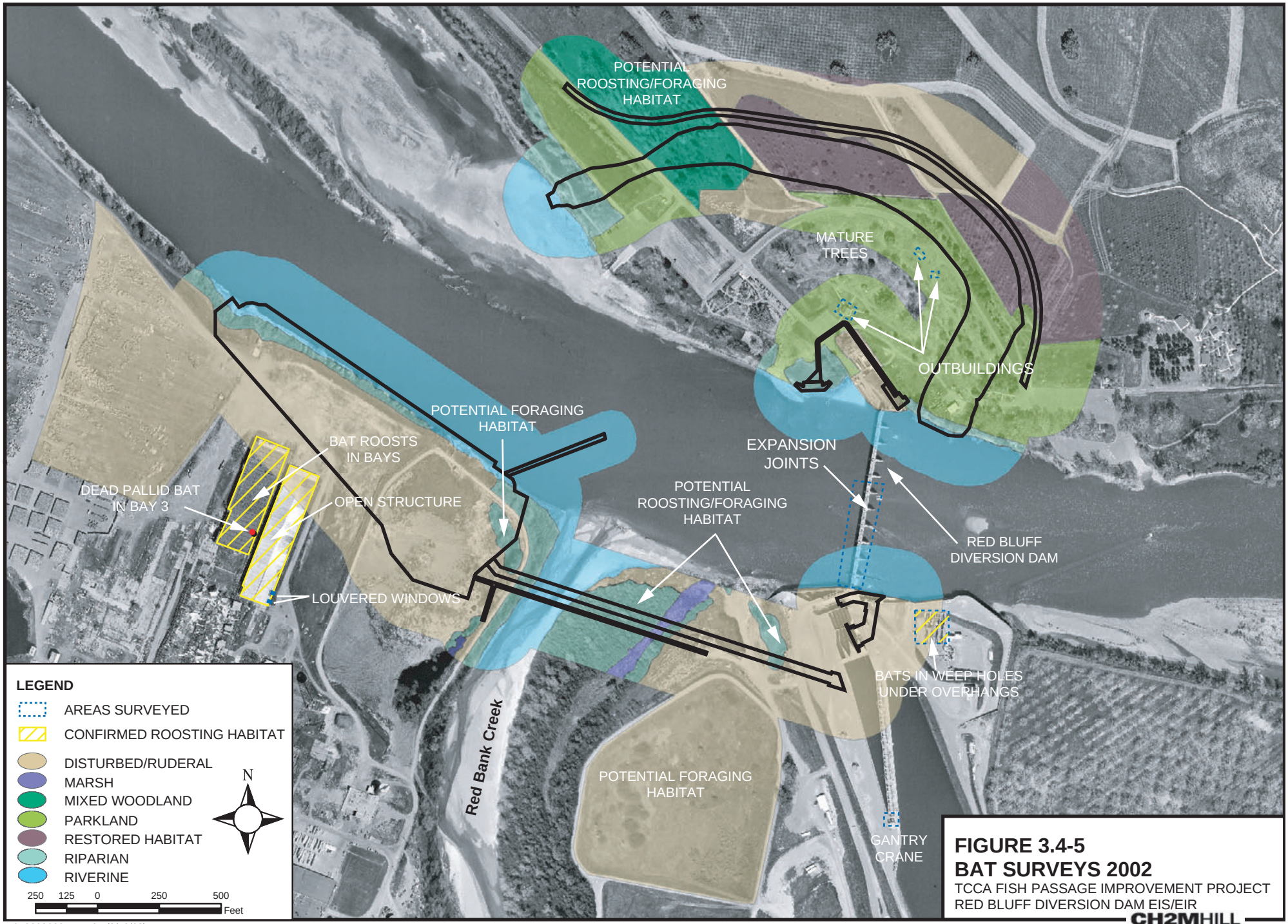

FIGURE 3.4-5
BAT SURVEYS 2002
TCCA FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

CH2MHILL

W042002002RDD_85 (8/13/02)

FIGURE 3.4-6
BAT HABITAT—ABANDONED COVERED STORAGE BUILDING
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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FIGURE 3.4-7
MEXICAN FREE-TAIL BATS
INSIDE CEMENT WALL CAVITY ROOST
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W042002002RDD_87

CH2MHILL

FIGURE 3.4-8
BAT HABITAT—OPEN-WALLED ABANDONED STORAGE BUILDING
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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CH2MHILL

Acoustic Monitoring. Four types of echolocation calls were recorded. Echolocation calls of the Mexican free-tail were distinctive in this case. A second call type could have been pallid bat or big brown bat; either species (or both) are likely.

The final two call types were myotis, which are often reported as phonic types based on the characteristic frequency of the sonagrams (40 kilohertz and 50 kilohertz). The echolocation calls of many species of bats are indistinguishable by acoustic means alone (especially when recorded near roosts), and capture is required to confirm identification. However, the Yuma myotis (*Myotis yumanensis*) is a 50-kilohertz phonic type and would be expected to occur in buildings along the Sacramento River. The 40-kilohertz calls may have been attributable to the small-footed myotis (*Myotis ciliolabrum*).

For a complete description of the bat survey, refer to Appendix F.

Federal Jurisdictional Waters

USACE has jurisdictional authority to regulate discharge of dredging material and fill into "waters of the United States (including wetlands)" under Section 404 of the Clean Water Act. The Code of Federal Regulations (33 CFR Section 328.3) defines waters of the United States as all navigable waters, including: (1) all tidal waters; (2) all interstate waters and wetlands; (3) all other waters such as lakes, rivers, streams (perennial or intermittent), mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds – the use, degradation or destruction of which could affect interstate commerce; (4) all impoundments of water mentioned above; (5) all tributaries to waters mentioned above; (6) territorial seas; and (7) all wetlands adjacent to waters mentioned above.

Wetlands are those areas that are inundated or saturated by surface or groundwater at a frequency and duration (wetland hydrology) sufficient to support, and that under normal circumstances do support, a prevalence of wetlands vegetation (hydrophytic vegetation) typically adapted for life in saturated soil conditions (hydric soils). Wetlands generally include swamps, marshes, bogs, and similar areas (40 CFR 230.3 and 33 CFR 328). Any actions that involve the placement of fill material into jurisdictional waters and wetlands, including such activities as sidecasting material during ditch excavation or temporary fills to provide equipment access during construction must comply with Section 4040 of the Clean Water Act.

Under Section 10 of the Rivers and Harbors Act of 1899, USACE also regulates the obstruction or alteration of navigable waters (including tidal waters) of the United States. It is important to note that Section 10 jurisdiction includes navigable waters within the mean high water line that have been diked or filled.

A comprehensive delineation of jurisdictional waters, including pre-jurisdictional waters and wetlands, will be conducted within 1 year prior to the beginning of project construction activities.

The 1987 Wetland Delineation Manual requires an examination for the presence of indicators of three mandatory diagnostic characteristics. These characteristics, or wetland parameters, are hydrophytic vegetation, wetlands hydrology, and hydric soils. Except in limited instances, the 1987 Wetland Delineation Manual requires evidence of a minimum of one positive indicator from each of the three mandatory wetlands parameters for an area to be called a "wetland'' under Section 404 jurisdiction. A comprehensive delineation of jurisdictional waters, including pre-jurisdictional waters and wetlands, will be conducted within 1 year prior to the beginning of project construction activities.

3.4.2 Environmental Consequences

This section provides a discussion of the consequences of the project alternatives on biological resources as compared to the No Action Alternative. Each project alternative impacts a different amount of wildlife habitat, and, in turn, wildlife communities and/or special-status species. Table 3.4-4 lists the acreage of each habitat type that would be affected by each alternative. Acreage is broken down into temporary and permanent impacts for each alternative. A discussion of the impacts on habitats and special-status species follows the table. For a complete description of the project alternatives, refer to Chapter 2 of this document.

TABLE 3.4-4
Acreage of Habitat Impacts for Project Alternatives

	Alternatives										
		1A: 4-month Improved Ladder		1B: 4-month Bypass		2A: 2-month Improved Ladder		2-month with Existing Ladders		3: Gates-out	
Vegetation Habitat	No Action	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact
Riparian	0	2.18	5.56	2.60	6.30	2.18	5.56	2.05	4.76	2.05	4.76
Freshwater marsh	0	0.05	0.71	0.05	0.71	0.05	0.71	0.05	0.71	0.05	0.71
Mixed woodland	0	0	0	1.37	4.30	0	0	0	0	0	0
Restored habitat	0	0	0	4.96	4.80	0	0	0	0	0	0
Annual grassland	0	0	0	0	0	0	0	0	0	0	0
Disturbed	0	11.75	44.12	12.90	51.70	11.75	44.12	11.36	41.35	11.36	41.3
Parkland	0	0.19	4.86	4.19	12.32	0.19	4.86	0	0	0	0

Methodology

Potential impacts to biological resources were assessed through mapping habitat in the project area onto aerial photographs, converting the mapped habitats to a Geographic Information Systems database, calculating acreage of each type of habitat from the database, and then overlaying the project features onto the Geographic Information Systems database to determine acres of each habitat that would be impacted by the project features. A 200-foot buffer zone around all project components was considered to encompass the entire area potentially impacted during construction activities. Habitat where project components would be located was considered permanently lost. Habitat within the buffer zone was assumed to be removed during construction of the project components but could be restored following completion of the project. These impacts were considered temporary.

Impacts to wildlife, including special-status species, were determined according to changes in the amount and/or quality of habitat in the project area. Impacts to federal- and state-listed species with the potential to occur in the project area were individually evaluated on the basis of changes in the amount and quality of habitat and the use of the project area by each species.

Significance Criteria

The following criteria were used to evaluate the significance of effects on wildlife. These criteria are based on the *CEQA Guidelines* and NEPA regulations. Construction and operation impacts on wildlife resources were considered significant if they would result in any of the following:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFG or USFWS.
- Have a substantial adverse effect on any riparian habitat, or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFG or USFWS.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, and coastal) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

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

Impacts on Wildlife Habitat and Wildlife.

Impact 1A–BR1: Riparian Habitat. Up to 7.74 acres of riparian habitat would be impacted under this alternative (Figure 3.4-9). The permanent loss of 2.18 acres of riparian habitat would occur with the permanent land conversion resulting from installation of the access bridge, the conveyance pipeline, left fish ladder, and the fish screen and forebay. Up to an additional 5.56 acres of riparian habitat could be removed to accommodate construction activities required for the forebay/ conveyance and left fish ladder. 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 the same duration (4 months) during the same time period (May 15 through September 15) as under current operation. Therefore, there would be no change in the extent or frequency of inundation of Lake Red Bluff and no change in the nature or extent of riparian vegetation adjacent to the lake.

Riparian habitat that would be impacted under this alternative is predominantly located along Red Bank Creek, with small amounts on the north and south sides of the Sacramento River. A small patch of riparian habitat with limited plant species and structural diversity would be impacted on the north side of the river. The habitat quality of this area is very low because of this low level of diversity and the high levels of human activity resulting from the adjacent park. 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

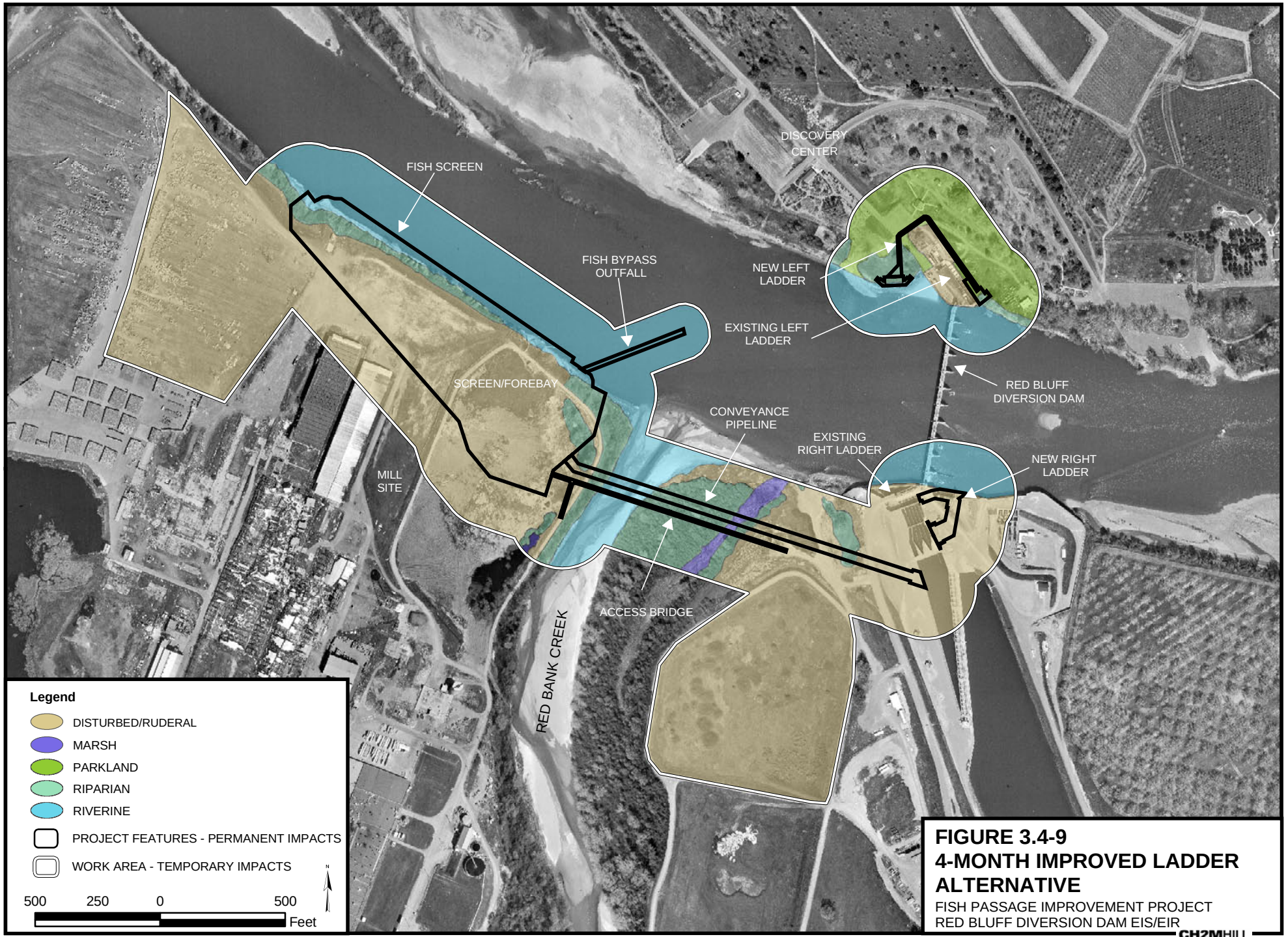

FIGURE 3.4-9
4-MONTH IMPROVED LADDER ALTERNATIVE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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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 up to 7.74 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 1A; however, under the criterion used, construction and operations of Alternative 1A would result in a significant impact to riparian habitat.

Impact 1A–BR2: Freshwater Marsh Habitat. At least 0.05 acre of freshwater marsh would be permanently lost with construction of the conveyance pipeline and access bridge. An additional 0.71 acre of freshwater marsh is within the 200-foot construction area around the conveyance pipeline and access bridge and could be impacted during construction. For this analysis, it is assumed that all of the 0.71 acre of freshwater marsh within the construction area would be permanently lost, for a total of 0.76 acre.

The marsh habitat that would be impacted consists of two areas: a narrow strip on the south bank of the Sacramento River, which is surrounded by riparian habitat on the east side of Red Bank Creek; and a smaller area on the west side of Red Bank Creek. This is an artificially created marsh, established from the drainage area of the current Pactiv plant. The total acreage of freshwater marsh in the project area is 2.01 acres; the freshwater marsh acreage that would be impacted by this alternative constitutes about one-third of the total marsh acreage. The habitat is of low value to wildlife species because the areas are small, isolated patches with high levels of human disturbance. Although loss of this small amount of freshwater marsh would not significantly impact wildlife populations, migratory corridors, or nursery sites, at least one of the two freshwater marsh areas is probably a federal-protected wetlands under Section 404 of the Clean Water Act. Assuming that the impacted freshwater marsh is protected under Section 404, its loss under this alternative is considered a significant impact.

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

Impact 1A–BR3: Disturbed Habitat. Under this alternative, 56 acres of disturbed habitat would be impacted by the project activities. Of this acreage, approximately 12 acres would be permanently converted to

new facilities. The remaining 44 acres would be temporarily disturbed during construction. Following construction, temporarily disturbed areas would be naturally colonized by plants and remain as disturbed habitat. Disturbed areas support very little vegetation – predominantly blackberry and star thistle – and are of very low habitat value for wildlife. Most of this habitat is bare ground. Because of its very low value as wildlife habitat, and because it consists predominantly of non-native plant species, loss of this disturbed habitat would not result in significant biological impacts.

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

Impact 1A–BR4: Parkland Habitat. Under this alternative, a total of 5.05 acres of parkland would be impacted. Of this acreage, 0.19 acre would be permanently converted to new facilities. The remaining 4.86 acres would be temporarily disturbed during construction. Following construction, temporarily disturbed areas would be replanted to grow back into their pre-construction condition. The habitat value of the park is low because of the high level of human use, low plant species diversity, and limited vegetation structural diversity. As a result, wildlife species using the park consist of those tolerant of human activity such as gray squirrels, scrub jays, and crows. The borders of the park could also provide habitat used by deer and a greater variety of rodent and bird species. Because of its low value as wildlife habitat, loss of parkland habitat would not result in significant biological impacts.

The impacts from construction and operations on parkland 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 habitats 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 1A–BR5: 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 (2.74 acres permanently lost and 5.41 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 project area use by little willow flycatchers, no significant impacts to little willow flycatchers would occur under this alternative.

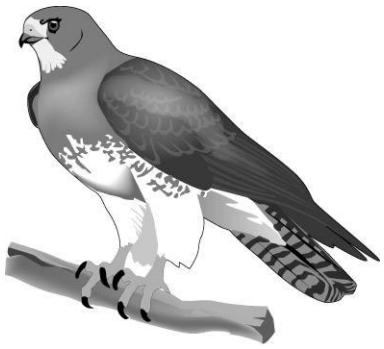
The impacts from construction and operations on little willow flycatchers would be less than significant; therefore, no mitigation is required.

Impact 1A–BR6: Western Yellow-billed Cuckoo. Under this alternative, a small amount of riparian habitat would be impacted (2.74 acres permanently lost and 5.41 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 project area use 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 1A–BR7: Bald Eagle. Bald eagles do not nest in the project area but occasionally occur in the project area during the winter. Bald eagles require perch sites such as trees near water bodies where they forage. In the project area, bald eagles could use riparian trees as perch sites from which to forage for fish in the Sacramento River. Although this alternative would remove some riparian habitat, large trees would remain available in riparian areas not affected by construction. Considering the low level of use of this area by bald eagles, the small reduction in riparian habitat under this alternative would not significantly impact foraging opportunities for bald eagles in the project area.

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



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Impact 1A–BR8: Swainson's Hawk. Swainson's hawks are not known to occur in the project area, and their potential to use riparian habitat in the project area appears low. As a result, the small loss of riparian habitat under this alternative would not significantly impact Swainson's hawks.

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

Impact 1A–BR9: Valley Elderberry Longhorn Beetle. VELB are entirely dependent on the elderberry shrub. Vegetation surveys conducted in 2002 reported six elderberry shrubs and/or groups of shrubs that occur in riparian habitat and eight shrubs that occur in ruderal habitat within

the construction footprint of this alternative. In riparian habitat, Elderberry Shrub Nos. 2, 3, 6, and 7 (Shrubs E2, E3, E6, and E7) are on the left bank (north side) of the Sacramento River within the 200-foot construction buffer zone of the proposed new left fish ladder. Shrubs E34 and E35 occur on the right bank (south side) of the Sacramento River within the 200-foot construction buffer zone of the proposed conveyance pipeline and the access bridge. In ruderal habitat, Shrub E5 occurs within the 200-foot construction buffer zone of the left fish ladder. Shrubs E25, E28, E29, E30, E31, E32, and E33 occur on the right side of the river. 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 under this alternative 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 1A–BR10: Peregrine Falcon. This species is not known to nest in the vicinity of the project area but has been observed in the Red Bluff area during the 1999 Audubon Christmas bird counts and observed on rare occasions during breeding bird surveys in the area. The project area provides minimal foraging habitat for peregrine falcons, which more typically prey on waterfowl attracted to Sacramento Valley wildlife refuges. Because of the low quality and small amount of habitat that would be impacted under this alternative, no significant impacts to the peregrine falcon would occur under this alternative.

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

Impacts on Other Special-status Species.

Impact 1A–BR11: Osprey. Two of the three osprey nests on the south side of the Sacramento River area are occupied and are within the area that would be temporarily impacted under this alternative (Figure 3.4-9) during construction of the conveyance pipeline, access bridge, and fish screen. It is anticipated that both of the nesting platforms would need to be removed during construction. The removal of these nest sites constitutes a significant impact.

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

Impact 1A–BR12: Bats. The presence of three bat species was visually confirmed, and a fourth species was acoustically detected. The species visually confirmed were myotis (*Myotis* sp.), Mexican free-tail bats (*Tarida brasilensis*), and either pallid bats (*Antrozous pallidus*) or big brown bats (*Eptesicus fuscus*). A pallid bat carcass was found at the site, but guano associated with pallid bats was not found and guano associated with big brown bats was found. Numerous roost locations were documented in the two abandoned storage buildings at the Mill Site. Evidence was found that bats roost in some of the hydroelectric structures of RBDD in concrete weep holes and under metal overhangs. Several areas appeared to provide potential roosting and foraging habitat: the camping and recreational park area on the north side of the Sacramento River, the upland vegetation and open grasslands on the southwest side of the river, and riparian and wetlands areas (Figure 3.4-5).

The two abandoned buildings used as bat roosts are within the 200-foot buffer area considered to be temporarily impacted by all project alternatives. However, there are no plans to remove these buildings. Therefore, no significant impacts to bats would occur. If at the time of project construction a decision is made to permanently impact the roosting habitat by removing the buildings, bats would be significantly impacted, and appropriate mitigation for exclusion of bats from the habitat would be prescribed. For detailed mitigation measures refer to Appendix F.

To further ensure that there would be no significant impact, a 25-foot buffer area will be demarcated and flagged around the buildings. No construction activities would occur within this area. Construction materials will not be stored in the buildings occupied by bats, nor would workers enter the buildings. If these avoidance measures are not possible, TCCA would work with CDFG to coordinate an appropriate avoidance measure.

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

1B: 4-month Bypass Alternative

Impacts on Wildlife Habitat and Wildlife.

Impact 1B–BR1: Riparian Habitat. This alternative (Figure 3.4-10) would permanently or temporarily remove 8.9 acres of riparian habitat. This includes the permanent loss of 2.6 acres of riparian habitat with land conversion resulting from installation of the bypass, access bridge, conveyance pipeline, and the fish screen and forebay. Up to an additional 6.3 acres of riparian habitat could be removed to

accommodate construction activities required for the bypass work area and the forebay/conveyance and right fish ladder work areas. These impacts would constitute a temporary impact. Following completion of construction, temporarily impacted areas of riparian habitat would be planted with native riparian trees and shrubs to restore the habitat.

Riparian habitat that would be impacted under this alternative is predominantly located along Red Bank Creek and the north side of the Sacramento River, with small amounts also on the south side of the river. The riparian habitat on the north side of the river that would be impacted is of low quality because of the low level of diversity and the high levels of human activity in this area. This area is adjacent to a boat launch in a heavily used recreational area that is adjacent to a camp-ground. In addition, a public footpath winds through the riparian area. 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.

Under this alternative, the gates would be in the river for the same duration (4 months) during the same time period (May 15 through September 15) as under current operation. Therefore, there would be no change in the extent or frequency of inundation of Lake Red Bluff and no change in the nature or extent of riparian vegetation adjacent to the lake.

In total, this alternative would permanently or temporarily remove about 8.9 acres of riparian habitat. The 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 1B; however, under the criterion used, construction and operations of Alternative 1B would result in a significant impact to riparian habitat.

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

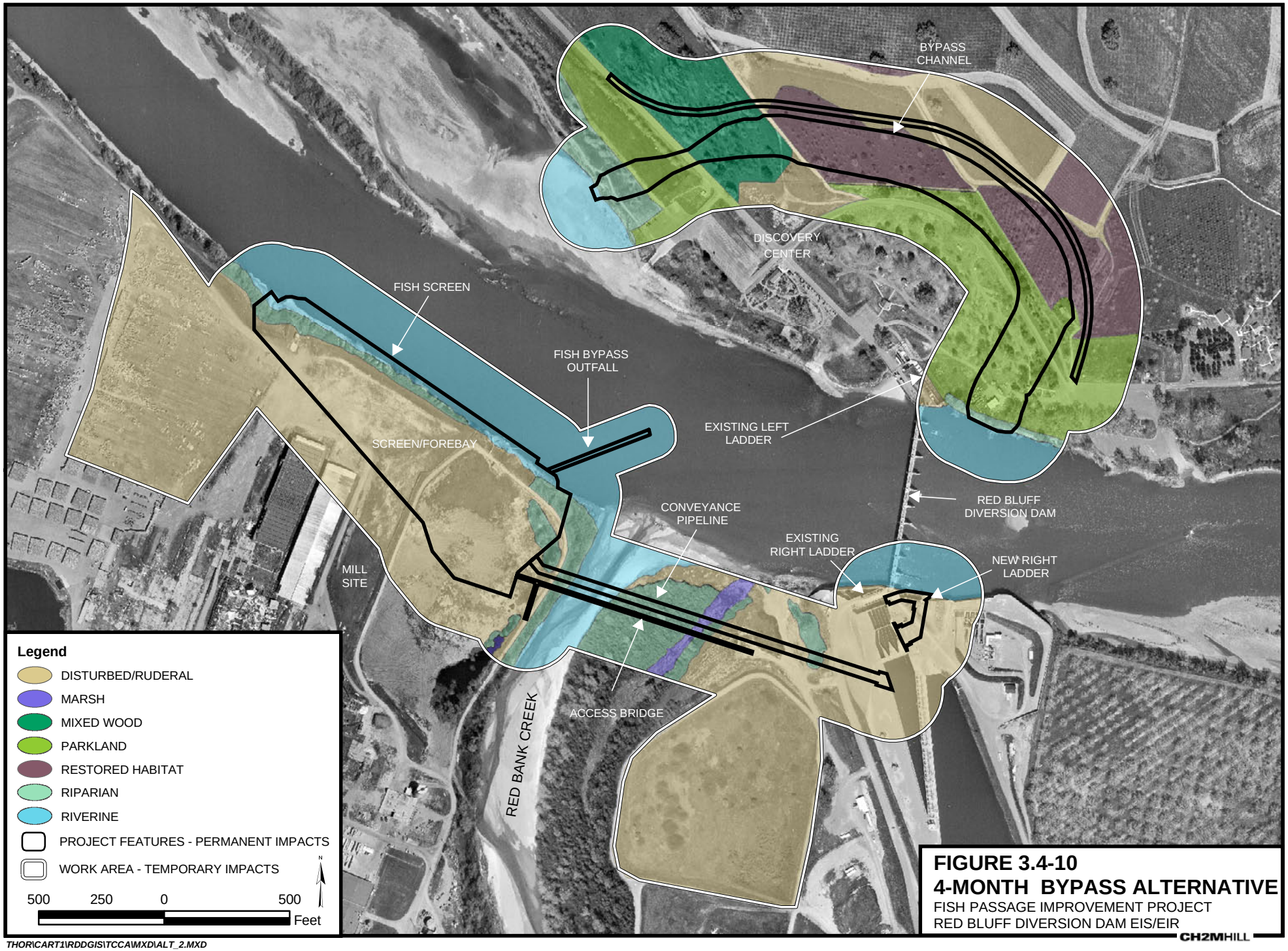

FIGURE 3.4-10
4-MONTH BYPASS ALTERNATIVE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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

Impact 1B–BR3: Mixed Woodland Habitat. A total of 5.67 acres of mixed woodland habitat would be impacted. Of this acreage, about 1.37 acres would be permanently converted into the bypass facility. The remaining 4.30 acres would be temporarily disturbed during construction of the bypass facility. This area is an isolated block adjacent to the road entering the campground on the north side of the Sacramento River. Larger trees are clustered in two general areas, and shrubs and grasses cover the remaining area. Although the large trees and structural complexity added by shrubs and smaller trees make this area attractive to wildlife, its small size, current isolation, and proximity to human activity reduces its wildlife habitat value. Because of its relatively low value as wildlife habitat and the small amount impacted, loss of mixed woodland habitat would not result in significant biological impacts.

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

Impact 1B–BR4: Restored Habitat. Under this alternative, 9.76 acres of restored habitat would be impacted. The restored habitat is a mitigation area that has been planted at various times during the last 5 to 10 years. This habitat takes on an orchard-like appearance and has little under-story cover for wildlife species, though it is filling in over time. While the area provides cover and some foraging habitat for bird species and smaller mammals, it provides limited habitat value because of its young age. However, because the restored habitat was created as mitigation for removal of riparian habitat and/or oak woodland elsewhere, its removal would result in inadequate mitigation for the previous impact. Therefore, removal of restored habitat under this alternative is a significant impact.

The impacts from construction and operations on restored habitat would be significant.

Impact 1B–BR5: Disturbed Habitat. Under this alternative, 64.60 acres of disturbed habitat would be impacted. This land is of low habitat value and supports very little vegetation except for blackberry and star thistle. Most of this habitat is bare ground, with less than an acre covered in rock remnants from dam construction. Because of its very low value as wildlife habitat and because it consists predominantly of non-native plant species, loss of disturbed habitat would not result in significant biological impacts.

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

Impact 1B–BR6: Parkland Habitat. A total of 16.51 acres of parkland habitat would be impacted under this alternative. Of this acreage, 4.19 acres would be permanently converted to new facilities, and temporary impacts from construction would impact 12.32 acres of land This parkland is a managed campground and is of low wildlife value, because of the presence of high human activity and relatively small amount of continuous habitat. Because of its low value as wildlife habitat, loss of parkland habitat would not result in significant biological impacts.

The impacts from construction and operations on parkland 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 habitats 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 1B–BR7: 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 and mixed woodland habitat would be impacted (2.60 acres permanently lost and 6.30 acres temporarily affected for riparian, and 1.37 acres permanently lost and 4.30 acres temporarily affected for mixed woodland). 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 1B–BR8: Western Yellow-billed Cuckoo. Under this alternative, a small amount of riparian habitat would be impacted (2.60 acres permanently lost and 6.30 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.

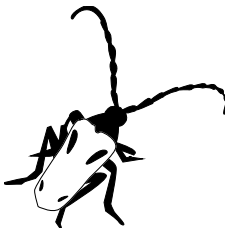
Impact 1B–BR9: Bald Eagle. The impacts on bald eagles under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–BR7).

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

Impact 1B–BR10: Swainson's Hawk. ~~The impacts on Swainson's hawk under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–BR8).~~The removal of large trees in the mixed woodland habitat would reduce the value of the area to support nesting Swainson's hawk.

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

Impact 1B–BR11: Valley Elderberry Longhorn Beetle. VELB are entirely dependent on the elderberry shrub. Under this alternative, the same elderberry shrubs that would be affected by the 4-month Improved Ladder Alternative would also be affected here. An additional 10 shrubs located in the bypass footprint on the north side of the river also have the potential to be impacted. Shrubs E21 and E22 are located in grassland habitat; Shrubs E11, E13, E14, E15, and E20 occur in parkland habitat; Shrub E19 occurs in restored habitat; Shrub E7 occurs in riparian habitat; and Shrub E12 occurs in disturbed habitat. Shrub stems range from less than 1 inch to greater than 5 inches in diameter, and exit holes have been observed in two of the shrubs (E15 and E20) (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 and the facility footprint that would be permanently impacted. Because some of 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 for all shrubs. 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 1B–BR12: Peregrine Falcon. The impacts on peregrine falcon under Alternative 1B 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 1B–BR13: Osprey. The impacts on osprey under Alternative 1B would be the same as those identified for Alternative 1A (see Impact 1A–BR11 and Figures 3.4-4 and 3.4-10).

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

Impact 1B–BR14: Bats. The impacts on bats under Alternative 1B 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.

2A: 2-month Improved Ladder Alternative

Impacts on Wildlife Habitat and Wildlife.

Impact 2A–BR1: Riparian Habitat. Up to 7.74 acres of riparian habitat would be impacted under this alternative (Figure 3.4-11). The permanent loss of 2.18 acres of riparian habitat would occur with the permanent land conversion from installation of the access bridge, the conveyance pipeline, left fish ladder, and the fish screen and forebay. Up to an additional 5.56 acres of riparian habitat could be removed to accommodate construction activities required for the forebay/ conveyance and left fish ladder. 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 the reduced period of time (2 months) relative to the No Action Alternative. The gates would be in during 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 north and south side of the Sacramento River. The riparian habitat on the north side of the river that would be impacted is a small patch with limited plant species and structural diversity. The habitat quality of this area is very low because of the low level of diversity and the high

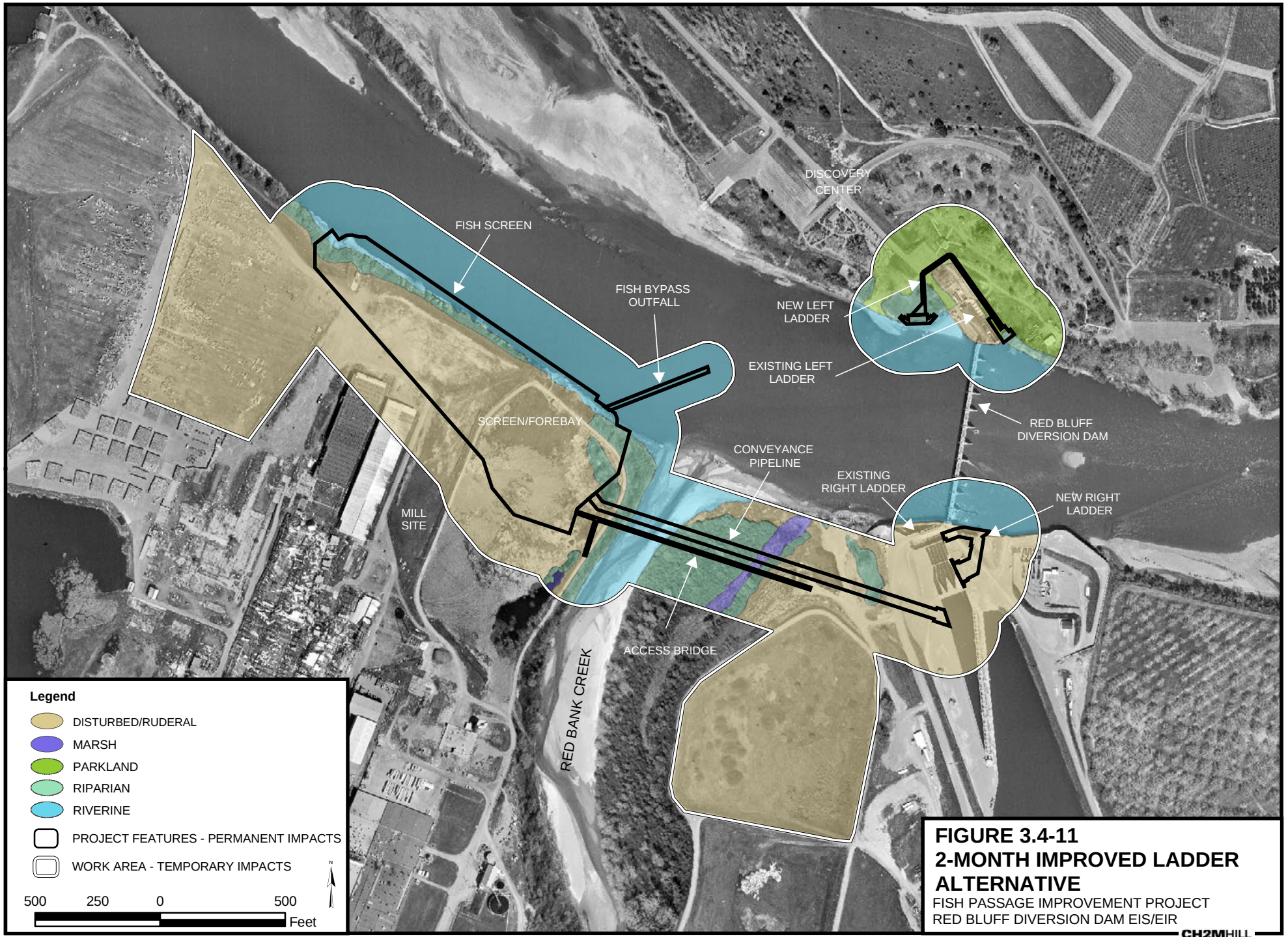


FIGURE 3.4-11
2-MONTH IMPROVED LADDER ALTERNATIVE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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levels of human activity resulting from the adjacent park. 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 7.74 acres of riparian habitat. The 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 2A; however, under the criterion used, construction and operations of Alternative 2A would result in a significant impact to riparian habitat.

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

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

Impact 2A–BR3: Disturbed Habitat. The impacts on disturbed habitat under Alternative 2A 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.

Impact 2A–BR4: Parkland Habitat. The impacts on parkland habitat under Alternative 2A would be the same as those identified for Alternative 1A (see Impact 1A–BR4).

The impacts from construction and operations on parkland 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 having 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 2A–BR5: 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 (2.18 acres permanently lost and 5.56 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 2A–BR6: Western Yellow-billed Cuckoo. Under this alternative, a small amount of riparian habitat would be impacted (2.18 acres permanently lost and 5.56 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 2A–BR7: Bald Eagle. The impacts on bald eagles under Alternative 2A 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 2A–BR8: Swainson's Hawk. The impact on Swainson's hawk under Alternative 2A 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 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.

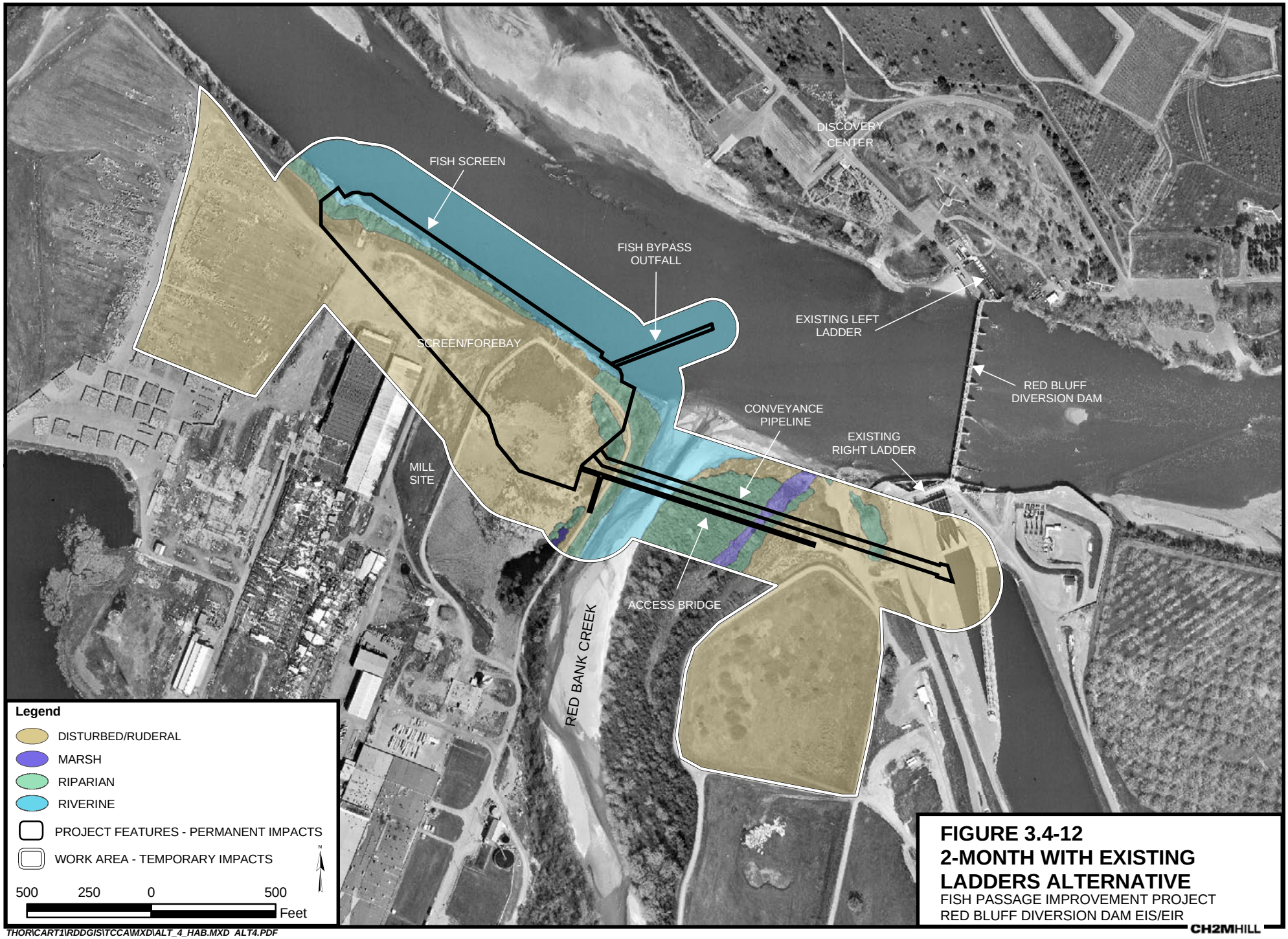

FIGURE 3.4-12
2-MONTH WITH EXISTING LADDERS ALTERNATIVE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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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).

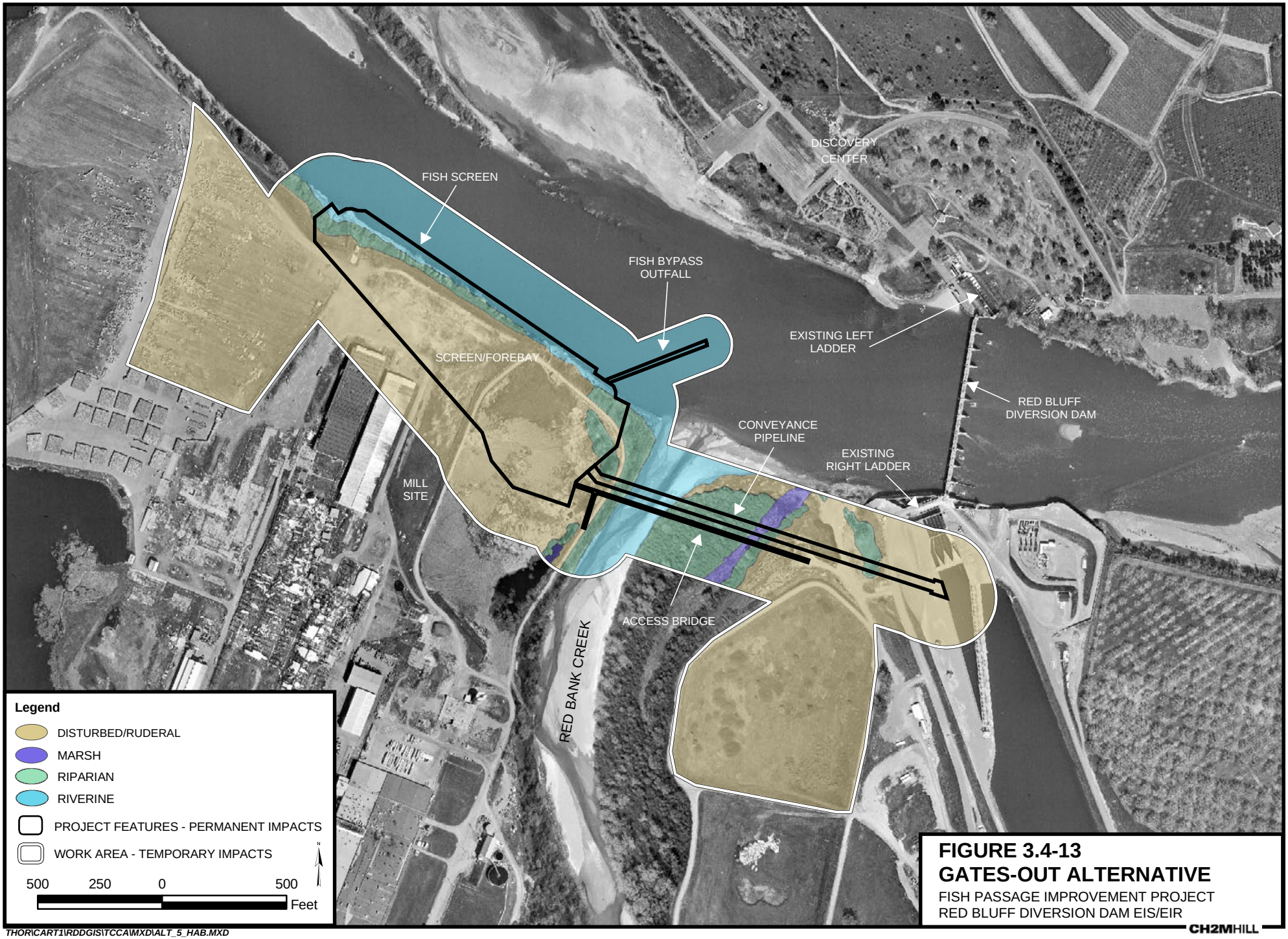

FIGURE 3.4-13
GATES-OUT ALTERNATIVE
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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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. Section 7 consultation with USFWS has been concluded with the issuance of a Biological Opinion. With this mitigation, impacts to VELB would be less than significant.

Mitigation 1A–BR11: Prior to the start of construction activities, all~~the~~ three~~two~~ platforms that can support~~ing~~ 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 64 ~~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.

Central Valley Recreation

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

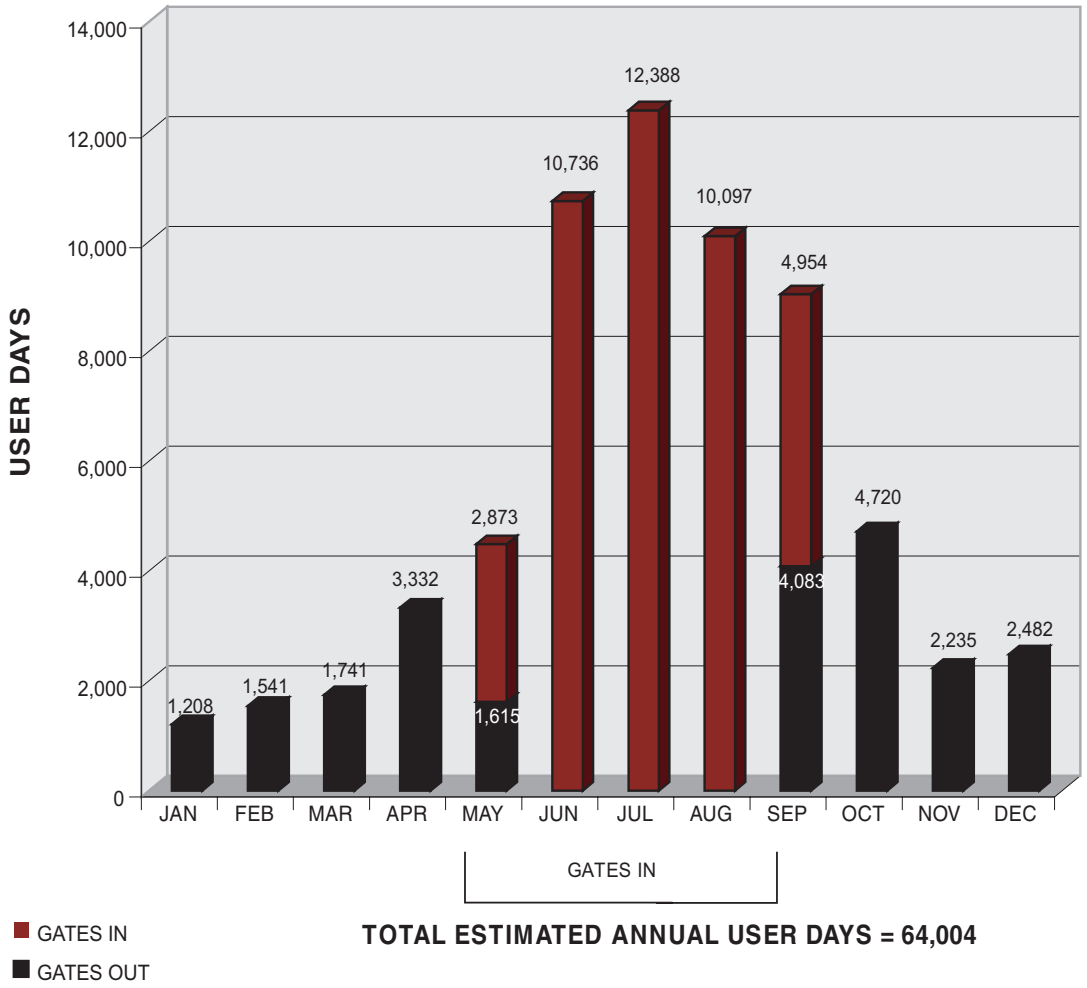

FIGURE 3.5-1
ESTIMATED MONTHLY USER DAYS
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W072002003RDD_002

CH2MHILL

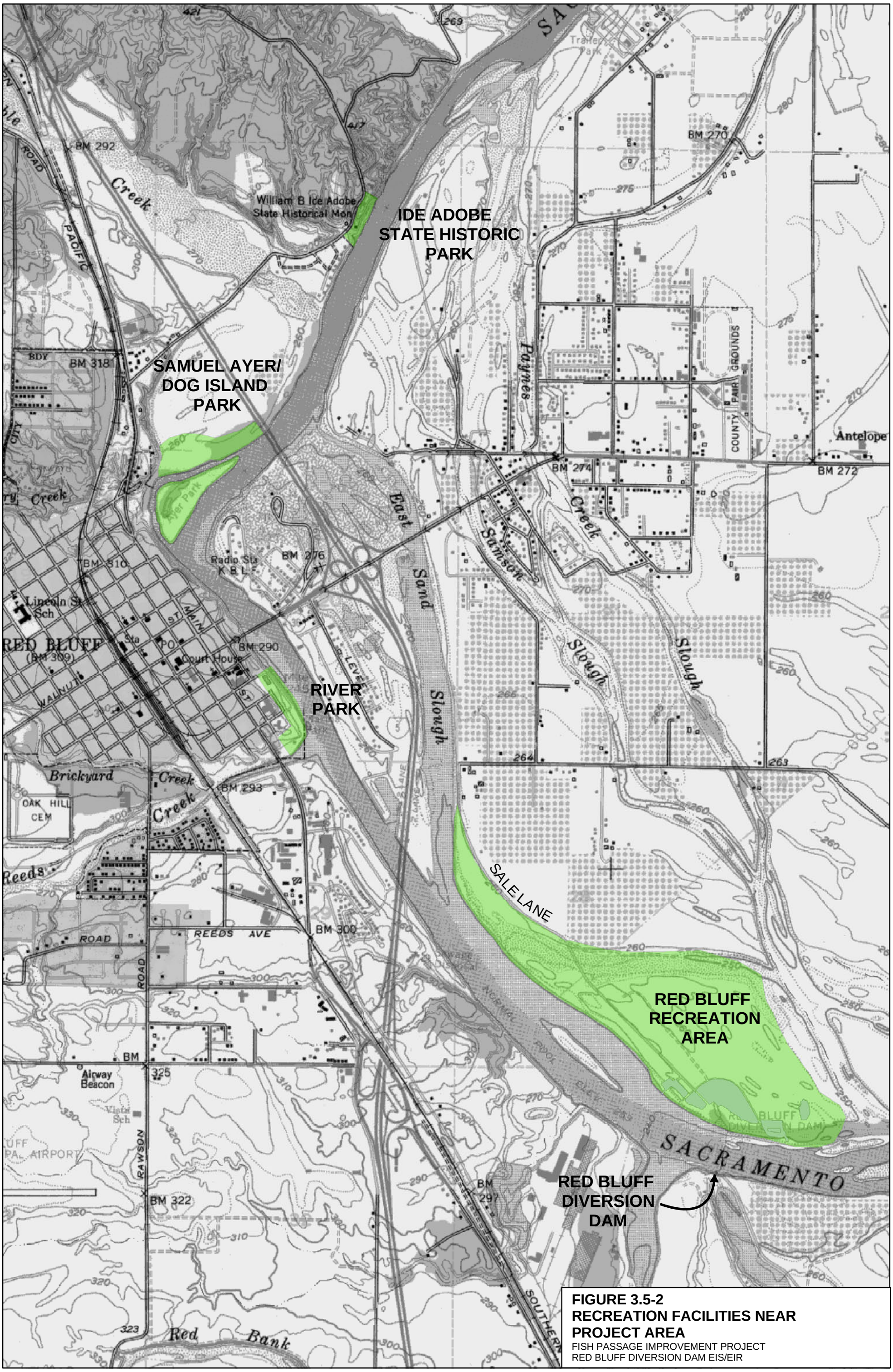

FIGURE 3.5-2
RECREATION FACILITIES NEAR PROJECT AREA
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

THOR\CART1\RDDGIS\RB_DAM\MXD\TCAA_parks_3_5_2.MXD

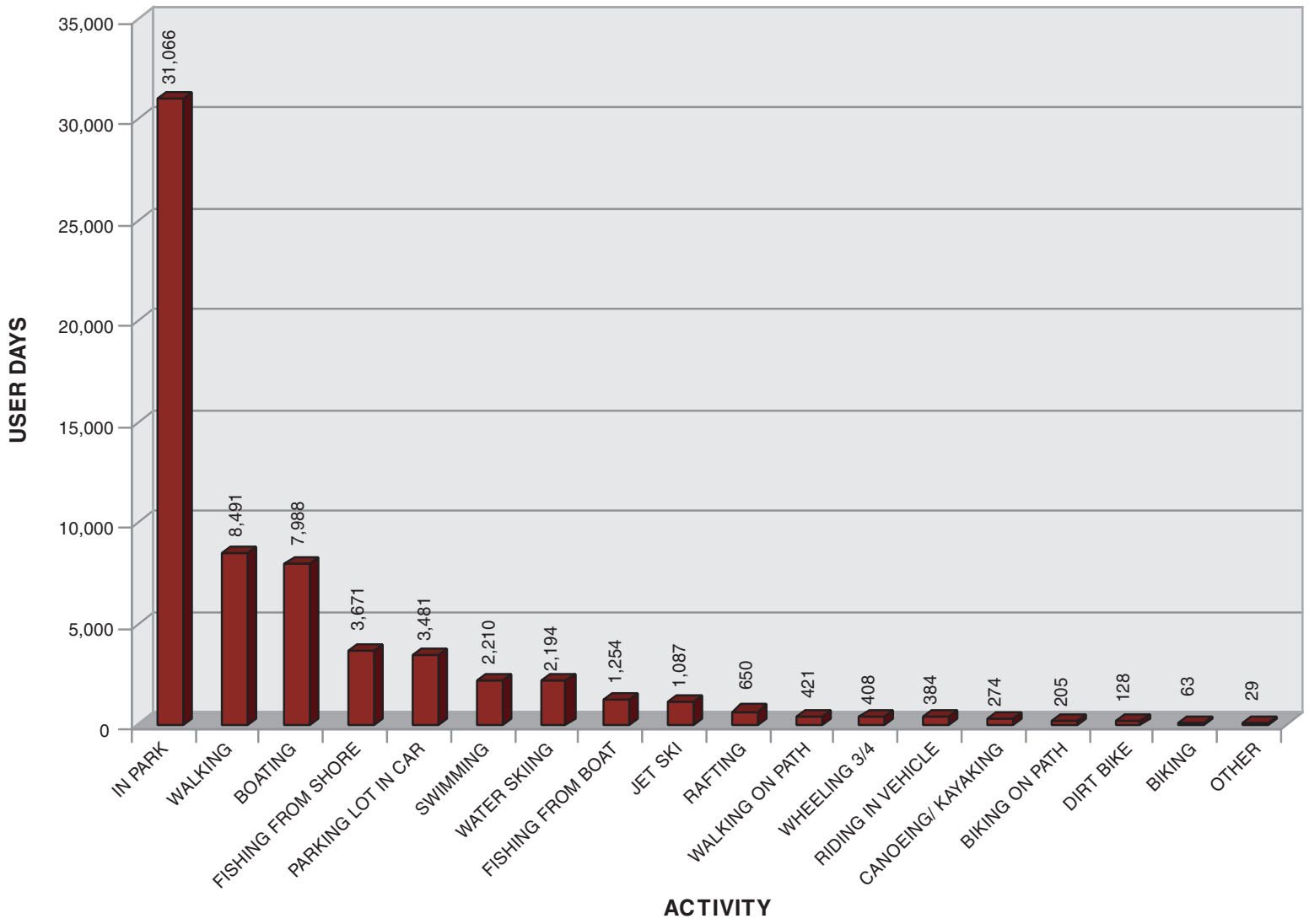

FIGURE 3.5-3
ESTIMATED ANNUAL USER DAYS BY ACTIVITY
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

W072002003RDD_003

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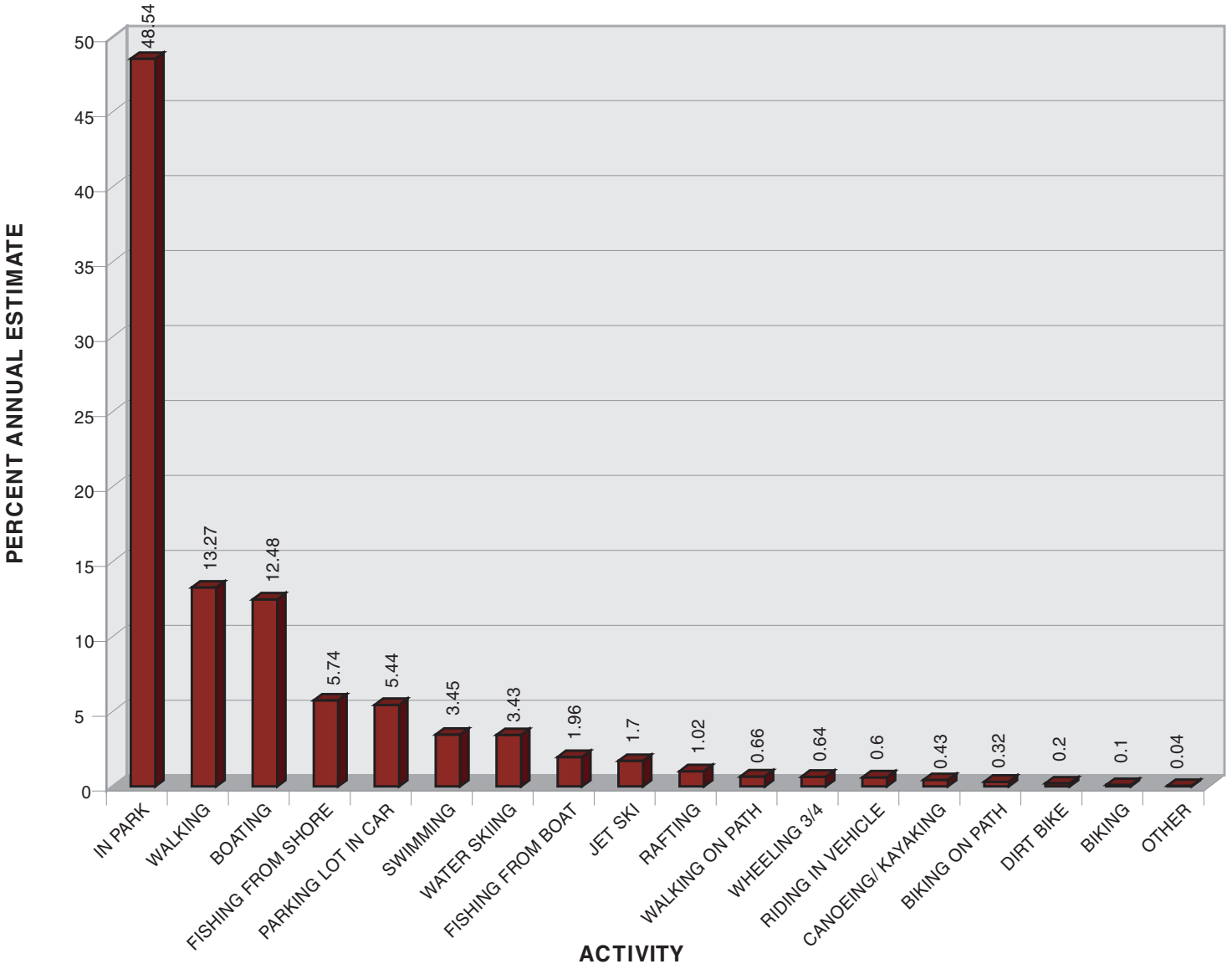

FIGURE 3.5-4
ESTIMATED ANNUAL PERCENTAGE OF USER DAYS BY ACTIVITY
FISH PASSAGE IMPROVEMENT PROJECT
RED BLUFF DIVERSION DAM EIS/EIR

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accessible by 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.

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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

Activity	Estimated User Days		Estimated User Days Lost
	Gates In May+Jun+Sep	Gates Out May+Jun+Sep	
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 and all supporting infrastructure (roads/trails and utilities) 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

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CH2MHILL

- 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.