterly movement of groundwater from Stony Creek.

Local Geology

The project area is on the upper member of the Riverbank Formation.

The project area is on the upper member of the Riverbank Formation, a Late Pleistocene-age stream/terrace deposit of fluvial/deltaic origin. This unit consists of moderately well-consolidated, interconnected, and discontinuous layers and lenses of channel and overbank deposits containing varying mixtures of gray, brown, reddish-brown, and red-orange-brown gravel, sand, silt, and clay. These deposits occur along channels, floodplains, and natural levees of major streams; are highly permeable; and vary in thickness from 5 to 15 feet (RWQCB, 1990).

The upper member of the Riverbank Formation is underlain by the Middle Pleistocene-age Red Bluff Formation. This clastic, continental, alluvial fan deposit comprises well-consolidated layers and lenses of interconnected and disconnected mixtures of bright red and orange-red gravel with minor amounts of sand and silt, generally 5 to 15 feet thick. The Red Bluff Formation is underlain by the Pliocene-age Tehama Formation, a well-consolidated deposit consisting of dense to very dense sandy clay and clayey gravel (RWQCB, 1990).

Seismology

No active faults are within the site vicinity, and no other geologic hazards are known.

No active faults are within the site vicinity, and no other geologic hazards are known. The nearest mapped active fault is the Cleveland Fault, located approximately 65 miles southeast of the site near the Town of Oroville. Occasional seismic activity (less than 5.5 on the Richter magnitude scale) has been measured north of Redding (30 miles north of Red Bluff) in the last 5 years; however, no surface rupture is associated with the activity.

Hydrogeology

Significant water-producing geologic units are the unconsolidated to semi-consolidated non-marine sediments that range from the Oligocene to Miocene ages (13 to 25 million years ago) to recent ages and are located in the valley trough. Generally, unconfined groundwater exists in the relatively shallow alluvial fan, floodplain, and stream channel deposits. It is partially confined in and under the flood-basin deposits and is confined beneath impervious clay and mudflow strata in the older Pleistocene and Pliocene formations. The depth to groundwater increases from the central portions of the basin towards the margins. Levels are usually highest in the spring and lowest in the fall. Permeability values for the claybound soils range from 10^{-5} to 10^{-7} centimeters per second, indicating relatively impermeable strata (RWQCB, 1990).

Groundwater in the immediate vicinity of Lake Red Bluff is greatly affected by the annual filling of the lake. This change in the surface elevation of the Sacramento River corresponds to a change in the groundwater hydraulic gradient.

Groundwater in the North Valley moves in the general direction of the Sacramento River. In the valley south of Sutter Buttes, the groundwater gradient is nearly flat, sloping toward the Sacramento River or the Delta; however, intensive development of groundwater has created pumping depressions along the east side from Marysville to Sacramento County and on the west side of Solano County. Groundwater replenishment occurs through deep percolation of streamflow, precipitation, and applied irrigation water. Most of the recharge occurs in the north and east sides of the valley where precipitation is the greatest.

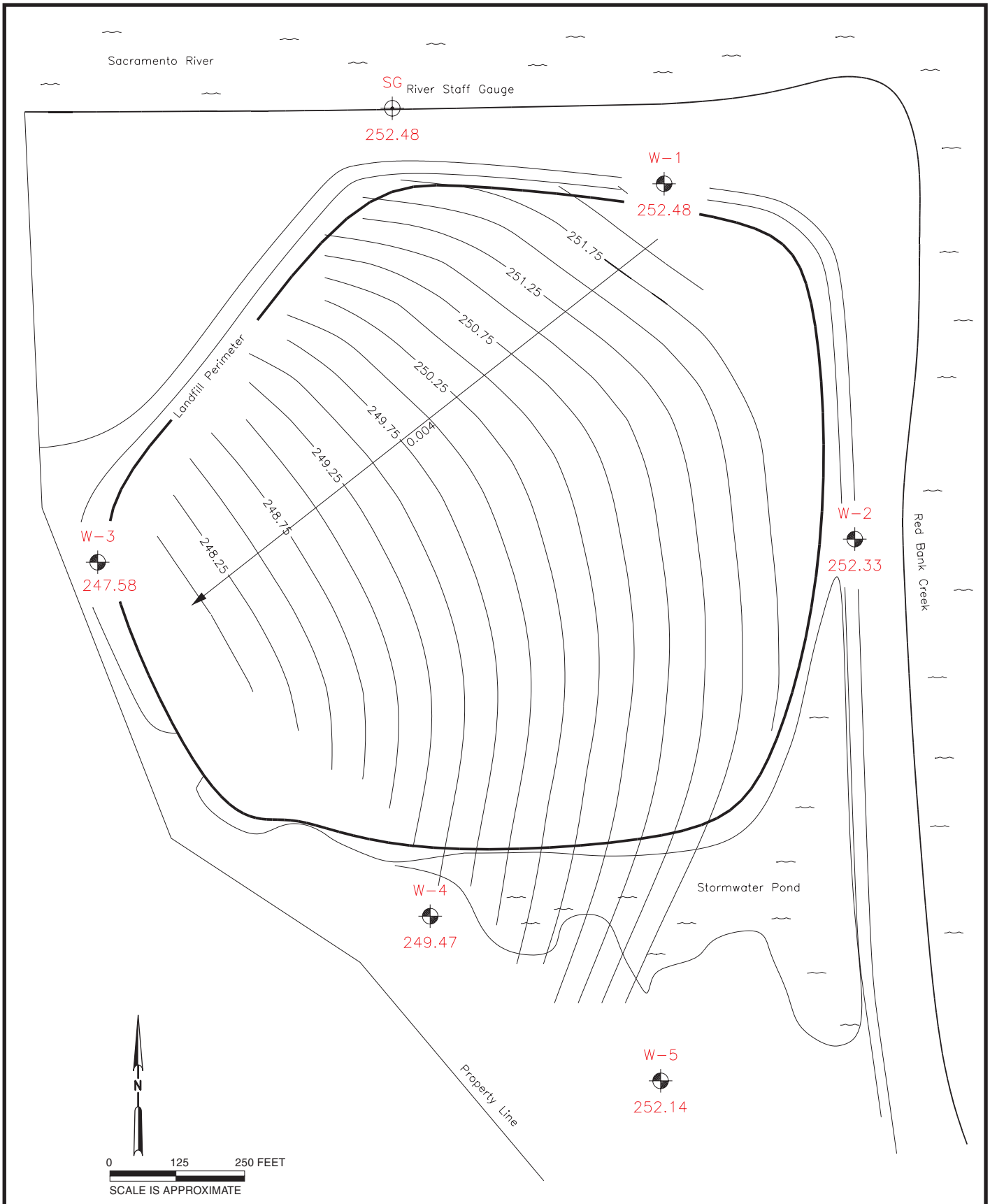
Groundwater in the immediate vicinity of Lake Red Bluff is greatly affected by the annual filling of the lake. As discussed in Section 3.3.1, the filling of Lake Red Bluff coincides with the gates-in period from May 15 through September 15 of each year. This change in the surface elevation of the Sacramento River, which subsequently becomes Lake Red Bluff, corresponds to a change in the groundwater hydraulic gradient as evidenced by groundwater elevation measurements conducted during the gates-in and gates-out periods. Data collected from monitoring wells in the vicinity of RBDD during the gates-out periods from 1996 to 2000 indicated that lateral hydraulic gradients ranged from 0.002 to 0.005 foot per foot to the north to northeast, thus indicating a groundwater flow direction toward the Sacramento River in the vicinity of RBDD. The lateral hydraulic gradient during gates-in periods from 1996 to 2000 ranged from 0.002 to 0.005 foot per foot to the west to northwest, thus indicating a change in the direction of groundwater flow away from the vicinity of RBDD. Figures 3.7-1 and 3.7-2 display groundwater contours and the hydraulic gradient at the Pactiv landfill during gates-in and gates-out periods (URS Corporation, 2000).

Groundwater quality is generally excellent in the region. In the most recent summary of groundwater conditions (1991), total dissolved solids (TDS) in the Red Bluff area were classified as less than 200 mg/L, which is below drinking water standards. No evidence of elevated levels of boron, nitrates, arsenic, or selenium has been found in the groundwater in the Red Bluff area. Groundwater quality in the immediate vicinity of RBDD is monitored quarterly and is discussed in Section 3.3.3. For a more complete discussion on groundwater quality, refer to Section 3.3.3.

Mineral resources in the vicinity of the site include two gravel and sand quarries. This project is not anticipated to impact current quarry operations.

Mineral Resources

Mineral resources in the vicinity of the site include two gravel and sand quarries. The Red Bluff Quarry is located approximately 7 miles south of the site, and Valley Rock Products is located in Corning, approximately 27 miles south of the site. This project is not anticipated to impact current quarry operations.



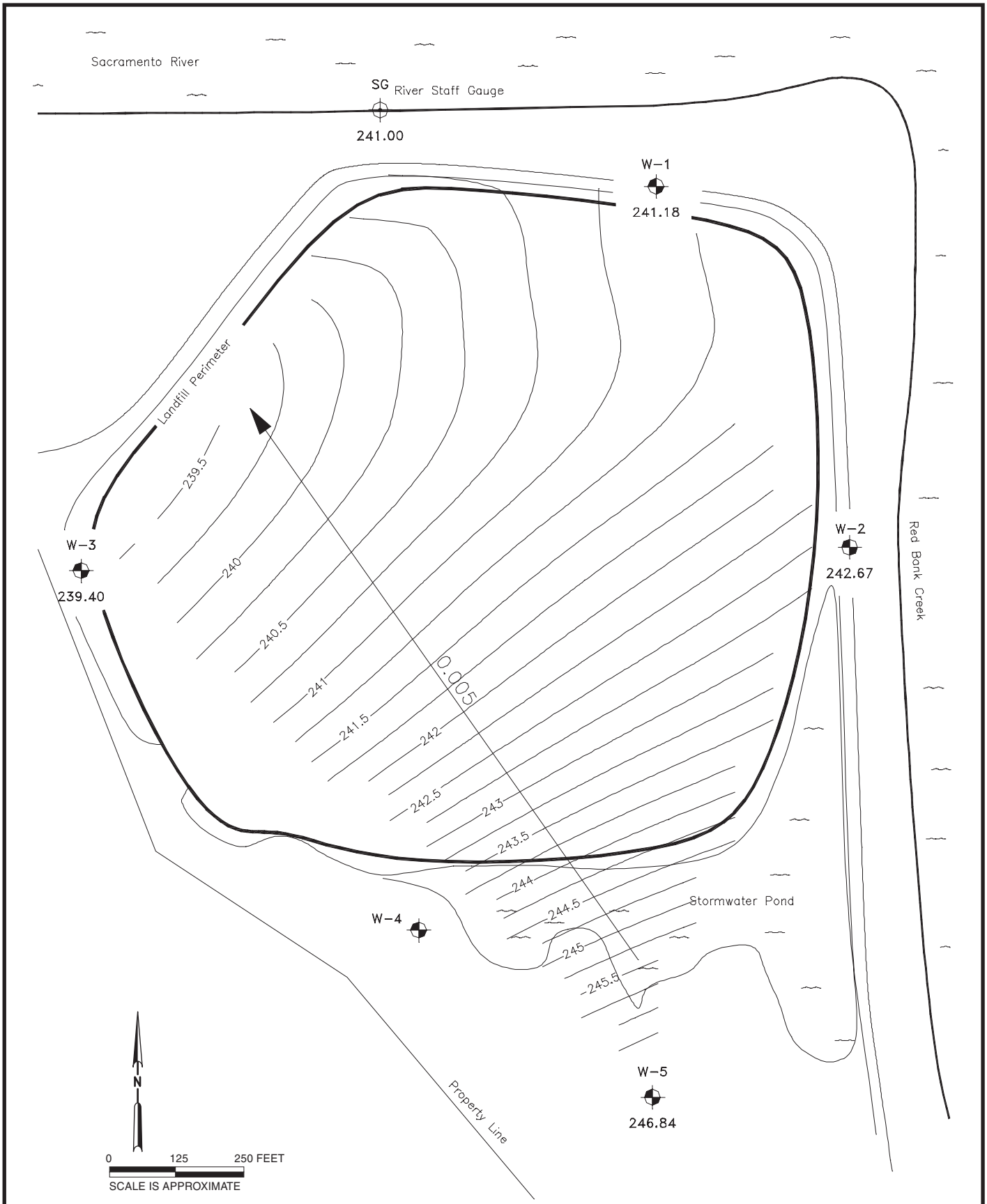
LEGEND

0.001 GROUNDWATER DIRECTION FLOW AND GRADIENT

FIGURE 3.7-1
GATES-IN PERIOD
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W122001005RDD_07 (12/14/01)

CH2MHILL



LEGEND

0.001 GROUNDWATER DIRECTION FLOW AND GRADIENT

FIGURE 3.7-2
GATES-OUT PERIOD
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W122001005RDD_08 (12/14/01)

CH2MHILL

Hazardous Materials

Pactiv occupies an 8.3-acre site approximately 1,400 feet upstream of RBDD. The site (comprising a portion of Assessor's Parcel No. 35-08-2) is a Class III landfill owned and operated by the Pactiv Corporation. This facility was first operated by Diamond International Corporation in 1957 as an open burn dump. In 1964, dikes surrounding the site were constructed in conjunction with the construction of RBDD. The facility was purchased by Pactiv in 1983 (RWQCB, 1990).

The Pactiv landfill is used for the disposal of dried paper sludge generated at the onsite industrial wastewater treatment facility. The last time sludge was dumped at this location was during the third quarter of 1999, when 6,980 CY were dumped. Typically, 2,500 CY of waste is dumped annually (URS, 2000). During some years no waste is dumped at all (RWQCB, 1990).

In addition, this site includes an active wastewater treatment plant that currently discharges approximately 1.9 million gallons per day to the Sacramento River. Wastewater is monitored for 5-day biochemical oxygen demand, chemical oxygen demand (COD), total suspended solids (TSS), total organic carbon, and pH.

This landfill site is viewed as somewhat problematic because of its location, in summer months when RBDD gates are closed, river water backs up and creates Lake Red Bluff. When this occurs, groundwater rises and comes in contact with waste in the unlined landfill. At times when the groundwater level is high, elevated levels of inorganic constituents are detected in groundwater collected from site wells. Constituents currently being monitored include TDS, turbidity, iron, soluble iron, manganese, alkalinity, bicarbonate, chloride, sulfate, dissolved organic carbon (DOC), COD, pH, Total Kjeldahl Nitrogen, nitrate, sulfides, specific conductivity, calcium, magnesium, potassium, sodium, and tannins and lingins.

Of these constituents, TDS, turbidity, iron, and manganese concentrations have exceeded the secondary maximum contamination levels in the well downgradient of the landfill. A slight seasonal variation in manganese concentrations appears to occur in the downgradient well, with peaks in concentrations occurring in September and December of each year. No seasonal variation was detected in concentrations of TDS, turbidity, and iron in the downgradient well. In addition, alkalinity, TDS, DOC, specific conductivity, calcium, magnesium, manganese, potassium, and sodium concentrations were found to be significantly greater (according to an ANOVA statistical analysis) in the downgradient well than the upgradient well (URS Corporation, 2000). Pactiv has completed a corrective action plan in response to the elevated levels of the constituents detected in site wells in October 2000. The corrective action plan indicated that Pactiv intends to close the landfill, possibly by

capping the landfill with a geosynthetic clay liner or designating a containment zone. As outlined in the February 2001 Work Plan, further site characterization is being performed in preparation for site closure (Pactiv, 2001).

3.7.2 Environmental Consequences

Methodology

The geological environmental consequences of the proposed alternatives are derived from a comparison against the No Action Alternative. The comparison examined changes to the site's fundamental geology, topsoil, and geography during construction and post-construction operations of the facilities. Mitigation is identified for all potential geological impacts. The proposed mitigation meets CEQA requirements by neutralizing the geologic impact to a less than significant level.

Significance Criteria

Significance criteria represent the thresholds used to identify whether an impact would be potentially significant. These criteria are based on Appendix G of the *CEQA Guidelines* and professional judgment.

Impacts on geology and soils would be significant if they would result in any of the following:

- Exposure of people or structures to potential substantial geologic hazards. This may include earthquakes, ground failure, or similar hazards.
- Substantial soil erosion or loss of topsoil.
- Creation of unstable soil or geological conditions, potentially resulting in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
- Location of the project on expansive soils.

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Construction-related.

Impact 1A–G1: Excavation. Approximately 800,000 CY of material would need to be excavated to complete construction of this alternative. This includes excavation for the pumping station and forebay, as well as the

right bank and left bank fish ladders. Approximately 600,000 CY of this material would be stored onsite.

The impacts from excavation during construction would be significant and unavoidable.

Operations-related.

Impact 1A–G2: Geology. No impacts involving geologic hazards are expected from the operation of this proposed alternative. The fundamental geology of the area would remain unchanged. No active faults are within the site vicinity, and no other geologic hazards are known. Therefore, the potential for seismic activity, liquefaction, landslide, expansive soils, or other event would be minimal.

The impacts from operations on geology would be less than significant; therefore, no mitigation is required.

1B: 4-month Bypass Alternative

Construction-related.

Impact 1B–G1: Excavation. Approximately 800,000 CY of material would need to be excavated to complete construction of this alternative. This includes excavation for the pumping station, forebay, and bypass channel. Approximately 600,000 CY of this material would be stored onsite.

The impacts from excavation during construction would be significant and unavoidable.

Operations-related.

Impact 1B–G2: Geology. Impacts on geology under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–G2).

The impacts from operations on geology would be less than significant; therefore, no mitigation is required.

2A: 2-month Improved Ladder Alternative

Construction-related.

Impact 2A–G1: Excavation. Impacts from excavation under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–G1).

The impacts from excavation during construction would be significant and unavoidable.

Operations-related.

Impact 2A–G2: Geology. Impacts on geology under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–G2).

The impacts from operations on geology would be less than significant; therefore, no mitigation is required.

2B: 2-month with Existing Ladders Alternative

Construction-related.

Impact 2B–G1: Excavation. Approximately 750,000 CY of material would need to be excavated to complete construction of this alternative. The primary excavation for this alternative is required to construct the Mill Site pump station and conveyance facilities. Approximately 580,000 CY of this material would remain onsite.

The impacts from excavation during construction would be significant and unavoidable.

Operations-related.

Impact 2B–G2: Geology. Impacts on geology under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–G2).

The impacts from operations on geology would be less than significant; therefore, no mitigation is required.

3: Gates-out Alternative

Construction-related.

Impact 3–G1: Impacts from excavation under Alternative 3 would be the same as those identified for Alternative 2B (see Impact 2B–G1).

The impacts from excavation during construction would be significant and unavoidable.

Operations-related.

Impact 3–G2: Geology. Impacts on geology under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–G2).

The impacts from operations on geology would be less than significant; therefore, no mitigation is required.

3.7.3 Mitigation

This section discusses mitigations for each significant impact described in Environmental Consequences.

1A: 4-month Improved Ladder Alternative

Mitigation 1A–G1. To minimize soil erosion, movement of sediments, loss of topsoil, and associated water quality impacts, an approved drainage, grading, and erosion control plan would be completed prior to construction. This plan would meet all local requirements and incorporate construction site Best Management Practices (BMP) to stabilize areas cleared of vegetation and soil stockpiles. BMPs may include preservation of existing vegetation, silt fences, and/or straw

bales. Covering soil stockpiles with mulch or matting as well as continuous maintenance of erosion control measures would be necessary. Timely re-vegetation of disturbed sites would minimize post-construction erosion impacts.

1B: 4-month Bypass Alternative

Mitigation 1B–G1. See Mitigation 1A–G1.

2A: 2-month Improved Ladder Alternative

Mitigation 2A–G1. See Mitigation 1A–G1.

2B: 2-month with Existing Ladders Alternative

Mitigation 2B–G1. See Mitigation 1A–G1.

3: Gates-out Alternative

Mitigation 3–G1. See Mitigation 1A–G1.

3.8 Agricultural Resources

3.8.1 Affected Environment

Central Valley Project

The Central Valley is an important agricultural region for both the state and the United States. In 1993, the 19 Central Valley counties contributed more than 60 percent, by value, of California's agricultural production and included 6 of the top 10 agricultural counties in the state. The Central Valley produces almost 10 percent of the total United States market value of crop production, including 40 percent of the nation's fruits and nuts, 20 percent of the cotton, and 15 percent of the vegetables. California producers account for about 10 percent of total United States agricultural exports. These exports represent almost 25 percent of the gross farm income of the state. Many of California's leading export commodities are largely or exclusively grown in the Central Valley, including cotton, rice, almonds, grapes, oranges, walnuts, prunes, tomatoes, and wheat.

Almost 80 percent of the irrigated land in California is located in the Central Valley. Water deliveries for agriculture average about 22.5 maf per year, with CVP providing about 25 percent, the State Water Project about 10 percent, local surface-water rights about 30 percent, and groundwater about 35 percent.

Most districts that receive CVP supplies also use other supplies such as groundwater. Use of such sources varies on an annual basis because of changes in weather and crop market conditions.

The CVP normally supplies irrigation water to approximately 200 water districts, individuals, and companies through water service, water rights, and exchange contracts. The type of contract a particular district holds determines the potential CVP water supply curtailments in dry years. Those districts with water service contracts are subject to the greatest curtailments (as much as 100 percent), while districts with water rights settlement contracts, such as those along the Sacramento River, are cut no more than 25 percent. Districts/entities with pre-1914 water rights that do not have settlement contracts with USBR are entitled to their full right regardless of CVP operations.

The CVP normally supplies irrigation water to approximately 200 water districts, individuals, and companies through water service, water rights, and exchange contracts.

In recent years, CVP water has been delivered to about 13,000 full-time and 6,300 part-time farms, or just less than 50 percent of all Central Valley farms. The Federal Farm Program has been especially important to individual farmers in the Central Valley, particularly for rice and cotton production, as a substantial share of the revenue from these crops was derived directly or indirectly from the program. From 1985 to 1995, as many as 400,000 acres of California rice and cotton land was idled by acreage reduction requirements. Additional fallowing was allowed

during the worst drought years, without loss of most government payments. The 1996 Farm Bill resulted in a major revision to the programs for most crops, including rice and cotton. Acreage reduction programs have been eliminated, and government payments per unit of crop produced have been replaced with declining lump-sum payments.

Sacramento Valley

Agriculture is the largest industry in the Sacramento Valley. The region produces a wide variety of crops including rice, grain, tomatoes, field crops, fruits, and nuts. The value of Sacramento Valley crop production reached $1.7 billion in 1992, with rice, tomatoes, and orchard crops providing the highest revenues. The CVP's Tehama-Colusa service area is representative of areas within the region that are heavily dependent on CVP supplies. Districts within the Tehama-Colusa service area hold water service contracts with USBR, making them subject to water delivery curtailments up to 100 percent in dry years. All TCCA member districts rely on CVP service contracts for a portion of their supplies. A total of 25 such districts are located within the Sacramento Valley region. Approximately 10 percent of the applied water within the Sacramento Valley is provided through CVP service contracts.

Agriculture is the largest industry in the Sacramento Valley. The region produces a wide variety of crops including rice, grain, tomatoes, field crops, fruits, and nuts.

The service area of the TC and Corning canals lies entirely in the area of origin of the Sacramento River watershed along the westerly side of the Sacramento River valley. A total of 18 water districts contract with the federal government for water deliveries from the TC and Corning canals. These districts have contracts totaling 325,000 acre-feet of water each year and provide service to over 150,000 acres of land located in Tehama, Glenn, Colusa, and Yolo counties.

Corning Canal

The Corning Canal was authorized in 1950 as part of the CVP and completed in 1959. It is a 21-mile long earth-lined canal starting at RBDD and ending about 4 miles south of the City of Corning.

Corning Canal serves Proberta, Thomes Creek, and Corning water districts

The water districts served by the canal include Proberta, Thomes Creek, and Corning water districts. The Corning Water District was formed in 1954, specifically to supplement the local groundwater supply with water from the CVP.

Tehama-Colusa Canal

Construction of the TC Canal was started in 1964 as a result of signed contracts between USBR and water districts dating back as early as 1954, and was completed in 1980. The canal is a 111-mile-long concrete-lined structure also starting at RBDD and ending approximately 2 miles south of Dunnigan. The canal travels through Tehama, Glenn, and Colusa counties, and ends in Yolo County.

The water districts served by the canal include Orland-Artois, Glide, Kanawha, Holthouse, 4-M, La Grande, Davis, Westside, Myers-Marsh, Cortina, Colusa, and Dunnigan water districts.

The diverted water is used mainly for irrigating agriculture, with a very small percentage used for non-agriculture purposes. The principal crop types associated with the TC and Corning canals include almonds, olives, rice, corn, wheat, alfalfa, vine seeds, irrigated pasture, beans, sugar beets, tomatoes, and orchard fruits (see Table 3.8-1).

TABLE 3.8-1
TC and Corning Canals' Formation Date, Acreage, and Crop Types[a]

District	Formation Date	District Acreage	Irrigated Acreage	Dominant Crop Types
4-M Water District	1978	15,000	956	Almonds, alfalfa, row crops, wheat
Colusa County Water District	1954		40,348	Almonds, vine seeds, tomatoes
Corning Water District			5,060	Subtropical orchard, improved pasture, rice
Cortina Water District			575	Alfalfa, almonds
Davis Water District			863	
Dunnigan Water District			7,235	Alfalfa, wheat, almonds
Glenn Valley Water District	1978	1,954	700	Rice, tomatoes, grain/hay
Glide Water District			4,984	Rice, wheat, alfalfa
Holthouse Water District			509	Almonds, vineyard, tomatoes
Kanawha Water District			13,920	Wheat, rice, corn, sugar beets
Kirkwood Water District			335	
La Grande Water District			1,376	Rice, tomatoes
Myers-Marsh Water District			251	Alfalfa, tomatoes
Orland-Artois Water District	1954		25,572	Almonds, alfalfa, rice, wheat, subtropical orchards
Proberta Water District			2,438	Improved pasture, corn, rice, grains
Thomes Creek Water District			1,372	Rice, alfalfa, almonds
Westside Water District			13,561	Tomatoes, wheat, almonds

[a]Data is based on 1999 TCCA water deliveries.

3.8.2 Environmental Consequences

This section provides a discussion of the consequences of the project alternatives on agricultural resources as compared to the No Action Alternative. Each project alternative impacts each agricultural area differently.

Methodology

An analysis was conducted to compare the ability of the alternatives to provide water reliability in meeting agricultural water demand. For the years 1989 through 1999, water delivery records were reviewed, as well as the maximum amount of water delivered on each day between May and September. These calculations helped establish the historical range of deliveries accommodated by TCCA over that time period.

The second step of the analysis included calculating reference evapotranspiration for the combined TCCA member districts. Reference evapotranspiration is used to calculate crop water consumption for both agricultural and natural vegetation. The analysis used the modified Pennman-Monteith method, which is endorsed by the Food and Agriculture Organization of the United Nations.

For the TCCA districts, average crop mix, as determined by the USBR needs assessment, was used as a representative crop variety over the period of record. The percentage of specific crops was prorated against the recorded acres irrigated in each year between 1989 and 1999. The acreage of each crop in each year, in conjunction with average monthly climate data, was used to derive a monthly water demand for the 1989 to 1999 period. Daily water demand was assumed to follow a pattern similar to the daily water deliveries. Using daily water deliveries, the monthly crop demands were disaggregated into daily demands to give a sense of variability within months. Average and maximum daily crop demand was then determined similar to those reported for water delivery. In most cases, crop demand far outpaces actual water deliveries.

Average modeled crop demand reflects the water needs of crops grown by TCCA member districts indicated by acres in production, water requirements of different crops, and weather conditions, averaged over the 11-year study period. The difference between crop demand and water delivery is likely accounted for by water reuse, groundwater pumping, and precipitation. Maximum modeled crop demand is simply the maximum calculated crop demand for each day of the period of record. These average and maximum water deliveries and average and maximum crop demands were then compared to the delivery capability from RBDD under each of the project alternatives.

Each of the alternatives includes various assumptions about the amount of capacity available to divert water into the TCCA system, and the time periods during which that capacity is available. Thus, the maximum potential diversion under each alternative is a measure of the water supply reliability of the alternative. The difference between the No Action Alternative and the various alternatives is a measure of the addition or reduction in total water supply reliability of the action alternatives. Further, by comparing the alternatives to the actual water

deliveries and the modeled crop demand, it is possible to assess how the alternatives might constrain crop selection.

See Appendix A for a detailed agricultural water supply benefit analysis.

Significance Criteria

The following criteria were used to evaluate the significance of effects on agriculture. These criteria are based on the *CEQA Guidelines* and NEPA regulations. Construction and operations impacts on agricultural resources were considered significant if they would:

- Convert prime farmland, unique farmland, or farmland of statewide importance (farmland), as shown on the maps prepared pursuant to the farmland mapping and monitoring program of the California resources agency, to non-agricultural use.
- Conflict with existing zoning for agricultural use, or a Williamson Act Contract.
- Involve other changes in the exiting environment which, due to their location or nature, could result in conversion of farmland, to non-agricultural use.

For the purposes of distinguishing project alternatives from the No Action Alternative, the average and maximum water delivery and average and maximum modeled crop demand for each alternative were compared to the No Action Alternative. As a result of this comparison, water supply delivery either increased or decreased for each of the alternatives, during the irrigation period of May 1 through September 30. Changes in water reliability are used in the analysis of impacts or benefits.

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Construction-related Impacts.

Impact 1A–AG1: Agricultural Uses. The existing CVP agricultural uses would not be precluded during the construction period. The construction process would be sequenced so that irrigation deliveries to agricultural users would continue uninterrupted.

The impacts from construction on agricultural uses would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1A–AG2: Agricultural Use and Prime Agricultural Land. The operation of Alternative 1A would have no significant impact on existing CVP agricultural uses, nor would the project affect prime agricultural land and/or convert prime agricultural land to a non-agricultural use.

Increased pumping capacity at TCCA would have beneficial impacts to water deliveries within the CVP. Increased supply and availability of TCCA water to the associated districts during the off-peak irrigation season would result in an increase in the ability to reliably schedule project water during the gates-out period. Although this would not affect contract amounts, it may allow individual farmers to plant additional crops that require irrigation outside of the gates-in period. Such a change could increase the production efficiency of member districts.

Table 3.8-2 summarizes Alternative 1A diversion capacity and maximum diversion, as well as the total quantity difference between the Alternative 1A and the No Action Alternative.

TABLE 3.8-2
Comparison of Diversion Capacity and Maximum Diversion; Difference Between Alternative 1A and No Action Alternative

	No Action Alternative		1A: 4-month Improved Ladder Alternative		Difference	
Time Period	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)
May 1 through May 14	485	14,405	1,700	50,490	1,215	36,086
May 15 through May 31	2,500	79,200	2,500	79,200	0	0
June 1 through June 30	2,500	148,500	2,500	148,500	0	0
July 1 through August 31	2,500	306,900	2,500	306,900	0	0
September 1 through September 15	2,500	74,250	2,500	74,250	0	0
September 16 through September 30	485	14,405	1,700	50,490	1,215	36,086
Total		**637,659**		**709,830**		**72,171**

Note: Total maximum diversion would not change the cumulative CVP water service contract held by TCCA member districts.

Impacts to water reliability from Alternative 1A would be beneficial because of increased pumping capacity during the irrigation season. The largest amount of benefit from this alternative would occur during May 1 through May 14, and September 16 through September 30, when RBDD is typically in the gates-out position. Increased pumping capacity would greatly benefit this period when agricultural demands are still considerable. For the period of May 1 through May 14, average and

maximum water deliveries and average and maximum crop demand exceed the ability of the No Action Alternative to deliver water. For the same time period, the maximum water delivery would exceed the ability of Alternative 1A to deliver water. For the period of September 16 through September 30, average and maximum crop demand would exceed the ability of the No Action Alternative to deliver water, but the ability of Alternative 1A to deliver water would not be exceeded. For the majority of the irrigation season, May 15 through September 15, Alternative 1A could meet the water needs defined by average and maximum water delivery and average and maximum crop demand. See Figure 3.8-1 for a graphic comparison of the alternatives.

The impacts from operations on agricultural water demands would be beneficial; therefore, no mitigation is required.

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impact 1B–AG1: Agricultural Uses. Construction-related impacts under Alternative 1B would be the same as those listed under Alternative 1A (see Impact 1A–AG1).

The impacts from construction on agricultural uses would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1B–AG2: Agricultural Use and Prime Agricultural Land. The operations of Alternative 1B would have no significant impact on existing CVP agricultural uses, nor would the project affect prime agricultural land and/or convert prime agricultural land to a non-agricultural use.

Increased pumping capacity at TCCA would have beneficial impacts to water deliveries within CVP. Increased supply and availability of TCCA water to the associated districts during the off-peak irrigation season would result in an increase in the ability to reliably schedule project water during the gates-out period. Although this would not affect contract amounts, it may allow individual farmers to plant additional crops that require irrigation outside of the gates-in period. Such a change could increase the production efficiency of member districts.

Table 3.8-3 summarizes Alternative 1B diversion capacity and maximum diversion, as well as the total quantity difference between the proposed project and the No Action Alternative.

Impacts to water reliability from Alternative 1B would be beneficial because of increased pumping capacity during the irrigation season. The largest amount of benefit from this alternative would occur during May 1 through May 14, and September 16 through September 30, when

TABLE 3.8-3
Comparison of Diversion Capacity and Maximum Diversion; Difference Between Alternative 1B and No Action Alternative

	No Action Alternative		1B: 4-month Bypass Alternative		Difference	
Time Period	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)
May 1 through May 14	485	14,405	1,700	50,490	1,215	36,086
May 15 through May 31	2,500	79,200	2,500	79,200	0	0
June 1 through June 30	2,500	148,500	2,500	148,500	0	0
July 1 through August 31	2,500	306,900	2,500	306,900	0	0
September 1 through September 15	2,500	74,250	2,500	74,250	0	0
September 16 through September 30	485	14,405	1,700	50,490	1,215	36,086
Total		**637,659**		**709,830**		**72,171**

Note: Total maximum diversion would not change the cumulative CVP water service contract held by TCCA member districts.

RBDD is typically in the gates-out position. Increased pumping capacity would greatly benefit this period, when agricultural demands are still quite considerable. For the period of May 1 through May 14, average and maximum water deliveries and average and maximum crop demand would exceed the ability of the No Action Alternative to deliver water. For the same time period, the maximum water delivery would exceed the ability of Alternative 1B to deliver water. For the period of September 16 through September 30, average and maximum crop demand would exceed the ability of the No Action Alternative to deliver water, but the ability of Alternative 1B to deliver water would not be exceeded. For the majority of the irrigation season, May 15 through September 15, Alternative 1B could meet the water needs defined by average and maximum water delivery and average and maximum crop demand. See Figure 3.8-1 for a graphic comparison of the alternatives.

The impacts from operations on agricultural water demands would be beneficial; therefore, no mitigation is required.

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impact 2A–AG1: Agricultural Uses. Impacts on agricultural uses under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–AG1).

The impacts from construction on agricultural uses would be less than significant; therefore, no mitigation is required.

LEGEND

- NO ACTION ALTERNATIVE
- 4-MONTH GATES-IN ALTERNATIVE
- AVERAGE WATER DELIVERY
- MAXIMUM WATER DELIVERY
- AVERAGE MODELED CROP DEMAND
- MAXIMUM MODELED CROP DEMAND

FIGURE 3.8-1
AVERAGE AND MAXIMUM WATER DELIVERY AND AVERAGE AND MAXIMUM MODELED CROP DEMAND COMPARED TO NO ACTION AND 4-MONTH GATES-IN ALTERNATIVES
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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Operations-related Impacts.

Impact 2A–AG2: Agricultural Use and Prime Agricultural Land. The operations of Alternative 2A would have no significant impact on existing CVP agricultural uses, nor would the project affect prime agricultural land and/or convert prime agricultural land to a non-agricultural use.

Increased pumping capacity at TCCA would have beneficial impacts to water deliveries within CVP. Increased supply and availability of TCCA water to the associated districts during the off-peak irrigation season would result in an increase in the ability to reliably schedule project water during the gates-out period. Although this would not affect contract amounts, it may allow individual farmers to plant additional crops that require irrigation outside of the gates-in period. Such a change could increase the production efficiency of member districts.

Table 3.8-4 summarizes Alternative 2A diversion capacity and maximum diversion, as well as the total quantity difference between the proposed project and the No Action Alternative.

TABLE 3.8-4
Comparison of Diversion Capacity and Maximum Diversion; Difference Between Alternative 2A and No Action Alternative

	No Action Alternative		2A: 2-month Improved Ladder Alternative		Difference	
Time Period	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)
May 1 through May 14	485	14,405	2,000	59,400	1,515	44,996
May 15 through May 31	2,500	79,200	2,000	63,360	(500)	(15,840)
June 1 through June 30	2,500	148,500	2,000	118,800	(500)	(29,700)
July 1 through August 31	2,500	306,900	2,500	306,900	0	0
September 1 through September 15	2,500	74,250	2,000	59,400	(500)	(14,850)
September 16 through September 30	485	14,405	2,000	59,400	1,515	44,996
Total		**637,659**		**667,260**		**29,601**

Note: Total maximum diversion would not change the cumulative CVP water service contract held by TCCA member districts.

Impacts to water reliability from Alternative 2A would be beneficial because of increased pumping capacity during the irrigation season. The largest amount of benefit from this alternative occurs during May 1 through May 14, and September 16 through September 30, when RBDD is typically in the gates-out position. Increased pumping capacity would greatly benefit this period, when agricultural demands are still quite considerable. For the period of May 15 through July 14 however, a

maximum modeled crop demand exceeds the ability of Alternative 2A, as does a portion of the maximum water delivery. Although year-round pumping capacity would increase under this alternative, during the peak-irrigation season, irrigation deliveries would actually decrease because of reduced diversion ability. For the remainder of the irrigation season, July 15 through September 30, Alternative 2A could meet average and maximum water delivery and average and maximum crop demand. Alternative 2A would reduce the reliability of water diversion during the May 15 through June 30 and September 1 through 15 periods; however, because of increased capacity in the May 1 through 14 and September 16 through 30 periods, Alternative 2A would increase the reliability of water diversion over the No Action Alternative. See Figure 3.8-2 for a graphic comparison of the alternatives.

The impacts from operations on agricultural water demands would be beneficial; therefore, no mitigation is required.

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impact 2B–AG1: Agricultural Uses. Impacts from construction on agricultural uses under Alternative 2B would the same as those identified for Alternative 1A (see Impact 1A–AG1).

Impacts from construction on agricultural uses would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2B–AG2: Agricultural Use and Prime Agricultural Land. The operation of Alternative 2B would have no significant impact on existing CVP agricultural uses, nor would the project affect prime agricultural land and/or convert prime agricultural land to a non-agricultural use.

Increased pumping capacity at TCCA would have beneficial impacts to water deliveries within CVP. Increased supply and availability of TCCA water to the associated districts during the off-peak irrigation season would result in an increase in the ability to reliably schedule project water during the gates-out period. Although this would not affect contract amounts, it may allow individual farmers to plant additional crops that require irrigation outside of the gates-in period. Such a change could increase the production efficiency of member districts.

Table 3.8-5 summarizes Alternative 2B diversion capacity and maximum diversion, as well as the total quantity difference between the proposed project and the No Action Alternative.

LEGEND

- NO ACTION ALTERNATIVE
- GATES-OUT ALTERNATIVE
- 4-MONTH GATES-IN ALTERNATIVE
- AVERAGE WATER DELIVERY
- MAXIMUM WATER DELIVERY
- AVERAGE MODELED CROP DEMAND
- MAXIMUM MODELED CROP DEMAND

FIGURE 3.8-2
AVERAGE AND MAXIMUM WATER DELIVERY AND MODELED CROP DEMAND COMPARED TO NO ACTION AND 2-MONTH GATES-IN ALTERNATIVES AND NO ACTION AND GATES-OUT ALTERNATIVE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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TABLE 3.8-5
Comparison of Diversion Capacity and Maximum Diversion; Difference Between Alternative 2B and No Action Alternative

	No Action Alternative		2B: 2-month with Existing Ladders Alternative		Difference	
Time Period	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)
May 1 through May 14	485	14,405	2,000	59,400	1,515	44,996
May 15 through May 31	2,500	79,200	2,000	63,360	(500)	(15,840)
June 1 through June 30	2,500	148,500	2,000	118,800	(500)	(29,700)
July 1 through August 31	2,500	306,900	2,500	306,900	0	0
September 1 through September 15	2,500	74,250	2,000	59,400	(500)	(14,850)
September 16 through September 30	485	14,405	2,000	59,400	1,515	44,996
Total		**637,659**		**667,260**		**29,601**

Note: Total maximum diversion would not change the cumulative CVP water service contract held by TCCA member districts.

Impacts to water reliability from Alternative 2B would be beneficial because of increased pumping capacity during the irrigation season. The largest amount of benefit from this alternative would occur during May 1 through May 14, and September 16 through September 30, when RBDD is typically in the gates-out position. Increased pumping capacity would greatly benefit this period, when agricultural demands are still quite considerable. For the period of May 15 through July 14 however, a maximum modeled crop demand exceeds the ability of Alternative 2B, as does a portion of the maximum water delivery. Although year-round pumping capacity increases under this alternative, during the peak irrigation season, irrigation deliveries actually would decrease because of reduced diversion ability. For the remainder of the irrigation season, July 15 through September 30, Alternative 2B could meet average and maximum water delivery and average and maximum crop demand. Alternative 2B would reduce the reliability of water diversion during the May 15 through June 30 and September 1 through 15 periods; however, because of increased capacity in the May 1 through 15 and September 16 through 30 periods, Alternative 2B would increase the reliability of water diversion over the No Action Alternative. See Figure 3.8-2 for a graphic comparison of the alternatives.

The impacts from operations on agricultural water demands would be beneficial; therefore, no mitigation is required.

3: Gates-out Alternative

Construction-related Impacts.

Impact 3–AG1: Agricultural Uses. Impacts from construction on agricultural uses under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–AG1).

The impacts from construction on agricultural uses would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 3–AG2: Agricultural Use and Prime Agricultural Land. The operation of Alternative 3 would have no significant impact on existing CVP agricultural uses, nor would the project affect prime agricultural land and/or convert prime agricultural land to a non-agricultural use.

Increased pumping capacity at TCCA would have beneficial impacts to water deliveries within CVP. Increased supply and availability of TCCA water to the associated districts during the off-peak irrigation season would result in an increase in the ability to reliably schedule project water during the gates-out period. Although this would not affect contract amounts, it may allow individual farmers to plant additional crops that require irrigation outside of the gates-in period. Such a change could increase the production efficiency of member districts.

Table 3.8-6 summarizes Alternative 3 diversion capacity and maximum diversion, as well as the total quantity difference between the proposed project and the No Action Alternative.

TABLE 3.8-6
Comparison of Diversion Capacity and Maximum Diversion; Difference Between Alternative 3 and No Action Alternative

	No Action Alternative		3: Gates-out Alternative		Difference	
Time Period	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)	Capacity (cfs)	Maximum Diversion (acre-feet)
May 1 through May 14	485	14,405	2,500	74,250	2,015	59,846
May 15 through May 31	2,500	79,200	2,500	79,200	0	0
June 1 through June 30	2,500	148,500	2,500	148,500	0	0
July 1 through August 31	2,500	306,900	2,500	306,900	0	0
September 1 through September 15	2,500	74,250	2,500	74,250	0	0
September 16 through September 30	485	14,405	2,500	74,250	2,015	59,846
Total		**637,659**		**757,350**		**119,691**

Note: Total maximum diversion would not change the cumulative CVP water service contract held by TCCA member districts.

Impacts to water reliability from Alternative 3 would be beneficial because of increased pumping capacity during the irrigation season. The largest amount of benefit from this alternative would occur during May 1 through May 14, and September 16 through September 30, when RBDD is typically in the gates-out position. Increased pumping capacity would greatly benefit this period, when agricultural demands are still quite considerable. For the period of May 1 through May 14, average and maximum water deliveries and average and maximum crop demand would exceed the ability of the No Action Alternative to deliver water. The water delivery ability of Alternative 3 would satisfy the average and maximum water deliveries and average and maximum crop demand for the entire irrigation season, with the exception of a single day where maximum modeled crop demand would not be met. Alternative 3 would increase the reliability of water diversion by increasing capacity in the May 1 through 14 and September 16 through 30 over the No Action Alternative. See Figure 3.8-2 for a graphic comparison of the alternatives.

The impacts from operations on agricultural water demands would be beneficial; therefore, no mitigation is required.

3.8.3 Mitigation

No negative impacts from construction or operations of the proposed alternatives have been identified; therefore, no mitigation is provided.

3.9 Power Resources

This section addresses the power consumption of the various alternatives as well as the potential sources of power that might supply the electrical needs of the potential project. Hydropower generation facilities in CVP play an important role in meeting statewide demand for electricity. In 2000, hydropower accounted for approximately 15 percent (42,000 Gigawatt-hours) of the total electricity used in California (284,000 Gigawatt-hours) (California Energy Commission, 2002). CVP generation accounted for approximately 6,000 Gigawatt-hours of energy in 2000, approximately 15 percent of the total hydropower production and 2 percent of the total energy consumed. However, the annual and seasonal variability of hydropower is an important factor in considering the potential impacts of the alternatives.

Hydropower generation facilities in CVP play an important role in meeting statewide demand for electricity.

3.9.1 Affected Environment

California Electricity Market Structure

California's electric deregulation created a statewide electricity market with its own characteristics and governance. When California deregulated, it established the California Power Exchange to operate a power exchange system from which the state's investor-owned utilities (IOU) (PG&E, Southern California Edison, and San Diego Gas & Electric) had to buy their power on a day-ahead and day-of basis. The highest price power supply bid that was needed for the next day set the price for the entire market. The IOUs were also prevented from hedging into future markets. This eliminated bilateral, negotiated agreements from the market place.

As power suppliers gained an understanding of the market, the Pacific Northwest began to experience the second driest water year of record, and there was a decrease in the natural gas supplies available to California.

This led to a situation where wholesale market prices became extremely volatile and provided opportunities for market manipulation. The California Independent System Operator had responsibility to provide the system with "spinning reserves" which it had to purchase on the spot market, driving wholesale power prices even higher.

The IOUs were unable to pass the increased costs on to their retail customers. As a result, their financial capabilities were quickly lost, and they approached bankruptcy. This eventually led to credit concerns on the part of power suppliers who then withheld supplies because of payment concerns.

The state became involved in purchasing power supply in January 2001. At the end of January 2001, the California Power Exchange suspended its day-ahead and day-of market operations.

In early March 2001, DWR negotiated and executed 40 contracts for nearly 8,900 megawatts for 10 years to meet South California Edison and PG&E needs. These contracts, negotiated during the power crisis, are at above-market prices, and the state is making an ongoing effort to renegotiate the contracts. The state has had some success in this regard.

In April 2001, PG&E filed a voluntary petition for bankruptcy protection under Chapter 11 of the U.S. Bankruptcy Code. Also in April, the Federal Energy Regulatory Commission issued its initial order to provide market mitigation for summer 2001, followed by a second order in June that revised, clarified, and expanded upon the April order. In May, the state authorized the sale of $13.4 billion in bonds to finance power purchases and other measures to ease the crisis.

In June, a Federal Energy Regulatory Commission administrative law judge mediated negotiations on the appropriate level of refunds due California from power suppliers. The negotiations broke down over a lack of documentation.

With the October 2001 California Public Utilities Commission order ending direct access in the state, California's deregulation of its wholesale electricity markets came to an end. The state is now in a position of being a major power purchaser and seller, and longer-term bilateral contracts dominate the market.

The state is now in a position of being a major power purchaser and seller, and longer-term bilateral contracts dominate the market.

In December, the Federal Energy Regulatory Commission issued additional extensive orders clarifying the market mitigation framework that exists in California today; that is due to expire on September 30, 2002. Efforts are underway to redesign the California wholesale power market and to extend the present market mitigation framework until such time as a new framework can be put in place.

In May 2002, documents surfaced indicating deliberate market manipulation by various power marketers that in turn have led to calls for refunds, increased regulatory scrutiny, and perhaps litigation.

Central Valley Project

USBR owns and operates RBDD and serves the dam's electrical loads with Project Use Power (PUP; see discussion under Eligibility). The following discussion sets the framework for existing electrical service to the dam.

USBR's CVP and Washoe Project include 11 power plants with a maximum operating capability of about 2,044 megawatts and an estimated average annual generation of 4.6 million megawatt-hours (MWh). USBR operates all of the power plants with the exception of

one, which is operated by the state for USBR. The Western Area Power Administration (Western), a federal power marketing agency, markets and transmits the power available from the CVP and Washoe Project. Table 3.9-1 provides a summary of CVP hydroelectric generation facilities.

TABLE 3.9-1
Hydroelectric Generation Facilities

CVP Division	Power Plant	Location	Generating Units	Capability (kW[a])
Trinity River	Trinity	Trinity Dam/Trinity River	2	139,650
	Lewiston	Lewiston Dam/Trinity River	1	350
	J.F. Carr	Whiskeytown Dam	2	157,000
	Spring Creek	Spring CreekPower Conduit	2	200,000
Shasta	Shasta	Shasta Dam/Sacramento River	7[b]	625,000
	Keswick	Keswick Dam/Sacramento River	3	105,000
American River	Folsom	Folsom Dam/American River	3	215,000
	Nimbus	Nimbus Dam/American River	2	14,900
Delta	San Luis	San Luis Reservoir	8 (total)	202,000 (CVP share) (424,000 total)
	O'Neill	San Luis Canal	6	29,000
East Side	New Melones	New Melones Dam/ Stanislaus River	2	383,000
Total Capability				**2,070,900**

[a]kW = kilowatt.
[b]Includes two station service units.

Western has historically combined CVP hydroelectric output with supplemental power from other sources to enhance CVP power and to market an amount of firm power to its customers that would not be available in all years solely from CVP facilities.

The Western Area Power Administration markets and transmits the power available from the CVP and Washoe Project.

The first priority for CVP generation is PUP, defined by USBR law and used to operate the CVP and Washoe Project facilities. Western markets the remaining power, currently about 1,580 megawatts, under long-term contracts with 80 preference customers in northern and central California. These contracts expire December 31, 2004, as does a related contract with PG&E, Western Contract 14-06-200-2948A (2948A).

Contract 2948A governs the interconnection of the PG&E and Western systems, Western's use of the PG&E transmission and distribution system, and integration of their respective loads and resources. It

provides for coordinated use and dispatch of CVP and PG&E power resources to meet the federal load supported by the contract. There is insufficient CVP generation in every hour to support the Project Use and Western marketing obligations.

Under the contract, PG&E is responsible for firm electric service to Project Use loads that exceed 100 kW of demand for 3 consecutive months. The charges for that service are limited to wheeling charges and transmission losses. The contract expires December 31, 2004, and replacement arrangements are needed. These arrangements need to reflect the PG&E bankruptcy reorganization and acknowledge who is the appropriate provider of transmission services. Whatever the future arrangements, USBR will retain the statutory service requirement for Project Use loads.

Future Western contractual arrangements for services similar to those provided by PG&E under Contract 2948A might or might not be provided by PG&E. Alternatively, after the contract expires, Western may take an increased role in providing firming services to preference power customers.

Because of the contract expirations, Western developed a new Marketing Plan for the CVP and Washoe Project power in 1997. The Marketing Plan, recently finalized, sets forth the Western policies and procedures under which it will market CVP power. Western will sign 20-year contracts, effective January 1, 2005, with preference customers. Table 3.9-2 lists Western's current customers and long-term requirements (kW).

TABLE 3.9-2
Western Customers by Agency and Sub-agency Type and Associated Firm Power

Customers by Agency and Sub-agency Types	Long-term Firm (kW)
Federal Agencies	
Air Force, U.S. Department of	
Beale Air Force Base	20,507
David Grant Medical Facility, Travis	3,552
McClellan Air Force Base	10,655
Onizuka Air Force Base	3,500
Travis Air Force Base	11,299
Travis Wherry Housing (Air Force Base)	100
Category Total:	**49,613**
Defense Logistics Agency	
Parks Reserve Forces Training Area	500
Sharpe Facility	4,000
Tracy Defense Distribution Depot	3,800
Category Total:	**8,300**

TABLE 3.9-2
Western Customers by Agency and Sub-agency Type and Associated Firm Power

Customers by Agency and Sub-agency Types	Long-term Firm (kW)
Energy, U.S. Department of	
DOE/Lawrence Livermore/Site 300	2,000
DOE/Lawrence Berkeley National Laboratory	9,000
DOE/Lawrence Livermore National Laboratory	23,897
DOE/Stanford Linear Accelerator Center	12,903
Category Total:	**47,800**
National Aeronautics and Space Administration	
Ames Research Center	80,000
Moffett Federal Airfield	3,984
Category Total:	**83,984**
Navy, U.S. Department of	
Naval Air Station, Lemoore	21,869
Naval Communications Station, Stockton	2,943
Naval Radio Station, Dixon	915
Naval Weapons Station, Concord	2,687
Oakland Army Base	2,275
Category Total:	**30,689**
State Agencies	
Department of Corrections	
California Medical Facility, Vacaville	1,800
California State Prison, Sacramento	2,300
Deuel Vocational Institution	1,700
Northern California Youth Center	2,200
Sierra Conservation Center	3,000
Category Total:	**11,000**
Department of Parks and Recreation	
California State Parks and Recreation, Folsom	100
Category Total:	**100**
State Universities	
CSUS Nimbus	40
University of California, Davis	21,500
Category Total:	**21,540**
Municipalities	
Alameda, City of	21,145
Avenal, City of	622
Biggs, City of	1,300

TABLE 3.9-2
Western Customers by Agency and Sub-agency Type and Associated Firm Power

Customers by Agency and Sub-agency Types	Long-term Firm (kW)
Gridley, City of	4,200
Healdsburg, City of	1,490
Lodi, City of	5,173
Lompoc, City of	2,042
Oakland, Port of	745
Palo Alto, City of	171,200
Redding, City of	91,000
Roseville, City of	69,000
San Francisco, City and County of	2,012
Shasta Lake, City of	11,450
Silicon Valley Power	73,000
Ukiah, City of	4,917
Category Total	**459,296**
Public Utility Districts	
Calaveras Public Power Agency	8,000
East Bay Municipal Utility District	3,914
Lassen Municipal Utility District	23,500
Modesto Irrigation District	4,845
Sacramento Municipal Utility District	361,000
Trinity County Public Utility District	17,000
Tuolumne Public Power Agency	8,000
Turlock Irrigation District	2,190
Category Total:	**428,449**
Rural Electric Cooperatives	
Plumas-Sierra Rural Electric Cooperative	17,900
Category Total:	**17,900**
Irrigation and Water Districts	
Arvin-Edison Water Storage District	30,000
Banta-Carbona Irrigation District	3,700
Broadview Water District	500
Byron-Bethany Irrigation District	2,200
Cawelo Water District	3,500
East Contra Costa Irrigation District	2,000
East Contra Costa Irrigation District	500
Eastside Power Authority	1,914
Glenn-Colusa Irrigation District	3,343
James Irrigation District	638
Kern-Tulare Water District	638
Lower Tule River Irrigation District	914

TABLE 3.9-2
Western Customers by Agency and Sub-agency Type and Associated Firm Power

Customers by Agency and Sub-agency Types	Long-term Firm (kW)
Patterson Water District	2,000
Provident/Princeton Irrigation District	750
Rag Gulch Water District	500
Reclamation District 2035	1,600
San Juan Water District	1,000
San Luis Water District (Fittje)	3,250
San Luis Water District (Kalijian)	3,400
Santa Clara Valley Water District	638
Sonoma County Water Agency	6,000
West Side Irrigation District	2,000
West Stanislaus Irrigation District	5,200
Westlands Water District	16,391
Westlands Water District 6-1	1,850
Westlands Water District 7-1	3,200
Category Total:	**97,626**
Railroads and Railways	
Bay Area Rapid Transit District	4,000
Category Total:	**4,000**
Economic Development	
Merced Irrigation District	3,724
Pittsburg Power Company	3,869
Category Total:	**7,593**
Grand Total:	**1,267,890**

Western will market its Base Resource, which is defined as CVP and Washoe Project power output and existing power purchase contracts extending beyond 2004 that Western determines is available for marketing. The priorities for CVP power are Project Use; first preference customers (preference customers within the counties of Trinity, Calaveras, and Tuolumne); and adjustments for maintenance, reserves, transformation losses, and certain ancillary services. The remaining power is available for marketing.

Data from Western, summarized in Table 3.9-3, show the estimated monthly amount of power available from CVP under average water conditions, under a rolling dry year and under a rolling wet year; the estimated PUP for the same 3 years; and the remaining power available for sale.

TABLE 3.9-3
Estimated Amount of CVP Power Available for Sale

	CVP (MWh)			Project Use (MWh)			Net CVP Project Use (MWh)		
Month	Average Year	Rolling Dry Year	Rolling Wet Year	Average Year	Rolling Dry Year	Rolling Wet Year	Average Year	Rolling Dry Year	Rolling Wet Year
January	331,567	143,733	458,664	147,204	140,768	156,107	184,363	2,965	302,557
February	313,753	134,420	703,017	123,143	129,753	157,344	190,610	4,666	545,673
March	344,767	174,874	714,516	113,965	142,204	104,934	230,802	32,670	609,582
April	375,708	218,054	789,889	60,540	33,193	87,425	315,168	184,861	702,464
May	560,475	356,260	575,712	63,461	45,964	100,940	497,014	310,296	474,772
June	592,539	504,263	553,827	91,418	22,130	154,242	501,121	482,133	399,585
July	664,040	436,587	788,749	105,802	19,997	156,410	558,238	416,590	632,340
August	542,982	357,394	533,772	105,390	34,491	71,301	437,592	322,903	462,471
September	300,960	204,312	246,853	97,304	47,293	85,586	203,656	157,019	161,267
October	227,994	143,449	195,731	91,846	27,286	104,884	136,148	116,163	90,847
November	210,758	119,261	331,327	106,780	19,421	117,813	103,978	99,840	213,514
December	274,877	119,158	651,137	127,449	132,031	140,961	142,821	12,471	494,233
Annual	4,740,420	2,911,765	6,543,194	1,234,302	794,531	1,437,947	3,501,511	2,117,635	5,089,305

The determination of whether or not a load is considered a Project Use load is made by USBR. The available resources are indicated in Table 3.9-4.

TABLE 3.9-4
Western 2004 Marketing Plan Estimated CVP Power Resources and Adjustments

Power Resources/Adjustment	Range/Value
Annual Energy Generation	2,400,000 to 8,600,000 MWh
Monthly Energy Generation	100,000 to 1,100,000 MWh
Monthly Capacity	1,100 to 1,900 megawatts
Annual Project Use	670,000 to 1,670,000 MWh
Monthly Project Use	10,000 to 180,000 MWh
Monthly Project Use (on peak)	30 to 230 megawatts
Monthly Maintenance	0 to 300 megawatts
Reserves – Hydro	Minimum 5% of monthly capacity
CVP Transmission and Transformation Losses from the Generator Bus to a 230-kilovolt Load Bus	1.8% currently

Source: Western, Notice of Final 2004 Power Marketing Plan.

During some critically dry months, purchases may be required to meet Project Use and first preference customers' obligations. A customer's ability to use the Base Resource for meeting its load will be directly related to the amount of firming provided by Western and the customer's ability to integrate its Base Resource with its other power resources. At the customer's option, Western will provide varying degrees of Base Resource firming and power management services.

Under the Marketing Plan, Western's CVP customers are responsible for providing for the delivery of Western power to their loads and will incur transmission system losses. Figure 3.9-1 illustrates the CVP's power generating and transmission facilities. The Marketing Plan also anticipates that customers will be responsible for scheduling power deliveries with the California Independent System Operator control area. Customers can purchase this service from Western or from a third party.

TCCA is not a preference customer of Western. Because the deadline for application to become a preference customer under the Western 2004 Marketing Plan has passed, there may not be an opportunity for TCCA to become a preference customer until the new contracts expire, perhaps 20 years away. This precludes TCCA from being able to purchase preference power from Western.

However, the use of PUP to serve RBDD electrical loads directly affects Western's power marketing efforts.

TCCA is not a preference customer of Western, which precludes TCCA from being able to purchase preference power from Western. However, the use of PUP to serve RBDD electrical loads directly affects Western's power marketing efforts.

Eligibility

The following discussion is based on USBR's Mid-Pacific Region Draft Policy Statement on Project Use Power, dated September 8, 2000. At the publication of this DEIS/EIR, there were no known changes to the Draft Policy.

PUP is electrical power as defined by USBR law and/or that is used to operate CVP or the Washoe Project facilities. PUP can also be provided to USBR-designated facilities that meet authorized purposes under USBR law, to meet statutory and contractual obligations, and in water rights settlements. Other PUP uses include station-service requirements at USBR dams, power plants, pumping plants, and designated loads directly associated with the federal project. PUP is only available to those USBR project features in which the United States retains ownership. The Secretary of the Interior has discretion in the application of PUP pursuant to the law. That discretion has been delegated to the Commissioner of USBR. PUP is not made available to pump non-project water or to pump project water outside the authorized service area.

Revenues associated with PUP are not considered power sales revenue; they are considered water revenue. Use of PUP reduces the power that can be sold to assist in the repayment of the project. PUP is used when the cost of power from other sources does not result in an economic advantage over the use of PUP.

USBR policy is to reserve as Project Use only that project generation needed to meet the minimum electric service requirements, considering the most economical methods of providing electric service. From the Mid-Pacific Region Draft Policy Statement, "The amount of power required to provide irrigation service shall not be more than the amount required to provide water delivery by gravity from that point on unless specifically authorized by Congress."

To the degree practical, project loads are scheduled to minimize the amount of PUP required during peak load hours. Also, PUP loads are considered critical and are excluded from voluntary or elective load dropping. The cost of PUP power is approximately 1.3 cents per kilowatt-hour (kWh).

RBDD Energy Consumption

The power supply for operation of RBDD and related diversion facilities and the Corning Canal Pumping Plant is provided as CVP PUP, the cost of which is included in USBR's O&M charges to the water users on the TC and Corning canals.

Current energy use at RBDD includes the Corning Canal Pumping Plant, the administration and other buildings, the RPP, and all of the other loads at the diversion dam.

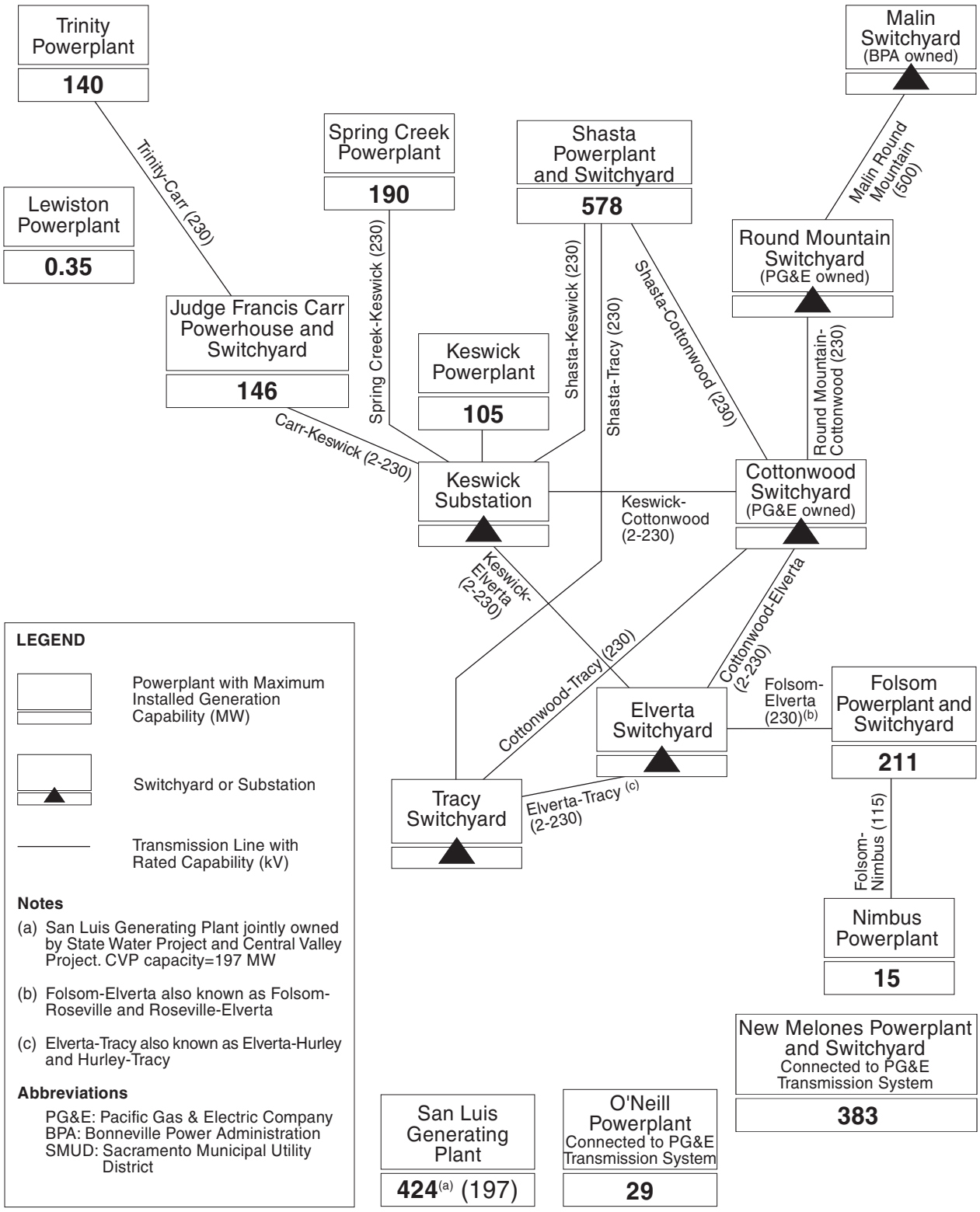

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FIGURE 3.9-1
CVP POWER GENERATION FACILITIES AND ASSOCIATED TRANSMISSION FACILITIES
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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In any given year, the use can vary significantly depending on water conditions, weather, and water allocations. The total estimated monthly kWh energy requirements for both the main pump station and the fish bypass pump station are shown in Table 3.9-5. It also shows the estimated monthly energy use to an estimated peak demand in each month based on the number of hours in the month and the estimated relationship of peak demand to average usage. There is considerable year-to-year and month-to-month variability in these numbers, depending on water conditions and weather.

The most significant amount of PUP goes to the operation of the seasonal pumps and RPP and the Corning Canal Pumping Plant. Figure 3.9-2 shows existing annual energy use.

TABLE 3.9-5
Estimated Monthly Energy Use and Peak Demands

Month	Monthly Energy Use (kWh)	Peak Demand (kWh)
January	213,595	1,500
February	119,970	900
March	452,735	2,100
April	963,589	3,000
May	658,164	1,400
June	207,284	500
July	170,566	400
August	157,467	400
September	564,708	3,200
October	862,678	3,200
November	156,136	600
December	87,602	400
Total	**4,614,492**	**3,200[a]**

[a]Annual maximum.

3.9.2 Environmental Consequences

Methodology

For the purposes of this EIS/EIR, it was assumed that CVP would continue to be operated to meet authorized project purposes, which include providing water deliveries to water users, meeting fish and wildlife needs, and generating power. Records of power usage were reviewed for both RBDD and CVP. For each alternative, estimates of projected power usage were made, given the typical amounts of water delivered to TCCA districts and typical pumping efficiencies of similar-scale pump stations. Projected usage for each of the alternatives was then compared to overall usage of CVP to determine the scale of the effect on the overall system.

Significance Criteria

Alternatives were analyzed for their impacts on power consumption. Long-term reductions in power availability to preference power customers could require individual customers to either purchase additional power through the open power markets or construct new power facilities. Given the evolving nature of the power market under recent deregulation statutes and regulations, and in light of the complexity of the grid on which power is wheeled among various locations in the western United States, it is impossible to predict from where replacement power would come. Because natural gas plants are increasingly an economic and relatively clean source of fossil fuel power, it seems likely that elimination of some power from the net CVP power available to preference customers would result in greater natural gas power generation somewhere in the western United States, for ultimate consumption in California. To assess the severity of the impacts, the following significance criteria were developed:

- A 50-megawatt reduction in capacity available for sale to preference power customers in January, February, March, June, July, August, September, or December (the months typically most sensitive to reduced capacity).
- A reduction of 5 percent or more in the annual energy available for sale to preference power customers.
- A reduction of 5 percent or more in the average energy available for sale to preference power customers during any month.

No Action Alternative

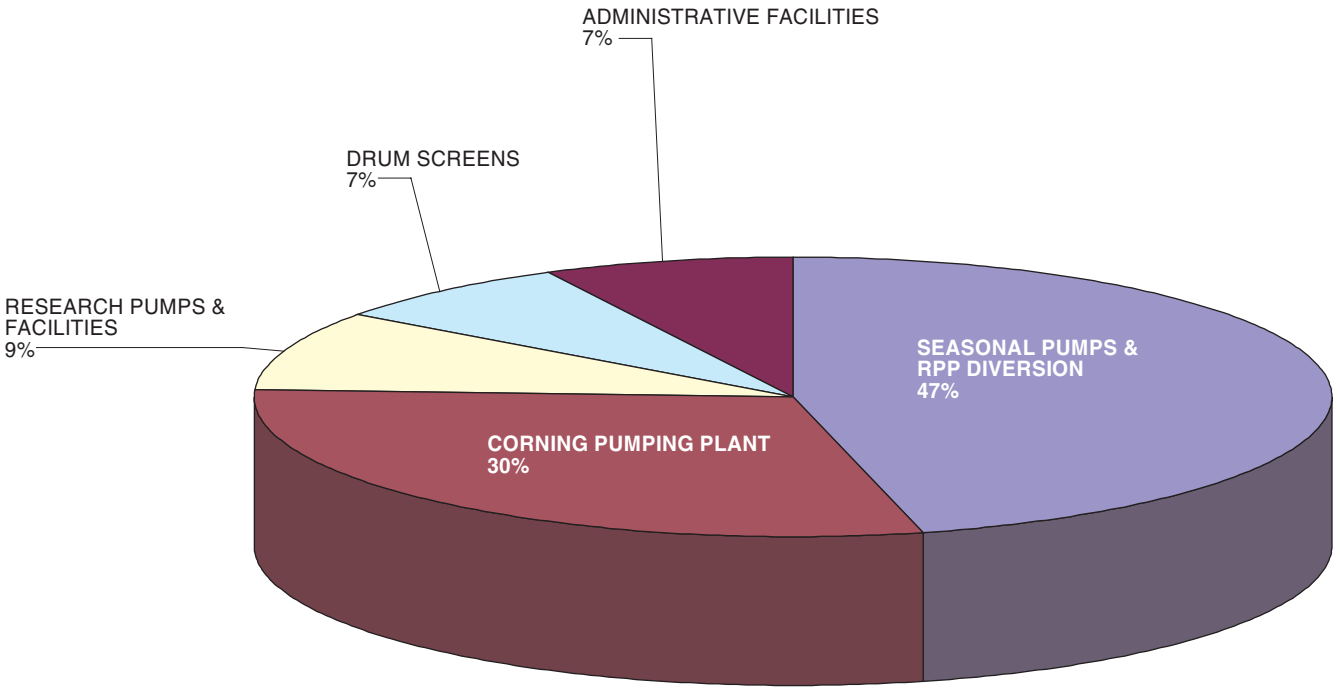
No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Construction-related Impacts.

Impact 1A–PR1: Power Resources. Construction of the proposed facilities would not affect power resources in the project area.

There would be no construction-related impacts on power resources; therefore, no mitigation is required.



NOTE: CURRENT ANNUAL ENERGY USE TOTALS 4,800 MWH

FIGURE 3.9-2
EXISITNG ANNUAL ENERGY USE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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Operations-related Impacts.

Impact 1A–PR2: Power Resources. The electricity use for the Corning Canal Pumping Plant, administration facilities, drum screens, and research are estimated to be unchanged under this alternative. The loads that would change are the seasonal pumps and RPP diversion loads.

Table 3.9-6 compares the estimated monthly kWh energy requirements for both the main pump station and the fish bypass pump station for Alternative 1A to the No Action Alternative. In addition, it converts the estimated monthly energy use to an estimated peak demand in each month based on the number of hours in the month and the estimated relationship of peak demand to average usage.

The incremental use of each alternative is the difference between the alternative and the No Action Alternative. Based on the level of accuracy, the No Action Alternative and Alternative 1 have the same annual electricity use, although there are differences as to during which month the use occurs. It can be seen that the estimated peak demand does not increase to the same extent as the energy use. This is because the annual energy use increases are spread out over the various months, and the load factor is relatively unchanged.

Using the monthly energy use from Table 3.9-6, Figure 3.9-3 shows, for a dry water year, how much of the power Western has available to market. It can be seen that in January and February, the loads for Alternative 1A represents about 6 percent of the available Western power, which is less than the No Action Alternative.

TABLE 3.9-6
Estimated Monthly Energy Use and Peak Demands for the 4-month Gates-in Alternative[a]

	No Action Alternative		1A: 4-month Gates-in Alternative	
Month	Monthly Energy Use (kWh)	Peak Demand (kWh)	Monthly Energy Use (kWh)	Peak Demand (kWh)
January	213,595	1,500	187,988	1,300
February	119,970	900	202,495	1,600
March	452,735	2,100	314,245	1,500
April	963,589	3,000	809,148	2,500
May	658,164	1,400	1,020,397	2,200
June	207,284	500	184,948	500
July	170,566	400	214,327	500
August	157,467	400	224,842	600
September	564,708	3,200	323,361	1,800
October	862,678	3,200	614,539	1,900
November	156,136	600	318,905	1,200
December	87,602	400	235,583	1,100
Total	**4,614,492**	**3,200[b]**	**4,650,778**	**2,500[b]**

[a]There is considerable year-to-year and month-to-month variability in these numbers, depending on water conditions and weather.
[b]Annual maximum.

In all other months but December, the percentages are generally less than 0.5 percent (or 0.005 per unit) of the power Western has to market in a dry year. In a dry-year December, power would have to be purchased to meet PUP needs; the new loads, if served with PUP, would increase the amount of power to be purchased.

In an average or wet water year, the percentages are well within the normal variability of the system (less than 0.5 percent on a total load basis).

Because California is a summer peaking system, and the new loads are small percentages of the net CVP power in the summer months, there should be less controversy over serving the new pumping loads with PUP.

From this, it can be concluded that the use of PUP to serve any increased loads resulting from Alternative 1A would have an insignificant effect on Western's power marketing, except in the winter. In the winter, California usually has sufficient in-state electrical generation to export power to the Northwest.

The impacts from operations on power resources would be less than significant; therefore, no mitigation is required.

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impact 1B–PR1: Power Resources. Impacts from construction on power resources under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–PR1).

There would be no construction-related impacts on power resources; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1B–PR2: Power Resources. Impacts on power resources under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A-PR2).

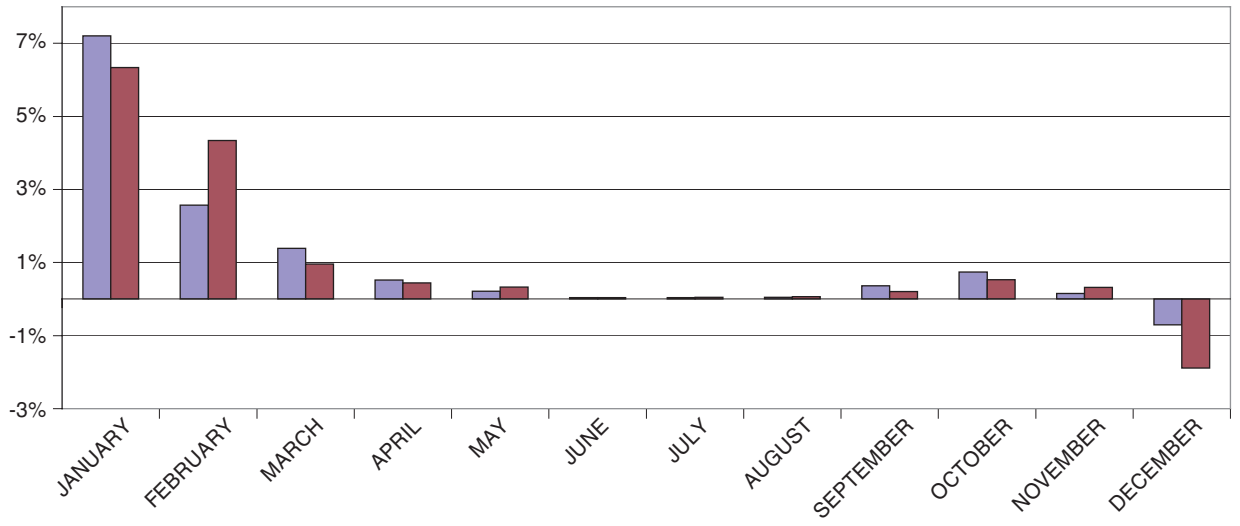
The impacts from operations on power resources would be less than significant; therefore, no mitigation is required.

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impact 2A–PR1: Power Resources. Impacts from construction on power resources under Alternative 2A would be same as those identified for Alternative 1A (see Impact 1A–PR1).

There would be no construction-related impacts on power resources; therefore, no mitigation is required.



LEGEND

NO ACTION

ALTERNATIVE 1

FIGURE 3.9-3
RBDD DRY WATER YEAR ADJUSTED LOADS AS A PERCENT OF NET CVP POWER — NO ACTION ALTERNATIVE VERSUS ALTERNATIVE 1

FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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Operations-related Impacts.

Impact 2A–PR2: Power Resources. The electricity use for the Corning Canal Pumping Plant, administration facilities, drum screens, and research are estimated to be unchanged under this alternative. The loads that would change are the seasonal pumps and RPP diversion loads.

Table 3.9-7 compares the estimated monthly kWh energy requirements for both the main pump station and the fish bypass pump station for Alternative 2A to the No Action Alternative. In addition, it converts the estimated monthly energy use to an estimated peak demand in each month based on the number of hours in the month and the estimated relationship of peak demand to average usage.

The incremental use of each alternative is the difference between the alternative and the No Action Alternative. Based on the level of accuracy, the No Action Alternative and Alternative 2 represents about a 33 percent increase in annual electricity use. It can be seen that the estimated peak demand does not increase to the same extent as the energy use. This is because the annual energy use increases are spread out over the various months, and the load factor is relatively unchanged.

TABLE 3.9-7
Estimated Monthly Energy Use and Peak Demands for the 2-month Gates-in Alternative[a]

	No Action Alternative		2A: 2-month Gates-In Alternative	
Month	Monthly Energy Use (kWh)	Peak Demand (kWh)	Monthly Energy Use (kWh)	Peak Demand (kWh)
January	213,595	1,500	176,873	1,200
February	119,970	900	192,238	1,500
March	452,735	2,100	302,956	1,400
April	963,589	3,000	798,247	2,500
May	658,164	1,400	1,390,120	3,000
June	207,284	500	1,187,417	2,600
July	170,566	400	214,327	500
August	157,467	400	224,842	600
September	564,708	3,200	500,366	2,800
October	862,678	3,200	603,718	2,800
November	156,136	600	308,360	1,100
December	87,602	400	224,583	1,100
Total	**4,614,492**	**3,200[b]**	**6,124,047**	**3,000**

[a]There is considerable year-to-year and month-to-month variability in these numbers, depending on water conditions and weather.
[b]Annual maximum.

Using the monthly energy use from Table 3.9-7, Figure 3.9-4 shows, for a dry water year, how much of the power Western has available to market. It can be seen that in January and February, the loads for Alternative 2A represent about 6 percent of the available Western power, which is less than the No Action Alternative.

In all other months but December, the percentages are generally less than 0.5 percent (or 0.005 per unit) of the power Western has to market in a dry year. In a dry-year December, power would have to be purchased to meet PUP needs; the new loads, if served with PUP, would increase the amount of power to be purchased.

In an average or wet water year, the percentages are well within the normal variability of the system (less than 0.5 percent on a total load basis).

Because California is a summer peaking system, and the new loads are small percentages of the net CVP power in the summer months, there should be less controversy over serving the new pumping loads with PUP.

From this, it can be concluded that the use of PUP to serve any increased loads resulting from Alternative 2A would have an insignificant effect on Western's power marketing, except in the winter. In the winter, California usually has sufficient in-state electrical generation to export power to the Northwest.

The impacts from operations on power resources would be less than significant; therefore, no mitigation is required.

2B: 2-month with Existing Ladder Alternative

Construction-related Impacts.

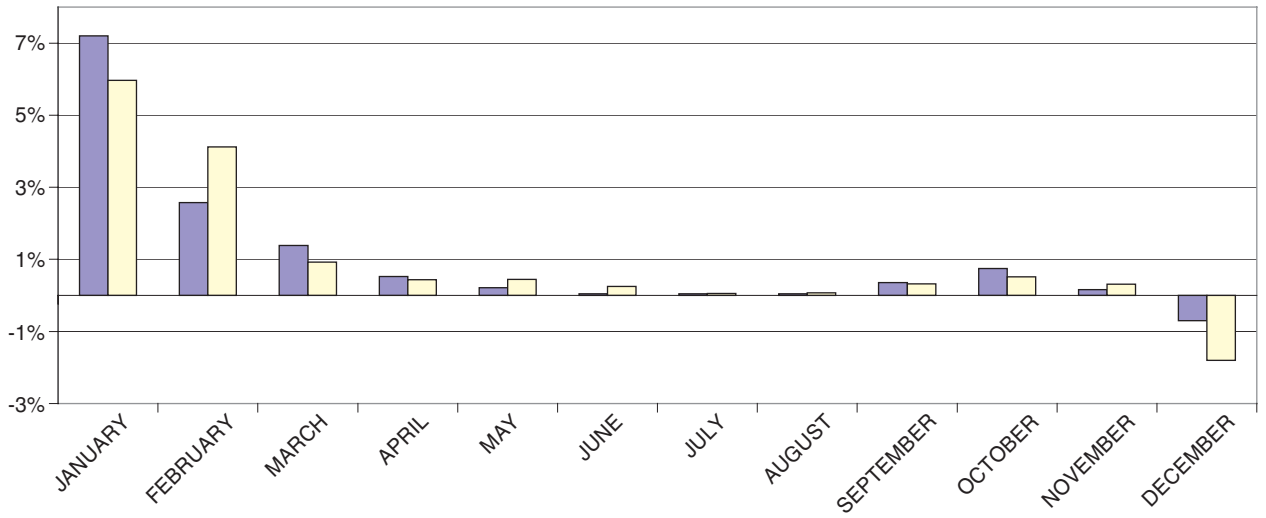
Impact 2B–PR1: Power Resources. Impacts from construction on power resources under Alternative 23B would be the same as those identified for Alternative 1A (see Impact 1A–PR1).

There would be no construction-related impacts on power resources; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2B–PR2: Power Resources. Impacts on power resources under Alternative 2B would be the same as those identified for Alternative 2A (see Impact 2A-PR2).

The impacts from operations on power resources would be less than significant; therefore, no mitigation is required.



LEGEND

- NO ACTION
- ALTERNATIVE 2

FIGURE 3.9-4
RBDD DRY WATER YEAR ADJUSTED LOADS AS A PERCENT OF NET CVP POWER — NO ACTION ALTERNATIVE VERSUS ALTERNATIVE 2
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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3: Gates-out Alternative

Construction-related Impacts.

Impact 3–PR1: Power Resources. Impacts from construction on power resources under Alternative 3 would be the same as those identified for Alternative 1A (see Impace 1A–PR1).

There would be no construction-related impacts on power resources; therefore, no mitigation is required.

Operations-related Impacts.

Impact 3–PR2: Power Resources. The electricity use for the Corning Canal Pumping Plant, administration facilities, drum screens, and research are estimated to be unchanged under this alternative. The loads that would change are the seasonal pumps and RPP diversion loads.

Table 3.9-8 compares the estimated monthly kWh energy requirements for both the main pump station and the fish bypass pump station for the Alternative 3 to the No Action Alternative. In addition, it converts the estimated monthly energy use to an estimated peak demand in each month based on the number of hours in the month and the estimated relationship of peak demand to average usage.

TABLE 3.9-8
Estimated Monthly Energy Use and Peak Demands for the Gates-out Alternative[a]

	No Action Alternative		3: Gates-out Alternative	
Month	Monthly Energy Use (kWh)	Peak Demand (kWh)	Monthly Energy Use (kWh)	Peak Demand (kWh)
January	213,595	1,500	216,373	1,500
February	119,970	900	228,688	1,800
March	452,735	2,100	343,073	1,600
April	963,589	3,000	836,963	2,600
May	658,164	1,400	1,430,688	3,100
June	207,284	500	1,227,058	2,700
July	170,566	400	1,458,896	3,100
August	157,467	400	1,546,229	3,800
September	564,708	3,200	538,735	3,000
October	862,678	3,200	642,174	3,000
November	156,136	600	345,831	1,300
December	87,602	400	263,672	1,200
Total	**4,614,492**	**3,200[b]**	**9,078,379**	**3,800**

[a]There is considerable year-to-year and month-to-month variability in these numbers, depending on water conditions and weather.
[b]Annual maximum.

The incremental use of each alternative is the difference between the alternative and the No Action Alternative. Based on the level of accuracy, the No Action Alternative and Alternative 3 represent about a doubling of the annual electricity use. It can be seen that the estimated peak demand does not increase to the same extent as the energy use. This is because the annual energy use increases are spread out over the various months, and the load factor is relatively unchanged.

Using the monthly energy use from Table 3.9-8, Figure 3.9-5 shows, for a dry water year, how much of the power Western has available to market. It can be seen that in January and February the loads for Alternative 3 are about the same as for the No Action Alternative.

In all other months but December, the percentages are generally less than 0.5 percent (or 0.005 per unit) of the power Western has to market in a dry year. In a dry-year December, power would have to be purchased to meet PUP needs; the new loads, if served with PUP, would increase the amount of power to be purchased.

In an average or wet water year, the percentages are well within the normal variability of the system (less than 0.5 percent on a total load basis).

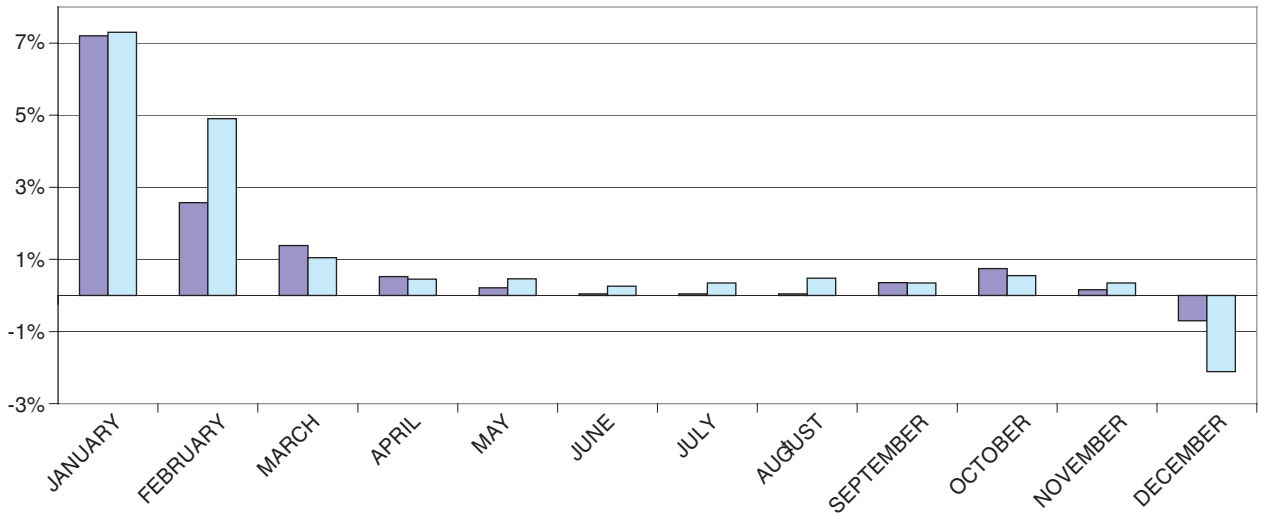
Because California is a summer peaking system, and the new loads are small percentages of the net CVP power in the summer months, there should be less controversy over serving the new pumping loads with PUP.

From this, it can be concluded that the use of PUP to serve any increased loads resulting from Alternative 3 would have an insignificant effect on Western's power marketing, except in the winter. In the winter, California usually has sufficient in-state electrical generation to export power to the Northwest.

The impacts from operations on power resource would be less than significant; therefore, no mitigation is required.

3.9.3 Mitigation

No significant impacts from construction or operations of the proposed alternatives have been identified; therefore, no mitigation is provided.



LEGEND

- NO ACTION
- ALTERNATIVE 3

FIGURE 3.9-5
RBDD DRY WATER YEAR ADJUSTED LOADS AS A PERCENT OF NET CVP POWER — NO ACTION ALTERNATIVE VERSUS ALTERNATIVE 3
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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3.10 Socioeconomics

Potential project impacts to the local economy of the City of Red Bluff and Tehama County were identified as a key concern of project stakeholders. This section provides background information about current socioeconomic conditions and provides an analysis of how the proposed project alternatives may impact the local economy.

Potential project impacts to the local economy of the City of Red Bluff and Tehama County were identified as a key concern of project stakeholders.

3.10.1 Affected Environment

This section addresses current conditions in population and housing, labor force and employment, recreation, and the region's economic base.

Population and Housing

Historical trends in population since 1970 for the City of Redding, Tehama County, and the State of California are shown in Table 3.10-1. In the 1970s and 1980s, both the City and County grew more rapidly than other areas of the state. In the 1990s, this trend reversed, and the County grew at a rate similar to that of the state, and the City grew more slowly. In fact, the City grew very slowly in the 1990s; population increased from 12,363 in 1990 to 13,147 in 2000.

TABLE 3.10-1
Historical Population Trends in the City of Red Bluff, Tehama County, and the State of California

	Population				Percentage Growth		
Area Evaluated	1970	1980	1990	2000	1970 to 1980	1980 to 1990	1990 to 2000
Red Bluff	7,676	9,490	12,363	13,147	24	30	6
Tehama County	29,600	39,100	49,625	56,039	32	27	13
California	20,039,000	23,782,000	29,760,021	33,871,648	19	25	14

Sources: U.S. Department of Census Bureau. California Department of Finance, Demographic Research.

The age structure of the population of the City of Red Bluff, Tehama County, and the State of California is shown on Figure 3.10-1. Compared to the rest of the state, both the City and County have fewer persons of working age and more retirees as a percent of total population.

Data from the 2000 Census indicate that there were 5,567 housing units in Red Bluff with a homeowner vacancy rate of 2.7 percent and a rental vacancy rate of 8.4 percent. There were 20,403 housing units in the County, and the County's vacancy rates (2.3 percent and 8.6 percent, respectively) were similar to those in the City. Both the City and County had higher vacancy rates than the state overall, which had an owner vacancy rate of 1.4 percent and a rental vacancy rate of 3.7 percent.

Reflecting the City and County's higher percentage of retirees, the persons per household in 2000 for the City and County (2.57 and 2.67,

respectively) are less than the state average of 2.94 persons per household.

Labor Force, Unemployment, and Income

In 2000, the civilian labor force in Tehama County was 25,760; about a quarter of those employees (5,580) lived in Red Bluff. In recent years, the unemployment rate has been higher in the County than in the state as a whole. For example, in 1990, the unemployment rate was 10.0 percent in the County versus 5.8 percent statewide; and in 2000, the rates were 6.9 percent to 4.9 percent, respectively.

1990 U.S. Department of Census data indicate that the labor force in Tehama County has a somewhat less formal education than the state average. For example, in 1990, the proportion of the population with less than a high school education was 28 percent in Tehama County compared to 24 percent for the state. The proportion of the population with less than a bachelor's degree was 89 percent in Tehama County compared to 77 percent for the state.

The fastest growing sectors of the local economy are retail, trade, finance, insurance, and real estate.

Incomes in Tehama County are much lower than other areas of the state. In the County, 1999 median per capita income was $22,378, which ranked 51st of the 58 counties in California. Statewide, median per capita income was $29,376.

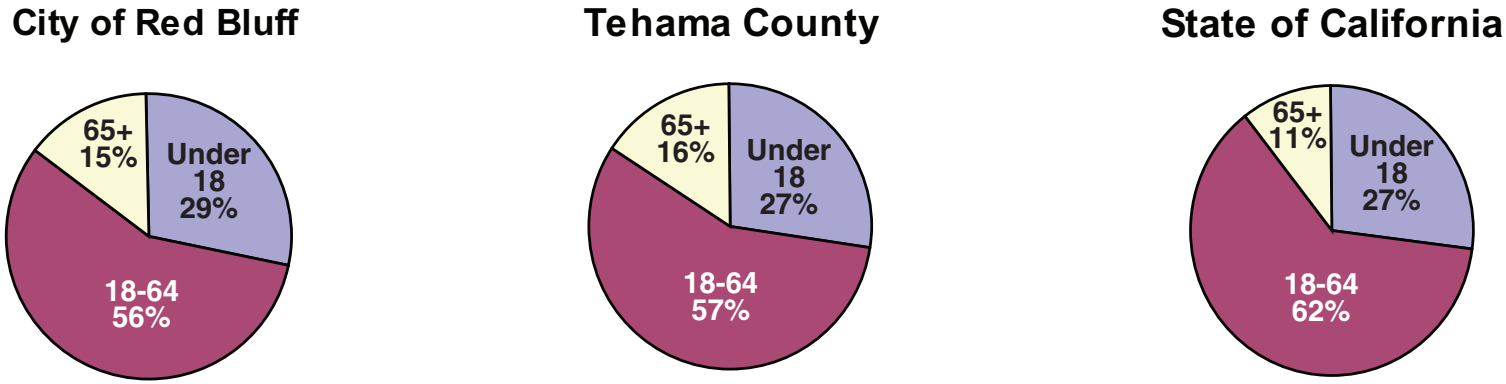
Economic Base

Employment by industry sector in 1990 and 2000 is shown in Table 3.10-2 for Tehama County and the State of California. As shown, total employment grew much more rapidly during the 1990s in Tehama County (31 percent) than did the rest of the state (13 percent). The fastest growing sectors of the local economy are retail, trade, finance, insurance, and real estate.

Table 3.10-3 provides a comparison of employment by industry sector for Tehama County and the State of California. As shown, the local economy is highly dependent on agriculture, including forestry. One recent study (Umbach, 1997) reported that as of 1997, 21 percent of Tehama County's jobs were related to agriculture, compared to 4 percent for the state as a whole. The main cash crops in the County are dried plums, walnuts, dairy and beef cattle, almonds, corn, alfalfa, and olives. Farmland makes up approximately 47 percent of the total acreage in the County.

Farmland makes up approximately 47 percent of the total acreage in the County.

Lumber and wood products manufacturing is also important to the local economy, as it represents over 6 percent of total employment in Tehama County, compared with less than 1 percent for the state. In 2000, the County produced over 100 million board-feet of timber, which was over 5 percent of the state's total.



Source: U.S. Department of Census Bureau.

FIGURE 3.10-1
AGE STRUCTURE OF RED BLUFF, TEHAMA COUNTY, AND THE STATE OF CALIFORNIA
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

TABLE 3.10-2
Tehama County and State of California Employment by Sector, 1990 and 2000

	Tehama County Employment		California Employment		1990 to 2000 Percent Change	
Industry	**1990**	**2000**	**1990**	**2000**	**County**	**State**
Agriculture, Forestry, Fishing	1,090	1,480	363,600	408,500	36	12
Mining and Construction	320	450	599,500	750,400	41	25
Manufacturing	2,050	2,500	2,068,800	1,947,800	22	-6
Transportation and Public Utilities	330	460	612,200	743,600	39	21
Wholesale Trade	200	200	768,900	818,200	0	6
Retail Trade	2,620	4,240	2,223,800	2,477,400	62	11
Finance, Insurance, Real Estate	410	650	808,800	819,900	59	1
Services	2,300	3,020	3,343,100	4,612,900	31	38
Government	2,750	3,550	2,074,800	2,318,100	29	12
Federal	290	280	362,100	272,900	-3	-25
State	330	350	382,000	443,400	6	16
Local	2,130	2,920	1,330,700	1,601,800	37	20
Other [a]	5,930	7,050	1,455,700	1,348,800	19	-7
Total Employment	**18,000**	**23,600**	**14,319,200**	**16,245,600**	**31**	**13**

Source: California Employment Development Department.

[a] Includes self-employed and any net difference in persons who live in the County (or state) but work in another county (or state).

TABLE 3.10-3
Tehama County and State of California Percent of Total Employment by Industry Sector, 2000

	Percent of Total	
Industry	**County**	**State**
Agriculture, Forestry, Fishing	6.3	2.5
Mining and Construction	1.9	4.6
Manufacturing	10.6	12.0
Lumber and Wood Products	6.3	0.4
Other	4.3	11.6
Transportation and Public Utilities	1.9	4.6
Wholesale Trade	0.8	5.0
Retail Trade	18.0	15.2
Finance, Insurance, Real Estate	2.8	5.0
Services	12.8	28.4
Government	15.0	14.3
Federal	1.2	1.7
State	1.5	2.7
Local	12.4	9.9
Other [a]	29.9	8.3
Total	**100.0**	**100.0**

Source: California Employment Development Department.

[a] Includes self-employed and any net difference in persons who live in the County (state) but work in another county (state).

A relatively high proportion of County workers are employed in the retail sector (18 percent in the County versus 15.2 percent for the state). Compared to the rest of the state, the County also has a much higher proportion of self-employed workers and workers who commute to other areas for employment, such as Redding.

The California Employment Development Department lists (alphabetically) the nine major employers in the County, their location, and their primary business as follows:

- Bell-Carter Foods (Corning, preserved fruits and vegetables)
- Bidwell Elementary School (Red Bluff, education)
- Metteer Elementary School (Red Bluff, education)
- Red Bluff Union High School (Red Bluff, education)
- Sierra Pacific Industries (Corning and Red Bluff, wood products)
- St. Elizabeth Community Hospital (Red Bluff, hospital)
- Tehama County (Red Bluff, public administration)
- Tenneco Packaging (Red Bluff, plastic products)
- Wal-Mart (Red Bluff, department store and distribution center)

The Sacramento River and Lake Red Bluff provide recreation opportunities that result in economic activity in and around the City of Red Bluff.

Recreation

The Sacramento River and Lake Red Bluff provide recreation opportunities that result in economic activity in and around the City of Red Bluff. As documented below, a recent study estimated about 64,000 user days of recreation on the river and lake with the main recreational activities including biking, boating and rafting, fishing, jet skiing, park-based activities, walking, and water skiing.

A number of events held along the river and lake that provide economic benefits to the region includes an annual 4th of July celebration and the Nitro National Drag Boat Festival, which bring 20,000 spectators or more to the shores of Lake Red Bluff every Memorial Day weekend.

3.10.2 Environmental Consequences

Methodology

Implementation of any of the build alternatives has the potential to impact the economy of Red Bluff and Tehama County. A number of different types of economic impacts, both positive and negative, may result, including:

Positive Impacts

- Income and jobs from construction/installation of the fish screen and pumps
- Potential long-term benefits from improvement in fish runs

Negative Impacts

- Reductions of income and jobs associated with:
  - Loss of lake-dependent recreation and tourism activity
  - Loss of the Nitro National drag boat races
- Reductions in property values resulting from the loss of the lake
- Fiscal impacts to the City of Red Bluff
- Loss of quality of life and community cohesion

A discussion of each of these potential impacts is provided below.

Overview of Input-Output Analysis. When data were available to estimate monetary impacts associated with the project alternatives, input-output (I-O) analysis was used to estimate the economic impacts. In this analysis, the economic impacts are estimated using Implan, a model originally developed at USFS that is now sold and supported by MIG, Inc. I-O analysis is a commonly used technique that examines the relationships within a local economy between businesses and their customers. I-O analysis includes a model of transactions in the local economy that allows an analyst to track how a change in final demand ripples through the economy in the form of direct, indirect, and induced spending.

In the I-O framework, a project or action that results in new spending for final demand or a reduction in existing spending is called a direct effect. The businesses that make the final sales must in turn purchase goods and services from other businesses. These indirect purchases are called indirect effects, which continue until leakages from the region in the form of imports, wages, or profits to persons outside the region end the cycle. Finally, workers at the producing businesses spend their wages in the local economy and purchase additional goods and services. These purchases are referred to as induced effects. The total economic impact of an action is the sum of the direct, indirect, and induced effects. I-O models generate multipliers that can be multiplied to direct purchases to represent the total direct, indirect, and induced effect of an action to different sectors of the economy.

The total economic impact of an action is the sum of the direct, indirect, and induced effects.

In conducting an I-O analysis, indirect and induced effects result only when businesses purchase goods and services from other local businesses. Purchases from businesses outside the region are leakages from the local economy. Thus, regional purchase coefficients, which represent the proportion of local demand that is purchased from local businesses, are used in the analysis to prevent an overstatement of the economic impacts to the local economy.

Finally, in I-O analysis, it is only new spending in a region that is considered in an impact analysis. Examples of such spending would include a new manufacturing plant locating in a region, a major new construction project, growth in tourism, or growth in an event attended

by out-of-town residents. Growth in existing businesses or events attended only by local residents are typically excluded from an I-O analysis because they are considered to represent a reallocation of dollars that would have been otherwise spent elsewhere in the economy. In this case, two economic impacts are being analyzed (lake-dependent recreation and tourism and the Nitro National drag boat races) that could result in a reduction of spending in the local economy. The specific assumptions made about how local vs. non-local spending for these impacts are considered in the analysis are addressed below in the discussion of those impacts.

For this analysis, an Implan model of Tehama County was used, so multipliers used to estimate impacts in the I-O analysis are estimated using business relationships in Tehama County. Impacts are reported for sales (referred to as output in I-O modeling) and employment.

Two economic impacts are being analyzed (lake-dependent recreation and tourism and the Nitro National drag boat races) that could result in a reduction of spending in the local economy.

Construction Impacts. The impacts of project construction on local sales and employment are shown in Table 3.10-4. In the table, employment is shown both as an average over the duration of the project and in employee-years. Employee-years is perhaps the better measure for assessing the number of jobs created by the project, and average employment is useful for assessing the number of workers on the project at any one time. As shown, the 2-month Improved Ladder Alternative would result in the most local spending ($90 million) and employment (889 employee-years). The Gates-out Alternative would result in the most local average employment (an average of 316 jobs during construction).

The 2-month with Existing Ladders Alternative would result in the lowest level of local spending ($73 million) and employment (715 employee-years). The 4-month Gates-in Alternative would result in the lowest level of local average employment at an average of 263 jobs during construction.

Data provided by Implan indicate that there are roughly 350 employees in Tehama County that work in construction trades that could be affected by project construction.

For perspective, data provided by Implan indicate that there are roughly 350 employees in Tehama County that work in construction trades that could be affected by project construction. Thus, the impacts shown would spread beyond just Tehama County, and many of these jobs would be filled by workers from a multi-county region.

Fish-run Improvements. One of the main objectives of the TCCA Fish Passage Improvement Project is to improve the long-term ability to reliably pass anadromous fish and other species of concern past RBDD. At this time, it is difficult to predict whether the build alternatives in and of themselves would result in substantial improvements in fish survival rates, but the potential exists. If such improvement occurs, improved fish runs could result in a modest increase in economic activity in the City of Red Bluff as expenditures increase for food, groceries, fuel, and fishing supplies.

The results of the Fishtastic! analysis indicate that potential improvement in fish runs would be greatest under the 2-month Gates-in alternatives and the Gates-out Alternative, and somewhat less improvement would be likely under the 4-month Gates-in alternatives.

TABLE 3.10-4
Economic Impacts of Project Construction

	Alternatives				
	1A: 4-month Improved Ladder	**1B: 4-month Bypass**	**2A: 2-month Improved Ladder**	**2B: 2-month with Existing Ladders**	**3: Gates-out**
Construction Cost (Million 2002$)	$84.5	$90.2	$94.4	$79.0	$88.0
In-region Sales (Million 2002$)					
Direct	$59.5	$64.8	$67.0	$53.9	$59.6
Indirect	$11.1	$12.1	$12.5	$10.1	$11.1
Induced	$9.6	$10.4	$10.8	$8.7	$9.6
Total[a]	**$80.3**	**$87.3**	**$90.3**	**$72.6**	**$80.3**
In-region Employment					
Construction Duration (years)	3.0	3.0	3.0	2.5	2.5
Direct	161	176	182	175	194
Indirect	51	56	57	55	61
Induced	51	55	57	55	61
Average Employment During Construction[b]	**263**	**287**	**296**	**286**	**316**
Employee-years[c]	**790**	**860**	**889**	**715**	**791**

[a]Totals may not add because of rounding.

[b]Assumes employment levels are constant during construction.

[c]Total employment times construction duration.

Economic Losses from Reduced Lake-dependent Recreation and Tourism Spending. Lake Red Bluff provides many benefits to the local community: everything from a pleasant aesthetic experience, to a means to cooling off in the summer, to injections of income into the local economy. This section provides the results of an analysis of the potential for loss of sales and employment that may result from the loss of Lake Red Bluff. These estimates exclude impacts associated with the loss of the Nitro National drag boat races, which are estimated separately.

The estimates of reduced lake-dependent recreation and tourism spending are based on the results of a survey of local motels, campgrounds, and RV parks; Implan spending and employment data; and estimated spending profiles from a national survey of recreation at USACE projects (Propst et al., 1998).

Table 3.10-5 provides an estimate of the lake-dependent hotel and other lodging sales that would be foregone under the Gates-out Alternative (Alternative 3) and the 2-month Gates-in alternatives (Alternative 2). The first line of the table shows total annual estimated hotel and other lodging sales in Tehama County. This is followed by an estimated increase in sales during the gates-out and 2-month gates-in periods of

30 and 20 percent, respectively. These estimates were derived from information provided about summer and non-summer staffing levels and occupancy in the motel survey.

TABLE 3.10-5
Lake-dependent Direct Lodging Sales Loss

	Alternative	
Lodging Sales	**Gates-out**	**2-month Gates-in**
County Hotel and Other Lodging Sales		
Annual[a]	$12,967,360	$12,967,360
Percent Increase Above Average During Months Impacted[b]	30%	20%
During Impact Period if No Seasonality	$4,322,453	$2,161,227
During Impact Period	$5,619,189	$2,593,472
Additional Sales During Impact Period	$1,296,736	$432,245
City Hotel and Other Lodging Sales		
Red Bluff Percent of County[c]	62%	62%
Additional Sales During Impact Period	$803,976	$267,992
Lake-dependent Hotel and Other Lodging Sales		
Percent of Additional Sales that Is Lake-dependent[b]	50%	50%
Additional Lake-dependent Sales	$401,988	$133,996

[a]Implan, 2002.
[b]CH2M HILL estimate based on motel survey and recreation data (Guthrie, 1996).
[c]City of Red Bluff, Finance Department; Tehama County Clerk and Recorder's Office.

The additional hotel and other lodging sales during the impact period is calculated as the difference between estimated sales during the impact period and estimated sales during the impact periods assuming sales occurred at a constant rate throughout the year (e.g., $5,619,189 - $4,322,453 = $1,296,736).

Additional hotel and lodging sales in the City of Red Bluff were estimated by multiplying additional sales in the County by 62 percent, which is the percentage of total transient occupancy tax revenue that is collected within the City limits (California State Controller's Office, 2000). Finally, it is estimated that 50 percent of those additional sales are lake-dependent. Interviews with the motel operators indicated that while the lake was a big draw for some motels, others felt that much of their additional summer business resulted from summer business clientele and persons vacationing in the I-5 corridor. The result is an estimate that approximately $402,000 per year in total direct lake-dependent hotel and lodging sales would be foregone during the Gates-out Alternative, and $134,000 per year would be foregone under the 2-month Gates-in alternatives.

Table 3.10-6 shows estimates of other lake-dependent spending. Other lake-dependent spending is derived from the hotel and lodging estimates presented in Table 3.10-5 and spending profiles derived from surveys conducted at 12 USACE projects (Propst et al., 2002).

TABLE 3.10-6
Lake-dependent Revenue Bridged to Implan Sectors

	USACE Data[a]			Lake-dependent	
Revenue Estimates	**1996 $/party/day**	**2002[b] $/party/day**	**Percent of Hotel[c]**	**4-month**	**2-month**
Hotel/Motel	$49.22	$59.09		$401,988	$133,996
Other Expenses	$59.06	$69.17		$470,504	$156,835
Camping	$1.96	$2.35	4.0	$16,009	$5,336
Grocery	$12.17	$14.22	24.1	$96,756	$32,252
Restaurant	$13.50	$15.78	26.7	$107,334	$35,778
Auto and RV	$8.18	$8.88	15.0	$60,417	$20,139
Boating	$10.42	$12.51	21.2	$85,111	$28,370
Fishing and Hunting	$2.97	$3.56	6.0	$24,218	$8,073
Recreation and Entertainment	$3.28	$3.94	6.7	$26,791	$8,930
Miscellaneous	$6.60	$7.92	13.4	$53,868	$17,956
Total Spending	**$108.28**	**$128.26**		**$872,493**	**$290,831**

Bridge Table to Implan Sectors

			Lake-dependent	
Industry/Commodity	**Sector**	**Revenue Sources**	**4-month**	**2-month**
Industry	463	Hotels and Lodging Places	$417,997	$139,332
Commodity	MIREC[d]	Food–Offsite	$96,756	$32,252
Industry	454	Eating and Drinking	$107,334	$35,778
Commodity	MIREC	Gas and Oil (40%)	$58,211	$19,404
Commodity	MIREC	Other Auto Expense (40%)	$24,167	$8,056
Commodity	436	Water Transportation (40%)	$34,044	$11,348
Commodity	473	Equipment Rental and Leasing (20%)	$29,106	$9,702
Commodity	488	Amusement and Recreation	$51,009	$17,003
Commodity	MIREC	Miscellaneous Expenses/Souvenirs	$53,868	$17,956
Total			**$872,493**	**$290,831**

[a]Propst et al., 1998.
[b]Escalated using data from U.S. Department of Labor, Bureau of Labor Statistics, 2002.
[c]MIG, Inc. 2002.
[d]MIREC = Micro-Implan Recreation Economic Impact Estimation System.

The spending profiles include spending on camping, groceries, restaurants, autos and RVs, boating, fishing, recreation and entertainment, and miscellaneous spending. Average spending per party-day for each expense is shown in 1996 dollars and then inflated to 2002 dollars using relevant price indexes. Then the percent of spending relative to the USACE's hotel/motel estimate is used to estimate lake-dependent spending on the other expenses. As shown, it is estimated that total direct lake-dependent spending is approximately $872,000 per year under the 4-month Gates-in alternatives and approximately $291,000 per year under the 2-month Gates-in alternatives.

The second part of the table shows how the estimated spending is "bridged" to Implan sectors. The numbered sectors refer to Implan-defined sectors. Sectors designated as "MIREC" use spending profiles developed from a model and national study of recreation expenditures

called the Micro-Implan Recreation Economic Impact Estimation System developed at Michigan State University (Stynes, 2002). This is necessary to estimate the indirect and induced spending associated with these expenditures.

The Implan model was used to estimate indirect and induced impacts of the loss of lake-dependent spending. Table 3.10-7 provides total direct, indirect, and induced spending losses resulting from the loss of lake-dependent economic activity for each alternative. As shown, the alternatives result in total direct, indirect, and induced sales losses of $1.0 million for the Gates-out Alternative, and about $363,000 for the 2-month Gates-in alternatives. About 19 jobs would be lost under the Gates-out Alternative, and six jobs would be lost under the 2-month Gates-in alternatives.

TABLE 3.10-7
Direct, Indirect, and Induced Lake-dependent Economic Losses

Economic Losses	Direct	Indirect	Induced	Total
Lake-dependent Economic Losses – Gates-out Alternative				
Sales	$872,000	$95,000	$121,000	$1,088,000
Employment	16	1	2	19
Lake-dependent Economic Losses – 2-month Gates-in Alternatives				
Sales	$291,000	$32,000	$40,000	$363,000
Employment	5	<1	1	6

Loss of the Nitro Nationals Drag Boat Races. The Nitro National drag boat race is a long-standing community event that occurs each year over the Memorial Day weekend and results in a substantial injection of dollars into the local economy. Under the Gates-out and 2-month Gates-in alternatives, the community would lose the boat drag event. An estimate of the economic impact of that loss follows.

The Nitro National drag boat race is a long-standing community event that occurs each year over the Memorial Day weekend and results in a substantial injection of dollars into the local economy.

This analysis is based upon prior analyses of the economic impacts of the event prepared by the event promoters with input from the local Chamber of Commerce (A&J Events, 2002). An initial version of that analysis was included in the Lake Red Bluff FEIS (USDA/USFS, 1991), and a recent update of that analysis was prepared by A&J Events using 1999 data. Staff at A&J Events provided estimates of spectators, expenses, and revenues for the 2002 event. These estimates were used as a baseline for the estimate.

A&J Events staff forecast that this year's event would attract 25,000 spectators. Spending by those spectators and boaters were estimated and are presented in Table 3.10-8. Spectator spending on meals, refreshments, and other expenses were derived using historical spending estimates updated for inflation. Only spending from out-of-region spectators and boaters were included in the spending estimates. As shown, it was estimated that the 2002 boat drag event would result in new spending of approximately $1.9 million from spectators and

$429,000 from boaters. Table 3.10-9 shows estimates of sales from lodging and total tax revenues. As shown, it was estimated that total sales to motels and RV parks during the event would be $134,000. Total City and County tax revenue from sales and use taxes and the County motel tax were estimated to be $45,000. Total direct spending on the event of $2.7 million was broken down into sectors in Table 3.10-10. The spending profile shown in this table was derived and prepared using confidential expense information provided by A&J Events (A&J Events, 2002).

TABLE 3.10-8
2002 Memorial Day Nitro Nationals Spectator and Boater Spending

	Spectators			Boaters		
Event Days and Meals	**Average Expense ($)**	**No. Spectator**	**Total Expense ($)**	**Average Expense ($)**	**No. Boaters**	**Total Expense ($)**
Event Totals–1999						
Saturday		7,332				
Sunday		8,892				
Total		16,224				
Event Totals–2002						
Saturday		11,298				
Sunday		13,702				
Total		25,000				
Event Totals						
Local Saturday		5,084			0	
Not Local Saturday		6,214			1,981	
Total Saturday		11,298			1,981	
Local Sunday		5,344			0	
Not Local Sunday		8,358			1,981	
Total Sunday		13,702			1,981	
Meal Totals						
Friday Dinner	33.75	6,214	209,723	33.75	1,981	66,867
Saturday Breakfast	6.75	11,298	76,262	6.75	1,981	13,373
Saturday Refreshments	33.75	11,298	381,308	40.23	1,981	79,706
Saturday Dinner	33.75	7,203	243,101	33.75	1,486	50,153
Saturday Evening	6.75	7,203	48,620	13.50	1,981	26,747
Sunday Breakfast	6.75	13,702	92,489	6.75	1,981	13,373
Sunday Refreshments	33.75	13,702	462,443	40.23	1,981	79,706
Sunday Dinner	33.75	5,248	177,120	33.75	991	33,446
Monday Breakfast	6.75	4,179	28,208	6.75	991	6,689
Miscellaneous	6.75	12,500	84,375	14.85	1,981	29,422
Auto Expenses	5.40	12,500	67,500	14.85	1,981	29,422
Total Spending			**1,871,147**			**428,903**

Source: Information is based on an analysis conducted by A&J Events, 2000; updated using 2002 budget data from A&J Events. Per-day spending updated for inflation by CH2M HILL.

TABLE 3.10-9
2002 Memorial Day Nitro Nationals Lodging and Tax Revenues

Revenue Source	Lodging and Tax Revenues
Motel Revenue	
Beds (2 night total)	1,800
Average Room Rate	$70
Motel Revenue	$126,000
Transient Occupancy Tax	10%
Transient Occupancy Tax Revenue	$12,600
RV Park Revenue	
Spaces (2 night total)	300
Average Per Night Fee	$25
RV Park Revenue	$7,500
Sales Tax	
City and County Rate	1.25%
Spectator and Boater Spending	$2,300,051
Motel and RV Park	$133,500
Taxable Promoters Expenses	$175,241
Total Taxable Spending	$2,608,791
City and County Sales Tax Revenue	$32,610
Total Tax Revenue	**$45,210**

TABLE 3.10-10
2002 Memorial Day Nitro Nationals—Total Direct Local Spending Bridged to Implan/MIREC Sectors

Industry or Commodity	Sector Number	Name	Expense ($)
Industry	523	State and Local Government–Non Education	49,210
Industry	520	Federal Government–Nonmilitary	11,000
Industry	493	Other Medical and Health Services	2,700
Industry	488	Amusement and Recreation NEC[a]	9,500
Industry	487	Racing and Track Operation	27,000
Industry	473	Equipment Rental and Leasing	3,000
Industry	470	Other Business Services	23,750
Industry	469	Advertising	8,500
Industry	463	Hotels and Lodging Places	133,500
Industry	459	Insurance Carriers	10,000
Commodity	MIREC	Misc. Expenses/Souvenirs	113,797
Industry	454	Eating and Drinking	1,083,529
Commodity	MIREC	Food–Offsite	1,010,804
Commodity	MIREC	Gas and Oil	67,845
Commodity	MIREC	Other Auto Expense	29,076
Industry	446	Sanitary Services and Steam Supply	6,000
Commodity	HH	High Income	64,791
Total			**2,654,001**

[a]NEC = not elsewhere classified.

The Implan model was used to estimate indirect and induced impacts of the loss of the Nitro National drag boat races. Table 3.10-11 provides total direct, indirect, and induced spending losses resulting from the loss of the Nitro National drag boat races, which assumes it would take place under both the Gates-out Alternative and the 2-month Gates-in alternatives. As shown, the alternatives result in total direct, indirect, and induced sales losses of $3.2 million and the loss of about 49 jobs. The job loss estimates are difficult to interpret because they are based on relationships between jobs and annual sales, and this represents losses of economic activity in support of a weekend event. Therefore, the impact is likely to result in more temporary jobs lost than shown, but fewer full-time jobs lost than shown.

It is possible that a change to the Gates-out Alternative or the 2-month Gates-in alternatives would result in a reduction in property values.

TABLE 3.10-11
Direct, Indirect, and Induced Economic Impacts from Loss of Nitro Nationals

	Direct	Indirect	Induced	Total
Sales	$2,654,000	$196,000	$304,000	$3,154,000
Employment	42	3	5	49

Note: Numbers may not add because of rounding.

Property Value Impacts. A survey of lakefront and lake-access properties was conducted to identify properties that may be affected negatively by the project alternatives. It is possible that a change to the Gates-out Alternative or the 2-month Gates-in alternatives would result in a reduction in property values. The potential for property value impacts was estimated by first identifying properties that are adjacent to the lake, or with a lake view, or properties with lake access defined as properties within walking distance (three to five blocks) of River Park. The properties were identified using field surveys and information obtained from the Tehama County Assessor's Office (2001).

The survey included residential and small commercial properties as well as properties located within Red Bluff City limits and unincorporated Tehama County. Lands that are zoned for industrial use, government-owned land, mills, and churches were excluded from the analysis. Properties included in the residential category included single-dwelling units, multi-family units, and vacant home sites. Small commercial properties included vacant and occupied parcels with businesses such as mini markets, medical and dental offices, restaurants, fast food establishments, full service stations, and professional offices.

Data from the Tehama County Assessor's Office were used to gain perspective into the magnitude of potential property tax impacts. The Fiscal Year 2001-02 total assessed value for Tehama County is $2.73 billion. The City of Red Bluff has a market valuation of approximately $483 million. Properties identified as being on the lake or having lake access have an assessed value of approximately $33.6 million, which

represents approximately 1.2 percent of the total assessed value of the County. Most of the value of those properties, $29 million, is located within the City of Red Bluff. This represents approximately 6 percent of the total assessed value of the City ($483 million). A breakdown into residential and small commercial property in the City and unincorporated County is provided in Table 3.10-12.

TABLE 3.10-12
Value and Number of Properties that May Be Affected by Project Alternatives

	Within Red Bluff City Limits			Unincorporated County		
	On Lake	Park Access	Total	On Lake	Park Access	Total
Assessed (Million $, Fiscal Year 2001-02)						
Residential	$4.7	$12.4	$17.1	$3.7	$0	$3.7
Small Comm	$6.4	$5.7	$12.0	$0.7	$0	$0.7
Total	**$11.0**	**$18.1**	**$29.1**	**$4.4**	**$0**	**$4.4**
Number of Properties						
Residential	40	114	154	29	0	29
Small Comm	16	43	59	3	1	4
Total	**56**	**157**	**213**	**32**	**1**	**33**

Note: The results shown in this table are estimates of the total value of properties that may experience an impact in property values. They are not an estimate of the loss of property tax value.

The likelihood of impacts to property values associated with the different alternatives is difficult to quantify because of the numerous factors that contribute to real estate valuations. Phone interviews with local real estate agents and the County Assessor's Office were conducted to obtain information on historical and current trends in the real estate market. The agents that were contacted did not recall a noticeable change in property values after 1988 when the operation of the lake was modified from 12 months to 8 months. Since that time, property values have steadily increased, particularly in the residential real estate market. One real estate agent described the current market as a "seller's market," with increasing property values (Bianco, 2002, pers. comm.). The Assistant Assessor noted that riverfront property throughout the County has been selling at a premium price, and houses and vacant lots in the Surrey Village area upstream from the diversion dam have experienced a significant increase in price because of their proximity to the river and the fact that they have year-round riverfront property (Stroud, 2002, pers. comm.).

The consensus opinion expressed during interviews is that it would be more difficult to sell property under the Gates-out Alternative than under the 2-month Gates-in alternatives. One real estate agent noted that there was not much of an impact going from a 12-month lake to a 6-month lake because property owners knew the lake would be usable during the summer months (Hill, 2002, pers. comm.). The interviewees were all generally of the opinion that the 2-month Gates-in alternatives

and the Gates-out Alternative would have a greater impact on market values than previous changes to the lake. Houses would be more difficult to sell, and property value changes would be more pronounced under the Gates-out Alternative than under the 2-month Gates-in alternatives.

Based on interviews and the limited data available to assess property tax impacts, it is likely that the Gates-out Alternative would result in a negative impact to properties within the City that are adjacent to the lake. Those properties are likely to sell for less in the future than they would otherwise. The amount of decline would depend on a number of other factors that are also important in establishing the value of residential and commercial properties. The effect on properties adjacent to the lake but outside the City limits is likely to be much less noticeable because there would be a much smaller change in the aesthetics and access in areas where the lake is not much wider than the free-flowing river. It is possible, but less likely, that properties within walking access to River Park (also known as City Park) would suffer a noticeable drop in property values under the Gates-out Alternative.

The extent of the potential decline in property values is uncertain. A recent study that summarized research into the added value of a view amenity in residential real estate indicated that lake-view premiums range from 4 to 18 percent (Benson, 1998). This could be considered a reasonable range of the potential for decline in value for properties with a view of the lake. Considering that the view is only available currently for 4 of 12 months and that in some areas a lake view would be replaced by a river view, it is likely that the loss of value for most properties would tend to be at the lower end of that range.

Under the 2-month Gates-in alternatives, it is possible that some properties would be more difficult to sell, which is another way of saying that, ultimately, sales prices would be somewhat lower than what they would have been if the gates were in for 4 months. However, the impact is not likely to be substantial.

The City receives a majority of its revenues from various taxes collected within the City limits.

Fiscal Impacts to City of Red Bluff. The Fiscal Year 2001-02 general fund revenues budgeted for the City of Red Bluff are approximately $4.7 million. The City receives a majority of its revenues from various taxes collected within the City limits. As shown in Table 3.10-13, the largest contributor to the City's revenues is sales taxes, which are expected to account for approximately $2.2 million, or nearly 47 percent of all revenues in Fiscal Year 2001-02. About 18 percent of the City's total revenues is projected to be derived from property taxes, and the transient occupancy tax would generate over 8 percent of total revenues. Other sources of revenue include licenses and permits, inter-governmental revenues, and other revenues.

TABLE 3.10-13
City of Red Bluff General Fund Revenues

Revenue Source	2001-02 Budget ($)	Percent of Total Revenues
Property Tax	860,000	18.2
Sales Tax	2,200,000	46.6
Transient Occupancy Tax	395,000	8.4
Other Taxes	192,000	4.1
Licenses and Permits	186,100	3.9
Intergovernmental Revenue	755,260	16.0
Other Revenues[a]	135,000	2.9
Total General Fund Revenues	4,723,360	100.0

Source: City of Red Bluff, Finance Department.

[a]Other revenues include charges for current services ($44,500), interest income ($67,000), and miscellaneous revenue ($23,500).

Tehama County assesses a tax rate of $1.00 per $100 of assessed values on all taxable property in the County. The property tax rate is allocated to the County, cities, special tax districts (i.e., cemeteries, flood control), and schools for annual operational expenses. For Fiscal Year 2001-02, the County general fund was estimated to receive approximately 18.7 percent of the total collections. The City of Red Bluff was estimated to receive about 3.15 percent of the total collections for its operations.

Because the market valuations of the properties surveyed represent a relatively small percentage of the overall assessed value of the County, a decrease in value of these properties would likely have a minor impact on the overall market value of the County.

As discussed above, under the 4-month Gates-in alternatives it is expected that property values would likely continue to increase and result in increased property tax collections and revenue. If the market valuations of the properties surveyed were to decrease in value because of either the 2-month Gates-in alternatives or the Gates-out Alternative, property tax revenues would experience a corresponding decrease. Because the market valuations of the properties surveyed represent a relatively small percentage of the overall assessed value of the County, a decrease in value of these properties would likely have a minor impact on the overall market value of the County.

A change in the market valuation of Red Bluff could potentially affect the amount of property taxes allocated to the City for annual operations. Currently, the City is allocated 3.15 percent of the total property tax collected in Tehama County. The allocation is calculated by the state and is partially based on total market valuations in the City, per capita market valuation, services provided by the City, and the allocation rate from previous years. Under the Gates-out Alternative, if property values decline or increase more slowly than projected trends, the City might receive a smaller property tax allocation rate. However, because of the relatively sizeable tax base in the City, a change in market valuations of the properties surveyed would likely have a minor impact

on the overall assessed value of the City. Thus, the allocation rate would likely not be impacted significantly.

More specifically, the properties analyzed currently pay approximately $286,000 in property taxes. According to state allocation rates, the City of Red Bluff currently receives approximately $9,000 (3.15 percent) in property tax revenues from the potentially affected parcels. The total amount of that revenue represents about 1 percent of the City's budgeted property tax revenues ($860,000) for Fiscal Year 2001-02. Thus, even in the unlikely event property values decline (rather than just grow more slowly) as a result of any of the alternatives, the impact on property collections in the City and County would be very small.

There may be more substantial fiscal impacts from reductions in sales and use taxes to the City of Red Bluff. As discussed above, under both the 2-month Gates-in alternatives and the Gates-out Alternative, local governments in Tehama County would lose an estimated $12,600 in transient occupancy tax and $32,600 in sales and use tax revenue from the loss of the Nitro National drag boat races. Based on data from the Board of Equalization, A&J Events, and the motel survey, it is estimated that 60 percent of the transient occupancy tax revenue would come from the City, and 80 percent of the sales and use tax revenue would come from the City. Also, the City would experience a loss of approximately $55,000 under the Gates-out Alternative and a loss of approximately $18,000 under the 2-month Gates-in alternatives resulting from a loss of lake-dependent recreation and tourism spending.

The combined impact to the City of Red Bluff from the loss of transient occupancy tax revenues and sales and use tax revenues is approximately $89,000 under the Gates-out Alternative and $52,000 under the 2-month Gates-in alternatives. When compared with total City tax revenues of $4.7 million, this represents a loss of 1.9 percent of total City revenues under the Gates-out Alternative and a loss of 1.1 percent of total City revenues under the 2-month Gates-in alternatives.

Reduced Quality of Life and Loss of Community Cohesion. Under the Gates-out Alternative, the greater Red Bluff community would lose an important physical feature and there would be a negative impact to the quality of life of local residents. While some residents prefer restoration of a free-flowing river, it is likely that a majority of local residents believe that they benefit from the presence of the lake in many non-quantifiable ways such as the cooling effect in summer months or just knowing the lake is there for recreation whenever one wants to go for a visit. This loss cannot be quantified, but is a sizeable loss to local residents. The impact on the quality of life and community cohesion would be much greater under the Gates-out Alternative than under the 2-month Gates-in alternatives.

The loss of the boat drag races would result in a loss of community cohesion and civic pride.

Under the 2-month Gates-in alternatives and the Gates-out Alternative, the Nitro National drag boat races, traditionally held on Lake Red Bluff over Memorial Day weekend, could no longer be held. Beyond the economic impact of this change, the boat drags is an important community event that is a shared reference point for local citizens. The loss of this event would result in a loss of community cohesion and civic pride. Even though this effect cannot be quantified, it would represent a loss to many local residents who enjoy the annual event.

A summary of the impacts to the build alternatives is shown in Table 3.10-14, with negative impacts shown in parenthesis. The results shown in the table will be used as the basis for the comparison of impacts presented below.

TABLE 3.10-14
Summary of Socioeconomic Impacts[a]

	Alternative 1: 4-month Gates-in	Alternative 2: 2-month Gates-in	Alternative 3: Gates-out
Construction Impacts (Option A)			
County Sales Impact	$80,300,000	$90,300,000	$88,000,000
Employee-years	790	889	791
Construction Impacts (Option B)			
County Sales Impact	$87,300,000	$72,600,000	Same as above
Employee-years	860	715	
Potential for Positive Economic Impacts from Fish-run Improvements	Less than Alt 2 and Alt 3	More than Alt 1, Similar to Alt 3	More than Alt 2, Similar to Alt 3
Economic Losses from Reduced Recreation and Tourism Spending (Direct, Indirect, Induced)			
Annual Sales	No impact	($363,000)[a]	($1,088,000)
Annual Employment	No impact	(6)	(19)
Economic Losses from the Loss of the Nitro National Drag Boat Races			
Annual Sales	No impact	($3,154,000)	($3,154,000)
Employment[b]	No impact	(49)	(49)
Potential Reduction in Property Values in City of Red Bluff			
Assessed Value of Potentially Impacted Properties	No impact	$29,100,000	$29,100,000
Number of Potentially Impacted Properties	No impact	213	213
Likely Decline in Property Values	None	(small)	(low end of 4-18% range)
Fiscal Impacts from Loss of Lake to the City of Red Bluff			
Property Tax Losses	No impact	(Small)	(Small)
Annual Sales and Use Tax Losses ($)	No impact	($52,000)	($89,000)
Annual Sales and Use Tax Losses (percent of City Total)	No impact	(1.1%)	(1.9%)
Reduced Quality of Life and Loss of Community Cohesion	No impact	(Moderate)	(High)

[a]Negative impacts are shown in parentheses.

[b]Employment impact is difficult to interpret. Number shown is based on annual relationship to sales, but most jobs affected are temporary jobs associated with the event.

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Construction-related Impacts.

Impact 1A–S1: Spending. Alternative 1A would result in direct, indirect, and induced spending of approximately $80.3 million and 790 employee-years during the project. These impacts are similar to those of Alternative 3.

The impacts from construction on socioeconomics would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1A–S2: Improved Fish Runs. The only operations-related impact under Alternative 1A would be the potential for positive economic impacts from improved fish runs. However, the potential for positive economic impact is uncertain and should be viewed as speculative at this stage of analysis.

The impacts from operations on socioeconomics would be less than significant; therefore, no mitigation is required.

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impact 1B–S1: Spending. Alternative 1B would result in direct, indirect, and induced spending of approximately $87.3 million and 860 employee-years. These impacts are just below those of Alternative 2A, which has the greatest economic impact during construction.

The impacts from construction on socioeconomics would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 1B–S2: Improved Fish Runs. Impacts from operations on socioeconomics under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A– S2).

The impacts from operations on socioeconomics would be less than significant; therefore, no mitigation is required.

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

The 2-month Improved Ladder Alternative would result in the greatest economic impact during construction.

Impact 2A–S1: Spending. Alternative 2A would result in direct, indirect, and induced spending of approximately $90.3 million and 889 employee-years. These impacts would be the greatest of the alternatives.

The impacts from construction on socioeconomics would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2A–S2: Improved Fish Runs, Reduced Recreation and Tourism Spending, and Loss of Property Values. As shown in Table 3.10-14, there would be a number of potential economic impacts under the 2-month Gates-in alternatives. In general, the impacts associated with the 2-month Gates-in alternatives would be noticeable, but not significant.

The one positive impact, the potential for positive economic impacts from fish-run improvements would be similar in magnitude to Alternative 3 and more than Alternatives 1A and 1B. However, the potential for positive economic impact is uncertain and should be viewed as speculative at this stage of analysis.

The combined impact from reduced recreation and tourism spending and from the loss of the Nitro National drag boat races is estimated to be about $3.5 million per year. This is small relative to total annual sales in Tehama County of $1.7 billion, but it would be a more substantial impact to the City of Red Bluff. One measure of this impact is the resulting loss of sales and use tax revenue of $52,000, which is about 1.1 percent of the City's total revenues from sales and use taxes.

There would be some potential for a loss of property values for the owners of property adjacent to the lake or with easy access to the lake resulting from the loss of the lake for an additional 2 months of the year. There would also be a moderate reduction in the quality of life and reduced community cohesion for local residents. ***However, the lake would still be present during the hottest summer months (July and August), and while the socioeconomic impacts would be noticeable, the impacts would not be significant; therefore, no mitigation is required.***

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impact 2B–S1: Spending. Alternative 2B would result in direct, indirect, and induced spending of approximately $72.6 million and 715 employee-years. These impacts would be the lowest of the alternatives.

The impacts from construction on socioeconomics would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 2B–S2: Improved Fish Runs, Reduced Recreation and Tourism Spending, and Loss of Property Values. Impacts from operations on socioeconomics under Alternative 2B would be the same as those identified for Alternative 2A (see Impact 2A–S2).

The impacts from operations on socioeconomics would be less than significant; therefore, no mitigation is required.

3: Gates-out Alternative

Construction-related Impacts.

Impact 3–S1: Spending. Alternative 3 would result in direct, indirect, and induced spending of approximately $80.3 million and 791 employee-years. These impacts are similar to those of Alternative 1A.

The impacts from construction on socioeconomics would be less than significant; therefore, no mitigation is required.

Operations-related Impacts.

Impact 3–S2: Improved Fish Runs, Reduced Recreation and Tourism Spending, Decreased Property Value, and Reduced Quality of Life and Community Cohesion. As shown in Table 3.10-14, there would be a number of potential economic impacts under Alternative 3. Although there have been gradual reductions in the amount of time the lake has been available each year, the total loss of Lake Red Bluff would have much more dramatic effects on the local economy than those in recent history. The sum total of the various impacts of this alternative would result in a significant economic impact to the local community.

The one positive impact, the potential for positive economic impacts from fish-run improvements would be similar in magnitude to Alternative 3 and more than Alternatives 1A and 1B. However, the potential for positive economic impact is uncertain and should be viewed as speculative at this stage of analysis.

The combined impact from reduced recreation and tourism spending and from the loss of the Nitro National drag boat races is estimated to be about $4.2 million per year. This is small relative to total annual sales in Tehama County of $1.7 billion, but it would be a more substantial impact to the City of Red Bluff. One measure of this impact is the resulting loss of sales and use tax revenue of $89,000, which is about 1.9 percent of the City's total revenues from sales and use taxes. This impact is not quite double the impact that would be experienced under Alternatives 2A and 2B.

It is likely that the value of properties adjacent to the lake or with easy access to the lake would decline from the loss of the lake. While it is uncertain how large this impact would be, it is expected that, in general,

the impact would be in the low end of national estimates of the value of lake views and proximity of 4 to 18 percent.

This alternative would also result in a noticeable impact to local residents in a number of social aspects such a reduction in the quality of life and reduced community cohesion. Even though these impacts are hard to quantify, they are nonetheless real impacts to the local community.

The sum of the effects on local economic activity, fiscal impacts to the City of Red Bluff, property value declines, and social impacts under Alternative 3 result in a significant socioeconomic impact and cannot be mitigated.

3.10.3 Mitigation

This section discusses mitigations for each significant impact described in Environmental Consequences.

1A: 4-month Improved Ladder

No significant impacts from construction or operations of Alternative 1A have been identified; therefore, no mitigation is provided.

1B: 4-month Bypass Alternative

No significant impacts from construction or operations of Alternative 1B have been identified; therefore, no mitigation is provided.

2A: 2-month Improved Ladder Alternative

No significant impacts from construction or operations of Alternative 2A have been identified; therefore, no mitigation is provided.

2B: 2-month with Existing Ladders Alternative

No significant impacts from construction or operations of Alternative 2B have been identified; therefore, no mitigation is provided.

3: Gates-out Alternative

Significant, unavoidable impacts under Alternative 3 cannot be mitigated; therefore, no mitigation is provided.

3.11 Cultural Resources

3.11.1 Affected Environment

The cultural resources of the project area were reviewed to determine whether sensitive or important resources might be impacted as a result of the project. This section reviews known and potential resources that may be impacted by project implementation.

Ethnography

The dominant group of native inhabitants of the Red Bluff area is the Wintu. The Wintu are the northernmost dialectical groups of the Wintun, whose territory roughly incorporates the western side of the Sacramento Valley from the Carquinez Straits north to include most of the upper Sacramento River drainage, the McCloud River, and the lower reaches of the Pit River. The Wintun, a collective name, were divided into three subgroups with the southern, central, and the northern dialects known respectively as Patwin, Nomlaki, and Wintu. The area surrounding RBDD has been identified as belonging to the River Nomlaki (Goldschmidt, 1978). The River Nomlaki village of Tehemet was near the confluence of the Sacramento River and Elder Creek, approximately 5 miles south of the current RBDD (Goldschmidt, 1978).

Although Wintun subsidence was heavily weighted toward the acorn, the Sacramento River supplied a large variety of foods, not only including fish, but also large and small game found at or near the river.

Although subsistence was heavily weighted toward the acorn, the staple of the diet, the Sacramento River supplied a large variety of foods. These likely included not only fish but also large and small game found at or near the river. Hunting and seasonal gathering of vegetables occurred throughout the villages' territories.

Villages were usually situated along rivers and streams or close to springs where reliable water supplies allowed a semi-permanent occupation. Major villages were located along the riverbanks, with locations oriented to higher spots on the natural levees. Smaller villages tended to be along the tributary streams and near springs. Cultural resources surveys in the region have demonstrated that there was very heavy use of tributary streams and other areas at a distance from the main river, while early ethnographies had emphasized the concentration of population along the Sacramento River.

Historical Settlement

Tehama County began in 1856, with the incorporation of portions of Colusa, Butte, and Shasta counties. The community of Tehama was the first County seat, but this honor was transferred to Red Bluff in 1857 (Hoover et al., 1970).

The earliest European explorer in the area was most likely the Spanish explorer Luis Arguello in 1821, followed 7 years later by Jedediah Strong Smith. Other fur trappers and travelers followed, and the route along the Sacramento River became known as the California-Oregon Trail, and later, the California-Oregon Road (Hoover et al., 1970).

Interest in settlement in the county began somewhat by accident when JohnBidwell, Peter Lassen, and John Burheim were in pursuit of horse thieves in 1843 and ended their chase somewhere near Red Bluff. Peter Lassen was so impressed with the area that he applied for a Mexican Land Grant.

The community of Red Bluff was named after the prominent geologic feature, the bluffs, located along the Sacramento River. The earliest known reference to the future town is in May 1850, when Sashel Woods and Charles L. Wilson were noted to be laying out a town at Red Bluffs, or the Bluffs (Bruff cited in Gudde, 1969). Other early names applied to Red Bluff include Leodocia and Covertsburg. By 1854, maps showed the community as Red Bluffs (Gudde, 1969). The community of Proberta, located approximately 4 miles south of RBDD, was named after a railroad station in 1889, in honor of Edward Proberta (Gudde, 1969).

One cultural resource, a small, one-room, single-story structure was identified within the proposed activity area of all of the action alternatives.

Known Structural Resources

One cultural resource, a small, one-room, single-story structure was identified within the proposed activity area of all of the action alternatives. This resource was assigned a temporary designation, PA-02-01, and was recorded to current California Office of Historic Preservation standards. California Department of Parks and Recreation 523 Series forms, photographs, a scaled sketch map, and location map were also documented. The reported locations of cultural resources identified in the literature search were thoroughly checked, but the area was found to have been substantially modified during recent times; accordingly, they are not considered further.

PA-02-01 consists of a front gable, rectangular-shaped, single-story, wood frame building with tongue-and-groove siding, galvanized sheet metal roof (replacement over green composition rolled roofing), with two, double-sash windows, close eaves, and a plywood door (replacement). It measures approximately 20 by 10 feet. A 20- by 8-foot platform (34 inches high) is located directly adjacent to the building on the south side. A concrete pad, measuring 30 by 30 feet, with threaded rebar imbedded, is located approximately 11 feet to the east. Some evidence of recent (unauthorized) habitation was evident, with refuse and a chair (overturned) in the building.

Given the size of the building, it is unlikely that it ever served as a residence. It is more likely that the building was used for storage, or as a temporary work station. Three power poles also are located in

proximity, possibly indicating use as some support building for water pumping activities. The presence of an elevated platform adjacent to the building (at window height) may also imply that the building was not originally built or designed for the use at this locale, but was moved to the site after construction. The building is not shown on the USGS Red Bluff East 7.5-minute series topographic quadrangle.

It is questionable as to whether or not the structure was originally built at this site. The small size and lack of internal elements that would allow for habitation essentially precludes the possibility that this structure was associated with an individual important in history. It was most likely a small support structure used during the operation of the Diamond International Lumber Yard, a development itself that is less than 50 years in age.

The small size and lack of internal elements that would allow for habitation essentially precludes the possibility that this structure was associated with an individual important in history.

3.11.2 Environmental Consequences

As with most construction projects, implementation of any of the build alternatives has the potential to impact cultural resources in the project vicinity. Following is a description of the methods used to determine the existence of sensitive resources as well as the potential for impacts to those resources.

Methodology

A literature review was conducted on the project vicinity. According to the Northeast Information Center of the California Historical Resources Information, three early archeological inspections were conducted in the vicinity of RBDD. Two prehistoric-period cultural resources have been identified and recorded within a one-half-mile radius of the proposed activity area. Three unrecorded cultural resources to be located within the proposed activity area were plotted on Information Center maps. All of these resources were noted for additional consideration.

A request for information concerning Sacred Lands and the names of individuals and/or groups who may have knowledge of the proposed activity area was submitted to the Native American Heritage Commission. The Heritage Commission replied with a list of names of individuals and organizations that may have knowledge of the area, and with information indicating that no Sacred Lands are known to be located within the proposed activity area. Letters with accompanying maps were sent to three Native American individuals and groups listed to request information on the proposed activity area, or information concerning individuals who might have knowledge of the area. Letters and maps were also sent to the Tehama County Genealogical and Historical Society and Tehama County Museum Foundation requesting information they might have concerning the proposed activity area.

Two responses to these inquires were received. One noted that any area adjacent to a water course is sensitive and could have the potential to

contain cultural resources. The second, from the Tehama County Genealogical and Historical Society, noted that they were not aware of any historic-period resources at the proposed activity area.

The proposed activity area incorporates two areas administered by federal agencies, USFS and USBR. Both agencies were contacted for assistance in obtaining the necessary permits for an archeological inspection.

The proposed project area was evaluated by a professional archeologist by means of parallel transects not exceeding 15 meters in width. Every effort was made to inspect all exposed sediment, including the cutbanks along both banks of the Sacramento River. One area, consisting of a dense stand of riparian species, was not inspected because of limited access. Portions of the Recreation Area, administered by Mendocino National Forest, were covered with sod; and surface visibility was limited to small, disturbed areas. The remaining area was generally free of vegetative cover. The results of the inspections, consultations, and research form the basis of the impact analysis.

Significance Criteria

The Proposed TCCA Fish Passage Improvement Project requires compliance with Section 106 of the National Historic Preservation Act of 1966. Section 106 requires that federal agencies take into account the effect of their actions on properties that may be eligible for, or listed in, the National Register of Historic Places (NRHP). Further, decisions regarding management of cultural resources hinge on determinations of their significance (36 CFR 60.2). As part of this decision-making process, the National Park Service has identified components that must be considered in the evaluation process, including:

- NRHP criteria for significance
- Historical context
- Integrity

The NRHP criteria for evaluation are those resources:

(a) That are associated with events that have made a significant contribution to the broad patterns of our history; or

(b) That are associated with the lives of persons significant in our past; or

(c) That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or

(d) That have yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

For this analysis, the historical context is defined as a narrative statement "that groups information about a series of historic properties based on a shared theme, specific time period, and geographical area." To evaluate resources in accordance with federal guidelines, these sites must be examined to determine whether they are examples of a defined "property type." The property type is a "grouping of individual properties based on shared physical or associative characteristics." Through this evaluation, each site is viewed as a representative of a class of similar properties rather than as a unique phenomenon.

A well-developed historical context helps determine the association between property types and broad patterns of American history.

A well-developed historical context helps determine the association between property types and broad patterns of American history. Once this linkage is established, each resource's potential to address specific research issues can be explicated.

For a property to be eligible for listing in the NRHP, it must meet one of the criteria for significance (36 CFR 60.4 [a, b, c, or d]) and retain integrity. Integrity is defined as "the authenticity of a property's historic identity, evidenced by the survival of physical characteristics that existed during the property's historic or prehistoric period."

To define the concept of integrity, this analysis uses seven aspects or qualities that define integrity in various combinations. The seven aspects are location, design, setting, materials, workmanship, feeling, and association. To retain historic integrity, a property will possess several or usually most of these aspects. The retention of specific aspects is necessary for a property to convey this significance. Determining which of the seven aspects are important involves knowing why, where, and when the property is significant.

For a property to be eligible for listing in the NRHP, it must meet one of the criteria for significance and retain integrity.

This evaluation used the following steps in assessing integrity:

- Define the essential physical features that must be present for a property to represent its significance
- Determine whether the essential physical features are visible enough to convey their significance
- Determine whether the property needs to be compared with similar properties
- Determine, based on the significance and essential physical features, which aspects of integrity are particularly vital to the property being nominated and if they are present

Ultimately, the question of integrity is answered by whether or not the property retains the identity for which it is significant. All properties change over time. It is not necessary for a property to retain all its

historic physical features or characteristics. However, the property must retain the essential physical features that enable it to convey its historic identity. The essential physical features are those features that define why a property is significant.

A property's historical significance depends on certain aspects of integrity. Determining which of the aspects is most important to a particular property requires an understanding of the property's significance and its essential physical features. For example, a property's historic significance can be related to its association with an important event, historical pattern, or person. A property that is significant for its historic association is eligible for listing if it retains the essential physical features that made up its character or appearance during the period of its association with the important event, historical pattern, or person.

A property important for association with an event, historical pattern, or person ideally might retain some features of all seven aspects of integrity. Integrity of design and workmanship, however, might not be as important to the significance, and would not be relevant if the property were an archeological site. A basic integrity test for a property associated with an important event or person is whether a historical contemporary would recognize the property as it exists today. For archeological sites that are eligible under Criteria a and b, the seven aspects of integrity can be applied in much the same way as they are to buildings, structures, or objects.

In summary, the assessment of a resource's NRHP eligibility hinges on meeting two conditions:

- The site must meet at least one of the NRHP evaluation criteria either individually or as a contributing element of a district based on the historic context that is established
- The site must possess sufficient integrity, i.e., it must retain the qualities that make it eligible for the NRHP

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Construction-related Impacts.

Impact1A–CR1: Identified Structural Resources. The one-story structure, PA-02-01, does not retain integrity as indicated in the replaced front door, new roof, and addition of the raised platform on the south side.

This resource does not qualify as a historic property under the NRHP criteria.

The impacts from construction activities on this structure would be less than significant; therefore, no mitigation is required.

Impact 1A–CR2: Unidentified Cultural Resources. Construction activities related to this alternative include excavation and other grading and digging activities.

It is possible that currently unidentified cultural resources could be discovered during these activities, and destruction of such resources could result in a significant impact.

Operations-related Impacts. ***No impacts are anticipated during operations under Alternative 1A; therefore, no mitigation is required.***

1B: 4-month Bypass Alternative

Construction-related Impacts.

Impact1B–CR1: Identified Structural Resources. Impacts on identified cultural resources from construction under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–CR1).

The impacts from construction activities on this structure would be less than significant; therefore, no mitigation is required.

Impact 1B–CR2: Unidentified Cultural Resources. Impacts on unidentified cultural resources from construction under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–CR2).

It is possible that currently unidentified cultural resources could be discovered during these activities, and destruction of such resources could result in a significant impact.

Operations-related Impacts. ***No impacts are anticipated during operations under Alternative 1B; therefore, no mitigation is required.***

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impact 2A–CR1: Identified Structural Resources. Impacts on identified cultural resources under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–CR1).

The impacts from construction activities on this structure would be less than significant; therefore, no mitigation is required.

Impact 2A–CR2: Unidentified Cultural Resources. Impacts on unidentified cultural resources from construction under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–CR2).

It is possible that currently unidentified cultural resources could be discovered during these activities, and destruction of such resources could result in a significant impact.

Operations-related Impacts. ***No impacts are anticipated during operations under Alternative 2A; therefore, no mitigation is required.***

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impact 2B–CR1: Identified Structural Resources. Impacts on identified cultural resources under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–CR1).

The impacts from construction activities on this structure would be less than significant; therefore, no mitigation is required.

Impact 2B–CR2: Unidentified Cultural Resources. Impacts on unidentified cultural resources from construction under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–CR2).

It is possible that currently unidentified cultural resources could be discovered during these activities, and destruction of such resources could result in a significant impact.

Operations-related Impacts. ***No impacts are anticipated during operations under Alternative 2B, therefore, no mitigation is required.***

3: Gates-out Alternative

Construction-related Impacts.

Impact 3–CR1: Identified Structural Resources. Impacts on identified cultural resources from construction under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–CR1).

The impacts from construction activities on this structure would be less than significant; therefore, no mitigation is required.

Impact 3–CR2: Unidentified Cultural Resources. Impacts on unidentified cultural resources from construction under Alternative 3 would be the same as those identified for Alternative 2A (see Impact 1A–CR2).

It is possible that currently unidentified cultural resources could be discovered during these activities, and destruction of such resources could result in a significant impact.

Operations-related Impacts. ***No impacts are anticipated during operations under Alternative 3; therefore, no mitigation is required.***

3.11.3 Mitigation

This section discusses mitigations for each potentially significant impact described in Environmental Consequences.

1A: 4-month Improved Ladder Alternative

Mitigation 1A–CR2. With any surface inspection there is always a remote possibility that previous activities (both natural and cultural) have obscured prehistoric or historic period artifacts or habitation areas, leaving no surface evidence that would permit discovery of these cultural resources. If during construction activities, unusual amounts of non-native stone (obsidian, fine-grained silicates, basalt), bone, shell, or prehistoric or historic period artifacts (purple glass) are discovered, or if areas that contain dark-colored sediment that do not appear to have been created through natural processes are discovered, then work should cease in the immediate area of discovery, and a professionally qualified archeologist should be contacted immediately for an onsite inspection of the discovery. If any bone is uncovered that appears to be human, the Tehama County Coroner would be contacted, according to state law. If the coroner determines that the bone most likely represents a Native American interment, the Coroner would contact the Native American Heritage Commission in Sacramento for identification of the most likely descendants.

Implementation of this mitigation would reduce potentially significant impacts to a less than significant level.

1B: 4-month Bypass Alternative

Mitigation 1B–CR2. See Mitigation 1A–CR2.

2A: 2-month Improved Ladder Alternative

Mitigation 2A–CR2. See Mitigation 1A–CR2.

2B: 2-month with Existing Ladders Alternative

Mitigation 2B–CR2. See Mitigation 1A–CR2.

3: Gates-out Alternative

Mitigation 3–CR2. See Mitigation 1A–CR2.

3.12 Aesthetic and Visual Resources

3.12.1 Affected Environment

The Sacramento River is considered an important aesthetic and visual resource for residents of the City of Red Bluff and Tehama County and visitors to the area. The river largely defines the eastern edge of the City, although there are some incorporated areas to the east of the river. Residents and visitors actively use the river for recreation, both on and adjacent to the river. Four publicly accessible parks are in the project vicinity, and many residences and businesses line the river as it flows through town. For northbound travelers along I-5, the Sacramento River at Red Bluff is the first large body of water viewed north of the Sacramento area. Anyone traveling through Red Bluff on I-5 crosses the Sacramento River twice, a source of some pride for Red Bluff residents. When the dam gates are in the lowered position for 4 months each summer (May 15 through September 15), the formation of Lake Red Bluff causes some viewers to feel that Red Bluff has an abundance of water. In addition to raising the river elevation immediately adjacent to RBDD, Lake Red Bluff also increases the river's elevation for roughly 6 miles upstream, to a point slightly north of the Ide Adobe State Historic Park. This increased river elevation results in the river becoming significantly wider at RBDD (a portion of the river known as Lake Red Bluff) and East Sand Slough filling in with water (also referred to as Lake Red Bluff). A northbound traveler on I-5 through Red Bluff during the 4-month gates-in period not only experiences two river crossings, but also experiences intermittent water views as the interstate parallels East Sand Slough for between 0.5 and 1 mile through town. This extended water view is considered by some to be important in attracting tourists and new residents to Red Bluff.

The Sacramento River is considered an important aesthetic and visual resource for residents of the City of Red Bluff and Tehama County and visitors to the area.

Throughout the year, the volume of water in the Sacramento River varies greatly, accounting for some degree of visual change in the river, as increased flow corresponds with increased river elevation. Flow in the Sacramento River during the gates-out period of September 15, 2001 through March 14, 2002, ranged from a mean low flow of 5,677 cfs to a mean high flow of 51,337 cfs. During the gates-in period of May 15, 2001 through September 15, 2001, the mean low daily flow was 8,467 cfs, and the mean high daily flow in the river was 16,040. Aerial photographs of the project vicinity under both the gates-in and gates-out conditions are shown on Figures 3.12-1 and 3.12-2, respectively. Many figures have been created to display the visual resources of the project area; for reader ease, all Section 3.12 figures are located at the end of this section.

Throughout the year, the volume of water in the Sacramento River varies greatly, accounting for some degree of visual change in the river, as increased flow corresponds with increased river elevation.

Study Methods

Because of the geographic scope of the project vicinity, the project setting was divided into four subareas or reaches with somewhat

Because of the geographic scope of the project vicinity, the project setting was divided into four subareas or reaches with somewhat distinctive visual conditions and project-related issues.

distinctive visual conditions and project-related issues. The use of these subareas provides a convenient way of focusing the analysis to provide a comprehensive assessment of the setting and any changes resulting from the proposed project. Figure 3.12-3 illustrates the geographic extent of each reach. The first reach is referred to as the Lower River/ Red Bluff Recreation Area, and is generally defined as RBDD northward to the Sacramento River/East Sand Slough split. The second reach encompasses the general area known as East Sand Slough. The third reach is referred to as the Middle River, and encompasses the Sacramento River between the Sacramento River/East Sand Slough split and the northern I-5 crossing. The fourth reach is generally the Sacramento River north of the northern I-5 crossing, and is referred to as the Upper River. The sections below describe in detail the setting of each of these reaches.

To structure the analysis of project effects on visual resources, view areas most sensitive to the project's potential visual impacts were identified.

To structure the analysis of project effects on visual resources, view areas most sensitive to the project's potential visual impacts were identified. For each of these areas, viewpoints, referred to as "key viewpoints," were established. Photographs taken from these viewpoints were used to document the appearance of the river under gates-in and gates-out conditions, and in some cases were used as the basis for development of photo simulations illustrating how the area would appear with the addition of the proposed project facilities. Upon review of project plans and project area conditions and use patterns, a preliminary set of key viewpoints considered to be most sensitive to project construction and operation was identified. These key viewpoints were presented to the SWG on March 12, 2002. Generally, the SWG concurred that the key viewpoints selected were appropriate to assess the visual character of the project vicinity. Given the geographic scope of the project vicinity, however, the SWG requested that additional key viewpoints be added to the analysis, including viewpoints from locations on the Sacramento River. The SWG also emphasized the importance of public, rather than private, views. Ultimately, 15 key viewpoints were identified to capture the visual character of the project vicinity, from RBDD to north of Ide Adobe State Historic Park. These viewpoints were photographed in March 2002 to show the gates-out period and in May 2002 to show the gates-in period. Figure 3.12-3 indicates the locations of the 15 key viewpoints.

The gates-out condition was documented on March 26, 2002, when the mean daily flow in the Sacramento River was 7,098 cfs. The gates-in condition was documented on May 16, 2002, when the mean daily flow in the Sacramento River was 11,565 cfs.

To respond to the CEQA requirement that an assessment be made of the visual quality of the landscapes potentially affected by the project, the discussion of the views seen from the key viewpoints presented in this section includes ratings of the visual quality of the landscapes that they

represent. These ratings were developed on the basis of a series of in-field observations carried out during the period from February through May 2002, review of photos of the affected areas, review of methods for assessment of visual quality, and review of research on public perception of the environment and scenic beauty ratings of landscape scenes. The final assessment of the visual quality of the views from each of the key viewpoints was made based on professional judgement that took a broad spectrum of factors into consideration. The factors considered included evaluation of:

- Natural features, including topography, water courses, rock outcrops, and natural vegetation
- The positive and negative effects of human-made alterations and built structures on visual quality
- Visual composition, including assessment of the complexity and vividness of patterns in the landscape

The final ratings assigned fit within the rating scale summarized in Table 3.12-1. This scale, which is based on the scale developed for use with an artificial intelligence system for evaluation of landscape visual quality (Buhyoff et al., 1994), provides a useful framework for the qualitative ratings because it is based on research about the ways that the public evaluates visual quality, and provides an intuitively meaningful description of what is means for a landscape to have been assigned a particular rating.

TABLE 3.12-1
Landscape Visual Quality Scale Used in Rating the Areas Potentially Affected by the Proposed Project

Rating	Explanation
Outstanding Visual Quality	A rating reserved for landscapes with exceptionally high visual quality. These landscapes will be significant regionally and/or nationally. They usually contain exceptional natural or cultural features that contribute to this rating. They will be what we think of as “picture post card” landscapes. People will be attracted to these landscapes to be able to view them.
High Visual Quality	Landscapes that have high-quality scenic value. This may be due to cultural or natural features contained in the landscape or to the arrangement of spaces contained in the landscape that causes the landscape to be visually interesting or a particularly comfortable place for people. These are often landscapes that have high potential for recreational activities or where the visual experience is important.
Moderately High Visual Quality	Landscapes that have above average scenic value but are not of high scenic value. The scenic value of these landscapes may be due to human-made or natural features contained within the landscape, the arrangement of spaces in the landscape, or to the two-dimensional attributes of the landscape.
Moderate Visual Quality	Landscapes that have average scenic value. They usually lack significant human-made or natural features. Their scenic value is primarily a result of the arrangement of spaces contained in the landscape and the two-dimensional visual attributes of the landscape.

TABLE 3.12-1
Landscape Visual Quality Scale Used in Rating the Areas Potentially Affected by the Proposed Project

Rating	Explanation
Moderately Low Visual Quality	Landscapes that have below average scenic value but not low scenic value. They may contain visually discordant human-made alterations, but these features do not dominate the landscape. They often lack spaces that people will perceive as inviting and provide little interest in terms of two-dimensional visual attributes of the landscape.
Low Visual Quality	Landscapes with low scenic value. The landscape is often dominated by visually discordant human-made alterations; or they are landscapes that do not include places that people will find inviting and lack interest in terms of two-dimensional visual attributes.

Note: Rating scale based on Buhyoff et al., 1994.

Lower River/Red Bluff Recreation Area

The Lower River/Red Bluff Recreation Area is dominated by the 488-acre Recreation Area, which occupies the entire eastern bank of this reach.

The Lower River/Red Bluff Recreation Area is dominated by the 488-acre Recreation Area, which occupies the entire eastern bank of this reach. USFS manages the Recreation Area with an emphasis on the interpretation of natural systems through displays, facilities, and programs. Popular activities at the Recreation Area include boating; individual and group camping; walking, biking, and picnicking; fish viewing; and bird watching. Users of the Recreation Area include local residents, tourists, and students. The Recreation Area is also home to the Discovery Center, which provides visitors with educational information about the Sacramento River. This center features walking trails through native riparian forests, grasslands, wetlands, and oak woodlands; demonstration agricultural sites; and a temporary modular building that hosts an environmentally focused charter school, as well as scheduled programs and events.

Section 3.5, Recreation, provides a detailed discussion of the types of activities that take place at the Recreation Area and the number of users that participate in each activity. Generally, attendance at the Recreation Area is greater during the summer, when RBDD gates are in the down position (Figure 3.5-1). However, many more persons use the Recreation Area for in-park activities, rather than river- or lake-centered activities (Figure 3.5-3).

The western bank of the river in the Lower River/Red Bluff Recreation Area primarily consists of various industrial uses. Immediately north of RBDD are the existing intake headworks, right bank fish ladder, and diversion dam facilities. North of these facilities is Red Bank Creek. The remainder of the western bank consists of a manufacturing facility, a landfill for wastewater treatment sludge, and a vacant industrial site (referred to as the Mill Site). The northern extent of the western bank of the Lower River/Red Bluff Recreation Area consists of the City's wastewater treatment plant.

There are no residential uses adjacent to the Lower River/Red Bluff Recreation Area reach.

Five viewpoints were established within the Lower River/Red Bluff Recreation Area reach to capture representative views within this reach of the project vicinity. Figure 3.12-4 shows the location of these five viewpoints and the direction in which they were photographed.

All proposed project facilities are located within the Lower River/Red Bluff Recreation River reach. Therefore, the viewpoints selected within this reach are intended to establish the project setting for potential visual impacts resulting from both construction and operation of the proposed project and from a change in gate operation.

All proposed project facilities are located within the Lower River/Red Bluff Recreation River reach. Therefore, the viewpoints selected within this reach are intended to establish the project setting for potential visual impacts resulting from both construction and operation of the proposed project and from a change in gate operation. Some of the viewpoints and associated figures address potential facilities, some address gate operation, and some address both.

Gates-out Condition. When RBDD gates are in the raised position (gates-out), the Sacramento River approximates a free-flowing river, and the movement of water is visible through the Lower River/Red Bluff Recreation Area reach. Under the gates-out condition, water depth in this reach is such that the eastern bank of the river along the Recreation Area consists of exposed gravel, which is lightly vegetated part of the time. One can follow a well-defined high water mark along the eastern bank of the river throughout this reach. The western bank is bordered by a nearly vertical bluff, along which a high water mark is also readily evident.

Gates-in Condition. When the gates of RBDD are in the lowered position (gates-in), Lake Red Bluff is formed, and the movement of water is considerably slowed through the Lower River/Red Bluff Recreation Area reach. During the gates-in period, water depth increases approximately 12 to 14 feet at the dam (compared to the gates-out period), flooding the eastern bank of the Recreation Area so that no exposed gravel remains and the width of the river increases. The flooded area along the Recreation Area along this reach is popular for water skiers because the shallow water of the lake is warmer than that of the river.

Viewpoint #1. Viewpoint #1 was established in the boat ramp area north of RBDD. This viewpoint was selected to capture representative views that a large number of visitors to the Recreation Area experience. From Viewpoint #1, one can see westward across the Sacramento River, north and south along the Sacramento River, across East Sand Slough and the Sacramento River, northward along East Sand Slough, and northward along the trail that follows East Sand Slough.

Figure 3.12-5a depicts the westerly view across the Sacramento River under the gates-out condition. In the foreground of the view, a wide, lightly vegetated bed of exposed gravel is visible. During several

months of the gates-out period, the gravel becomes lightly vegetated, as shown on this figure. In the middleground of this view, the Sacramento River is visible as it flows roughly north to south through this vicinity. The background view of Figure 3.12-5a is largely industrial. At the far left of the view, Red Bank Creek can be seen as it empties into the Sacramento River, and industrial buildings are visible on the plateau above the bank in the area toward the right side of the photograph. The western bank of the river that is visible in this view would be the location of the proposed pump station, fish screen, and conveyance facility across Red Bank Creek.

Figure 3.12-5b is the same view as depicted on Figure 3.12-5a, except under the gates-in condition. The gates-in condition raises the elevation of the Sacramento River approximately 12 to 14 feet in this location, which causes the formation of Lake Red Bluff. The lightly vegetated gravel in the foreground of Figure 3.12-5a is now completely covered by water.

Figure 3.12-6a depicts the westerly view across the Sacramento River under the gates-out condition, continuing the view toward the north shown on Figure 3.12-5a. Figure 3.12-6a also shows the continuation of industrial buildings along the plateau above the bank of the river. The western bank of the river that is visible in this view is the area where the proposed pump station and fish screen would be located.

Figure 3.12-6b is the same view as depicted on Figure 3.12-6a, except under the gates-in condition. The rise in river elevation causes the debris in the river and the gravel in the foreground to be completely covered by water.

Figure 3.12-7a is a view looking upstream along the Sacramento River under the gates-out condition. The foreground is lightly vegetated gravel; the middleground is the Sacramento River; and the background is the bank of the Sacramento River with mountain views in the far distance.

Figure 3.12-7b is the same view as depicted on Figure 3.12-7a, except under the gates-in condition. As on Figure 3.12-6b, the rise in river elevation causes the debris in the river and the gravel in the foreground to be completely covered by water.

Figure 3.12-8a is a view looking northward toward East Sand Slough and the Antelope Boulevard bridge under the gates-out condition. In the foreground of this view is an expanse of lightly vegetated gravel that extends into East Sand Slough, which is visible at the right side of the view. The Antelope Boulevard bridge and the mountains beyond are visible in the distance.

Figure 3.12-8b is the same view as depicted on Figure 3.12-8a, except under the gates-in condition. The formation of Lake Red Bluff causes

water to back up and fill East Sand Slough. Figure 3.12-8b shows East Sand Slough completely filled with water.

Figure 3.12-9a is a view looking northward under the gates-out condition along the walking/biking trail that parallels East Sand Slough. The left portion of the photograph shows the lightly vegetated gravel that becomes East Sand Slough farther north. The right two-thirds of the photo shows the walking/biking trail with recreation and picnicking areas. This view includes the area where the western extent of the proposed bypass channel would be located.

Figure 3.12-9b is the same view as depicted on Figure 3.12-9a, except under the gates-in condition. This view shows East Sand Slough completely filled with water to its eastern bank. The vegetation that appears green and lush during the gates-out period is now dry and brown.

Viewpoint #2. Viewpoint #2 was established at the entrance to the Discovery Center. This viewpoint was also selected to capture representative views that a large number of visitors to the Recreation Area may experience, particularly those who visit the Discovery Center. From Viewpoint #2, one can look west across a parking lot toward the Sacramento River and can also look east toward the Sycamore Campground.

Figure 3.12-10a is a view looking west toward the Sacramento River under the gates-out condition. In the near foreground of the view, the parking lot serving the boat ramp is visible. In the middleground, the Sacramento River, which is partially obscured by vegetation, can be seen. On the western bank of the river, the old industrial facilities are visible.

Figure 3.12-10b is the same view as depicted on Figure 3.12-10a, except under the gates-in condition. In this view, increased foliage along the river almost completely obscures the view of the river, making a change in river elevation and width undetectable.

Figure 3.12-11 is a view looking east along the road that encircles the Sycamore Campground and toward the area where the proposed bypass channel would be sited. Intersecting roads dominate the foreground view of this photograph; and grass, shrubs, and trees are in the middleground.

Viewpoint #3. Viewpoint #3 is a view looking northwest along the access road that leads from the Sycamore boat ramp out of the Recreation Area (Figure 3.12-12). This view encompasses a portion of the area where the bypass channel would be developed if the bypass alternative were selected.

Viewpoint #4. Viewpoint #4 is a view from Sale Lane north of the Discovery Center, looking southward into the Recreation Area (Figure 3.12-13). This view encompasses a portion of the area where the bypass channel would be developed if the bypass alternative were selected.

Viewpoint #5. Viewpoint #5 was established within the Sacramento River west of the Recreation Area. This viewpoint was selected to capture representative views that river users may experience in the vicinity of the proposed project. From this point in the river, one may look west and downstream toward the location of the proposed pump station and fish screen, east and downstream toward the location of the proposed left bank intake and fish ladder, and upstream toward the Sacramento River/East Sand Slough split.

Figure 3.12-14a is a view looking eastward under the gates-out condition toward the location of the proposed left bank intake and fish ladder. The river dominates the foreground of this view. The far right side of the middleground shows the easterly extent of the diversion dam. The proposed left bank intake and fish ladder would be located just to the left of the existing dam facility.

Figure 3.12-14b is the same view as depicted on Figure 3.12-14a, except under the gates-out condition. In this view, increased river elevation is evident, as the water line extends up to the vegetation lining the river.

Figure 3.12-15a is a view looking southwest under the gates-out condition toward the location of the proposed pump station and fish screen. The river also dominates the foreground of this photograph. The middleground shows the western bank of the river that is the location of the proposed pump station and fish screen.

Figure 3.12-15b is the same view as depicted on Figure 3.12-15a, except under the gates-in condition. An increase in river elevation is evident along the western bank of the river.

Figure 3.12-16a is a view looking upstream under the gates-out condition toward the Sacramento River/East Sand Slough split. The foreground and left side of this photograph shows the Sacramento River extending northward. The exposed gravel in the right three-quarters of the photograph of middleground is the beginning of East Sand Slough.

Figure 3.12-16b is the same view as depicted on Figure 3.12-16a, except under the gates-in condition. In this view, the increased river elevation has resulted in water covering the exposed gravel shown in the middleground of Figure 3.12-16a.

Lower River/Red Bluff Recreation Area Visual Character and Quality. A summary evaluation of the visual character and quality of each of the

viewpoints in the Lower River/Red Bluff Recreation Area for both the gates-out and gates-in period is provided in Table 3.12-2.

TABLE 3.12-2
Visual Character and Quality of the Lower River/Red Bluff Recreation Area Viewpoints

Visual Character and Quality	
Gates Out	**Gates In**
Viewpoint #1	
Overall Description: Viewpoint #1 includes views east and north across the Sacramento River from the Recreation Area.	
Visual Character: Flowing river bordered by wide gravel strand in foreground and striking bluff on opposite shoreline. Abandoned mill and visually prominent water tower on top of bluff create a sense that this is a human-dominated landscape.	Visual Character: Same as under the gates-out condition, although water is a much more dominant feature of the landscape under the gates-in condition.
Visual Quality: Moderate	Visual Quality: Moderate
Viewpoint #2	
Overall Description: Viewpoint #2 includes views from the entrance to the Discovery Center at the Recreation Area east across a parking lot toward the Sacramento River and west overlooking a road and open space that is part of the Recreation Area.	
Looking East	
Visual Character: Paved parking lot framed by vegetation, through which the Sacramento River and abandoned mill on top of the bluff on the far side of the river can be viewed. The parking lot and industrial buildings create a sense that this is a human-dominated landscape.	Visual Character: Same as under the gates-out condition, although additional vegetation growth reduces the effect of water on the landscape.
Visual Quality: Moderately Low	Visual Quality: Moderately Low
Looking West	
Visual Character: Intersection of two paved roads, beyond which is a mixture of vegetation, including trees and shrubs, with views of foothills in the distance. The view is primarily natural looking, but the paved roads create a sense that this is a human-dominated landscape.	
Note: Viewpoint #2 looking west is not oriented toward the Sacramento River, so there is no difference between the gates-in and gates-out condition.	
Visual Quality: Moderate	
Viewpoint #3	
Overall Description: Viewpoint #3 is a view north from the boat ramp parking lot south of the Discovery Center at the Recreation Area along a paved road that surrounds the Sycamore Grove Campground.	
Visual Character: Intersection of paved parking lot and road, alongside which is a mixture of vegetation, including grass and trees, with interspersed small outbuildings. The managed vegetation and paved roads indicate that this is a human-dominated landscape.	
Note: Viewpoint #3 is not oriented toward the Sacramento River, so there is no difference between the gates-in and gates-out condition.	
Visual Quality: Moderate	

TABLE 3.12-2
Visual Character and Quality of the Lower River/Red Bluff Recreation Area Viewpoints

Visual Character and Quality	
Gates Out	**Gates In**
Viewpoint #4	
Overall Description: Viewpoint #4 is a view south along Sale Lane as if approaching the Discovery Center at the Recreation Area.	
Visual Character: Paved road with trees and grass alongside. The orderly, managed vegetation and paved road indicate that this is a human-dominated landscape.	
Note: Viewpoint #4 is not oriented toward the Sacramento River, so there is no difference between the gates-in and gates-out condition.	
Visual Quality: Moderate	
Viewpoint #5	
Overall Description: Viewpoint #5 includes views southeast, southwest, and north from a point on the Sacramento River.	
Visual Character: Flowing river bordered by a gentle slope with trees and shrubs on one bank and a striking bluff on the opposite shoreline. Old boat ramp and dam facilities on the eastern bank and abandoned mill, power poles, and water tower on the western bank contribute to the sense that this is a human-dominated landscape.	Visual Character: Same as the gates-out condition, although water plays a marginally greater role in the landscape during the gates-in period.
Visual Quality: Moderately High	Visual Quality: Moderately High

The East Sand Slough reach is bordered east and west by the Recreation Area to the south of Antelope Boulevard and is bordered by private land north of Antelope Boulevard.

East Sand Slough

The East Sand Slough reach is bordered east and west by the Recreation Area to the south of Antelope Boulevard and is bordered by private land north of Antelope Boulevard. Because views and uses of East Sand Slough are principally south of Antelope Boulevard, this section discusses only that portion of the reach. A paved walking/biking trail that is part of the Recreation Area parallels East Sand Slough all the way to Antelope Boulevard.

No project facilities are proposed to be constructed within the East Sand Slough reach, so all viewpoints were selected to assess potential visual impacts from a change in gate operation.

After I-5 crosses the Sacramento River at the southern end of Red Bluff, it parallels East Sand Slough for the majority of its length. Most of the views of East Sand Slough from northbound I-5 are partially obscured by vegetation, but periodic breaks in the trees allow for unobstructed, if brief, views. No residences are adjacent to East Sand Slough. The nearest homes are on the east side of Sale Lane between the Recreation Area and Antelope Boulevard.

Two viewpoints were established within East Sand Slough to capture representative views within this reach of the project vicinity. No project facilities are proposed to be constructed within the East Sand Slough reach, so all viewpoints were selected to assess potential visual impacts from a change in gate operation. Figure 3.12-17 shows the location of

these two viewpoints and the direction in which they were photographed.

Gates-out Condition. Under the dry gates-out condition, East Sand Slough is broad, flat, and sandy. The edges of the slough become lightly vegetated under the gates-out condition, but the center remains sandy. When East Sand Slough is dry, it effectively increases the land area of the Recreation Area, and the area is used by walkers and bikers, as evidenced by informal trails that bisect the slough.

Gates-in Condition. When RBDD gates are in the lowered position and the river elevation rises upstream of the dam, East Sand Slough floods and fills in with water, and is commonly referred to as Lake Red Bluff. Because it is shallow and relatively still, the water in East Sand Slough/ Lake Red Bluff is typically warmer than that in the river, and is commonly used by water skiers.

Viewpoint #6. Viewpoint #6 was established at the intersection of Sale Lane with the walking/biking trail that parallels East Sand Slough. From Viewpoint #6, a visitor can traverse the slough both north and south, and has unobstructed views of East Sand Slough in all directions.

Figure 3.12-18a is a view looking south and slightly west under the gates-out condition. The view is dominated by the broad, flat bottom of East Sand Slough. Bare sand is visible down the middle of the slough, with lightly vegetated edges.

Figure 3.12-18b is the same view as depicted on Figure 3.12-18a, except under the gates-in condition. This view shows East Sand Slough filled in with water from bank to bank.

Figure 3.12-19a is a view looking north and slightly west under the gates-out condition. This view is also dominated by the broad, flat bottom of East Sand Slough. The northern end of East Sand Slough has less bare sand, and vegetation is sparse. I-5 can be seen in the background of the photo, and the far right edge of the photo shows the walking/biking trail extending north.

Figure 3.12-19b is the same view as depicted on Figure 3.12-19a, except under the gates-in condition. This view shows East Sand Slough filled in with water from bank to bank.

Viewpoint #7. Viewpoint #7 was established to represent views toward the slough from I-5. The viewpoint selected is located at a point along I-5 where a break in the trees provides northbound freeway travelers with an unobstructed view toward the east. From Viewpoint #7, a northbound traveler has a brief unobstructed view of East Sand Slough, the Recreation Area on the east and west sides of the slough, orchards on the east side of Sale Lane, and mountains in the far distance.

Figure 3.12-20a is a view looking east from northbound I-5 under the gates-out condition. The view is dominated by the western edge of the Recreation Area adjacent to the interstate (foreground view) and by fields, hills, and mountains to the far east (background view). East Sand Slough is visible as a narrow swath running through the center of the photograph.

Figure 3.12-20b is the same view as depicted on Figure 3.12-20a, except under the gates-in condition. This view shows East Sand Slough filled in with water through the center of the photograph.

East Sand Slough Visual Character and Quality. A summary evaluation of the visual character and quality of each of the viewpoints in the East Sand Slough reach for both the gates-out and gates-in period is provided in Table 3.12-3.

TABLE 3.12-3
Visual Character and Quality of the East Sand Slough Viewpoints

Visual Character and Quality	
Gates Out	**Gates In**
Viewpoint #6	
Overall Description: Viewpoint #6 includes views north and south along East Sand Slough.	
Visual Character: Large expanse of sand bordered by natural-looking grass, shrubs, and trees. The absence of obvious human-made facilities contributes to a sense of nature in an otherwise urban setting, although glimpses of freeway traffic and trails indicate a human-altered landscape.	Visual Character: Same as under the gates-out condition, except the large expanse of sand is replaced by a large body of water. The natural character of the view remains, while the landscape is changed by the addition of water.
Visual Quality: Moderately High	Visual Quality: Moderately High
Viewpoint #7	
Overall Description: Viewpoint #7 is a view from I-5 across East Sand Slough.	
Visual Character: View of natural field with agriculture and associated buildings with East Sand Slough as a sandy strip between them, and mountains in the far distance. The combination of natural field and sandy slough in the foreground with agricultural fields and buildings and mountains in the background create a landscape that obviously has a human-made component but is visually pleasing.	Visual Character: Same as under the gates-out condition, except the strip of sand is replaced by a strip of water. The pleasing combination of natural and human-made features remains, while the landscape is changed by the addition of water.
Visual Quality: Moderately High	Visual Quality: Moderately High

The Middle River is likely the most heavily used and viewed of the four reaches in the project area. Two widely used parks lie within the Middle River, and a large number of private residences front the river throughout this reach.

Middle River

The Middle River is likely the most heavily used and viewed of the four reaches in the project area. Two widely used parks lie within the Middle River, and a large number of private residences front the river through-

out this reach. City Park lies on the western bank of the Middle River, approximately in the mid-point of the reach. Roughly 43,000 visitor days per year are experienced at the City Park (Red Bluff City Parks and Recreation Department, 1999). City Park facilities include a boat dock, play equipment, and a swim pool. The City Park is generally a long, narrow stretch of land that hugs the west bank of the Sacramento River. Despite its orientation, the only water-related feature of the park is the boat ramp at the south end of the park. Other amenities, including play equipment, picnic areas, and swim pool, have views of the river but are not directly affected by it.

The Red Bluff Chamber of Commerce building is also located at the City Park. Samuel Ayer/Dog Island Park is located at a bend in the river at the northern end of the Middle River reach. This park hosts roughly 25,000 visitor days per year (Red Bluff City Parks and Recreation Department, 1999) and is used primarily for walking and wildlife viewing. The park is dry under the gates-out condition, but is surrounded by water during the gates-in period, becoming a river island accessible by a footbridge. Use of the park is generally unaffected by whether the gates are in the up or down position.

Numerous residences that are oriented to take advantage of river views line the east and west banks of the Sacramento River through this reach. Generally, residences on the west bank of the river are oriented higher above the river because of their location on a bluff, while the residences on the east bank are closer to the water. Many residences on both sides of the river have fixed or floating docks that are useable only under the gates-in condition.

Antelope Boulevard bisects this reach north of the City Park. Nearly 25,000 vehicles cross over the Sacramento River via the Antelope Boulevard bridge each day. Occupants of these vehicles have partially obstructed views across the Sacramento River both up- and down-stream. Pedestrians also use Antelope Boulevard bridge and have unobstructed views up- and downstream.

Five viewpoints were established within the Middle River reach to capture representative views within this reach of the project vicinity. No project facilities are proposed to be constructed within the Middle River reach, so all viewpoints were selected to assess potential visual impacts from a change in gate operation. Figure 3.12-21 shows the location of these five viewpoints and the direction in which they were photographed.

No project facilities are proposed to be constructed within the Middle River reach, so all viewpoints were selected to assess potential visual impacts from a change in gate operation.

Gates-out Condition. Similar to the Lower River/Red Bluff Recreation Area reach, the Middle River reach approximates a free-flowing river under the gates-out condition, with the movement of water readily visible. The western bank of the Middle River ranges from moderately to gently sloping toward the river to nearly vertical. The eastern bank

generally slopes gently toward the river. Between the City Park and the Antelope Boulevard bridge, the western bank of the river is dominated by massive gravel bars that obstruct views of the water from various locations. Other stretches of the Sacramento River along this reach also exhibit exposed gravel under the gates-out condition, particularly at bends in the river.

Gates-in Condition. Under the gates-in condition, water depth through the Middle River reach increases and water velocity decreases. The increase in water depth is sufficient to flood areas along the river that are exposed gravel under the gates-out condition, significantly changing the appearance of the river.

Viewpoint #8. Viewpoint #8 was established within the Sacramento River at the southern edge of the Middle River reach, just north of the southern I-5 crossing, approximately at the intake to the Elks Lodge harbor. This viewpoint was selected to capture representative views that river users may experience in the vicinity of the proposed project. From this point in the river, one may look downstream in the direction of the proposed pump station and fish screen (although the location of those facilities is not visible) and upstream toward the City Park.

Figure 3.12-22a is a view of the Sacramento River and adjacent property looking upstream under the gates-out condition. The river dominates the foreground and middleground of this view, but also exposed gravel bars along the edge of the City Park are visible.

Figure 3.12-22b is the same view as depicted on Figure 3.12-22a, except under the gates-in condition. An increase in river elevation is faintly discernable in this view along the shore in the far right side of the photograph and along the City Park, which is seen in the left side of the middleground of the photograph.

Viewpoint #9. Viewpoint #9 was established at the eastern edge of the City Park, just north of the boat ramp. This viewpoint was selected to capture representative views that users of the City Park may experience. From this point at the park, users have unobstructed views of the Sacramento River both up and downstream.

Figure 3.12-23a is a view of the Sacramento River looking downstream under the gates-out condition. The gravel bar that is exposed under the gates-out condition, with the river occupying the eastern edge of the riverbed dominates the foreground in this view.

Figure 3.12-23b is the same view as depicted on Figure 3.12-23b, except under the gates-in condition. In this view, the river occupies the riverbed from bank to bank. Significantly more water is seen from this view during the gates-in condition than during the gates-out condition.

Figure 3.12-24a is a view of the Sacramento River looking upstream. The gravel bar that is exposed under the gates-out condition dominates the foreground in this view. The water view at this location is nearly obscured by the gravel.

Figure 3.12-24b is the same view as depicted on Figure 3.12-24a, except under the gates-in condition. In this view, the river is visible from bank to bank, without being obscured by gravel. The increase in river elevation is evident both by the covered gravel in the foreground and the higher water line along the far bank of the river as seen in the middleground of the photograph.

Viewpoint #10. Viewpoint #10 was established at the Antelope Boulevard bridge where it crosses the Sacramento River. This viewpoint was selected to capture representative views that vehicle occupants and pedestrians may experience at various points of crossing the bridge. Along the length of the bridge, from both the north and south sides, partially obstructed and completely unobstructed views of the Sacramento River and adjacent properties are possible.

Figure 3.12-25a is a view from the northeast corner of the bridge looking toward the west across the Sacramento River under the gates-out condition. From this location and direction, a local motel and several residences on the west bank of the river are visible. Some exposed gravel is visible along the western bank.

Figure 3.12-25b is the same view as depicted on Figure 3.12-25a, except under the gates-in condition. The exposed gravel along the western bank that is visible on Figure 3.12-25a is covered with water in this view.

Figure 3.12-26a is a view from the northwest corner of the bridge looking northeast under the gates-out condition. From this location and direction, private residences and riparian vegetation is visible. A visible line of gravel denotes the high water mark along the eastern bank of the river.

Figure 3.12-26b is the same view as depicted on Figure 3.12-26a, except under the gates-in condition. The exposed gravel along the western bank of the river and in the bend of the river in the center of the photograph is covered by water in this view.

Figure 3.12-27a is a view from the southeast corner of the bridge looking in a southerly direction toward the City Park under the gates-out condition. From this location and direction, the exposed gravel around the City Park is visible.

Figure 3.12-27b is the same view as depicted on Figure 3.12-27a, except under the gates-in condition. The exposed gravel that runs the length of the City Park is completely covered by water in this view.

Figure 3.12-28a is a view from the southwest corner of the bridge looking in a southeasterly direction under the gates-out condition. From this location and direction, the view of the Sacramento River is nearly obscured by exposed gravel.

Figure 3.12-28b is the same view as depicted on Figure 3.12-28a, except under the gates-in condition. This view shows the Sacramento River filled with water from bank to bank, with no gravel visible.

Viewpoint #11. Viewpoint #11 was established at Rio Street where it intersects Cedar Street on a bluff overlooking the Sacramento River. Area residents are reported to use Rio Street to avoid traffic at the intersection of Antelope Boulevard and Main Street. This viewpoint was selected to capture a representative view that vehicle occupants may have as they take advantage of this shortcut. It is also representative of the views from homes that line the top of the bluff in this area. Viewpoint #11 is located at a bend in the river where there is an expansive view of the river to the northeast and a view to the southeast is also available.

Figure 3.12-29a is a view looking northeast along the Sacramento River toward the northern I-5 crossing under the gates-out condition. Samuel Ayer/Dog Island Park is visible in the far left of the photograph; private property occupies the far right. Some exposed gravel along bends in the river can be seen in this photograph.

Figure 3.12-29b is the same view as depicted on Figure 3.12-29a, except under the gates-in condition. The exposed gravel along bends in the river is covered by water in this view. The appearance of swift-moving water that is evident on Figure 3.12-29a is missing on Figure 3.12-29b, largely because of the slowing of river flow resulting from the gates-in condition.

Viewpoint #12. Viewpoint #12 was established at the water's edge of Samuel Ayer/Dog Island Park. Walking trails are located throughout the park, some of which extend to the edge of the Sacramento River. From Viewpoint #12, a visitor may experience views of the Sacramento River both up- and downstream.

Figure 3.12-30a is a view looking south-southeast (downstream) along the Sacramento River toward the Antelope Boulevard bridge under the gates-out condition. The view is dominated by water, although some exposed gravel can be seen along the eastern bank of the river as the river bends and continues south.

Figure 3.12-30b is the same view as depicted on Figure 3.12-30a, except under the gates-in condition. The exposed gravel along the eastern bank of the river as it bends and continues south is covered by water in this view. The water is also visibly more calm, with some floating debris evident.

Middle River Visual Character and Quality. A summary evaluation of the visual character and quality of each of the viewpoints in the Middle River reach for both the gates-out and gates-in period is provided in Table 3.12-4.

TABLE 3.12-4
Visual Character and Quality of the Middle River Viewpoints

Visual Character and Quality	
Gates Out	**Gates In**
Viewpoint #8	
Overall Description: Viewpoint #8 is a view north along the Sacramento River from the intake to the Elks Lodge harbor.	
Visual Character: Wide swath of water bordered on one bank by natural-looking shrubs and trees and on the other bank by manicured lawn, homes, and other buildings, with a bridge crossing the water in the distance. The water and vegetation contribute to a sense of naturalness, but the buildings and bridge indicate that this is a human-altered landscape. Visual Quality: Moderately High	Visual Character: Same as under the gates-out condition. Visual Quality: Moderately High
Viewpoint #9	
Overall Description: Viewpoint #9 includes view upstream and downstream along the Sacramento River from the Red Bluff City Park.	
Visual Character: Wide swath of gravel leads into a flowing river, with some natural-looking vegetation on one bank, and manicured lawn, trees, and homes on both banks. The lawn and homes contribute to the sense that this is a human-altered landscape, and the exposed gravel is a visually displeasing element of the landscape. Visual Quality: Moderate	Visual Character: Same as under the gates-out condition, except the large expanse of gravel is replaced by a large body of water. The landscape is significantly enhanced by the addition of water. Visual Quality: Moderately High
Viewpoint #10	
Overall Description: Viewpoint #10 includes views upstream and downstream along the Sacramento River from the Antelope Boulevard bridge.	
Looking Upstream	
Visual Character: Flowing river bordered by a mixture of natural and landscaped vegetation and commercial and residential buildings. Water and natural vegetation dominate the landscape, but the homes and buildings indicate a human-altered environment. The water has a sense of movement that is visually appealing. Visual Quality: Moderate	Visual Character: Same as during the gates-out condition, except that water plays a marginally greater role in the landscape. The water has a static appearance that is less visually appealing than when the river flows freely. Visual Quality: Moderate

TABLE 3.12-4
Visual Character and Quality of the Middle River Viewpoints

Visual Character and Quality	
Gates Out	**Gates In**
Looking Downstream	
Visual Character: Flowing river and wide expanse of gravel bordered by a mixture of natural and landscaped vegetation and commercial and residential buildings. The water, gravel, and vegetation dominate the landscape. The homes and manicured landscaping contribute to the sense that this is a human-altered landscape, and the exposed gravel is a visually displeasing element of the landscape. Visual Quality: Moderate	Visual Character: Same as under the gates-out condition, except the large expanse of gravel is replaced by a large body of water. The landscape is significantly enhanced by the addition of water. Visual Quality: Moderately High
Viewpoint #11	
Overall Description: Viewpoint #11 is a view east across the Sacramento River from Rio Road.	
Visual Character: The landscape is dominated by a wide, flowing river. Natural-looking vegetation borders one bank, while homes with landscaping border the opposite bank. An interstate bridge crosses the river in the near distance and foothills are visible in the far distance. The water and vegetation contribute to a sense of naturalness, but the houses and bridge indicate that this is a human-altered landscape. The water has a sense of movement that is visually appealing. Visual Quality: Moderately High	Visual Character: Same as under the gates-out condition, except water plays a slightly greater role in the landscape and the sense of movement associated with a swiftly flowing river is diminished. Visual Quality: Moderately High
Viewpoint #12	
Overall Description: Viewpoint #12 is a view downstream along the Sacramento River from the edge of Samuel Ayer/Dog Island Park.	
Visual Character: The landscape is dominated by a wide, flowing river. Natural-looking vegetation borders both banks, and some homes are visible atop a bluff overlooking the river. An interstate bridge crosses the river in the near distance. The water and vegetation contribute to a sense of naturalness, but the houses and bridge indicate that this is a human-altered landscape. The water has a sense of movement that is visually appealing. Visual Quality: Moderately High	Visual Character: Same as under the gates-out condition, except water plays a slightly greater role in the landscape and the sense of movement associated with a swiftly flowing river is diminished. Visual Quality: Moderately High

Upper River

The Upper River reach of the project area is defined as the portion of the Sacramento River north of the northern Red Bluff I-5 crossing. The Upper River includes one publicly accessible park and numerous residences. Ide Adobe State Historic Park is located on the western bank of the Sacramento River along this reach. Approximately 21,000 persons visit Ide Adobe State Historic Park each year, which has historical buildings, picnic areas, and river viewing areas. Private residences line the eastern and western banks of the Sacramento River through the entire Upper River reach. Most of these homes are oriented to take advantage of river views.

The Upper River reach of the project area is defined as the portion of the Sacramento River north of the northern Red Bluff I-5 crossing. The Upper River includes one publicly accessible park and numerous residences.

Three viewpoints were established within the Upper River to capture representative views within this reach of the project vicinity. No project facilities are proposed to be constructed within the Upper River reach, so all viewpoints were selected to assess potential visual impacts from a change in gate operation. Figure 3.12-31 shows the location of these three viewpoints and the direction in which they were photographed.

Gates-out Condition. Under the gates-out condition, the Upper River reach exhibits a high water mark ranging from approximately 2 feet to approximately 6 feet above water elevation. Some of the difference between river elevation and the high water mark may be from changes in flow in the river. The western and eastern banks of the river throughout the Upper River reach vary between vertical and bluff-like and gently sloping toward the water. Along most of the reach, riparian vegetation borders the riverbanks, but in some locations, manicured lawns extend to the water's edge.

Gates-in Condition. The river elevation increases in the Upper River reach when RBDD gates are in the lowered position. In the southern portion of the reach, just north of the I-5 crossing, the increase in water elevation is enough to allow East Sand Slough and the Sacramento River to connect at the northern extent of the slough. The northern extent of the gates-in effect extends at least to Ide Adobe State Historic Park, and possibly as far north as Surrey Village. Between Ide Adobe State Historic Park and Surrey Village, visible high water marks on the banks of the river may be a result of the gates-in effect, variations in water flow under the gates-out condition, or some combination thereof.

No project facilities are proposed to be constructed within the Upper River reach, so all viewpoints were selected to assess potential visual impacts from a change in gate operation.

Viewpoint #13. Viewpoint #13 was established within the Sacramento River upstream of the northern Red Bluff I-5 bridge, near the northern extent of East Sand Slough. This viewpoint was selected to capture representative views that river users may experience along this portion of the Upper River. From this point in the river, one may look upstream toward Ide Adobe State Historic Park (not visible from this location), downstream toward the I-5 bridge, and toward both the eastern and western banks of the river.

Figure 3.12-32a is a view of northern extent of East Sand Slough where it meets the Sacramento River under the gates-out condition. The break in the riparian vegetation roughly in the center of the photograph shows the location of the slough.

Figure 3.12-32b is the same view as depicted on Figure 3.12-32a, except under the gates-in condition. This view shows the East Sand Slough filled in with water and the river elevation higher in this location.

Viewpoint #14. Viewpoint #14 was established within the Sacramento River adjacent to Ide Adobe State Historic Park and also from Ide Adobe State Historic Park. This viewpoint was selected to capture representative views that river users may experience along this portion of the Upper River and also views of the Sacramento River that visitors to Ide Adobe State Historic Park may experience.

Figure 3.12-33a is a view of Ide Adobe State Historic Park from the Sacramento River under the gates-out condition. The historic adobe house is located in the upper left corner of the photograph. A high water mark is clearly visible along the lower one-third of the photo.

Figure 3.12-33b is the same view as depicted on Figure 3.12-33a, except under the gates-in condition. This view shows the water level in the river extending up to the vegetation that lines the river in this location and obscuring the rocky bank that is visible on Figure 3.12-33a.

Figure 3.12-34a is a view of the Sacramento River looking downstream from a viewing deck at Ide Adobe State Historic Park under the gates-out condition. A high water mark is visible but not obvious along the far bank of the river.

Figure 3.12-34b is the same view as depicted on Figure 3.12-34a, except under the gates-in condition. In this view, the increased river elevation is faintly evident on the far bank of the river where the rock and gravel bank that is visible on Figure 3.12-34a is covered with water.

Viewpoint #15. Viewpoint #15 was established on the Sacramento River close to the neighborhood known as Surrey Village. This viewpoint was selected to capture representative views that river users may experience at the northern extent of the gates-in effect (increased river depth).

Figure 3.12-35a is a view of the Sacramento River and residential area on the east bank of river, looking from the center of the river under the gates-out condition. In this area, riparian vegetation (with the exception of the trees) has been cleared from the riverbank, exposing manicured yards that extend to the river and providing river views to the home occupants. A high water mark is visible in this photo, which may be from either the gates-in effect or from variations in river flow under the gates-out condition. This figure also shows that the river is relatively fast moving through this reach.

Figure 3.12-35b is the same view as depicted on Figure 3.12-35a, except under the gates-in condition. In this view, the water level in the river appears to be approximately 2 feet higher than on Figure 3.12-35a, and the river flow appears to be slower than during the gates-out period.

Upper River Visual Character and Quality. A summary evaluation of the visual character and quality of each of the viewpoints in the Upper River reach for both the gates-out and gates-in periods is provided in Table 3.12-5.

TABLE 3.12-5
Visual Character and Quality of the Upper River Viewpoints

Visual Character and Quality	
Gates Out	**Gates In**
Viewpoint #13	
Overall Description: Viewpoint #13 is a view toward the entrance to East Sand Slough from the Sacramento River.	
Visual Character: Wide swath of flowing river bordered by natural vegetation, including shrubs and trees. Freeway signs are visible in the far distance. With the exception of the freeway signs, the landscape appears entirely natural. Visual Quality: Moderate	Visual Character: Same as under the gates-out condition, except water plays a slightly greater role in the landscape, and the freeway signs are obscured by vegetation growth. Visual Quality: Moderate
Viewpoint #14	
Overall Description: Viewpoint #14 includes a view of Ide Adobe State Historic Park from the Sacramento River and a view of the Sacramento River from Ide Adobe State Historic Park.	
View of Ide Adobe State Historic Park	
Visual Character: Rocky bank and grassy hillside with trees and shrubs and view of historic Ide Adobe State Historic Park. The historic building has been preserved as a reminder of California's early history; it contributes to the sense that this is a human-altered landscape along a natural water corridor. Visual Quality: Moderate	Visual Character: Same as under the gates-out condition. Visual Quality: Moderate
View from Ide Adobe State Historic Park	
Visual Character: Wide, swiftly flowing river bordered by shrubs and large trees with homes and docks visible on the far bank. The homes and docks contribute to the sense that this is a human-altered landscape along a natural water corridor. Visual Quality: Moderate	Visual Character: Same as under the gates-out condition, except the sense of movement associated with a swiftly flowing river is diminished. Visual Quality: Moderate

TABLE 3.12-5
Visual Character and Quality of the Upper River Viewpoints

Visual Character and Quality	
Gates Out	**Gates In**
Viewpoint #15	
Overall Description: Viewpoint #15 is a view of homes with landscaping that border the Sacramento River.	
Visual Character: Wide, swiftly flowing river bordered by homes with manicured lawns and trees of various heights. The landscaping contributes to the sense that this is a human-altered landscape along a natural water corridor.	Visual Character: Same as under the gates-out condition, except the sense of movement associated with a swiftly flowing river is somewhat diminished.
Visual Quality: Moderate	Visual Quality: Moderate

Visual Resource-related Plans and Policies

A number of local plans and policies were reviewed for aesthetic and visual resources-related discussions. An overview of the results of this review is provided below.

Lake Red Bluff Recreation Development Final Environmental Impact Statement. The Final EIR and accompanying ROD document the development and management of the Recreation Area. No aesthetics-related discussion was identified in the Lake Red Bluff FEIS.

City of Red Bluff General Plan. The City of Red Bluff General Plan was reviewed for any discussion of aesthetic-related plans, policies, goals, or objectives. Page 7 of the General Plan identifies one aesthetic-related goal and related objectives:

> **Goals, Objectives, and Policies for Land Use and Growth**
>
> II Goal: Community Charter and Aesthetics
>
> Conserve and improve community historic, residential neighborhood, public commons and traditional business sites and environments.
>
> Objectives:
>
> A. Promote and maintain pleasing and positive physical appearance for the community.
> B. Adopt and enforce architectural review guidelines and sign aesthetics standards.
> C. Abate deteriorated buildings.

D. Encourage maintenance of vacant buildings and landscape vegetation on developed sites.
E. Discourage long term outside storage of debris and waste, and material and products not on display for sale.

Page 21 of the General Plan provides a brief description of the aesthetic resources in the City of Red Bluff:

> The principal natural aesthetic resources of the City lie in its river and creek corridors, oak woodland and chapparal covered hills. These provide an open space resource for visual enjoyment and recreational pursuits and are essential to maintain the rural, open and small town character of the community.

Red Bluff Park System General Plan. No aesthetics-related discussion was identified in the Red Bluff Park System General Plan.

Tehama County General Plan. No aesthetics-related plans, policies, goals, or objectives were identified in the Tehama County General Plan under the general discussion of Natural Resource Lands and Recreation. However, the definition of resource lands does include areas of outstanding scenic value and scenic highway corridors.

The Scenic Highway Element of the Tehama County unit of the Tri-County Area Planning Council General Plan (incorporated in its entirety under the Tehama County General Plan) identifies Highway 36 through Red Bluff as a scenic highway. Through Red Bluff, Highway 36 is known as Antelope Boulevard, which crosses the Sacramento River and East Sand Slough north of RBDD.

Tehama County Recreational Trails Feasibility Study. No aesthetics-related discussion was identified in the Tehama County Recreational Trails Feasibility Study.

Tehama County Bikeways Plan. No aesthetics-related discussion was identified in the Tehama County Bikeways Plan.

Mendocino National Forest Environmental Impact Statement. The Mendocino National Forest EIS includes a discussion of visual resources. The objective of visual resource management, as identified in the EIS, is "to manage all Forest lands so as to obtain the highest possible visual quality commensurate with other resource uses and benefits." The Forest Service uses a visual management system to set Visual Quality Objectives for forest management. The visual quality objectives of Preservation, Retention, Partial Retention, and Modification have been assigned to various areas of the forest management area.

The Recreation Area was not assigned a Visual Quality Objective and was not specifically addressed in the EIS.

Mendocino National Forest Land and Resource Management Plan. Under the Mendocino National Forest Land and Resource Management Plan, the Recreation Area is managed solely for recreation. No aesthetic-related discussion that specifically addresses the Recreation Area was identified in the Mendocino National Forest Land and Resource Management Plan.

3.12.2 Environmental Consequences

Methodology

The visual impact assessment for project facilities was based on an evaluation of the changes to the existing visual resources that would result from construction and operation of the proposed project.

Analysis of the visual effects of potential changes expected to occur from implementation of the proposed project was based on field observations and review of the following information: local planning documents, project maps and drawings, photographs of the project area during the gates-out and gates-in periods, and review of computer-generated visual simulations from several of the key viewpoints.

Site reconnaissance was conducted as described above to view the proposed project vicinity, to identify potential key viewpoints, and to take representative photographs of existing visual conditions. A 35-mm camera with a 50-mm lens was used to take site photographs.

The computer-generated simulations are the result of an objective analytical and computer modeling process. The images are accurate within the constraints of the available site and project data. For the views from viewpoints selected for simulations, computer modeling and rendering techniques was used to produce the simulation images. Existing topographic and site data provided the basis for developing the initial model, and site plans and elevations for the components of the facilities were used to superimpose the proposed facilities on the photographs.

The visual impact assessment for a change in gate operation was based on a comparison of gates-out and gates-in photographs.

The visual impact assessment for project facilities was based on an evaluation of the changes to the existing visual resources that would result from construction and operation of the proposed project. These changes were assessed by evaluating the "after" views provided by the computer-generated visual simulations and comparing them to the existing visual environment. Because project facilities would be most visible during the gates-out period when the river elevation is at its lowest, the computer-generated visual simulations were generated using gates-out photographs. The visual impact assessment for a change in gate operation was based on a comparison of gates-out and gates-in photographs.

Significance Criteria

When making a determination of the extent and implications of visual changes, consideration is typically given to:

- Specific changes in the composition, character, and any specially valued qualities of the affected visual environment
- The context of the affected visual environment
- The extent to which the affected environment contains places or features that have been designated in plans and policies for protection or special consideration
- The relative numbers of viewers, their activities, and the extent to which these activities are related to the aesthetic qualities affected by potential changes

Given the above criteria, impacts to visual resources/aesthetics from the proposed project would be considered significant if it is determined that the project would result in any of the following:

- Have a substantial, demonstrable negative aesthetic effect on a scenic view
- Substantially damage scenic resources, including but not limited to trees, rock outcroppings, and historic buildings within a scenic highway
- Substantially degrade the existing visual character or quality of the site and its surroundings
- Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area

Project Appearance

Table 3.12-6, summarizes the changes that would occur with implementation of each proposed alternative, including changes in RBDD operation and new facilities to be constructed and operated. Following the table, each component of the proposed alternatives is described in detail.

Addition of Fourth Pump to Research Pumping Plant. RPP is currently operational and is not open to the public. A fourth pump would be installed in an existing bay at RPP; construction and operation of this pump would not be visible to the public. The addition of a fourth pump at the RPP is a component of all proposed alternatives.

TABLE 3.12-6
Summary of Project Changes by Alternative

Alternative	Change in RBDD Operation	New Facilities
No Action	RBDD gate operations would continue with an 8-month gates-out period and a 4-month gates-in period	A fourth pump would be added to RPP
1A: 4-month Improved Ladder Alternative	Same as the No Action Alternative	A fourth pump would be added to RPP A 1,380-cfs pump station with fish screen would be constructed and operated at the Mill Site, and a conveyance facility across Red Bank Creek to convey water from the Mill Site pump station to the TC Canal would be constructed and operated New right and left bank fish ladders would be constructed and operated in place of the existing fish ladders
1B: 4-month Bypass Alternative	Same as the No Action Alternative	A fourth pump would be added to RPP A 1,380-cfs pump station with fish screen would be constructed and operated at the Mill Site, and a conveyance facility across Red Bank Creek to convey water from the Mill Site pump station to the TC Canal would be constructed and operated A new ladder at the right dam abutment would be constructed and operated A 1,000-cfs bypass channel for fish passage would be constructed at the left dam abutment
2A: 2-month Improved Ladder Alternative	RBDD operation would change to a 10-month gates-out period and a 2-month gates-in period (July 1 to August 31)	A fourth pump would be added to RPP A 1,680-cfs pump station with fish screen would be constructed and operated at the Mill Site, and a conveyance facility across Red Bank Creek to convey water from the Mill Site pump station to the TC Canal would be constructed and operated New left and right bank fish ladders would be constructed and operated in place of the existing fish ladders

TABLE 3.12-6
Summary of Project Changes by Alternative

Alternative	Change in RBDD Operation	New Facilities
2B: 2-month with Existing Ladders Alternative	RBDD operation would change to a 10-month gates-out period and a 2-month gates-in period (July 1 through August 31)	A fourth pump would be added to RPP A 1,680-cfs pump station with fish screen would be constructed and operated at the Mill Site, and a conveyance facility across Red Bank Creek to convey water from the Mill Site pump station to the TC Canal would be constructed and operated
3: Gates-out Alternative	RBDD operation would change to a 12-month gates-out period, leaving the gates in the raised position year-round	A fourth pump would be added to RPP A 2,180-cfs pump station with fish screen would be constructed and operated at the Mill Site, and a conveyance facility across Red Bank Creek to convey water from the Mill Site pump station to the TC Canal would be constructed and operated

During construction of the Mill Site pump station and conveyance facilities, extensive construction activity would be visible from the Sacramento River and the Recreation Area.

Construction of the Mill Site pump station and conveyance facilities would result in the permanent removal of approximately 1,100 LF of the bluffs along the west side of the Sacramento River. As shown on Figure 2.3-1, the west bank of the river would be excavated to allow construction of a forebay, pump station, and fish screen. Up to 750,000 CY of material would be excavated. During construction, which is estimated to last approximately 18 months, extensive construction activity would be visible from the Sacramento River and the Recreation Area. To excavate the west bank of the river, long series of sheet pile would be required to establish dry areas for forming concrete structures, resulting in an approximately 1,400-LF cofferdam in the river. A construction barge located in the river would likely be visible. Construction equipment including cranes, front end loaders, pile drivers, back hoes, excavators, scrapers, bulldozers, dump trucks, and other construction equipment and tools would likely be visible at the Mill Site, although some equipment and construction activities may be obscured from view by the cofferdam once it is in place.

The Mill Site pump station and associated fish screen would be permanently visible to viewers located within the Sacramento River and at the Recreation Area.

When completed, the fish screen associated with the Mill Site pump station would be approximately 1,100 feet long along the west bank of the Sacramento River. The fish screen would be the dominant and most visible feature of the facilities. The facilities would be permanently visible to viewers located within the Sacramento River and at the Recreation Area.

The conveyance system across Red Bank Creek to connect the TC Canal and existing TCCA facilities with the Mill Site pump station would consist of pipes or culverts or a combination of both. A bridge would provide maintenance vehicle and personnel access between facilities. The conveyance system would be constructed using an open trench method, which would result in disturbed vegetation along its approximately 2,100-foot length. There is no public access to the construction area, and dense vegetation would partially screen construction views from the Sacramento River and the Recreation Area. Construction across Red Bank Creek would occur during the gates-out period, when the creek is not navigable, so that views to boaters would be unavailable. Security lighting at the Mill Site pump station would be required; lighting would be low-wattage and shielded.

Construction of the Mill Site pump station and conveyance facilities is a component of all proposed alternatives, with the exception of the No Action Alternative. Although different-sized pump stations are proposed for different alternatives, the analysis for visual resources assumes that the pump station would be constructed at 2,180 cfs, the largest size proposed under any alternative.

Left Bank Fish Ladder. The existing left bank fish ladder would be upgraded to improve fish passage. As shown on Figure 2.3-2, a new fish ladder entrance and new weir gates would be constructed at the location of the existing left bank fish ladder, and a new AWS intake to improve water flow through the fish ladder would be constructed north of RBDD, approximately at the east bank of the river. Construction of the left bank fish ladder and AWS intake would require the excavation of approximately 16,000 CY and a 150- to 175-LF cofferdam. The new AWS intake would be the most visible of the changes required for left bank fish ladder improvement, as it would be a new permanent structure. The AWS intake would be located in an area currently frequented by visitors to the Recreation Area, and would be visible to those users and to users on the Sacramento River. Security lighting at the AWS intake would be required; lighting would be low-wattage and shielded and similar in intensity to other nighttime lighting at the Recreation Area.

This project component is proposed for the 4-month Improved Ladder Alternative and the 2-month Improved Ladder Alternative.

Right Bank Fish Ladder. The existing right bank fish ladder would be upgraded similar to the left bank fish ladder, with an improved fish ladder entrance and new weir gates, and a new AWS intake. These improvements to the right bank fish ladder would be made within existing TCCA facilities on the western side of RBDD. The TCCA facilities are not open to the public, but construction would be visible from the Sacramento River and from the opposite bank of the river.

Operation of the right bank fish ladder improvements with AWS intake would not be visible to the public.

This project component is proposed for the 4-month Improved Ladder Alternative, 4-month Bypass Alternative, and the 2-month Improved Ladder Alternative.

Bypass Channel. Figure 2.3-4 shows the location of the proposed bypass channel. The bypass channel would begin approximately 1,600 feet north of RBDD, just north of the Recreation Area boat ramp. It would circle around the Recreation Area and Sycamore Campground, and would discharge into the Sacramento River south of the existing and new left bank fish ladder, downstream of RBDD.

Approximately 230,000 CY of material would be excavated for construction of the bypass channel. During an approximately 12-month construction period, extensive construction activity would be visible throughout the Recreation Area. Construction activities would include tree and vegetation removal, channel excavation, concrete work, and rock placement. A construction area the width and length of the 90-foot bypass channel plus room for construction equipment on both sides of the channel would be required. Construction equipment including front end loaders, back hoes, excavators, bulldozers, dump trucks, and other construction equipment and tools would be visible throughout the Recreation Area. A temporary fence to prevent public access to the construction area would be erected in advance of a permanent chain-link fence.

During construction of the bypass channel, extensive construction activity would be visible throughout the Recreation Area.

Construction of the bypass channel would result in the relocation of the road that circles around Sycamore Campground. As shown on Figure 2.3-4, a new road would branch from Sale Lane just before the bypass channel and follow the bypass channel to the parking area at the south boat ramp. Access to the Discovery Center would be maintained by construction of a bridge along Sale Lane over the bypass channel. Additionally, a foot bridge would be constructed over the bypass channel to facilitate access to the Discovery Center and the Sacramento River from the remainder of the facilities at the Recreation Area. When completed, the bypass channel would be at ground surface, approximately 90 feet wide, and would be lined with boulders and gravel. An 8-foot-high chain-link fence on both sides of the bypass channel would be constructed to prevent access.

This project component is proposed for the 4-month Bypass Alternative.

No Action Alternative

No changes to hydrology or surface-water management would occur. Gates would be operated during the current 4-month gates-in period. Construction activity would be limited to the installation of the fourth

pump at RPP. No other construction activity would occur as a result of the No Action Alternative.

1A: 4-month Improved Ladder Alternative

Because of the lengthy duration of construction and the sensitive view area, impacts to visual resources from construction of Alternative 1A are considered significant, although temporary.

No impacts to visual resources as a result of changed dam operation and the resulting seasonal formation of Lake Red Bluff would occur from Alternative 1A. Other construction- and operations-related impacts are discussed below.

Construction-related Impacts.

Impact 1A–VR1: Construction Views of Mill Site Pump Station and Conveyance Facilities and Left Bank Fish Ladder. Construction of the Mill Site pump station and conveyance facilities and AWS intake associated with improvements to the left bank fish ladder would be visible from the Sacramento River and the Recreation Area. Construction of all facilities associated with Alternative 1A would take roughly 3 years to complete. During the construction period, viewers would experience substantially degraded sites, although some construction activity may be screened from sight by cofferdams. Because of the lengthy duration of construction and the sensitive view area (from the Sacramento River and the Recreation Area), impacts to visual resources are considered significant, although temporary.

Temporary impacts from construction of the Mill Site pump station and conveyance facilities and left bank fish ladder AWS intake on visual resources would be significant and cannot be mitigated.

The Mill Site pump station and conveyance facilities represents a substantial change to the landscape as viewed from the Sacramento River and the Recreation Area.

Operations-related Impacts.

Impact 1A–VR2: Permanent Landscape Changes from Mill Site Pump Station and Conveyance Facilities. The Mill Site pump station and conveyance facilities represent a substantial change to the landscape as viewed from the Sacramento River and the Recreation Area. Figure 3.12-36 shows before project and after project views of the bluff on the west wide of the Sacramento River from Viewpoint #1. The before view is composed of the photographs used for Figures 3.12-5a and 3.12-6a seamed together to show the entire west riverbank. The after view is the same view with a computer-generated simulation of the Mill Site pump station and conveyance facilities as they would be seen from Viewpoint #1. Photos used to create the simulated view were taken during the gates-out period; this simulation represents a worst-case scenario because the river elevation is at its lowest point when the gates are raised, revealing more of the pumping facility and fish screen than when the gates are lowered and river elevation is higher. As seen on Figure 3.12-36, the fish screen associated with the Mill Site pump station would effectively replace approximately 1,400 LF of the bluff on the west side of the Sacramento River, creating an industrial-appearing facility in place of a natural feature.

Given the size of the new structure and the sensitivity of the viewing location, this project element represents a substantial degradation of the visual quality of the site. To help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help the new facility blend with the surrounding environment. Potential measures include selection of a concrete color and a finish for the fish screen panels (if available). The committee to evaluate visual resources mitigation measures would be based on the existing SWG. However, the visual and aesthetic impacts of the Mill Site pump station and conveyance facilities would remain significant even after mitigation.

Given the size of the new structure and the sensitivity of the viewing location, Alternative 1A represents a substantial degradation of the visual quality of the site.

Permanent landscape changes (impacts) of the Mill Site pump station and conveyance facilities would be significant and cannot be mitigated.

Impact 1A–VR3: Permanent Landscape Changes from Left Bank Fish Ladder AWS Intake. The new AWS intake associated with left bank fish ladder improvements represents a substantial change to the landscape as viewed from the Sacramento River and the Recreation Area. Figure 3.12-37 shows before project and after project views of the bank of the Recreation Area from Viewpoint #5. The before view is the same photograph used for Figure 3.12-14a. The after view is the same view with a computer-generated simulation of the left bank fish ladder AWS intake as it would be seen from Viewpoint #5. The photo used to create the simulated view was taken during the gates-out period; this simulation represents a worst-case view because the river elevation is at its lowest when the gates are raised, revealing more of the facility than when the gates are lowered and river elevation is higher. The AWS intake would be located adjacent to the industrial-appearing RBDD and related facilities. Given that the AWS intake has a function complementary to the dam facilities and possesses a relatively small scale compared to the diversion dam, this project element would be considered a less than significant impact to visual resources. However, to help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help the new facility blend with the surrounding environment. Potential measures include selection of a concrete color, a finish for the fish screen panels (if available), and landscaping around the facility. The committee to evaluate visual resources mitigation measures would be based on the existing SWG.

Given that the AWS intake has a function complementary to the dam facilities and possesses a relatively small scale compared to the diversion dam, this project element would be considered a less than significant impact to visual resources.

Permanent landscape changes (impacts) from operations of the AWS intake would be less than significant; therefore, no mitigation is required.

1B: 4-month Bypass Alternative

No impacts to visual resources as a result of changed dam operation and the resulting seasonal formation of Lake Red Bluff would occur

from Alternative 1B. Other construction- and operations-related impacts are discussed below.

Construction-related Impacts.

Impact 1B–VR1: Construction Views of Mill Site Pump Station and Conveyance Facilities. Temporary impacts resulting from construction of the Mill Site pump station and conveyance facilities under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–VR1).

Temporary impacts from construction of the Mill Site pump station and conveyance facilities on visual resources would be significant and cannot be mitigated.

Impact 1B–VR2: Construction Views of Bypass Channel. Construction of the bypass pipeline would be visible from the Sacramento River and from multiple locations within the Recreation Area. Construction of the bypass channel would take roughly 12 months to complete. During the construction period, viewers would experience substantially degraded views, including views of tree and other vegetation removal, channel trenching, temporary spoils piles, large construction equipment, concrete work, rock and gravel placement, and fence installation. A temporary fence would be installed around the construction area, but would likely not aid in reducing visual impacts from construction. Because of the sensitivity of the construction area and the number of recreational viewers in the immediate vicinity of construction, construction of the bypass pipeline would substantially degrade the visual character and quality of the site and its surroundings. Although it would be temporary, this impact to visual resources is considered significant and unavoidable.

Because of the sensitivity of the construction area and the number of recreational viewers in the immediate vicinity of construction, construction of the bypass pipeline would substantially degrade the visual character and quality of the site and its surroundings.

Temporary impacts from construction of the bypass channel on visual resources would be significant and cannot be mitigated.

Operations-related Impacts.

Impact 1B–VR3: Permanent Landscape Changes from Mill Site Pump Station and Conveyance Facilities. Permanent impacts resulting from operations of the Mill Site pump station and conveyance facilities under Alternative 1B wold be the same as those identified for Alternative 1A (see Impact 1A–VR2).

Permanent landscape changes (impacts) from operation of the Mill Site pump station and conveyance facilities would be significant and cannot be mitigated.

Impact 1B–VR4: Permanent Landscape Changes from Bypass Channel. The bypass channel would represent a substantial change to the landscape as viewed from the Sacramento River and throughout the Recreation Area. The intake for the bypass channel would be located approximately 1,600 feet north of RBDD. Exposed gravel and boulders would be visible at the intake during the gates-out period, as would an 8-foot-high chain-link fence. The bypass channel would extend from the intake across open space within the Recreation Area. Figure 3.12-38 shows the before and after views of the bypass channel from Viewpoint #1. This figure shows the channel intake and the channel as it extends into the Recreation Area. The photo used to create the simulated view is the same photograph used for Figure 3.12-14 and was taken during the gates-out period. This simulation represents a worst-case view because the river elevation is at its lowest when the gates are raised, revealing the bypass channel intake, which would be covered with water during the gates-in period.

The bypass channel would represent a substantial change to the landscape as viewed from the Sacramento River and throughout the Recreation Area.

Figure 3.12-39 shows before and after views of the bypass channel from Viewpoint #4. The photo used to create the simulated view is the same photograph used for Figure 3.12-13. Figure 3.12-39 shows the bypass channel as it would appear to a Recreation Area visitor driving toward the Discovery Center. The bypass channel enters the view from the right, crosses Sale Lane, where a bridge would be constructed, and continues out of the view to the left where it begins to curve around the Sycamore Campground. Figure 3.12-39 shows that a number of trees would be removed to allow the bypass channel to cross through the Recreation Area. A number of trees would also be removed to allow for the road that currently curves around the Sycamore Campground to be relocated beginning just above where this photograph was taken.

Figure 3.12-40 shows before and after views of the bypass channel from Viewpoint #2. The photo used to create the simulated view is the same photo used for Figure 3.12-11. Figure 3.12-40 shows the bypass channel as seen from the entrance to the Discovery Center as it curves around the Sycamore Campground toward its exit south of RBDD.
Figure 3.12-40 shows that a number of trees and shrubs would be removed to allow the bypass channel to cross through the Recreation Area. It is likely that the road shown extending away from the viewer that currently circles around the Sycamore Campground would be removed, as a new road would be constructed on the far side of the bypass channel as seen from this location.

Figure 3.12-41 shows before and after views of the bypass channel from Viewpoint #3. The photo used to create the simulated view is the same photo used for Figure 3.12-12. Figure 3.12-41 shows the bypass channel as seen from the parking lot for the south boat ramp at the Recreation Area. The bypass channel roughly follows the existing road toward the viewer, then curves left as it prepares to exit south of RBDD. The simulated view shows that a number of trees and shrubs would be removed to allow the bypass channel to cross through the Recreation Area. The existing road would be removed, and a new road constructed (the new road would connect to the parking lot to the right of this view).

Regardless of the location from which the bypass channel is viewed, it represents a significant visual intrusion in the midst of a landscape that receives heavy recreational use.

Regardless of the location from which the bypass channel is viewed, it represents a significant visual intrusion in the midst of a landscape that receives heavy recreational use. Because it crosses through the Recreation Area, it effectively creates a visual barrier from one location of the Recreation Area to another. This visual barrier represents a substantial degradation of the existing visual character of the Recreation Area. To help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help the bypass channel blend with the surrounding environment. Potential measures include selection of fencing material and landscaping around the channel. The committee to evaluate visual resources mitigation measures would be based on the existing SWG. However, the visual and aesthetic impacts of the bypass channel would remain significant even after mitigation.

The visual and aesthetic impacts of the bypass channel would remain significant even after mitigation.

Permanent landscape changes (impacts) from operations of the bypass channel would be significant and cannot be mitigated.

2A: 2-month Improved Ladder Alternative

Construction-related Impacts.

Impact 2A–VR1: Construction Views of Mill Site Pump Station and Conveyance Facilities and Left Bank Fish Ladder AWS Intake. Temporary impacts resulting from construction of the Mill Site pump station and conveyance facilities and left bank fish ladder AWS intake under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–VR1).

Temporary impacts from construction of the Mill Site pump station and conveyance facilities and left bank fish ladder AWS intake on visual resources would be significant and cannot be mitigated.

Operations-related Impacts.

Impact 2A–VR2: Permanent Landscape Changes from Mill Site Pump Station and Conveyance Facilities. Permanent impacts resulting from operations of the Mill Site pump station and conveyance facilities under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–VR2).

Permanent landscape changes (impacts) from operations of the Mill Site pump station and conveyance facilities would be significant and cannot be mitigated.

Impact 2A–VR3: Permanent Landscape Changes from AWS Intake. Permanent impacts resulting from operations of the AWS intake under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A-VR3).

Permanent landscape changes (impacts) from operations of the AWS intake would be less than significant; therefore, no mitigation is required.

Impact 2A–VR4: Permanent Landscape Changes from Reduction of Gates-in Time Period. Under Alternative 2A, the RBDD gates would remain in the up position for an additional 2 months, reducing the gates-in period from 4 months each year to 2 months each year. The visual resources-related effect of this change is illustrated on Figures 3.12-4 through 3.12-35b.

Figure 3.12-42 is an aerial photograph taken during the gates-out period with the extent of the water line during the gates-in period highlighted in red. This aerial view clearly identifies those areas that are under water during the gates-in period versus those areas that are under water during the gates-out period. A brief discussion of the difference by reach is provided below.

- **Lower River/Red Bluff Recreation Area.** As seen on Figure 3.12-42, and on Figures 3.12-4 through 3.12-16b, the Sacramento River occupies the western edge of the river channel as it flows through the Lower River/Red Bluff Recreation Area during the gates-out period. The eastern and shallower edge of the river channel is only covered with water during the gates-in period. When the eastern portion of the river channel is not flooded, it ranges in appearance from lush and green to dry and brown.

- **East Sand Slough**. As seen on Figure 3.12-42, and on Figures 3.12-17 through 3.12-20b, no water is in East Sand Slough during the gates-out period. When the gates of RBDD are lowered, East Sand Slough fills with water in approximately 24 hours; East Sand Slough drains in approximately the same time period with the RBDD gates are raised. The appearance of East Sand Slough various throughout the gates-out period, ranging from lush and green to appearing dry and brown.

- **Middle River Reach**. As seen on Figure 3.12-42 and on Figures 3.12-21 through 3.12-30b, the Sacramento River generally occupies the entire width of the river channel as it flows through the Middle River reach during both the gates-out and gates-in periods. One notable exception is the river adjacent to the City Park, where during the gates-out period, the river occupies the eastern edge of the river channel, exposing an expanse of gravel that extends from the boat dock at the south end of the City Park north to the Antelope Boulevard bridge.
- **Upper River Reach**. As seen on Figure 3.12-42, and on Figures 3.12-31 through 3.12-35b, the Sacramento River generally occupies the entire width of the river channel as it flows through the Upper River reach during both the gates-in and gates-out periods.

Because the quality of some of the views within the Middle River reach are considered moderate under the gates-out condition and moderately high under the gates-in condition, an increase in the gates-out condition may be considered to be a substantial degradation of the visual quality of the Middle River reach.

While Alternative 2A represents a 50 percent loss of the season that the lake forms, the resulting effect is one that viewers are accustomed to seeing for 8 months each year. The loss of increased river elevation that forms Lake Red Bluff would not be considered to be a significant impact for three of the four reaches of the Sacramento River evaluated in this section: Lower River/Red Bluff Recreation Area, East Sand Slough, and Upper River. However, because the quality of some of the views within the Middle River reach are considered moderate under the gates-out condition and moderately high under the gates-in condition, an increase in the gates-out condition may be considered to be a substantial degradation of the visual quality of the Middle River reach. Therefore, the impact to visual resources resulting from a reduction of the gates-in period would be considered significant. No mitigation measures have been identified that would help reduce this impact.

The permanent landscape change (impact) resulting from a reduction of the gates-in time period would be significant and cannot be mitigated.

2B: 2-month with Existing Ladders Alternative

Construction-related Impacts.

Impact 2B–VR1: Construction Views of Mill Site Pump Station and Conveyance Facilities. Temporary impacts resulting from construction of the Mill Site pump station and conveyance facilities under Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–VR1).

Temporary impacts from construction of the Mill Site pump station and conveyance facilities on visual resources would be significant and cannot be mitigated.

Operations-related Impacts.

Impact 2B–VR2: Permanent Landscape Changes from Mill Site Pump Station and Conveyance Facilities. Permanent impacts resulting from operations of the Mill Site pump station and conveyance facilities under

Alternative 2B would be the same as those identified for Alternative 1A (see Impact 1A–VR2).

Permanent landscape changes (impacts) from operations of the Mill Site pump station and conveyance facilities would be significant, and cannot be mitigated.

Impact 2B–VR3: Permanent Landscape Changes from Reduction of Gates-in Time Period. Permanent impacts resulting from a reduction in the gates-in period from 4 months each year to 2 months each year under Alternative 2B would be the same as those identified for Alternative 2A (see Impact 2A–VR4).

The permanent landscape change (impact) resulting from a reduction of the gates-in time period would be significant and cannot be mitigated.

3: Gates-out Alternative

Construction-related Impacts.

Impact 3–VR1: Construction Views of Mill Site Pump Station and Conveyance Facilities. Temporary impacts resulting from construction of the Mill Site pump station and conveyance facilities under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–VR1).

Temporary impacts from construction of the Mill Site pump station and conveyance facilities on visual resources would be significant and cannot be mitigated.

Operations-related Impacts.

Impact 3–VR2: Permanent Landscape Changes from Mill Site Pump Station and Conveyance Facilities. Permanent impacts resulting from operations of the Mill Site pump station and conveyance facilities under Alternative 3 would be the same as those identified for Alternative 1A (see Impact 1A–VR2).

Permanent landscape changes from operations of the Mill Site pump station and conveyance facilities would be significant and cannot be mitigated.

Impact 3–VR3: Permanent Landscape Changes from Elimination of Gates-in Time Period. Under Alternative 3, the RBDD gates would remain in the up position for the entire year, eliminating the gates-in period and the resulting formation of Lake Red Bluff. The impacts to visual resources resulting from Alternative 3 would be the same as those identified for Alternative 2A (see Impact 2A–VR4). However, under Alternative 2A, the increased river elevation that creates Lake Red Bluff would be reduced by 2 months each year, while under Alternative 3, Lake Red Bluff would cease to be formed annually. Because the change from the gates-in to gates-out appearance would be permanent, ultimately, Alternative 3 would have negative aesthetic effects on scenic

Because the change from the gates-in to gates-out appearance would be permanent, ultimately, the Gates-out Alternative would have negative aesthetic effects on scenic views and would substantially degrade the existing visual character and quality of the project vicinity as it relates to the reaches of the Sacramento River described in this section.

views and would substantially degrade the existing visual character and quality of the project vicinity as it relates to the reaches of the Sacramento River described in this section. This degradation would be particularly evident through the Lower River/Red Bluff Recreation Area, East Sand Slough, and the Middle River reach. Therefore, the impact of eliminating the annual gates-in period would be considered significant.

To help mitigate visual impacts, a committee would be formed following selection of a Preferred Alternative to develop measures intended to help improve the appearance of those areas through the Sacramento River reaches that are particularly impacted by the loss of Lake Red Bluff. Potential measures include natural vegetation or landscaping through the east bank of the river adjacent to the Recreation Area and East Sand Slough, and the creation of shallow lagoons or ponds adjacent to the Recreation Area and the City Park. The committee to evaluate visual resources mitigation measures would be based on the existing SWG. However, the visual and aesthetic impacts of the elimination of the annual gates-in period would remain significant even after mitigation. It should be noted that there is a difference of opinion about the aesthetic value of an impounded body of water versus a free-flowing river. Those who value the aesthetics of a free-flowing river may not consider the Gates-out Alternative to have significant adverse aesthetic and visual resources impacts. Because this analysis has attempted to be conservative in its determination of significance, a worst-case interpretation of the significance standards has been applied.

Those who value the aesthetics of a free-flowing river may not consider the Gates-out Alternative to have significant adverse aesthetic and visual resources impacts.

The permanent landscape change (impact) resulting from the elimination of the gates-in time period and formation of Lake Red Bluff would be a significant impact that cannot be mitigated.

Consistency with Applicable Plans and Policies

A comparison of the proposed project alternatives with the aesthetic and visual resources portions of applicable plans and policies identified in the Visual Resource-related Plans and Policies section indicates that the proposed project is consistent with all identified plans and policies.

3.12.3 Mitigation

No mitigation is proposed that would reduce significant impacts to aesthetic and visual resources impacts resulting from the proposed alternatives to a less than significant level. However, a committee to evaluate visual resources mitigation measures would be established following selection of a project alternative. Potential mitigation measures have been identified in each of the alternative discussions above.

FIGURE 3.12-1
AERIAL VIEW OF PROJECT AREA WITH GATES IN
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

Thor\cart1\rddgis\rb_dam\MXD\gate_in_aerial.mxd Figure 3_12-1.pdf 07/08/02

FIGURE 3.12-2
AERIAL VIEW OF PROJECT AREA WITH GATES OUT
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

Thor\cart1\rddgis\rb_dam\MXD\gates_out_aerial.mxd Figure_3_12-2.pdf 07/08/02

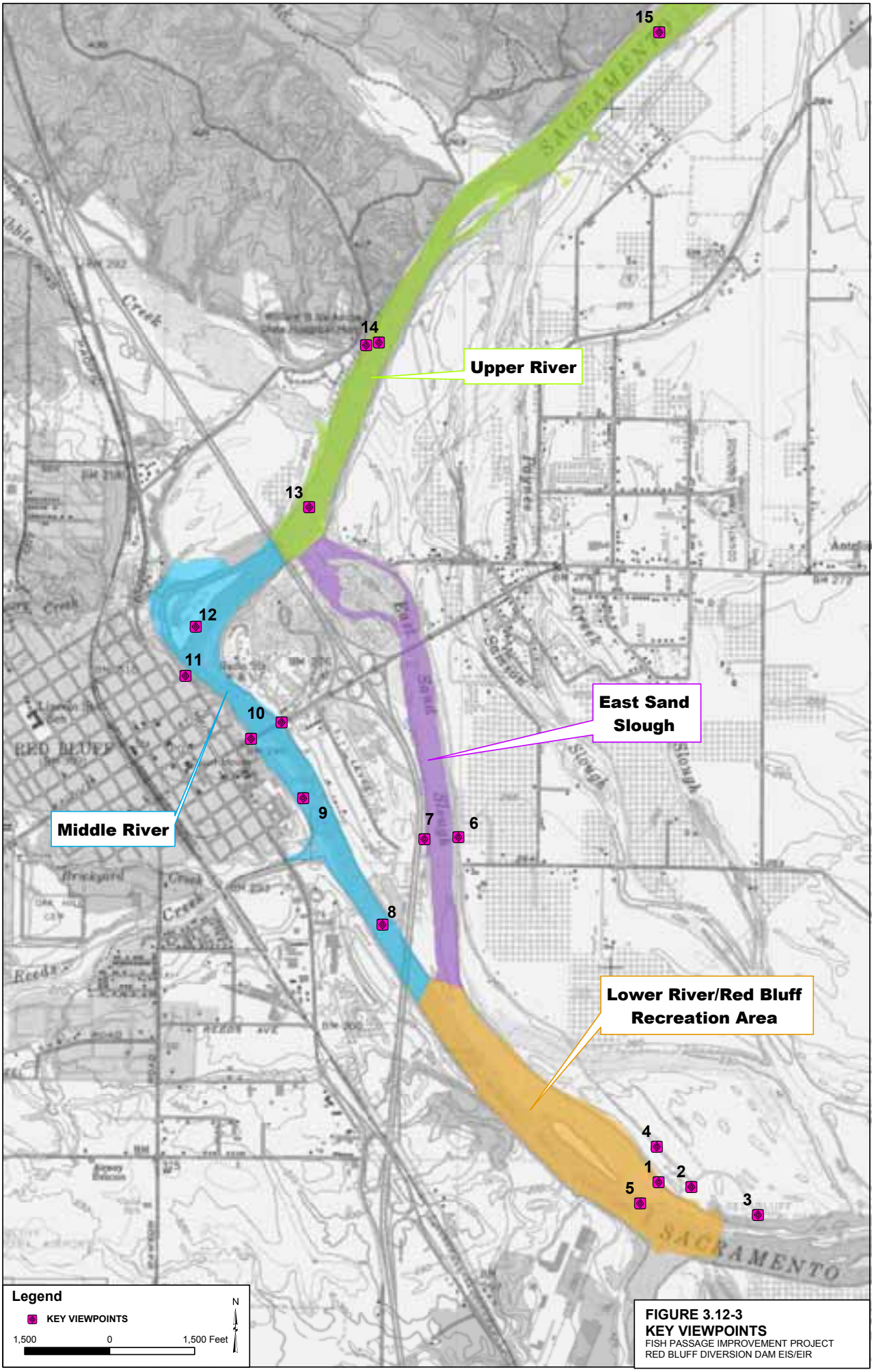


FIGURE 3.12-3
KEY VIEWPOINTS
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

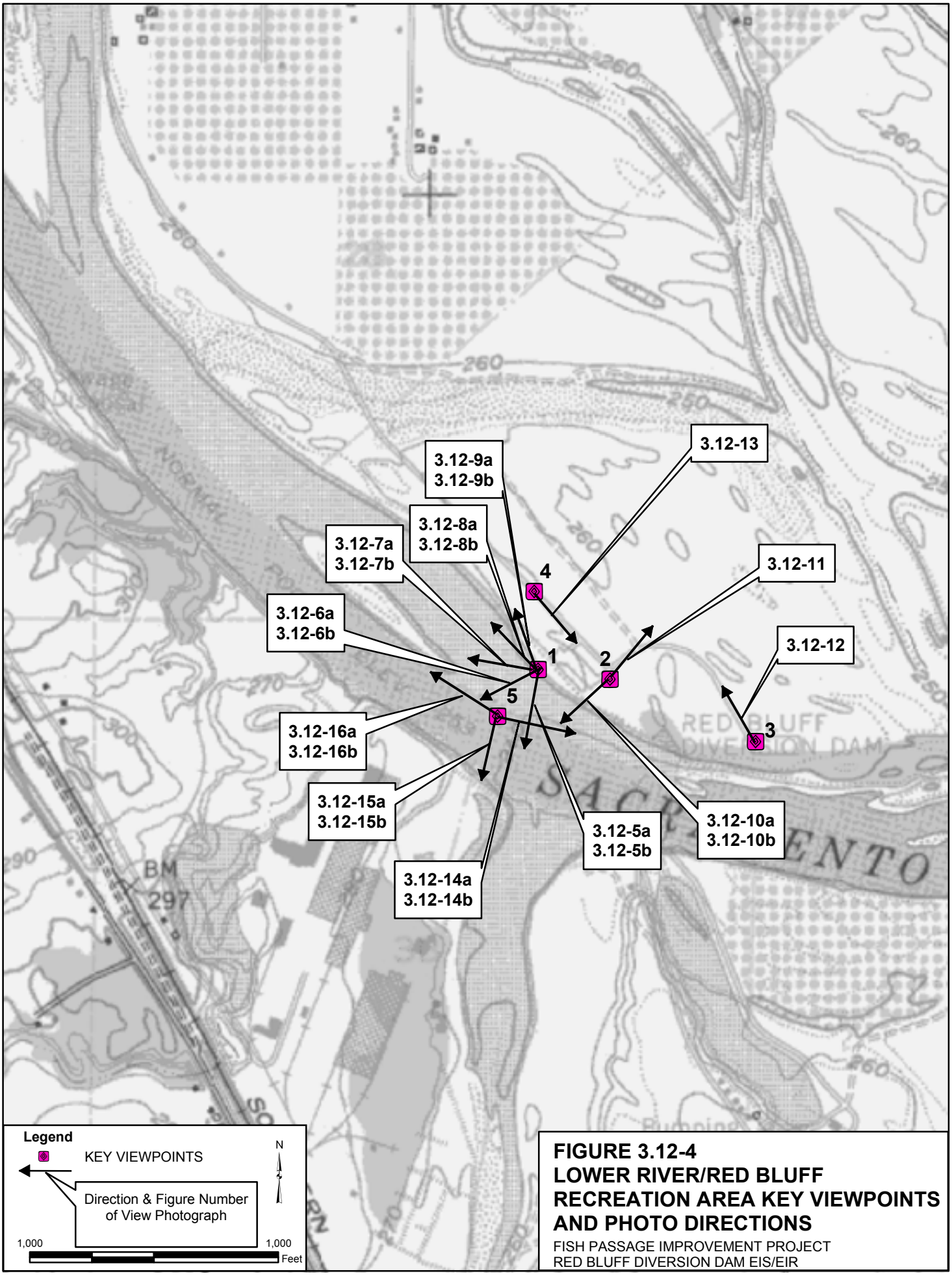


FIGURE 3.12-4
LOWER RIVER/RED BLUFF RECREATION AREA KEY VIEWPOINTS AND PHOTO DIRECTIONS

FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-5A
VIEW FROM VIEWPOINT #1, PHOTO 1
GATES-OUT CONDITION

FIGURE 3.12-5B
VIEW FROM VIEWPOINT #1, PHOTO 1
GATES-IN CONDITION

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #1
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W042002002RDD_50

CH2MHILL

FIGURE 3.12-6A
VIEW FROM VIEWPOINT #1, PHOTO 2
GATES-OUT CONDITION

FIGURE 3.12-6B
VIEW FROM VIEWPOINT #1, PHOTO 2
GATES-IN CONDITION

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #1
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W042002002RDD_51

CH2MHILL

FIGURE 3.12-7A
VIEW FROM VIEWPOINT #1, PHOTO 3
GATES-OUT CONDITION

FIGURE 3.12-7B
VIEW FROM VIEWPOINT #1, PHOTO 3
GATES-IN CONDITION

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #1
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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CH2MHILL

FIGURE 3.12-8A
VIEW FROM VIEWPOINT #1, PHOTO 4
GATES-OUT CONDITION

FIGURE 3.12-8B
VIEW FROM VIEWPOINT #1, PHOTO 4
GATES-IN CONDITION

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #1
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-9A
VIEW FROM VIEWPOINT #1, PHOTO 5
GATES-OUT CONDITION

FIGURE 3.12-9B
VIEW FROM VIEWPOINT #1, PHOTO 5
GATES-IN CONDITION

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #1
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-10A
VIEW FROM VIEWPOINT #2, PHOTO 1
GATES-OUT CONDITION

FIGURE 3.12-10B
VIEW FROM VIEWPOINT #2, PHOTO 1
GATES-IN CONDITION

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #2
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-11
VIEW FROM VIEWPOINT #2, PHOTO 2

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #2
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-12
VIEW FROM VIEWPOINT #3

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #3
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-13
VIEW FROM VIEWPOINT #4

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #4
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-14A
VIEW FROM VIEWPOINT #5, PHOTO 1
GATES-OUT CONDITION

FIGURE 3.12-14B
VIEW FROM VIEWPOINT #5, PHOTO 1
GATES-IN CONDITION

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #5
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W042002002RDD_59

CH2MHILL

FIGURE 3.12-15A
VIEW FROM VIEWPOINT #5, PHOTO 2
GATES-OUT CONDITION

FIGURE 3.12-15B
VIEW FROM VIEWPOINT #5, PHOTO 2
GATES-IN CONDITION

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #5
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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CH2MHILL

FIGURE 3.12-16A
VIEW FROM VIEWPOINT #5, PHOTO 3
GATES-OUT CONDITION

FIGURE 3.12-16B
VIEW FROM VIEWPOINT #5, PHOTO 3
GATES-IN CONDITION

LOWER RIVER/RED BLUFF RECREATION AREA VIEWPOINT #5
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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CH2MHILL

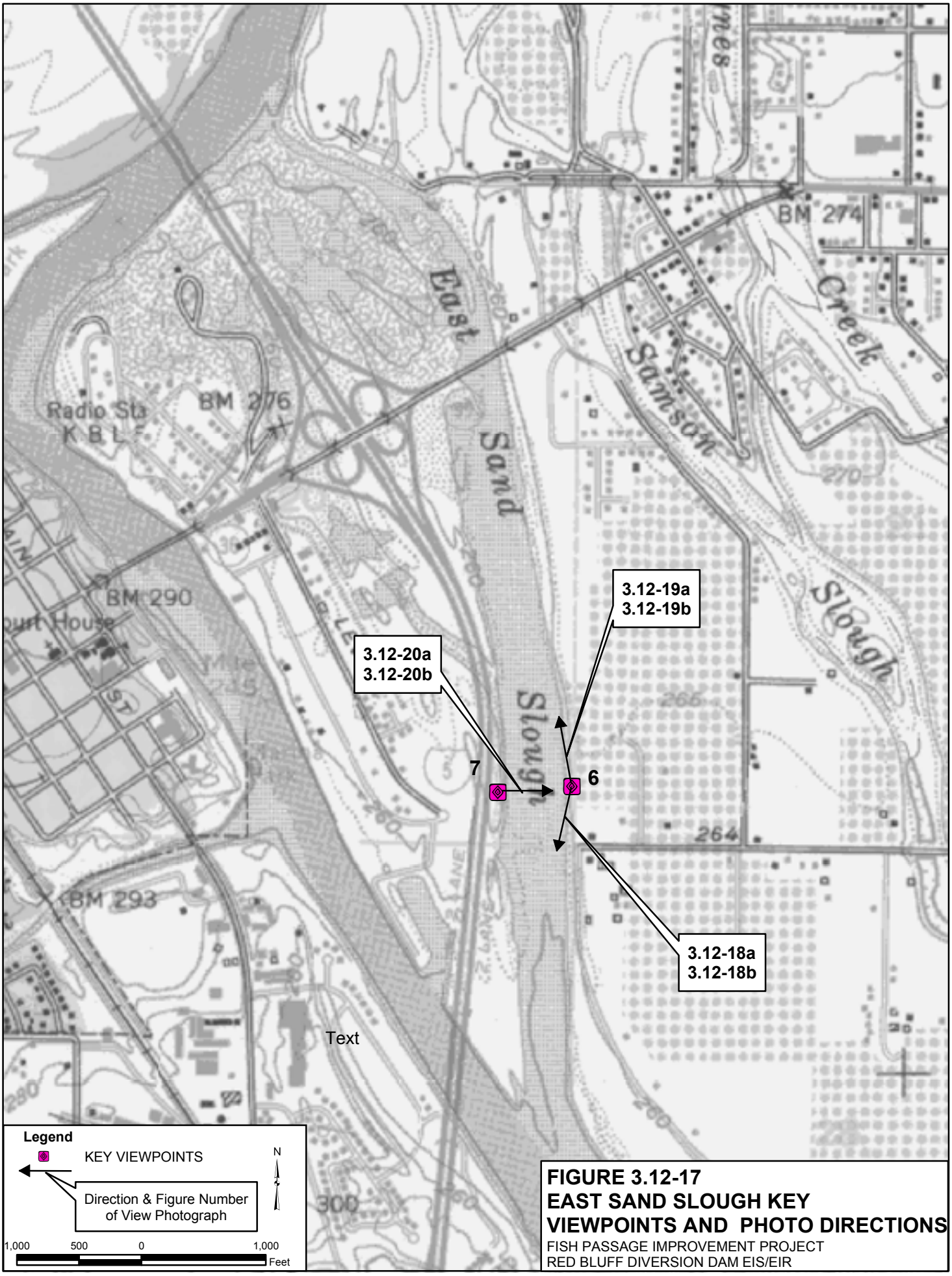

FIGURE 3.12-17
EAST SAND SLOUGH KEY VIEWPOINTS AND PHOTO DIRECTIONS
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-18A
VIEW FROM VIEWPOINT #6, PHOTO 1
GATES-OUT CONDITION

FIGURE 3.12-18B
VIEW FROM VIEWPOINT #6, PHOTO 1
GATES-IN CONDITION

EAST SAND SLOUGH VIEWPOINT #6
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-19A
VIEW FROM VIEWPOINT #6, PHOTO 2
GATES-OUT CONDITION

FIGURE 3.12-19B
VIEW FROM VIEWPOINT #6, PHOTO 2
GATES-IN CONDITION

EAST SAND SLOUGH VIEWPOINT #6
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-20A
VIEW FROM VIEWPOINT #7
GATES-OUT CONDITION

FIGURE 3.12-20B
VIEW FROM VIEWPOINT #7
GATES-IN CONDITION

EAST SAND SLOUGH VIEWPOINT #7
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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CH2MHILL

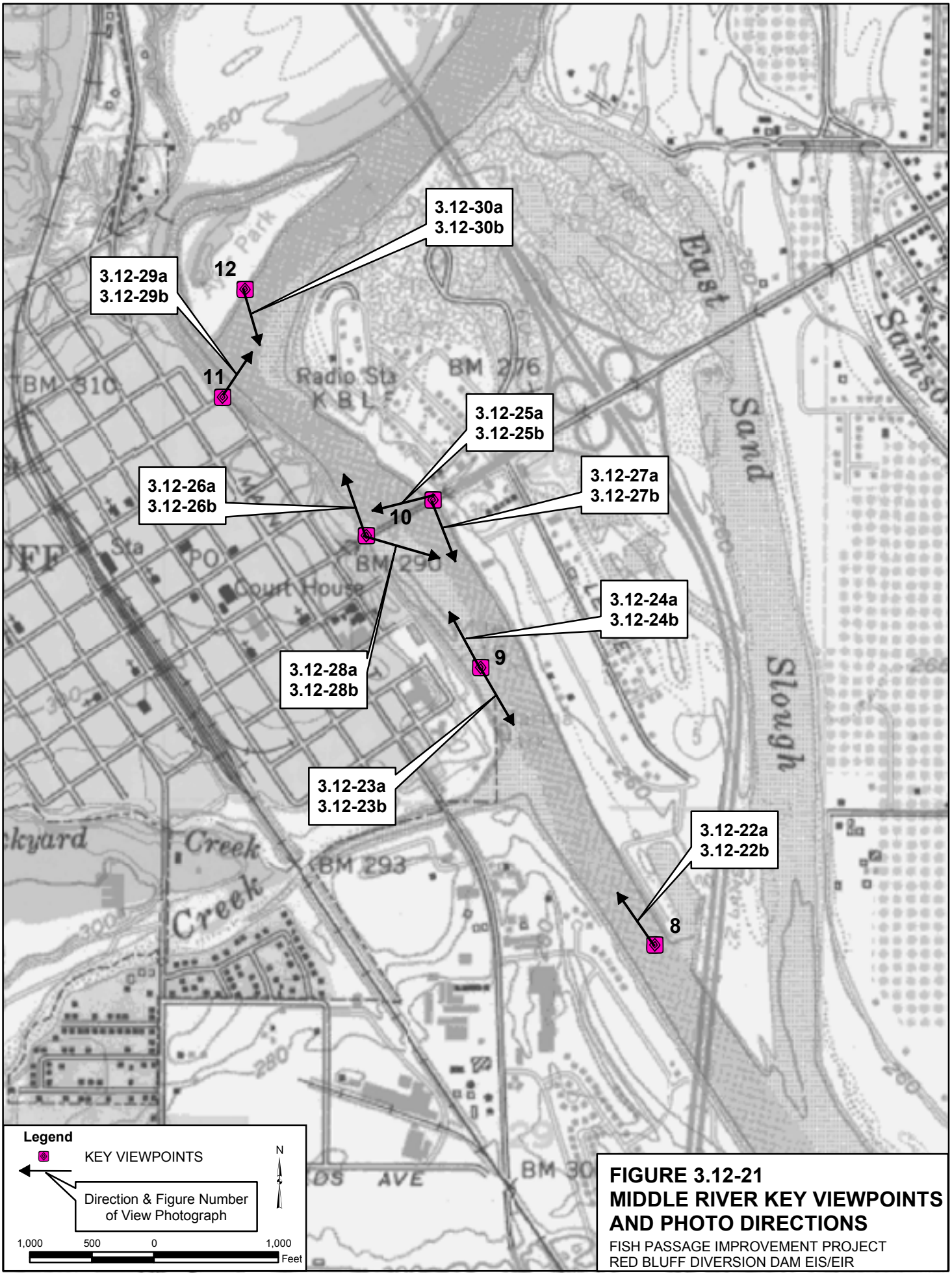

FIGURE 3.12-21
MIDDLE RIVER KEY VIEWPOINTS AND PHOTO DIRECTIONS
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-22A
VIEW FROM VIEWPOINT #8
GATES-OUT CONDITION

FIGURE 3.12-22B
VIEW FROM VIEWPOINT #8
GATES-IN CONDITION

MIDDLE RIVER VIEWPOINT #8
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-23A
VIEW FROM VIEWPOINT #9, PHOTO 1
GATES-OUT CONDITION

FIGURE 3.12-23B
VIEW FROM VIEWPOINT #9, PHOTO 1
GATES-IN CONDITION

MIDDLE RIVER VIEWPOINT #9
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-24A
VIEW FROM VIEWPOINT #9, PHOTO 2
GATES-OUT CONDITION

FIGURE 3.12-24B
VIEW FROM VIEWPOINT #9, PHOTO 2
GATES-IN CONDITION

MIDDLE RIVER VIEWPOINT #9
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-25A
VIEW FROM VIEWPOINT #10, PHOTO 1
GATES-OUT CONDITION

FIGURE 3.12-25B
VIEW FROM VIEWPOINT #10, PHOTO 1
GATES-IN CONDITION

MIDDLE RIVER VIEWPOINT #10
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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CH2MHILL

FIGURE 3.12-26A
VIEW FROM VIEWPOINT #10, PHOTO 2
GATES-OUT CONDITION

FIGURE 3.12-26B
VIEW FROM VIEWPOINT #10, PHOTO 2
GATES-IN CONDITION

MIDDLE RIVER VIEWPOINT #10
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-27A
VIEW FROM VIEWPOINT #10, PHOTO 3
GATES-OUT CONDITION

FIGURE 3.12-27B
VIEW FROM VIEWPOINT #10, PHOTO 3
GATES-IN CONDITION

MIDDLE RIVER VIEWPOINT #10
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-28A
VIEW FROM VIEWPOINT #10, PHOTO 4
GATES-OUT CONDITION

FIGURE 3.12-28B
VIEW FROM VIEWPOINT #10, PHOTO 4
GATES-IN CONDITION

MIDDLE RIVER VIEWPOINT #10
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-29A
VIEW FROM VIEWPOINT #11
GATES-OUT CONDITION

FIGURE 3.12-29B
VIEW FROM VIEWPOINT #11
GATES-IN CONDITION

MIDDLE RIVER VIEWPOINT #11
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-30A
VIEW FROM VIEWPOINT #12
GATES-OUT CONDITION

FIGURE 3.12-30B
VIEW FROM VIEWPOINT #12
GATES-IN CONDITION

MIDDLE RIVER VIEWPOINT #12
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

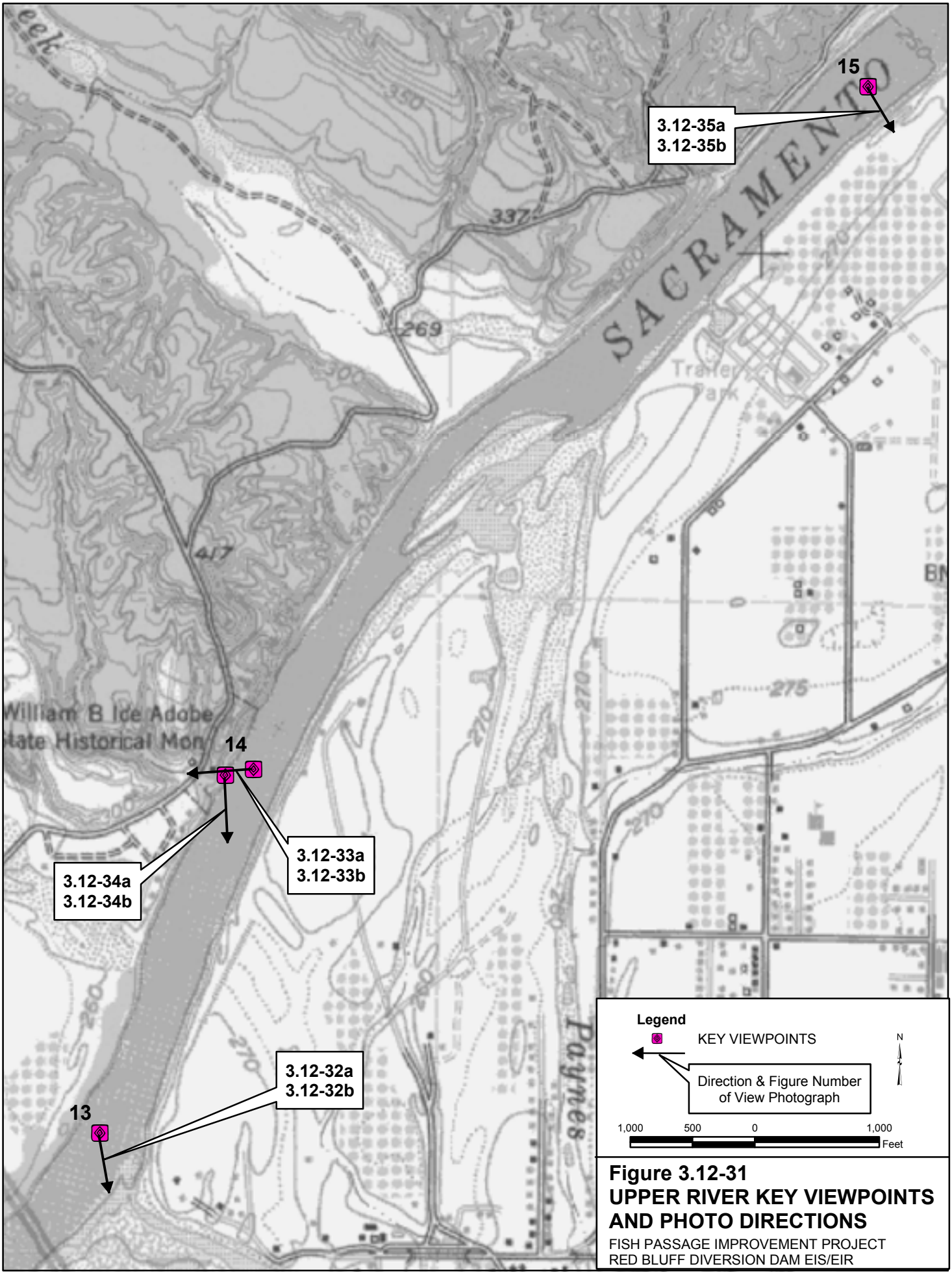

Figure 3.12-31
UPPER RIVER KEY VIEWPOINTS AND PHOTO DIRECTIONS
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.12-32A
VIEW FROM VIEWPOINT #13
GATES-OUT CONDITION

FIGURE 3.12-32B
VIEW FROM VIEWPOINT #13
GATES-IN CONDITION

UPPER RIVER VIEWPOINT #13
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-33A
VIEW FROM VIEWPOINT #14, PHOTO 1
GATES-OUT CONDITION

FIGURE 3.12-33B
VIEW FROM VIEWPOINT #14, PHOTO 1
GATES-IN CONDITION

UPPER RIVER VIEWPOINT #14
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-34A
VIEW FROM VIEWPOINT #14, PHOTO 2
GATES-OUT CONDITION

FIGURE 3.12-34B
VIEW FROM VIEWPOINT #14, PHOTO 2
GATES-IN CONDITION

UPPER RIVER VIEWPOINT #14
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

FIGURE 3.12-35A
VIEW FROM VIEWPOINT #15
GATES-OUT CONDITION

FIGURE 3.12-35B
VIEW FROM VIEWPOINT #15
GATES-IN CONDITION

UPPER RIVER VIEWPOINT #15
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

BEFORE PROJECT

AFTER PROJECT

FIGURE 3.12-36
BEFORE AND AFTER VIEWS OF MILL SITE PUMP STATION AND CONVEYANCE FACILITIES FROM VIEWPOINT #1
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W042002002RD_83 (7/9/02)

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BEFORE PROJECT

AFTER PROJECT

FIGURE 3.12-37
BEFORE AND AFTER VIEWS OF LEFT BANK FISH LADDER AWS INTAKE FROM VIEWPOINT #5
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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BEFORE PROJECT

AFTER PROJECT

FIGURE 3.12-38
BEFORE AND AFTER VIEWS OF
BYPASS CHANNEL FROM VIEWPOINT #1
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W042002002RD_82 (7/9/02)

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BEFORE PROJECT

AFTER PROJECT

FIGURE 3.12-39
BEFORE AND AFTER VIEWS OF BYPASS CHANNEL FROM VIEWPOINT #4
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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BEFORE PROJECT

AFTER PROJECT

FIGURE 3.12-40
BEFORE AND AFTER VIEWS OF
BYPASS CHANNEL FROM VIEWPOINT #2
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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BEFORE PROJECT

AFTER PROJECT

FIGURE 3.12-41
BEFORE AND AFTER VIEWS OF BYPASS CHANNEL FROM VIEWPOINT #3
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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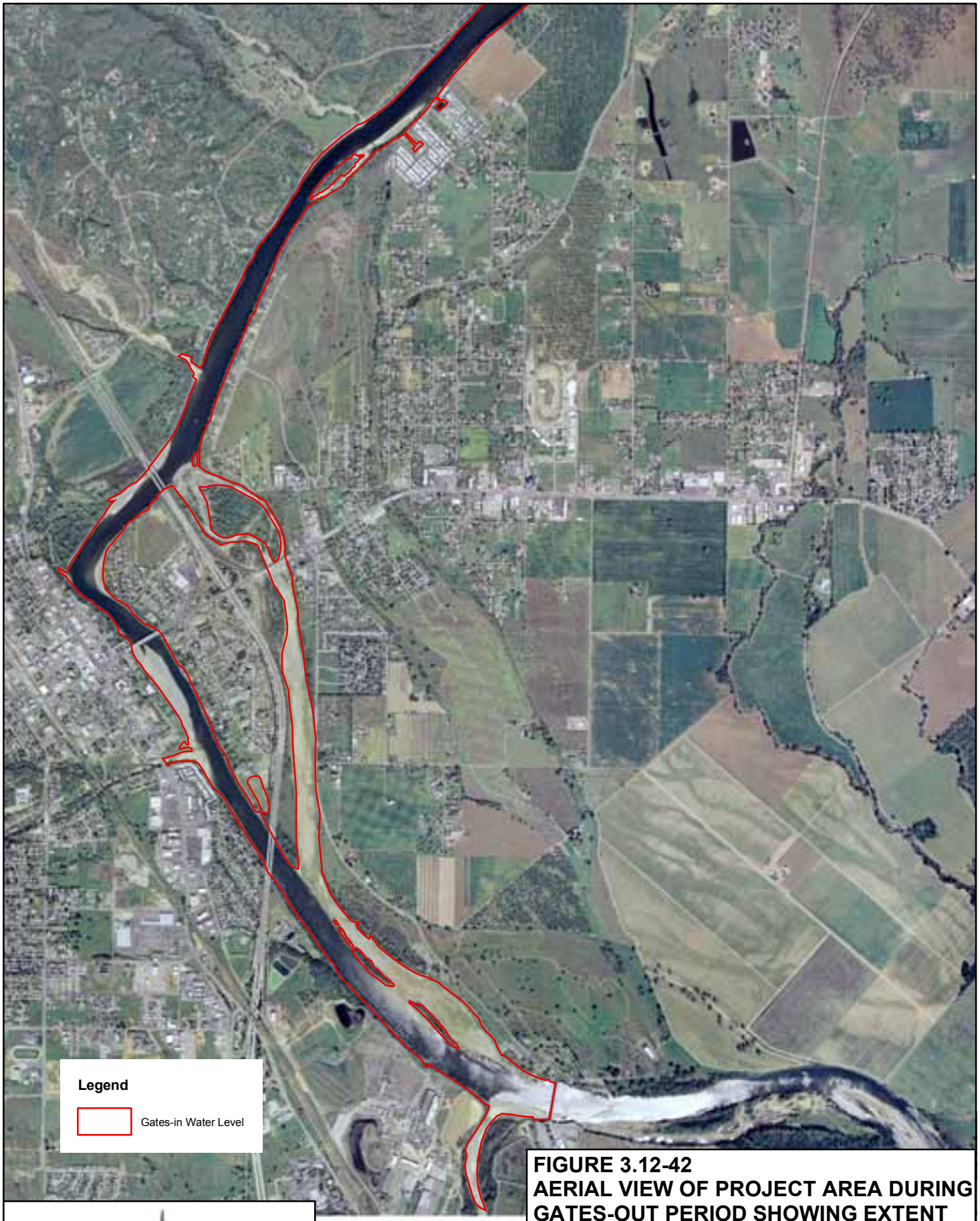

FIGURE 3.12-42
AERIAL VIEW OF PROJECT AREA DURING GATES-OUT PERIOD SHOWING EXTENT OF WATER COVERAGE DURING GATES-IN PERIOD
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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