

4.2 Botanical, Wetland, and Wildlife Resources

This section provides information on botanical, wetland, and wildlife resources that have been documented or have the potential to occur in or near the Restoration Project area. A qualitative and quantitative assessment of potential impacts on biological resources is described in the impact and mitigation portion of this section, along with measures that will be implemented to mitigate significant impacts. These mitigation measures have been developed through coordination with resource agencies and focus on avoiding, reducing, or compensating for potentially significant impacts on botanical, wetland, and wildlife resources.

Biological survey and documentation methods are discussed in Appendix G, "Methodologies." Methods and survey results are described in detail in the following reports:

- *Site Assessment for the California Red-Legged Frog, Battle Creek Salmon and Steelhead Restoration Project, Shasta and Tehama Counties* (Jones & Stokes 2001a);
- *Biological Survey Summary Report for the Battle Creek Salmon and Steelhead Restoration Project, Volumes I and II* (Summary Report) (Jones & Stokes 2001b, 2001c);
- *Site Assessment of the Battle Creek Salmon and Steelhead Restoration Project Area—Assessment of Bat Habitat in Water Diversion Tunnels* (Jones & Stokes pers. comm. 2002a);
- *California Spotted Owl Survey Results, Addendum to the Biological Survey Summary Report for the Battle Creek Salmon and Steelhead Restoration Project* (Jones & Stokes pers. comm. 2002b); and
- *Preliminary Delineation of Waters of the United States for the Battle Creek Salmon and Steelhead Restoration Project* (Jones & Stokes 2001c).

The wetland delineation report is considered preliminary until verified by the U.S. Army Corps of Engineers (Corps). The delineation is expected to be verified by August 2003. The documents listed above are available upon request at the U.S. Department of the Interior, Bureau of Reclamation, Mid-Pacific Region.

Biological resources in the Restoration Project area were identified on the basis of a review of existing information, a search of the California Natural Diversity Database (CNDDDB) (2000 and 2003), a special-status species list provided by USFWS (Appendix H), and field surveys conducted by Jones & Stokes between 2000 and 2002. Biological survey results of habitat types, wildlife, and waters of the United States identified within the Restoration Project study areas are presented in Figures 4.2-1 through 4.2-19.

As described in Appendix G, “Methodologies,” the study areas varied at each Restoration Project site and included a combination of diversion dams, flumes, pipelines, open canals, access roads, and staging areas. The study area for each site was based on proposed construction methods, use of existing or new access roads, terrain constraints, private property boundaries, fence lines, and dense vegetation that would not be removed during construction. The Restoration Project study areas are shown on the maps presented in Volume II of the Survey Summary Report (Jones & Stokes 2001c). The study area along existing access roads consisted of a 20-foot corridor on each side of the road edge (approximately 60 feet total).

Affected Environment

Regional Setting

The Restoration Project is located in the Battle Creek watershed in the Cascade Range Foothill physiographic region (Hickman 1993). The Battle Creek watershed is located on the volcanic slopes of Mt. Lassen in Tehama and Shasta Counties. The climate becomes increasingly Mediterranean from the higher portions of the project area towards the lower elevations in the northern Sacramento Valley. Summers are hot and dry and winters are mild and wet, with precipitation falling mostly as rain during late fall, winter, and early spring.

Plant Communities and Associated Wildlife Habitats

Table 4.2-1 summarizes the plant communities and associated wildlife habitats observed at each of the Restoration Project sites. Tables 4.2-2 through 4.2-5 summarize the total acreage of sensitive and common plant communities located on each of the Restoration Project sites for each alternative. Scientific names of plant and wildlife species mentioned in this section are provided in Appendix I.

Descriptions and names of plant communities were based on field surveys and on descriptions in the list of California terrestrial natural communities recognized by the CNDDDB (2000), Holland (1986), and Sawyer and Keeler-Wolf (1995). Although the Sawyer and Keeler-Wolf classification system represents the most recent treatment and includes greater community detail than the CNDDDB list, it is incomplete for many geographical areas in California. Additionally, some of the plant communities described in this report do not fit well into the communities that were defined by either Sawyer and Keeler-Wolf or Holland. Accordingly, some community-type names have been modified based on field observations.

Common Plant Communities and Associated Wildlife Habitats

The plant communities listed below comprise native or naturalized habitats that have not been substantially altered and that provide important wildlife habitat functions and values. Plant species and associated wildlife typically found in each common plant community are described in this section. All birds mentioned in this section were observed during wildlife surveys conducted in 2000, 2001, and 2002 at the Restoration Project area (Jones & Stokes 2001b, 2001c, 2002a) unless noted otherwise. The following common plant communities occur in the Restoration Project area:

- Annual grassland,
- Mixed chaparral,
- Live oak woodland,
- Blue oak woodland/savanna,
- Gray pine/oak woodland, and
- Westside ponderosa pine.

Figures 4.2-2, 4.2-4, 4.2-6, 4.2-8, 4.2-10, 4.2-12, 4.2-14, 4.2-16, and 4.2-18 show common plant communities and associated wildlife habitats at the proposed construction areas.

Annual Grassland

Annual grassland is the most common plant community in the Restoration Project area. It occupies understory and open areas in the gray pine/oak woodland and blue oak woodland/savanna communities. Annual grassland is dominated by mostly nonnative annual grass species, including soft chess, red brome, ripgut brome, medusahead, annual fescues, silver hairgrass, wild oat, lesser quaking-grass, and Italian ryegrass. Common native herbaceous species include tidy-tips, goldfields, yellowcarpet, popcornflowers, lowland shooting star, saxifrage, erect plantain, dwarf stonecrop, Fitch's spikeweed, filago, tarweeds, q-tips, marigold navarretia, downy navarretia, vetch, cowbag clover, tomcat clover, and white-tipped clover. Native perennial species include some of those mentioned in the description of blue oak woodland/savanna. Nonnative weedy species include filarees, star-thistle, and prickly lettuce.

Raptors that were observed foraging in grasslands of the Restoration Project area during the spring and summer included golden eagle, red-tailed hawk, American kestrel, and barn owl. Western kingbird and loggerhead shrike were seen perching on fence posts and searching for prey in grassland habitats. Ground-foraging birds observed included American crow, horned lark, American pipit, vesper sparrow, lark sparrow, savannah sparrow, western meadowlark, Brewer's blackbird, brown-headed cowbird, and house finch. Several species of swallows foraged over the grasslands for flying insects. Special-status raptor species that probably winter in grasslands of the Restoration Project area include white-tailed

kite, northern harrier, ferruginous hawk, rough-legged hawk, golden eagle, prairie falcon, and merlin. However, because no winter surveys were performed, none of these species, except golden eagle, were observed in the Restoration Project area.

Representative reptiles and mammals of annual grasslands include gopher snake, western rattlesnake (mostly near rock outcrops), garter snakes, racer, western fence lizard, coyote, mule deer, and California ground squirrel.

Mixed Chaparral

Mixed chaparral is common throughout the Restoration Project area, but is typically found on north-facing slopes in canyons and in openings of other community types after fires have removed overstory trees. This community is dominated by broad-leaved shrubs with small hard leaves, typically 10–16 feet tall, forming a dense overstory. Common shrubs include buckbrush, big manzanita, green-leaved manzanita, birch-leaved mountain-mahogany, coffeeberry, poison-oak, California yerba santa, and California buckeye. Overstory trees are typically absent except in the transition zone between community types, where scattered canyon live oaks and interior live oaks are present.

Bird species observed in chaparral habitats of the Restoration Project area included mountain quail, California quail, mourning dove, Anna's hummingbird, western scrub-jay, oak titmouse, bushtit, Bewick's wren, blue-gray gnatcatcher, wren, California thrasher, spotted towhee, California towhee, rufous-crowned sparrow, lesser goldfinch, fox sparrow, golden-crowned sparrow, white-crowned sparrow, dark-eyed junco, hermit thrush, western tanager, black-headed grosbeak, orange-crowned warbler, and lazuli bunting. The latter two species are common nesters in chaparral habitats.

Representative reptiles and mammals in mixed chaparral habitats include western fence lizard, western skink, gopher snake, common kingsnake, western rattlesnake, mule deer, coyote, and gray fox.

Live Oak Woodland

Live oak woodland is common in the Restoration Project area, typically occurring in canyons and valley bottoms near streams. This plant community forms a mosaic in the transition zones between gray pine/oak woodland and chaparral on north-facing slopes. Live oak woodland is dominated by a mixture of canyon live oak and interior live oak, usually forming a dense overstory. Other trees such as California bay, buckeye, and black oak are usually present, but are a minor component of the overstory. The understory typically is poorly developed or absent in areas with dense overstory, but poison-oak, pipevine, California melic grass, Pacific sanicle, and sword fern are common in open areas.

Representative nesting raptors of live oak woodland habitats observed in the Restoration Project area included red-tailed hawk, American kestrel, barn owl, great horned owl, western screech owl, and northern pygmy-owl. Other species observed included California quail, mourning dove, spotted towhee, California

towhee, lark sparrow, dark-eyed junco, Anna's hummingbird, acorn woodpecker, Nuttall's woodpecker, northern flicker, white-breasted nuthatch, Pacific-slope flycatcher, Hammond's flycatcher, ash-throated flycatcher, house wren, blue-gray gnatcatcher, orange-crowned warbler, black-throated gray warbler, Bullock's oriole, lazuli bunting, Hutton's vireo, western scrub-jay, oak titmouse, bushtit, Bewick's wren, western bluebird, American robin, California thrasher, brown-headed cowbird, house finch, lesser goldfinch, white-crowned sparrow, and golden-crowned sparrow.

Representative reptiles and mammals in live oak woodlands include western skink, northern alligator lizard, common kingsnake, gopher snake, western rattlesnake, deer mouse, western gray squirrel, striped skunk, ringtail, raccoon, bobcat, and mule deer.

Blue Oak Woodland/Savanna

Blue oak woodland/savanna in the Restoration Project area is located on sites with relatively thin, rocky soils. The community intergrades with gray pine/oak woodland at higher elevations and is replaced by annual grassland in thinner soils and at lower elevations.

Blue oak woodland/savanna is characterized by a relatively open canopy of trees dominated almost entirely by blue oaks. Shrubs are mostly lacking, but scattered individuals or occasional aggregations of mixed chaparral species may be present. Herbaceous species commonly found in the openings include blue dicks, grass nuts, soaproot, western buttercup, sanicle, manroot, bedstraws, puttyroot, and miner's lettuce. Most annual species are the same as those listed above for the annual grassland plant community.

Representative raptors observed in the Restoration Project area included red-tailed hawk, American kestrel, barn owl, great horned owl, and western screech owl. Other species observed included California quail, mourning dove, greater roadrunner, acorn woodpecker, Nuttall's woodpecker, northern flicker, white-breasted nuthatch, ash-throated flycatcher, blue-gray gnatcatcher, orange-crowned warbler, Bullock's oriole, Hutton's vireo, western scrub-jay, oak titmouse, bushtit, Bewick's wren, western bluebird, lark sparrow, brown-headed cowbird, California towhee, house finch, lesser goldfinch, white-crowned sparrow, and golden-crowned sparrow.

Representative reptiles and mammals in blue oak woodland/savanna include western fence lizard, gopher snake, California ground squirrel, coyote, striped skunk, and mule deer.

Gray Pine/Oak Woodland

Gray pine/oak woodland is common in the Restoration Project area where it transitions into westside ponderosa pine forest at higher elevations and into blue oak woodland and annual grassland at lower elevations. Mixed chaparral occurs in inclusions and forms the shrubby understory in places.

A varying mixture of blue oak and gray pine dominates gray pine/oak woodland. At higher elevations, scattered black oak, big-leaf maple, and California bay are also present. Associated shrub and sub-shrub species include many that are common to mixed chaparral, such as toyon, manzanita, coffeeberry, redberry, California buckeye, redbud, buckbrush, mountain-mahogany, poison-oak, lemonadeberry, bedstraws, and live oaks. Herbaceous species are mostly lacking where the shrub layer is best developed. In open areas, herbaceous species include many that are common to the adjacent blue oak woodland/ savanna and annual grassland plant communities.

Representative wildlife species include the species representative of live oak woodland habitats (see above).

Westside Ponderosa Pine Forest

Westside ponderosa pine forest occupies the upper elevations along access roads to the southern end of the Restoration Project area. Westside ponderosa pine forest also mixes with gray pine/oak woodland and mixed chaparral at lower elevations. Inclusions of Douglas-fir forest also occur at higher elevations adjacent to Westside ponderosa pine forest.

A relatively dense to open canopy of ponderosa pine with scattered incense cedar, black oak, and canyon live oak dominates westside ponderosa pine forest. Also present at lower elevations are occasional California bay and gray pine. Shrub and sub-shrub species include mountain lilac, manzanita, and live oak. At lower elevations, coffeeberry, redbud, blackberry, and poison-oak are found. Common herbaceous species include wild iris, snub pea, Indian-pink, aster, goldenrod, bracken fern, and woodland strawberry. Grasses include mountain brome, orchard grass, needlegrass, hedgehog dogtail, nitgrass, and annual fescues. Other species common to the annual grassland reach their higher elevation limits here.

Representative raptors observed in the Restoration Project area included red-tailed hawk, sharp-shinned hawk during migration, western screech owl, great horned owl, and northern pygmy-owl. Other species observed included band-tailed pigeon, red-breasted sapsucker, hairy woodpecker, northern flicker, pileated woodpecker (expected to occur but not observed), red-breasted nuthatch, white-breasted nuthatch, olive-sided flycatcher, western wood-pewee, Pacific-slope flycatcher, Cassin's vireo, warbling vireo, Nashville warbler, black-throated gray warbler, hermit warbler, Wilson's warbler, western tanager, black-headed grosbeak, lazuli bunting, chipping sparrow, Hutton's vireo, Steller's jay, western scrub-jay, oak titmouse, bushtit, brown creeper, winter wren, golden-crowned kinglet, American robin, spotted towhee, dark-eyed junco, mountain quail, brown-headed cowbird, purple finch, pine siskin, lesser goldfinch, and violet green swallows. Pileated woodpecker was not observed but is expected to occur.

Representative amphibians, reptiles, and mammals of ponderosa pine forests include California slender salamander, ring-necked snake, common kingsnake,

deer mouse, western gray squirrel, striped skunk, mule deer, raccoon, bobcat, and mountain lion.

Sensitive Plant Communities and Associated Wildlife Habitats

For the purpose of this EIS/EIR, sensitive communities are defined as those communities that are especially diverse or regionally uncommon, considered sensitive natural communities (as defined by DFG) (Holland 1986), or regulated by federal or state agencies including DFG, USFWS, and the Corps. Sensitive plant communities (e.g., wetlands and riparian areas) are given special consideration because they provide important ecological functions or support a unique or diverse assemblage of plant species.

Plant species and associated wildlife typically found in each sensitive plant community are described in this section. The following sensitive plant communities are present in the Restoration Project area:

- Emergent wetland,
- Seasonal wetland,
- Emergent scrub wetland,
- Groundwater seep wetland, and
- Riparian forest and scrub.

Four of these communities are classified as wetland communities. Wetlands are significant natural communities because of historical and current regional and statewide losses and because of the laws and policies that pertain to their protection, including Section 404 of the Clean Water Act (33 USC 1251–1376), the Governor of California’s Wetlands Conservation Policy (Executive Order W-59-93, August 23, 1993), and the no-net-loss policy established by Executive Order 11990 (42 FR 26961, May 25, 1997). Wetland communities in the Restoration Project area play a role in groundwater discharge by supporting stream base flow; capture sediment and nutrient runoff; and provide habitat for dependent wildlife and plant species.

Figures 4.2-3, 4.2-5, 4.2-7, 4.2-9, 4.2-11, 4.2-13, 4.2-15, 4.2-17, and 4.2-19 show wetlands and other waters of the United States identified within the proposed construction areas. The occurrences of wetland communities identified during field surveys are also documented as part of the wetland delineation report (Jones & Stokes 2001c). Wetlands are also listed in Table II-1 and their locations are shown on Maps D-1 through D-9 in Volume II of the Summary Report (Jones & Stokes 2001c). Sensitive plant communities are briefly described below.

Emergent Wetland

Approximately 3.13 acres of emergent wetlands were delineated on the Restoration Project sites (see Table II-1 in Volume II of the Summary Report [Jones & Stokes 2001c] for a list of individual wetland sites). Emergent wetlands are characterized by erect, rooted, herbaceous plants that are adapted to living in water (Cowardin et al. 1979). Perennial plants present for most of the growing season in most years usually dominate these wetlands. Dominant species include narrow-leaved cattail, rush, Parish's spike-rush, monkeyflower, and Himalayan blackberry. On the Restoration Project sites, emergent wetlands were delineated as potential waters of the United States because they are characterized by a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrologic conditions, and are adjacent to Battle Creek (Jones & Stokes 2001c).

Representative waterbirds that forage and rest in emergent wetlands and associated open water habitats in the Sierra Nevada foothills include pied-billed grebe, great blue heron, and great egret. Various ducks, including wood duck, green-winged teal, mallard, cinnamon teal, gadwall, American widgeon, and ring-necked duck, frequent emergent wetlands where they are joined by American coot, killdeer, black-necked stilt, greater yellowlegs, and common snipe. Typical amphibians and reptiles in these habitats are California newt, foothill yellow-legged frog, northwestern pond turtle, and garter snakes. Large mammals such as black-tailed deer may frequent emergent wetlands and use them as sources of drinking water.

Seasonal Wetland

Approximately 1.01 acres of seasonal wetlands were delineated on the Restoration Project sites and along access roads (see Table II-1 in Volume II of the Summary Report [Jones & Stokes 2001c] for a list of individual wetland sites). Seasonal wetlands are characterized by short-duration ponding sufficient to support hydrophytic plant species. These areas differ from vernal pools in various respects but are distinguished from them by the lack of vernal pool plant species. Seasonal wetlands in the Restoration Project area are dominated by Italian ryegrass, curly dock, cocklebur, annual hairgrass, Mediterranean barley, long-beaked hawkbit, hyssop loosestrife, toad rush, and occasional vernal pool species such as coyote thistle, Fremont's goldfields, woolly marbles, and water starwort.

On the Restoration Project sites, seasonal wetlands were delineated as potential waters of the United States because they are characterized by a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrologic conditions, and are adjacent to Battle Creek (Jones & Stokes 2001c). Seasonal wetlands can attract the same wetland-dependent birds and other wildlife that frequent emergent wetlands.

Emergent Scrub Wetland

Approximately 1.57 acres of emergent scrub wetlands were delineated on the Restoration Project sites (see Table II-1 in Volume II of the Summary Report [Jones & Stokes 2001c] for a list of individual wetland sites). Emergent scrub wetlands are characterized by the same erect, rooted, herbaceous hydrophytes

described above for emergent wetlands. In addition, these wetlands are dominated by broad-leaved, deciduous, hydrophytic trees and shrubs, usually less than 20 feet tall, such as willows and white alder. These wetlands may represent a successional stage leading to forested wetlands, or they may be relatively stable communities.

On the Restoration Project sites, emergent scrub wetlands were delineated as potential waters of the United States because they are characterized by a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrologic conditions, and are adjacent to Battle Creek (Jones & Stokes 2001c).

Representative wildlife species are similar to those species described above for emergent and seasonal wetlands.

Groundwater Seep Wetland

Approximately 1.11 acres of groundwater seep wetlands were delineated on the Restoration Project sites (see Table II-1 in Volume II of the Summary Report [Jones & Stokes 2001c] for a list of individual wetland sites). Groundwater seep wetlands are dominated by annual or perennial hydrophytes. The substrate is usually saturated to the surface for extended periods, especially early in the growing season, but saturation can be absent by the end of the season in most years. Dominant plant species include watercress, monkeyflower, various sedges, and liverworts.

On the Restoration Project sites, groundwater seeps were delineated as potential waters of the United States because they are characterized by a prevalence of hydrophytic vegetation, hydric soils, and wetland hydrologic conditions, and are adjacent to Battle Creek (Jones & Stokes 2001c).

Representative wildlife species are similar to those species described above for other wetland habitats.

Riparian Forest and Scrub

Riparian forest and scrub communities occur along perennial drainages in the Restoration Project area. For example, they occur along North Fork and South Fork Battle Creek, Ripley Creek, and Soap Creek; along several unnamed drainages; and in several emergent wetlands (Figures 4.2-3, 4.2-5, 4.2-7, 4.2-9, 4.2-11, 4.2-13, 4.2-15, 4.2-17 and 4.2-19; see also Table II-1 in Volume II of the Summary Report [Jones & Stokes 2001c] for a list of individual drainages that support riparian forest and scrub). Riparian scrub dominates areas along channels in most creeks and forms a mosaic with riparian forest or live oak woodland.

In areas with broader floodplains, riparian trees such as valley oak and western sycamore tend to dominate the overstory. Patches of Himalayan blackberry, scattered willows, and California wild grape usually comprise the understory in these areas.

In canyons with perennial streams (such as North Fork Battle Creek), several species are common in addition to the species listed above. Overstory species include California bay, white alder, big-leaf maple, fig, white mulberry, Douglas-fir, Pacific yew, and Oregon ash. Understory shrubs include poison-oak, western spicebush, dogwood, and several species of willow.

In the Restoration Project area, riparian communities are generally dominated by hydrophytic vegetation and hydrologic conditions, but lack hydric soil indicators. These riparian communities do not meet the Corps' definition of wetlands for purposes of the Clean Water Act because they lack all three indicators. Riparian communities that occur within the ordinary high water mark of Battle Creek and other drainages would be considered other waters of the United States, subject to regulation by the Corps under Section 404 of the Clean Water Act (33 USC 1251–1376).

Riparian forest and scrub habitats are among the most important wildlife habitats in the Restoration Project area. These habitats attract a high diversity of resident and neotropical migratory birds; species observed during field visits included belted kingfisher, downy woodpecker, black phoebe, warbling vireo, orange-crowned warbler, bushtit, western scrub-jay, Bewick's wren, house wren, American robin, yellow-breasted chat, western tanager, black-headed grosbeak, lazuli bunting, spotted towhee, and song sparrow. Important seed-eating species included house finch and lesser goldfinch.

Other representative wildlife species in riparian habitats of the Restoration Project area include most mammals, amphibians, and reptiles that are attracted by a source of flowing water. Riparian corridors are important deer migratory habitat. Bats may forage for insects over riparian areas in the canyons and roost in trees. The number of bat species using the Restoration Project area was not determined during the field surveys. Although not confirmed during field surveys, spotted bat, western red bat, fringed myotis, long-eared myotis, small-footed myotis, long-legged myotis, Yuma myotis, pallid bat, and Townsend's big-eared bat potentially occur, and all are considered species of concern by USFWS.

Noxious Weeds

For the purpose of this analysis, a *noxious weed* is a plant that has the potential to displace native plants and natural habitats, affect the quality of forage on rangelands, or affect cropland productivity. High-priority noxious weeds include all of the California Department of Food and Agriculture's A-rated species. Some B- and C-rated species were included in this analysis if they were identified by the county agricultural commissions as target noxious weeds. Additional weeds were included if they were considered to have great potential for displacing native plants and damaging natural habitats and were not considered too widespread to be effectively controlled.

During the field surveys, populations of five noxious weed species were located at several Restoration Project sites: medusahead, yellow star-thistle, Klamath weed, Scotch broom, and Chinese tree-of-heaven. Medusahead, yellow star-thistle, and Klamath weed are common in the Restoration Project region and are considered ubiquitous in California. These species are generally no longer targeted for eradication and control because they are so widespread and are very difficult to control (California Department of Food and Agriculture 2001). However, the Battle Creek Watershed Conservancy Noxious Weeds Removal Program does have measures for removal and control of these species (Paquin-Gilmore 1999).

Scotch broom, Klamath weed, yellow star-thistle, and medusahead are rated as list C species on the California Department of Food and Agriculture list of noxious weeds (California Department of Food and Agriculture 2001). Such species are so widespread that the agency generally does not endorse state- or county-funded eradication or containment efforts except in nurseries or seed lots. Although Chinese tree-of-heaven is not considered a noxious weed by the California Department of Food and Agriculture, it is a highly invasive horticultural species that displaces native riparian species (Bossard et al. 2000). Chinese tree-of-heaven was identified on the Wildcat Diversion Dam site, and Scotch broom was identified at the Coleman Diversion Dam/Inskip Powerhouse and Inskip Diversion Dam/South Powerhouse sites (Jones & Stokes 2001b, 2001c).

Special-Status Plants

Thirty-one special-status plants were identified during prefield investigations and field surveys as occurring or potentially occurring in the Restoration Project area (Table 4.2-6). No state- or federally listed plant species were previously documented in the Restoration Project study area, and no such plants were located during the field surveys.

Four species that are considered “plants of limited distribution,” or List 4 plants, by the California Native Plant Society (CNPS) (Skinner and Pavlik 1994; California Native Plant Society 2001) were located on the Restoration Project sites during the field surveys: woolly meadowfoam, shield-bracted monkeyflower, depauperate milk-vetch, and Bidwell’s knotweed. After considering available distribution information and reviewing file information, it was determined that none of these four species warrants evaluation as a special-status plant. These CNPS List 4 plants lack special significance in the Restoration Project area. Although considered plants of limited distribution by CNPS, they are not considered rare under CEQA (Public Resources Code §21000 *et seq.*), they are locally common in the Restoration Project area, and most populations will not be significantly affected during Restoration Project activities. Therefore, these species are not discussed in the Impact Assessment below.

The CNPS List 4 species were observed at multiple locations in the Restoration Project area including Coleman Diversion Dam, Inskip Powerhouse, South Canal, and South Diversion Dam and along several access roads. More information on each population is provided in Volume I of the Summary Report (Jones & Stokes 2001b).

Special-Status Wildlife

Thirty-seven special-status wildlife species were identified during the prefield survey investigation as having the potential to occur in the Restoration Project area (Table 4.2-7). The regulatory status of each species is listed in Table 4.2-7. The presence of the following 13 special-status animals or their potential habitats was documented during the field surveys:

- Valley elderberry longhorn beetle,
- Foothill yellow-legged frog,
- Northwestern pond turtle,
- Bald eagle,
- Golden eagle,
- Osprey,
- Cooper's hawk,
- Sharp-shinned hawk,
- American peregrine falcon,
- California spotted owl,
- Vaux's swift,
- Little willow flycatcher, and
- Yellow-breasted chat.

In addition to the species listed above, numerous bats were observed foraging over the Restoration Project area, and roosting bats were observed in abandoned tunnels near South Powerhouse and at Inskip Diversion Dam. The bats were not identified to the specific level; however, species that could occur in the Restoration Project area are listed in Table 4.2-7.

Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetle is federally listed as threatened; it is not listed by the state. It is a medium-sized (0.8 inch long) beetle with dark metallic-green forewings with red margins in the female and red forewings with dark green spots in the male. The beetle's entire life cycle is associated with elderberry

shrubs in California's Central Valley and the surrounding foothills. The larvae live in the pith of the elderberry stem. The adults emerge through distinctive oval exit holes. The presence of these exit holes is an indication of previous valley elderberry longhorn beetle use. The species may have always been rare; however, the substantial reduction in Central Valley riparian vegetation in the past 150 years probably has further reduced the beetle's range and isolated the remaining populations.

Valley elderberry longhorn beetle is not known to occur in the Restoration Project area; however, old exit holes have been found in elderberry shrubs 0.7 mile east of Paynes Creek, approximately 5 miles away from the Restoration Project area (CNDDDB 2003). Biologists found numerous elderberry shrubs with stems greater than 1 inch in diameter that could provide habitat for the beetle (Table 4.2-8). A few stems with possible exit holes were found in two separate large clusters of elderberry shrubs located on the South Powerhouse alternative access road. However, the holes were old, and it is uncertain whether they were made by emerging valley elderberry longhorn beetles; other wood-boring insects and woodpeckers could make similar-sized holes.

Foothill Yellow-Legged Frog

Foothill yellow-legged frog has been designated as a federal species of concern and a California species of special concern. This frog is easily distinguished from the rare, federally listed red-legged frog by the color of its legs. Yellow-legged frogs breed after the winter river levels have dropped in mid-March to May throughout the Coast Ranges, along the western side of the Sierra Nevada, and in most of northern California west of the Cascades. Habitat requirements for foothill yellow-legged frog include shallow, flowing streams with at least a cobble-sized substrate. Introduced predatory aquatic species such as fish and bullfrogs and poorly timed water releases from reservoirs have contributed to the decline of this species.

Larvae, juveniles, and one adult yellow-legged frog were observed near the South Powerhouse during field surveys. Adult and/or juvenile foothill yellow-legged frogs were also found near the Lower Ripley Creek Feeder Dam, South Diversion Dam, and Soap Creek Feeder (Jones & Stokes 2001b, 2001c).

Northwestern Pond Turtle

Northwestern pond turtle is a federal species of concern and a state species of special concern. It is endemic to the Pacific Northwest and, as the only native turtle in northern California, is unlikely to be misidentified. It is found north of the American River in a wide range of fresh or brackish rivers, streams, lakes, ponds, and wetlands. Basking sites, such as rocks, logs, or vegetation, are usually present. Northwestern pond turtles may be either largely inactive during the winter or active throughout the year, depending on location and

environmental conditions. Habitat destruction is the primary cause of population decline (Jennings et al. 1992). Introduced exotic fish and bullfrogs that prey on young turtles may also be causing decreases in recruitment.

One adult was found in Ripley Creek just upstream from Lower Ripley Creek Feeder Dam. The turtles are likely to occur elsewhere in the Restoration Project area; however, no individuals were found during field surveys.

Bald Eagle

Bald eagle is federally listed as threatened, state listed as endangered, and protected under the Bald and Golden Eagle Protection Act (16 USC 668–668d). The adult's distinctive white-feathered head and tail contrast sharply with its dark brown body and wings. Fish constitute most of the species' diet. Bald eagles winter throughout most of California at lakes, reservoirs, river systems, and some rangelands and coastal wetlands. They breed in forested habitats near reservoirs, lakes, and rivers in the northern half of the state. The nest is usually in a large tree near a large body of water with low human disturbance. Bald eagle populations declined as a result of eggshell-thinning from ingestion of dichlorodiphenyltrichloroethane (DDT), shooting, and disturbance of nest sites. However, because of protection under the federal Endangered Species Act (16 USC 1531–1544) and the Bald and Golden Eagle Protection Act, bald eagle populations have recovered across most of North America, and the species may soon be delisted.

Bald eagles hunt for fish within the Restoration Project area; however, no active or inactive nest sites were identified. Bald eagles likely nest outside the Restoration Project area, but near enough that the Restoration Project Area would lie within the daily range of foraging eagles. Adults were seen flying high over both forks of Battle Creek on several occasions during the spring field surveys.

Golden Eagle

Golden eagle, designated as a species of special concern by DFG, is a fully protected species under the California Fish and Game Code and is protected under the Federal Bald and Golden Eagle Protection Act (16 USC 668–668d). One of the largest raptors in the world, golden eagle is named for the golden crown and nape found on the adults. Golden eagle is a permanent resident throughout California, except in the center of the Central Valley, although it winters in this area (Zeiner et al. 1990). Golden eagles are closely associated with open range, including blue oak savanna, and avoid dense coastal and montane coniferous forests. Golden eagles, prey mostly on rabbits and rodents, need these open areas for hunting. They breed from late January through August, usually nesting on cliff ledges and less frequently in large trees.

Golden eagles were seen flying over the Restoration Project site at North Battle Creek Feeder Dam and the South Powerhouse, and two birds were observed in courtship display over the crags at South Diversion Dam. Old, unoccupied nests were found at the headwaters of Soap Creek Feeder and at the South Powerhouse. The eagles sighted may have nested in the region, but because their home range is very large, observations of pairs of golden eagles at a site do not necessarily indicate local nesting (Jones & Stokes 2001b, 2001c).

Osprey

Osprey is a California species of special concern. Ospreys are widely distributed throughout most of the world. Currently, ospreys breed in northern California from the Cascade Ranges south to Lake Tahoe and along the coast south to Marin County. Although most ospreys migrate, small numbers are present in winter along the entire California coast and near large inland bodies of water. Ospreys prey mainly on fish and, therefore, require open waters for foraging. They nest in large trees, on cliffs, or on human-made structures in open forest habitats. Pesticide contamination, nest-tree removal, alteration of the environmental quality of rivers and lakes, boating and other human disturbances in nesting areas, and illegal shooting have all led to the decline of osprey populations.

In April 2000, an adult osprey was observed perched on an active nest approximately 0.7 mile north of the access road to the South Diversion Dam. In June 2000, an adult osprey was observed hunting for fish along South Fork Battle Creek near Inskip Diversion Dam/South Powerhouse.

Cooper's Hawk

Cooper's hawk has been designated as a species of special concern by DFG. This medium-sized *Accipiter* is larger than sharp-shinned hawk; adults are easily identified by the reddish barring on their underparts and their lack of a white eyestripe. Prey is varied and includes small birds, small mammals, reptiles, and amphibians. Cooper's hawks can be found in a variety of habitats and elevations. They breed throughout most of California in a variety of woodland habitats but are not common. They will also nest in urban areas and seem to tolerate human disturbance near the nest. The highest densities probably occur in the foothill oak woodlands of the Sierra Nevada and Transverse Ranges. Cooper's hawks are found in greater numbers during migration and winter, when they can be found in all habitats throughout California. The decline of western United States populations is not well documented but has been attributed in California to habitat destruction, particularly that of lowland riparian habitat.

An immature Cooper's hawk observed during field surveys conducted in July 2000 was probably dispersing from its natal territory. An adult Cooper's hawk was seen in April 2001 on the road to South Diversion Dam and may have been a migrating bird not breeding locally. No other individuals were observed during

the breeding season (late April through August); therefore, they are considered not likely to have nested in the Restoration Project area during the 2000–2002 survey period.

Sharp-Shinned Hawk

Sharp-shinned hawk has been designated as a species of special concern by DFG. It is the smallest of the three North American species of the genus *Accipiter*, a group of forest-dwelling hawks. Skilled at maneuvering, sharp-shinned hawks feed largely on other birds. Found throughout North America, sharp-shinned hawks nest primarily in heavily forested locations with little human disturbance. In California, breeding birds are rare and are found primarily in dense, undisturbed conifer forests in the Sierra Nevada and northern Coast Ranges. During migration and winter, however, they are common in all habitats. Sharp-shinned hawks may never have been abundant in California during the breeding season; however, the population status in California is unknown.

Several individuals were seen during spring and fall migration (April and September) at various locations along access roads and Restoration Project sites. No individuals were observed during the breeding season (late April through August); therefore, they are not likely to nest in the Restoration Project area.

American Peregrine Falcon

American peregrine falcon is listed as endangered under the California Endangered Species Act (California Fish and Game Code §§2050–2068) and is currently fully protected under the California Fish and Game Code. The species was formerly federally listed as endangered but was delisted in 1999. USFWS has designated peregrine falcon as a species of concern for purposes of a 5-year monitoring period.

A large and powerful predator, peregrine falcon is the fastest bird in North America. The bird has a distinctive helmeted appearance formed by its black crown and nape and a black wedge extending below the eyes. Historically, resident American peregrine falcons nested throughout most of California. The population increased during winter, when migrating birds arrived from the north (Grinnell and Miller 1944). Currently, peregrine falcons breed in the mountains of the central and northern Coast Ranges and Cascade Range, where they nest on cliff ledges in woodland, forest, and coastal habitats. Peregrine falcons prefer to nest near marshes, lakes, and rivers that support an abundance of birds, but they may fly several miles to forage. Medium-sized birds, such as pigeons, shorebirds, and waterfowl, are the main prey. Marsh habitats are especially important in fall and winter, when they attract large concentrations of water birds. Pesticide use, especially DDT, was a primary cause of the decline in peregrine falcon populations. Other causes of decline include illegal shooting, illegal falconry activities, and habitat destruction.

One adult peregrine falcon was observed circling high over the road at South Diversion Dam during raptor surveys on April 13, 2001 (Jones & Stokes 2001b, 2001c).

California Spotted Owl

California spotted owl is a federal species of concern and a California species of special concern. Spotted owl is a large nocturnal bird, generally brown in color with irregular white spots on the back, head, and underparts. California spotted owl is paler in color with larger spots than the conspecific northern spotted owl, which is federally listed as endangered. Spotted owls frequently utter a distinctive four-note call during the breeding season. California spotted owls occur on the western side of the Sierra Nevada from the southern Cascade Range south to Kern County, in the southern part of the Coast Ranges, and in the mountain ranges of southern California south to Baja California. California spotted owls occupy coniferous, hardwood, and mixed forests that have complex, multilayered structure; large-diameter trees; and high canopy closure. They nest in tree cavities or in the abandoned nests of other animals in dense, old-growth forest. Roosting sites have similar characteristics. California spotted owls forage in a wider variety of forest types, including more open forests. The Sierra Nevada spotted owls prey largely on northern flying squirrels and dusky-footed woodrats. The status of the Sierra Nevada population of California spotted owl is uncertain, and long-term population trends are unknown.

Suitable nesting and roosting habitat occurs in dense forest with large trees on lower canyon slopes, and suitable foraging habitat occurs more widely throughout the Restoration Project area. California spotted owl is not known to breed within the Restoration Project area. A 2-year survey was completed in 2002. To date, no California spotted owls have been observed within the Restoration Project area (Jones & Stokes pers. comm. 2002b).

Vaux's Swift

Vaux's swift has been designated as a species of special concern by DFG. It is a migratory, insectivorous bird that forages in the air over forests, grasslands, and water. Vaux's swift is distinguished from the many species of swallows by its overall dark brown plumage, cigar-shaped body, and twittering wing beats. In California, the species breeds primarily in the narrow coastal redwood forest zone as far south as Santa Cruz County; it also occurs at lower densities across the northern end of the state and in the Sierra Nevada. Vaux's swifts breed in old-growth redwood and Douglas-fir forest types, nesting in large hollow trees and snags. Populations of Vaux's swift declined in Oregon and Washington during the 1980s, but data for California are lacking. The removal of large snags and hollow trees in late-seral stage forests has probably contributed to population declines.

An individual was sighted flying over blue oak savanna just outside the Restoration Project area on June 13, 2000, and a pair was observed at the Lower Ripley Creek Feeder on July 25, 2000 (Jones & Stokes 2001b, 2001c). Although the nest location is unknown, these birds are probably nesting in a large snag somewhere in the canyon of either South Fork or North Fork Battle Creek at a higher elevation outside the Restoration Project area.

Little Willow Flycatcher

Willow flycatcher is listed as endangered under the California Endangered Species Act. This listing includes all three subspecies that occur in California. Two of these subspecies could occur at the Restoration Project area. USFWS has listed one subspecies, southwestern willow flycatcher, as endangered; however, this subspecies does not occur at the Restoration Project area.

Little willow flycatcher belongs to a group of dull-plumaged, secretive, small flycatchers. It can be distinguished from other members of its genus by its loud song, "fitz-bew," and by its lack of a white eye ring. Of the two subspecies that could occur at the Restoration Project area, mountain willow flycatcher, is possibly present during migration, and little willow flycatcher could occur as both a migrant and breeding bird. Historically, little willow flycatcher was a common nesting species in the Sierra Nevada, Central Valley, and Coast Ranges, but now only isolated populations remain in the Sierra Nevada and the Cascade Range. Little willow flycatchers breed and forage almost exclusively in wet mountain meadow systems with willow-dominated scrub. They arrive on the breeding grounds in May and June and depart for South America in August. This species has declined for a variety of reasons, including nest parasitism by brown-headed cowbirds, loss and alteration of riparian and meadow habitats, and cattle grazing.

Willow flycatchers were seen at Eagle Canyon Diversion Dam in mid-June 2000. They were not identified to the subspecific level. Although these flycatchers were observed singing in appropriate nesting habitat, they are presumed to have been migrants because July searches of this area did not detect nesting willow flycatchers (Jones & Stokes 2001b, 2001c).

Yellow-Breasted Chat

Yellow-breasted chat has been designated as a species of special concern by DFG. It is the largest warbler in the United States, with a very large head, bright white "spectacles," bright-yellow breast, and white belly. Yellow-breasted chats feed on insects, spiders, berries, and other fruits. They breed from early May to early August, leave for wintering grounds in September, and return in April.

Although once common throughout riparian woodland and scrub habitats in California, the species is now an uncommon breeder in coastal California, in the

central and southern Sierra Nevada foothills, and in southern California, and is uncommon to rare in the Central Valley. The mid-elevation western slope of the northern Sierra Nevada is one of the strongholds for this species in California, and yellow-breasted chats are common throughout the riparian habitats in the Restoration Project region. Found in riparian habitats, chats in the Sierra Nevada foothills are very closely associated with blackberry brambles for cover and for foraging; they nest in dense vegetation. The loss and fragmentation of riparian habitats are major causes of the decline of yellow-breasted chat. Brood parasitism by brown-headed cowbird also has caused declines, even in areas with intact riparian habitat.

Yellow-breasted chats were found at three riparian sites with blackberry brambles and riparian scrub: Darrah Springs Feeder, Coleman Diversion Dam/Inskip Powerhouse, and Lower Ripley Creek Feeder. Suitable breeding habitat was found at Darrah Springs Feeder and Coleman Diversion Dam/Inskip Powerhouse, where the birds likely breed. The chats seen at the Lower Ripley Creek Feeder and Inskip Diversion Dam/South Powerhouse were migrants and do not nest in the area (Jones & Stokes 2001b, 2001c).

Special-Status Bats

Numerous bats were observed foraging over the Restoration Project area, and roosting bats were observed in abandoned tunnels near the South Powerhouse and at Inskip Diversion Dam. The bats were not identified to the specific level, but the following species could occur in the Restoration Project area based on their habitats and geographic range: spotted bat, western red bat, fringed myotis, long-eared myotis, small-footed myotis, long-legged myotis, Yuma myotis, pallid bat, and Townsend's big-eared bat. All these species have been designated as federal species of concern or California species of special concern, and/or are recognized by the Western Bat Working Group (and DFG) as high priority species.

On January 28 and 29, 2002, Jones & Stokes (pers. comm. 2002a) conducted field surveys for bats at water diversion tunnels at Inskip and Eagle Canyon Diversion Dams and along the South Canal. The purpose was to determine the presence of hibernating bats and to assess the potential suitability of these tunnels for use by bats. The field survey identified one hibernating bat inside Inskip Tunnel 3, approximately 100 feet from the entrance portal. The bat appeared to be a big brown bat. Additional bats were observed during other site visits; however, none of the bats were identified as special-status bats.

Other Sensitive Resources

Nesting Raptors

Nesting raptors and their nests are protected under Sections 3503 and 3503.5 of the California Fish and Game Code. In addition to the active osprey nest mentioned earlier, an active red-tailed hawk nest was found in a large cottonwood tree at the Coleman Diversion Dam site on April 13, 2001.

Migratory Birds

Under the Migratory Bird Treaty Act, migratory birds are protected from pursuing, hunting, taking, capturing, or killing. Nests and their contents are also protected. Many of the birds observed in the project area (listed in Appendix F) could potentially nest in vegetation and structures that could be affected during project construction.

Regulatory Setting

The following laws, regulations, or policies are relevant to the biological resources occurring within the Restoration Project area. Descriptions of these, if not described below, can be found in Chapter 5, “Consultation and Coordination:”

- Federal Clean Water Act, Section 404 (33 USC 1251–1376).
- Federal Endangered Species Act (16 USC 1531–1544).
- Fish and Wildlife Coordination Act (16 USC 661–667e)
- Migratory Bird Treaty Act (16 USC 703–712). The Migratory Bird Treaty Act states that, without a permit issued by the U.S. Department of the Interior, pursuing, hunting, taking, capturing, or killing any migratory bird is unlawful.
- USFWS Mitigation Policy (46 FR 7644, January 23, 1981). USFWS mitigation policy provides guidance for the protection and conservation of fish and wildlife resources. The intent is to protect and conserve the most important and valuable fish and wildlife resources, while allowing reasonable and balanced use of the nation’s natural resources. The mitigation policy defines mitigation to include avoiding impacts, minimizing impacts, rectifying impacts, reducing or eliminating impacts over time, and compensating for impacts. USFWS considers the stated order of mitigation elements to represent the most desirable sequence of steps in the mitigation planning process.
- USFWS Region 1 Policy on Wetlands. USFWS Region 1 policy applies, but is not limited, to USFWS involvement in federal projects. The policy is to

view wetland degradation or losses as an unacceptable change to an important national resource. It is the goal of USFWS Region 1 to ensure that no net loss (acreage or value, whichever is greater) of wetland habitats occurs. For the purposes of this policy, wetlands are defined according to Cowardin et al. (1979).

- California Endangered Species Act (Fish and Game Code §§2050–2068, 2126).
- California Native Plant Protection Act (Fish and Game Code §1900 *et seq.*). This act affords protection to plants listed as endangered or rare in California.
- Protection of Wetlands (Executive Order 11990; DFG Commission 1993).
- Streambed Alteration Agreement.
- Senate Concurrent Resolution No. 17, January 18, 1989. The loss of oak woodlands in California, especially valley oak woodlands, has led the California Department of Forestry and Fire Protection, CNPS, and The Nature Conservancy to identify the conservation and management of oak woodlands as a major concern. The California State Senate passed a resolution identifying the conservation of oak woodland as a priority of state agencies when authorizing actions and projects.
- The Carlson-Foley Act of 1968 (43 USC 12241–1243); Federal Noxious Weed Act of 1974 (7 USC 2814 *et seq.*); Executive Order 13112 (64 FR 6183, February 8, 1999). The Carlson-Foley Act deals with the identification, prevention, and control of invasive pest species, including noxious weeds.

Environmental Consequences

Summary

All the Action Alternatives (Five Dam Removal, No Dam Removal, Six Dam Removal, and Three Dam Removal) include activities that could adversely affect botanical, wetland, and wildlife resources. Those activities having the greatest potential to affect these resources are construction in the stream channel, access roads in the steep canyon sections, excavations, and discharges during and after dam removal. Feasible mitigation measures are provided for each significant impact to reduce it to a less-than-significant level.

Impact Significance Criteria

Based on Section 15065 and Appendix I of the CEQA Guidelines, with additional consideration given to specific Restoration Project concerns, impacts on biological resources would be considered significant if the Restoration Project would result in any of the following conditions.

- Long-term loss or degradation of a sensitive plant community because of substantial alteration of landform or site conditions (e.g., alteration of wetland hydrology).
- Substantial loss or degradation of a plant community and associated wildlife habitat.
- Fragmentation or isolation of wildlife habitats, especially riparian and wetland communities.
- Substantial disturbance or displacement of wildlife resulting from human activities.
- Avoidance by animals of biologically important habitat for substantial periods; such avoidance may increase mortality or reduce reproductive success.
- Disruption of natural wildlife movement corridors.
- Reduction in local population size attributable to direct mortality or habitat loss, lowered reproductive success, or habitat fragmentation of species that are state- or federally listed or proposed for listing as threatened or endangered; of portions of local populations that are candidates for state or federal listing and federal and state species of concern; or of species that qualify as rare and endangered under CEQA.
- Substantial reduction or elimination of species diversity or abundance.

Impact Assessment

This impact assessment for biological resources is based on draft engineering design drawings provided by Reclamation and site-specific information gathered during field surveys. This impact analysis qualitatively evaluates potential impacts on biological resources. A detailed quantitative analysis was not performed because the level of information that is currently available is not adequate for determining exact acreages of permanent and temporary disturbance of plant communities (particularly riparian and wetland communities). Acreages will be calculated when more detailed design specifications are available or, in some cases, as part of the postconstruction evaluation.

Figures 4.2-1 through 4.2-19, at the end of this section, graphically depict areas of potential disturbance to waters of the United States and biological resources resulting from construction activities at each of eight construction sites, as well as along South Canal. Figure 4.2-1 is an index map showing the boundaries of the nine site maps. Figures 4.2-2 through 4.2-19 show those areas where waters of the United States and biological resources may be affected.

The General Environmental Protection Measures listed in the introduction to this chapter will be implemented as part of the project to minimize and avoid impacts to resources. For potentially significant impacts that are not adequately avoided or minimized with these environmental protection measures, specific mitigation

measures have been identified. To the extent possible, the mitigation measures described for potential impacts on sensitive biological resources were developed through coordination with resource agencies. Additional compensatory mitigation for impacts on waters of the United States (including wetlands), riparian habitats, and valley elderberry longhorn beetle may also be identified as conditions of project permits (e.g., the Section 404 Clean Water Act permit issued by the Corps, the Section 1601 streambed alteration agreement with DFG, and the federal Endangered Species Act Section 7 authorization process administered by USFWS); any such conditions will be implemented as part of the Restoration Project.

No Action Alternative

The No Action Alternative would not affect botanical, wetland, or wildlife resources. Under the No Action Alternative, the Hydroelectric Project would continue to operate in accordance with the current FERC license. The Hydroelectric Project canal system would continue to convey and discharge substantial amounts of cooler waters from North Fork Battle Creek and major springs in the watershed to the lower-elevation reaches of South Fork Battle Creek.

Five Dam Removal Alternative (Proposed Action)

The Five Dam Removal Alternative would remove Wildcat, South, Coleman, Soap Creek Feeder, and Lower Ripley Creek Feeder Diversion Dams. Wildcat Canal and South Battle Creek Canal would also be removed. Fish screens and fish ladders would be constructed at the North Battle Creek Feeder, Eagle Canyon, and Inskip Diversion Dams. Those dams that are not removed would increase flow releases to levels identified in the 1999 MOU (Appendix D). The Five Dam Removal Alternative would also construct a bypass facility at the Inskip Powerhouse, and would construct tailrace connectors between South Powerhouse and Inskip Canal and between Inskip Powerhouse and Coleman Canal to prevent North Battle Creek water from mixing with South Battle Creek water. The Asbury Diversion Dam spill gates would be reoperated and a new gaging system installed to ensure an instream flow release of 5 cfs.

Specific impacts associated with the No Dam Removal Alternative are described below. Total acreage of biological communities and waters of the United States potentially affected for the Five Dam Removal Alternative are summarized in Table 4.2-2.

Impact 4.2-1 Significant—Potential disturbance or loss of 7.2 acres of woody riparian vegetation and associated wildlife habitat.

The Restoration Project could result in the temporary disturbance or permanent removal of woody riparian vegetation and associated wildlife habitat during construction of access roads and restoration activities along Battle Creek (Table

4.2-2). The most substantial removal of woody riparian habitat would occur at the North Battle Creek Feeder Diversion Dam, where a new 30-foot by 22-foot landing area for the new access road would be constructed along the creek's edge. This new landing area and foot access bridge would require the removal of approximately 7.2 acres of woody riparian vegetation.

The actual acreage of riparian forest that is removed or disturbed during construction of the access roads and Restoration Project activities will be determined as part of the environmental compliance program. The habitat removal will be assessed and measured by a qualified plant ecologist after construction activities are complete at each site. The impact acreage will be used to determine the exact acreage of compensatory mitigation and will be described in the Implementation Plan.

Riparian forest provides important shelter, foraging, and roosting habitat for a variety of wildlife species, including bats, and nesting habitat for raptors and migratory birds. Substantial statewide declines of riparian communities in recent years have increased concerns about dependent plant and wildlife species, leading state and federal agencies to adopt policies to arrest further loss. Riparian vegetation serves a variety of functions, such as providing bank stabilization, erosion control, and wildlife habitat. For these reasons, DFG has adopted a no-net-loss policy for riparian habitat value. USFWS mitigation policy identifies California's riparian habitats as Resource Category 2, for which no net loss of existing habitat value is recommended (46 FR 7644, January 23, 1981).

Although the exact acreage of impact is unknown at this time, construction of the new access road could result in potential long-term impacts on the riparian forest community at the site. In this analysis, the long-term loss or degradation of a sensitive plant community because of substantial alteration of landform or site conditions is considered a significant impact. In addition to the General Environmental Protection Measures that will be implemented before and during project construction, implementing the following mitigation measures would reduce this impact to a less-than-significant level.

Mitigation Measures for Impact 4.2-1. Reclamation will implement the following measures to avoid, minimize, and compensate for the potential loss of woody riparian vegetation and associated wildlife habitat.

Minimize Removal and Disturbance of Riparian Habitat. Reclamation will ensure that the unnecessary removal or disturbance of riparian habitat adjacent to the construction area will be avoided by installing orange construction barrier fencing (and sedimentation fencing in some cases) between the construction site and the riparian/creek area. The removal of woody riparian vegetation will be avoided by creating an exclusion zone (buffer) around woody riparian vegetation near the construction zone, educating construction crews about the importance of avoiding the sensitive habitat, and monitoring construction to ensure avoidance. The exclusion zone will be demarcated by orange construction fencing placed 20 feet beyond the drip line of the vegetation. The protected area will be designated as an "environmentally sensitive area."

The fencing will be installed prior to the initiation of construction activities and will be maintained throughout the construction period. The following paragraph will be included in the construction specifications for environmentally sensitive areas:

The Contractor's attention is directed to the areas designated as "Environmentally Sensitive Areas." These areas are protected, and no entry by the Contractor for any purpose will be allowed unless specifically authorized in writing by the Bureau of Reclamation. The Contractor shall take measures to ensure that Contractor's employees do not enter or disturb these areas, including giving written notice to his employees and subcontractors.

Temporary fences around the environmentally sensitive areas shall be installed as the first order of work. Temporary fences shall be furnished and constructed, maintained, and later removed as shown on the plans, as specified in the special provisions, and as directed by Reclamation. Fabric for temporary fences shall be commercial-quality polypropylene, orange in color, a minimum of 48 inches high, and approved by Reclamation for the purpose of temporary fencing.

Avoid Long-Term Impacts on Woody Riparian Vegetation and Associated Habitat. Reclamation will avoid long-term impacts on woody riparian vegetation by trimming trees and shrubs rather than removing entire woody plants. Where possible, shrubs and trees should be cut at least 1 foot above ground level to leave the root systems intact and allow for more rapid regeneration following construction. To avoid the take of eggs or nestlings of migratory birds and avoid violating the Migratory Bird Treaty Act (see Regulatory Setting), riparian vegetation should be removed during the nonbreeding season (October–December) prior to construction. If such timing is not feasible, riparian vegetation should not be removed until it can be demonstrated that it is not supporting nesting birds.

Compensate for the Loss of Woody Riparian Habitat. Reclamation will compensate for permanent impacts on woody riparian habitat to ensure no net loss of habitat functions and values. The compensation shall be provided at a minimum ratio of 1:1 (1 acre restored or created for every 1 acre affected) and may be a combination of onsite restoration/creation, offsite restoration, or mitigation credits. Compensation ratios shall be based on site-specific information and determined through coordination with state and federal agencies as part of the permitting process for the project. Compensation options are presented below.

1. Purchase mitigation bank credits at an agency-approved bank in the project region. This mitigation credit may be used to mitigate the disturbance or temporary loss of riparian vegetation. Reclamation shall provide written evidence to the resource agencies that mitigation credits have been purchased to compensate for the direct loss of woody riparian habitat.

or

2. Contribute funds, equal to the amount needed to purchase mitigation bank credits, to restore riparian habitat located within the Battle Creek watershed or other nearby lands that are publicly managed and will be protected in perpetuity. Reclamation will coordinate with appropriate individuals to determine whether there is a potential to create, restore, or enhance riparian habitat in the Battle Creek watershed.

or

3. Develop and implement a Riparian Restoration Plan. As part of the Implementation Plan (described as a General Environmental Protection Measure in the introduction to this chapter), Reclamation will retain a qualified ecologist to prepare a Riparian Restoration Plan to compensate for the removal of riparian vegetation along Battle Creek. This measure would apply to trees and shrubs that are removed entirely (including root systems) for construction of the Restoration Project. The plan will focus on replanting or enhancing riparian habitat on a suitable site within the creek's watershed. Woody riparian vegetation should be replaced at a minimum ratio of 1:1 (1 acre planted or enhanced for every 1 acre removed). Enhancement of riparian habitat could be accomplished along Battle Creek through the removal of invasive species and replacement with native riparian species. The feasibility of removing nonnative species and replanting native species will be evaluated as part of the Riparian Restoration Plan.

The Riparian Restoration Plan will be developed through coordination with USFWS, DFG, and the Corps, and described in detail as part of the Implementation Plan. The restoration plan will include design specifications, an implementation plan, maintenance requirements, and a monitoring program. Monitoring will be conducted for a minimum 5-year period to document the degree to which success criteria are achieved and to identify remedial actions that may be needed. Annual monitoring reports will be submitted to the appropriate resource agencies. The report will summarize the data collected during monitoring periods and describe how the habitats are progressing in terms of the success criteria (to be determined as part of the restoration plan). Success criteria will be determined through coordination with the resource agencies. A brief letter report summarizing the results of monitoring and recommending additional needed actions will be submitted to the appropriate resource agencies.

Impact 4.2-2 Significant—Potential introduction of noxious weeds or spread of existing noxious weeds.

Activities associated with implementation of the Restoration Project could introduce or spread noxious weeds into currently uninfested areas, possibly resulting in displacement of special-status plants, alteration of habitat for special-status wildlife, or substantial reduction of species diversity or abundance. Plants or seeds of noxious weeds may be dispersed on construction equipment if appropriate measures are not implemented. This impact could result in a substantial reduction or elimination of species diversity or abundance and is therefore considered significant. Implementing General Environmental Protection Measures; Mitigation Measures for Impact 4.7-1 in Section 4.7,

Geology and Soils; and the following mitigation measures would reduce this impact to a less-than-significant level.

Mitigation Measures for Impact 4.2-2. To avoid the introduction or spread of noxious weeds into previously uninfested areas, Reclamation will implement the following measures as part of the Restoration Project.

- Construction supervisors and managers will be educated on weed identification and the importance of controlling and preventing the spread of noxious weeds.
- Small, isolated infestations will be treated with approved eradication methods at an appropriate time to prevent and/or destroy viable plant parts or seed (treatment areas will be identified in the Implementation Plan).
- All equipment will be washed before entering Restoration Project sites. Because of the remoteness of the project area, equipment washing will be done off site at a paved facility (located away from sensitive biological resource areas). The contract inspectors and resource monitors will routinely inspect construction activities to verify that construction equipment is being washed.
- Implement measures set forth in the SWPPP to revegetate and restore disturbed areas immediately after construction is complete. The revegetation portion of the SWPPP will contain specifications for using certified weed-free native and nonnative mixes. The SWPPP will also specify that all disturbed areas will be weeded (if necessary) and reseeded in the following years if the postconstruction inventory (see following discussion) indicates that noxious weed species are colonizing the area.

A qualified plant ecologist will conduct a postconstruction inventory at years 1 and 2 after construction. The inventory will focus on areas disturbed during Restoration Project activities and will verify that ongoing activities have not resulted in the introduction of new noxious weed infestations. The plant ecologist will also prepare and submit an inventory letter to the resource agencies after each visit. Items addressed in the letter will include any new infestations of noxious weeds and the actions that have been taken to control noxious weed infestations. The Implementation Plan will contain guidelines for monitoring, documenting, and controlling noxious weed infestations located during the postconstruction inventory.

Impact 4.2-3 Significant—Potential loss or disturbance of 12.1 acres of waters of the United States (including wetlands).

Construction activities associated with the Restoration Project could result in the loss or disturbance of approximately 12.1 acres of waters of the United States (including wetlands), resulting in short-term (temporary) and/or long-term (permanent) impacts on wetland communities (Table 4.2-2). Some additional acreage of waters of the United States may be incidentally filled or disturbed during construction of access roads and establishment of staging areas. The estimated acreage of disturbance or fill material that would be placed into waters

of the United States will be determined after detailed design specifications are provided by Reclamation and before obtaining Section 404 Clean Water Act permits. An additional assessment of impacts will be conducted by a wetland ecologist after construction activities are complete. This postconstruction assessment will be used to quantify unanticipated impacts on waters of the United States.

Reclamation will implement measures as part of the project to avoid and minimize impacts on waters of the United States. Although these measures would minimize the extent of potential impacts, some disturbance or loss of waters of the United States would be necessary in order to construct the Restoration Project.

Because the proposed project could result in the placement of fill material into waters of the United States, this impact would be considered significant.

Implementing the General Environmental Protection Measures; Mitigation Measures for Impact 4.4-1 in Section 4.4, Water Quality; Mitigation Measures for Impact 4.7-1 in Section 4.7, Geology and Soils; and the following mitigation measures would reduce this impact to a less-than-significant level.

Mitigation Measures for Impact 4.2-3. Reclamation will implement the following measures to avoid, minimize, and compensate for the potential disturbance or loss of waters of the United States (including wetlands) along potential access roads and staging areas.

Avoid and Minimize Disturbance of Waters of the United States, Including Wetlands. To the extent possible, Reclamation will avoid and minimize impacts on waters of the United States (including wetlands) by implementing the following measures.

- Redesign or modify the project to avoid direct and indirect impacts on wetlands and streams, if feasible.
- Avoid construction activities in saturated or ponded wetlands and streams during the wet season (spring and winter) to the maximum extent possible. Where such activities are unavoidable, protective practices, such as use of padding or vehicles with balloon tires, shall be employed.
- Where determined necessary by resource specialists, use geotextile cushions and other materials (e.g., timber pads, prefabricated equipment pads, geotextile fabric) in saturated conditions to minimize damage to the substrate and vegetation.
- Stabilize exposed slopes and streambanks immediately upon completion of construction activities. Other waters of the United States shall be restored in a manner that encourages vegetation to reestablish to its preproject condition and reduces the effects of erosion on the drainage system.
- In highly erodible stream systems, stabilize banks using a nonvegetative material that will bind the soil initially and break down within a few years. If

Reclamation determines that more aggressive erosion control treatments are needed, the contractor will be directed to use geotextile mats, excelsior blankets, or other soil stabilization products.

- During construction, remove trees, shrubs, debris, or soils that are inadvertently deposited below the ordinary high water mark of streams in a manner that minimizes disturbance of the drainage bed and bank.
- In-stream construction within the ordinary high water mark will be restricted to the low-flow period of April through October.
- All activities shall be completed promptly to minimize their duration and resultant impacts.
- All staging areas for the Restoration Project will be subject to approval by Reclamation.
- To the extent possible, Reclamation will prohibit equipment access or staging in and near wetlands and other waters of the United States located along existing access roads. To the extent possible, access will be confined to existing roads.
- Resource monitors and contract compliance inspectors will routinely inspect protected areas to ensure that protective measures are in place and effective.
- All protective measures will remain in place until all construction activities have been completed near the resource and will be removed immediately following construction and reclamation activities.

Compensate for the Loss of Waters of the United States. Reclamation will compensate for permanent impacts to ensure no net loss of habitat functions and values. The compensation shall be provided at a minimum ratio of 1:1 (1 acre restored or created for every 1 acre filled) and may be a combination of onsite restoration/creation, offsite restoration, or mitigation credits. Compensation ratios shall be based on site-specific information and determined through coordination with state and federal agencies as part of the permitting process for the project. Compensation options are presented below.

1. Purchase mitigation bank credits at an agency-approved bank in the project region.

or

2. Contribute funds, equal to the amount needed to purchase mitigation bank credits, to restoration of wetlands and other waters in the Battle Creek watershed or other nearby lands that are publicly managed and will be protected in perpetuity. Reclamation will coordinate with appropriate individuals to determine whether there is a potential to create, restore, or enhance waters of the United States in the Battle Creek watershed.

or

3. Develop a wetland restoration plan that involves creating or enhancing wetland habitat on site or within the Battle Creek watershed. Potential

creation and enhancement sites shall be evaluated by Reclamation to determine whether this is a feasible option. If Reclamation determines that onsite or offsite restoration is possible, a restoration plan will be developed that describes where and when restoration will occur and who will be responsible for developing, implementing, and monitoring the restoration plan. When this option is selected, restoration will be conducted within the Battle Creek watershed.

Impact 4.2-4 Significant—Potential loss or disturbance of common upland woodland and forest communities and associated wildlife habitat.

The Restoration Project could result in the loss or disturbance of common woodland and forest communities, including gray pine/oak, blue oak, and/or live oak woodland, and westside ponderosa forest (Table 4.2-2). The most substantial impacts on a common plant community would occur along the South Battle Creek Canal and the Coleman Diversion Dam/Inskip Powerhouse sites. Along the South Battle Creek Canal, approximately 35.9 acres of woodland would be removed or disturbed during construction activities. Approximately, 19.8 acres of woodland would be removed or disturbed during construction activities at the Coleman Diversion Dam/Inskip Powerhouse site.

Most of the common woodland communities contain native oaks that could be removed during construction of access roads, staging areas, and other project features. These activities could result in short-term or long-term impacts on the oak woodlands and other common plant communities in the Restoration Project area. The estimated acreage of disturbance or loss of these communities will be determined after detailed design specifications are provided by Reclamation. An additional assessment of impacts will be performed by a plant ecologist after construction activities are complete. This postconstruction assessment will be used to quantify unanticipated impacts on the plant communities.

Oak woodland provides important foraging habitat for several species of wildlife, including mammals, birds, and reptiles. A variety of raptors use oak woodland habitat for nesting. The removal of these woodland habitats could result in the substantial loss or degradation of a plant community and associated wildlife habitat and the disruption of natural wildlife movement corridors. Therefore, this impact is considered significant. In addition to the General Environmental Protection Measures that will be implemented before and during project construction, implementation of the following mitigation measures would reduce this impact to a less-than-significant level.

Mitigation Measures for Impact 4.2-4. Reclamation will implement the following measures to avoid, minimize, and compensate for this impact.

- Retain an arborist to identify the species and numbers of native trees that will be removed or indirectly affected within the construction zone.
- Protect oaks that will not to be removed but that are within 61 meters (200 feet) of the grading activity by fencing them 1.5 meters (5 feet) beyond the

dripline and root zone (as determined by a certified arborist). This fence, intended to prevent activities that result in soil compaction beneath the canopy or over the root zone, will be maintained until all construction activities are complete. No grading, trenching, or movement of construction equipment will be allowed within fenced areas. Protection for oak trees on slopes will include installation of silt fences. A silt fence will be installed at the upslope base of the protective fence to prevent any soil drifting down over the root zone.

- Develop and implement an oak planting plan. The plan will specify collecting acorns from the local region, planting the acorns on site at a predetermined ratio based on the diameter at breast height of the removed trees, developing success criteria, and monitoring for a predetermined time period (e.g., 5 years) to evaluate the success criteria. In addition, the plan will contain adaptive management measures to ensure that the desired goals are achieved.
- Plantings shall be monitored annually by a qualified biologist for 5 years after construction is complete. The monitoring methods will be described in the Implementation Plan. Results of the monitoring shall be submitted to the appropriate agencies. Success will be achieved if there is a minimum of 50% survival by the end of the fifth year and a stable viable population for the duration of the monitoring period. If the performance standards are not met, remedial measures, such as replanting, will be implemented. During monitoring, the following information will be evaluated: average tree height, percent of tree cover, tree density, percent of woody shrub cover, seedling recruitment, and invasion by nonnative species. During the revegetation process, tree survival will be maximized by using deer screens or other maintenance measures as recommended by a certified arborist.
- Inspect the areas that have vegetative pruning and tree removal immediately prior to construction, following construction, and 1 year following construction to determine the amount of existing vegetative cover, cover that is removed, and cover that resprouts. If these areas have not resprouted sufficiently to return the cover to the level of cover existing prior to project construction, these areas will be replanted with the same species to reestablish the cover to the preproject condition.

Implementation of these measures would reduce the potential loss or disturbance of gray pine/oak, blue oak, and/or live oak woodland habitat impact to a less-than-significant level.

Impact 4.2-5 Significant—Potential disturbance to valley elderberry longhorn beetle habitat.

Seventeen elderberry shrubs occur in the project area that are capable of providing habitat for valley elderberry longhorn beetle. Most of these shrubs are along roadsides and would be subject to either direct or indirect disturbance from road improvement activities. Some of the shrubs, such as those near the Eagle Canyon Diversion Dam, are in the immediate vicinity of project features. USFWS considers any ground-disturbing activity within 100 feet of an

elderberry shrub within the range of valley elderberry longhorn beetle to be a potential take of the species (as defined under the federal Endangered Species Act). Because valley elderberry longhorn beetle is federally listed and because construction activities could directly or indirectly affect elderberry shrubs potentially resulting in take of this species, this impact is considered significant. Implementing the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measures for Impact 4.2-5. Impacts on valley elderberry longhorn beetle will be mitigated according to standard valley elderberry longhorn beetle compensation guidelines (USFWS 1999) through Section 7 consultation with USFWS. In general, the guidelines require compensation for direct and indirect impacts in the form of transplanting shrubs and planting seedling elderberry shrubs at a secure mitigation site. Avoidance of impacts requires a 100-foot no-disturbance buffer between the shrub and construction activities. Some activities are permitted within the 20–100 foot range through consultation with USFWS. A biological assessment under Section 7 of the federal Endangered Species Act has been prepared for this species. The actual compensation requirement will be provided in USFWS’s biological opinion. A preconstruction assessment is currently underway to assess the extent of disturbance to potential valley elderberry longhorn beetle habitat. Compensation will be provided on the basis of those results.

According to 2003 field survey results, 17 elderberry shrubs are located within 100 feet of the proposed project features and may be affected by construction activities. Impacts on valley elderberry longhorn beetle will be minimized by the following measures:

- A qualified biologist will identify and mark all elderberry shrubs with stems 1.0 inch or more in diameter within 100 feet of the impact area. A 100-foot buffer will be established around all elderberry shrubs, and no construction activities will be permitted within the buffer zone without consultation with USFWS. In areas where encroachment on the 100-foot buffer has been approved by USFWS, no ground-disturbing activities will be permitted within 20 feet of the dripline of each elderberry shrub unless the activity is necessary to complete the project. No riparian vegetation within 100 feet of elderberry shrubs will be removed by construction activities.
- Orange fencing will be placed around all shrubs to avoid inadvertent effects.
- Signs will be erected every 50 feet along the edge of the avoidance area with the following information: “This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended. Violators are subject to prosecution, fines, and imprisonment.” The signs will be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.
- An environmental education program will be presented to all construction personnel to brief them on the need to avoid impacts on valley elderberry

longhorn beetle and its habitat and the penalty for not complying with these requirements.

- If the proposed project cannot avoid elderberry shrubs by 100 feet (or 20 feet with USFWS consultation), the following mitigation measures will be implemented:
 - All elderberry shrubs with one or more stems measuring 1.0 inch or more in diameter that will be directly affected by construction activities (i.e., that will be destroyed) will be transplanted to a conservation area in accordance with USFWS's *Conservation Guidelines for Valley Elderberry Longhorn Beetle* (USFWS1999).
 - Each elderberry stem measuring 1.0 inch or more at ground level that is within 100 feet of construction activities will be replaced in a conservation area with elderberry seedlings or cuttings at a ratio between 1:1 and 8:1 depending on the diameter of the stem at ground level, whether the shrub is located in riparian habitat, and whether the shrub has evidence of exit holes.
 - A mix of native tree/plant species associated with the elderberry shrubs at the project site will be planted in the conservation area at ratios of 1:1 for elderberry shrubs without exit holes or 2:1 for elderberry shrubs with exit holes (native tree/plant species to each elderberry seedling or cutting) (Table 4.2-8). A mixture of native grasses and forbs should also be planted in the conservation area.
 - Each transplanted elderberry shrub should have at least 1,800 square feet of area. As many as five additional elderberry seedlings or cuttings and up to five associated natives may also be planted within the 1,800-square-foot transplant area.
- Adequate dust control measures are to be used during construction activities. Final measures will be set forth in USFWS' Biological Opinion, which will supercede the measures described here.

Impact 4.2-6 Significant—Potential disturbance of foothill yellow-legged frog habitat.

Surveys conducted for the Restoration Project indicate that foothill yellow-legged frog occurs in the project area. Construction activities could temporarily degrade foothill yellow-legged frog habitat at the Lower Ripley Creek Feeder Diversion Dam, Inskip Diversion Dam/South Powerhouse, Soap Creek Feeder, and South Diversion Dam sites. Restoration activities in these areas could disturb the shallow, rocky substrate required by foothill yellow-legged frogs and increase flows in areas that have been constrained by dam operations for many years. In addition, individual frogs could be killed during construction. The overall effects of the project, however, are considered beneficial to this species because the process of restoring the affected drainages will ultimately return them to an approximation of their former natural conditions. Nonetheless, because this species has declined throughout its range, and in particular throughout the Sierra Nevada, the short-term effects of the project are considered

significant. Accordingly, mitigation will focus on avoiding killing or injuring frogs in construction areas. In addition to the General Environmental Protection Measures that will be implemented before and during project construction, implementing Mitigation Measures for Impact 4.2-3 and the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure for Impact 4.2-6. Within 2 weeks prior to construction activities at Lower Ripley Creek Feeder Diversion Dam, Inskip Diversion Dam/South Powerhouse, Soap Creek Feeder, and South Diversion Dam, protocol-level surveys for foothill yellow-legged frog will be conducted by qualified biologists. If frogs, tadpoles, or egg masses are detected, barrier fencing will be constructed in the work area in a manner that will exclude frogs from entering the work area. For 3 days prior to construction activities (one survey each day), qualified biologists will survey each work site for foothill yellow-legged frogs and relocate any frog found within the exclusion area. If frogs are found within previously unoccupied sites, exclusion areas will be established at those sites. Frogs will be relocated to the nearest suitable habitat outside the exclusion area. After construction has been completed, the barrier fencing will be removed and the habitat will be restored.

In the event that all or part of this mitigation measure is considered unfeasible during implementation of the project, DFG and USFWS will be consulted to develop alternative measures.

Impact 4.2-7 Significant—Potential disturbance of northwestern pond turtle habitat.

Surveys conducted for the Restoration Project indicate that northwestern pond turtle occurs in the project area. Construction activities could temporarily degrade habitat for this species at Lower Ripley Creek Feeder Diversion Dam, Inskip Diversion Dam/South Powerhouse, Soap Creek Feeder, and South Diversion Dam. Restoration activities in these areas could disturb the pond and other open water habitats and basking sites required by northwestern pond turtle, as well as increasing flows in areas that have been constrained by dam operations for many years. In addition, individual turtles could be killed during construction. The overall effects of the project, however, are considered beneficial to this species because the process of restoring the affected drainages will ultimately return them to an approximation of their former natural conditions. Nonetheless, because this species has declined throughout its range, the short-term potential for mortality is considered significant. Accordingly, mitigation will focus on avoiding killing or injuring turtles in construction areas. In addition to the General Environmental Protection Measures that will be used before and during project construction, implementing Mitigation Measures for Impact 4.2-3 and the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure for Impact 4.2-7. Within 2 weeks prior to construction activities at Lower Ripley Creek Feeder Diversion Dam, Inskip Diversion Dam/South Powerhouse, Soap Creek Feeder, and South Diversion Dam, protocol-level surveys for northwestern pond turtle will be conducted by

qualified biologists. If turtles are detected, barrier fencing will be constructed in the work area in a manner that will exclude turtles from entering the work area. For 3 days prior to construction activities (one survey each day), qualified biologists will survey each of these work sites for turtles and will relocate any turtle found within the exclusion area. If turtles are found within previously unoccupied sites, exclusion areas will be established at those sites. Turtles will be relocated to the nearest suitable habitat outside the exclusion area. After construction has been completed, the barrier fencing will be removed and the habitat will be restored.

In the event that all or part of this mitigation measure is considered unfeasible during implementation of the project, DFG and USFWS will be consulted to develop alternative measures.

Impact 4.2-8 Significant—Potential disturbance of breeding habitat for yellow-breasted chat.

During surveys for the Restoration Project, yellow-breasted chats were detected and are considered to be breeding at two sites in the project area: Darrah Springs Feeder and Coleman Diversion Dam/Inskip Powerhouse. No construction is proposed at Darrah Springs under this alternative; however, construction at the Coleman Diversion Dam/Inskip Powerhouse could remove riparian scrub habitat required by this species for breeding and cover. Impacts on this habitat during the breeding season could also result in destruction of active nests and mortality of individual chats or their eggs. Yellow-breasted chat is an uncommon species in California; it is restricted to a habitat type (riparian scrub) that has declined substantially over past decades, and local breeding populations are considered to be declining. For these reasons, impacts resulting from removal of or disturbance to occupied breeding habitat and the potential for mortality of individuals or nests are considered significant. In addition to the General Environmental Protection Measures that will be implemented before and during project construction, implementing Mitigation Measures for Impact 4.2-1 and the following mitigation measure would reduce this impact to a less-than-significant level.

Mitigation Measure for Impact 4.2-8. Yellow-breasted chats are known to breed at two sites in the project area: Darrah Springs Feeder and Coleman Diversion Dam/Inskip Powerhouse. In addition, although no breeding was detected during surveys, potential breeding habitat exists at the Lower Ripley Creek Feeder and Inskip Diversion Dam/South Powerhouse project sites. Prior to construction during the breeding season of the construction year, a qualified biologist will survey all project sites to determine chat occupancy. If no breeding chats are detected, then no further mitigation is required. Surveys will be conducted between April 25 and May 25. If breeding chats are detected, a qualified biologist will install orange barrier fencing around the riparian vegetation to protect it from incidental damage. To minimize the potential for mortality or nest abandonment, the construction contractor will establish a 500-foot no-disturbance buffer around all active nesting sites during the breeding season (mid-April to mid-July).

In the event that all or part of this mitigation measure is considered unfeasible during implementation of the project, DFG and USFWS will be consulted to develop alternative measures.

Impact 4.2-9 Significant—Potential disturbance to nesting raptors.

Two nonlisted special-status raptors, osprey and golden eagle, are known or have potential to nest in the Restoration Project area. One active osprey nest was found during surveys; moreover, although no active golden eagle nests were found, suitable golden eagle nesting habitat exists throughout the project area. Construction activities occurring in the immediate vicinity of active nests could cause abandonment of nests and potentially result in death of young or eggs. Osprey and golden eagle are locally and regionally uncommon species, and the abandonment of active nests could affect local and regional breeding populations. Therefore, this impact is considered significant. In addition to the General Environmental Protection Measures that will be implemented before and during project construction, implementing the following mitigation measure will reduce this impact to a less-than-significant level.

Mitigation Measure for Impact 4.2-9. Prior to construction activities during the breeding season (generally February through July) of each construction year, a qualified biologist will survey the project sites to locate active osprey and golden eagle nests. If a nest is occupied, Reclamation will limit construction activities near the nest to the nonbreeding season (mid-July to February). Reclamation will establish a 0.5-mile-radius direct line-of-sight buffer for active golden eagle nests and a 500-foot-radius direct line-of-sight buffer for active osprey nests. In addition, Reclamation will maintain a 0.5-mile direct line-of-sight helicopter exclusion zone around any active nests.

In the event that all or part of this mitigation measure is considered unfeasible during implementation of the project, DFG and USFWS will be consulted to develop alternative measures.

Impact 4.2-10 Significant—Potential disturbance of bats in canal tunnels and on rocky cliffs and outcrops along canyon walls.

Construction activities may disturb special-status bats using tunnels near the South and Inskip Diversion Dams for roosting, breeding, migration, and hibernation habitat. In addition, construction activities may disturb bats that use the rocky cliffs and outcrops along canyon walls at Eagle Canyon and Wildcat Diversion Dams and other areas with potential bat habitat. Although bats were not identified to the specific level during surveys, several species of bats that could be using the tunnels for roosting, breeding, migration, and hibernation habitat are state species of special concern, federal species of concern, and Western Bat Working Group species of high priority. Construction disturbances could affect reproductive success, result in the abandonment of maternity sites, or disturb hibernating colonies. Disturbance at sites that support colonies or large concentrations of roosting bats could result in local population declines. This impact, therefore, is considered significant. In addition to the General Environmental Protection Measures that will be implemented before and during

project construction, implementing the following mitigation measure would reduce the impact to a less-than-significant level.

Mitigation Measure for Impact 4.2-10. Prior to all construction activities, a qualified biologist will survey construction sites, nearby tunnels, rocky cliffs and outcrops, and other potential bat habitats that could be adversely affected by construction to determine the presence or absence of bats. Bat surveys will be conducted to determine the presence of bats in tunnels during the spring (March through mid-May) for maternity colonies, summer (June through August) for roosting sites, fall (mid-August through October) for migrant stopover sites, and winter (November through February) for hibernating sites. At sites that support maternity colonies or large concentrations of roosting bats, Reclamation will restrict construction activities where practical to non-use periods or outside the breeding and hibernation periods. If impacts are unavoidable during any season, Reclamation will implement selected minimizing actions, including temporary closure and soundproofing of tunnel entrances during the day, to reduce disturbance of roosting bats. Survey and construction scheduling, buffer zones, and other mitigation measures will be developed in consultation with bat specialists, USFWS, and DFG.

Impact 4.2-11 Less than Significant—Possible loss of woody riparian vegetation along the South and Wildcat Canals from cessation of flows.

The Restoration Project could cause the loss of scattered woody riparian trees and shrubs along the South Canal (Figure 4.2-14) and the Wildcat Canal (Figure 4.2-6) as a result of cessation of flows. Canal leakage has supported the establishment of these riparian species in scattered locations along the canals. This impact is considered less than significant because the scattered riparian trees and shrubs along the canals provide minimal habitat functions and values for wildlife species. Additionally, as part of the Five Dam Removal Alternative, the South and Wildcat Diversion Dams would be removed, and flows to the canals would be restored to the original Battle Creek channel. The overall impacts on the riparian community downstream are expected to be beneficial because of increases in streamflows. No mitigation is required.

Impact 4.2-12 Less than Significant—Potential disturbance of foraging bald eagles along Battle Creek.

No bald eagle nests were found or are known to occur in the immediate vicinity of the project area. However, bald eagles may forage along North Fork and South Fork Battle Creek during the winter nonbreeding season (October through February). Breeding bald eagles that nest in the surrounding area, but outside the project area, may also use Battle Creek as foraging habitat during the breeding season (March through September). Overall use of the project by bald eagles appears to be low; during all field surveys only two bald eagles were detected flying over the project area, and none were found foraging or roosting in the project area.

The long-term impacts of the project are considered beneficial to bald eagles because the area will be restored to its pre-dam condition, allowing greater

movement of fish and creating natural pools. In the short term, construction noise disturbance and helicopter flights associated with restoration activities could temporarily displace roosting or foraging bald eagles. However, because of the low number of bald eagles apparently using the project area and the extent of available habitat throughout the project region, this level of possible displacement is not expected to disrupt overall bald eagle use of the area, affect individual eagles' ability to forage successfully, or affect reproductive efforts during any construction year. This impact is therefore considered less than significant.

Impact 4.2-13 Beneficial—Reduction of artificial flow fluctuations and increased survival of amphibians.

Powerhouses, canals, and reliable fish screens are all subject to planned and unplanned outages as part of preventative maintenance and in response to malfunctions. Such outages are typically infrequent and of short duration; during outages, water intended to go to the power canals is instead released to Battle Creek below the dam. At the end of outages, the water is again diverted into canals, thereby reducing the flow in the stream channel.

Amphibians typically found in streams like Battle Creek are capable of colonizing areas that are wetted for relatively short periods of time (e.g., several weeks). When the stream below the diversion dams receives all the canal flow during an outage, transitory habitat is created along edges of the stream channel that may remain wet long enough to be colonized by amphibians. When outages end and diversion of flows from the creek resume, the ramping rate may not be slow enough to allow the early amphibian life stages (i.e., eggs and tadpoles) to follow the receding water back to the normally wetted part of the stream.

To some extent the natural hydrograph creates seasonally transitory habitat, but habitat use patterns by amphibians have evolved with the relatively predictable seasonal changes in hydrology, and the rate at which these types of flows recede is generally slower than the ramping rate controlled by the dams. Removal of diversion dams would eliminate potential for unseasonal changes in transitory habitat in North Fork and South Fork Battle Creek and their tributaries. This change to flow regimes would benefit the early life stages of amphibians that may inhabit transitory aquatic habitat.

Under the No Action Alternative, flow reductions below the dams could be abrupt and have the potential to cause stranding or isolation of juvenile fish in the stream channel as the stream margin is dewatered (DFG pers. comm. 2001) and, by extension, could also cause stranding or isolation of early amphibian life stages. Such stranding may cause mortality to amphibians. Under the present FERC license there is no requirement governing the rate of flow changes.

The ramping rate specified in the Five Dam Removal Alternative for dams that would remain in place should improve the survival of early amphibian life stages occupying transient habitat during flow reductions by slowly ramping down the water surface elevation in the stream when returning power canals to service following outages. Improved survival of early amphibian life stages should

benefit amphibian populations downstream from dams, as well as populations of species that prey on amphibians.

Impact 4.1-14 Beneficial—Increase in quantity of amphibian habitat resulting from increased minimum instream flows.

The prescribed minimum instream flow releases are generally 5–20 times greater under the Five Dam Removal Alternative than under the FERC license. As discussed in the preceding section (4.1, Fish), these increases in minimum instream flows would significantly affect the amount of wetted habitat available¹ (Thomas R. Payne and Associates 1998a). Such increases would benefit animal species using aquatic habitat for foraging or reproduction, such as northwestern pond turtle, foothill yellow-legged frog, and salamanders. In general, aquatic habitat would increase within the mainstem and forks of Battle Creek under the Five Dam Removal Alternative. In no case does the Five Dam Removal Alternative provide less habitat for these organisms. Although not modeled by T.R. Payne and Associates (1998a), the wetted areas of the section of Soap, Lower Ripley, and Baldwin Creeks would also increase dramatically, as the required minimum instream flows would increase from 0 cfs at each of these sites.

Increased wetted habitat would likely lead to corresponding increases in the production of periphyton and aquatic macroinvertebrates, which form the basis of the food chain in stream ecosystems. These organisms provide a primary food source for animal species inhabiting aquatic habitats, such as northwestern pond turtle, foothill yellow-legged frog, and salamanders. Aquatic insects that metamorphose into aerial and terrestrial insects would contribute to the food supply of certain insectivorous wildlife, such as willow flycatcher and several bat species. Furthermore, wildlife species that prey on amphibians, such as green heron and common merganser, would also benefit from increased wetted habitat.

Impact 4.1-15 Beneficial—Substantial increase in quantity of bat roosting habitat in the South Canal tunnels due to termination of water flow through the tunnels.

Removal of the South Diversion Dam and associated facilities would result in termination of water flow through the South Canal tunnels. The resultant dry tunnels would potentially provide substantially increased roosting habitat for cave-dwelling bats. The actual use of the tunnels would depend on the new microclimate conditions established after the water flow is stopped.

No Dam Removal Alternative

For the No Dam Removal Alternative, none of the Battle Creek diversion dams would be removed. Instead, fish screens and fish ladders would be constructed at the North Battle Creek Feeder, Eagle Canyon, Wildcat, South, Inskip, and

¹ Habitat changes of greater than or equal to 10% of maximum weighted usable area were considered significant in this analysis.

Coleman Diversion Dams. The dams that are not removed would increase flow releases to levels required by AFRP.

Impacts on the botanical, wetland, and wildlife resources resulting from the construction of fish screens and ladders would be similar to those described for the Five Dam Removal Alternative (Proposed Action). The proposed construction areas are anticipated to be the same for the North Battle Creek Feeder, Eagle Canyon, Wildcat, South, Inskip, and Coleman Diversion Dam sites as under the Five Dam Removal Alternative. However, under the No Dam Removal Alternative, no construction is anticipated at Soap Creek Feeder, Lower Ripley Creek Feeder, or along the Wildcat and South Canals because these facilities would not be removed but would remain in their current condition. In addition, no bypass facilities or tailrace connectors would be constructed under the No Dam Removal Alternative.

The Restoration Project area would experience substantially less long-term benefit to riparian habitat under the No Dam Removal Alternative than under the Five Dam Removal Alternative because of continued streamflow diversion. Moreover, flow reductions below the diversion dams could be abrupt and have the potential to cause stranding or isolation of early amphibian life stages. Such stranding may cause mortality to amphibians.

Specific impacts associated with the No Dam Removal Alternative are described below. Total acreage of biological communities and waters of the United States potentially affected for the No Dam Removal Alternative are summarized in Table 4.2-3.

Impact 4.2-16 Significant—Potential disturbance or loss of 4.1 acres of woody riparian vegetation and associated wildlife habitat.

Like the Five Dam Removal Alternative, construction activities associated with the No Dam Removal Alternative could result in the temporary disturbance or permanent removal of woody riparian vegetation and associated wildlife habitat (Table 4.2-3). This impact is similar to Impact 4.2-1 described for the Five Dam Removal Alternative and is considered significant. Implementing the General Environmental Protection Measures and Mitigation Measures for Impact 4.2-1 would reduce this impact to a less-than-significant level.

Impact 4.2-17 Significant—Potential introduction of noxious weeds or spread of existing noxious weeds.

Activities associated with implementation of the Restoration Project could introduce or spread noxious weeds into currently uninfested areas, possibly resulting in the displacement of special-status plants, alteration of habitat for special-status wildlife, or substantial reduction of species diversity or abundance. Plants or seeds of noxious weeds may be dispersed on construction equipment if appropriate measures are not implemented. This impact is similar to Impact 4.2-2 described for the Five Dam Removal Alternative and could result in a substantial reduction or elimination of species diversity or abundance; it is therefore considered significant. Implementing the General Protection Measures

and the Mitigation Measures for Impact 4.2-2 would reduce this impact to a less-than-significant level.

Impact 4.2-18 Significant—Potential loss or disturbance of 11.6 acres of waters of the United States (including wetlands).

Under the No Dam Removal Alternative, construction activities could result in the loss or disturbance of approximately 11.6 acres of waters of the United States, resulting in short-term (temporary) and/or long-term (permanent) impacts on wetland communities (Table 4.2-3). As described for the Five Dam Removal Alternative, some additional acreage of waters of the United States may be incidentally filled or disturbed during construction of access roads and establishment of staging areas. The estimated acreage of disturbance or fill material that would be placed into waters of the United States will be determined after detailed design specifications are provided by Reclamation and before obtaining Section 404 Clean Water Act permits. An additional assessment of impacts will be conducted by a wetland ecologist after construction activities are complete. This postconstruction assessment will be used to quantify unanticipated impacts on waters of the United States.

Reclamation will implement measures as part of the project to avoid and minimize impacts on waters of the United States. Although these measures would minimize the extent of potential impacts, some disturbance or loss of waters of the United States would be necessary in order to construct the Restoration Project.

Because the proposed project could result in the placement of fill material into waters of the United States, this impact would be considered significant. This impact is similar to Impact 4.2-3 described for the Five Dam Removal Alternative and is considered significant. Implementing the General Environmental Protection Measures; Mitigation Measures for Impact 4.4-1 in Section 4.4, Water Quality; Mitigation Measures for Impact 4.7-1 in Section 4.7, Geology and Soils; and the Mitigation Measure for Impact 4.2-3 (described above) would reduce this impact to a less-than-significant level.

Impact 4.2-19 Significant—Potential loss or disturbance of common upland woodland and forest communities and associated wildlife habitat.

The No Dam Removal Alternative could result in the loss or disturbance of common woodland and forest communities, including gray pine/oak, blue oak, and/or live oak woodland, and westside ponderosa forest (Table 4.2-3). As described for the Five Dam Removal Alternative, most of the plant communities contain native oaks that could be removed during construction of access roads, staging areas, and other project features. These activities could result in short-term or long-term impacts on the oak woodlands and other common plant communities in the Restoration Project area. The estimated acreage of disturbance or loss of these communities will be determined after detailed design specifications are provided by Reclamation. An additional assessment of impacts will be performed by a plant ecologist after construction activities are complete.

This postconstruction assessment will be used to quantify unanticipated impacts on the plant communities.

Oak woodland provides important foraging habitat for several species of wildlife, including mammals, birds, and reptiles. A variety of raptors use oak woodland habitat for nesting. The removal of these woodland habitats could result in the substantial loss or degradation of a plant community and associated wildlife habitat and the disruption of natural wildlife movement corridors. Therefore, this impact is considered significant. This impact is similar to Impact 4.2-4 described for the Five Dam Removal Alternative and is considered significant. Implementing the General Environmental Protection Measures and the Mitigation Measure for Impact 4.2-4 would reduce this impact to a less-than-significant level.

Impact 4.2-20 Significant—Potential disturbance to valley elderberry longhorn beetle habitat.

Seventeen elderberry shrubs capable of providing habitat for valley elderberry longhorn beetle occur in the project area. Most of these shrubs are along roadsides and would be subject to either direct or indirect disturbance from road improvement activities. Some of the shrubs, such as those near the Eagle Canyon Diversion Dam, are in the immediate vicinity of project features. USFWS considers any ground-disturbing activity within 100 feet of an elderberry shrub within the range of valley elderberry longhorn beetle to be a potential take of the species (as defined under the federal Endangered Species Act). Because valley elderberry longhorn beetle is federally listed and because construction activities could directly or indirectly affect elderberry shrubs, potentially resulting in take of this species, this impact is considered significant. This impact is similar to Impact 4.2-5 described for the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-5 would reduce this impact to a less-than-significant level.

Impact 4.2-21 Significant—Potential disturbance of foothill yellow-legged frog habitat.

Surveys conducted for the Restoration Project indicate that foothill yellow-legged frog occurs in the project area. Construction activities could temporarily degrade foothill yellow-legged frog habitat at the Inskip Diversion Dam/South Powerhouse and South Diversion Dam sites. Restoration activities in these areas could disturb the shallow, rocky substrate required by foothill yellow-legged frogs and increase flows in areas that have been constrained by dam operations for many years. In addition, individual frogs could be killed during construction. Because this species has declined throughout its range, and in particular throughout the Sierra Nevada, the short-term effects of the project are considered significant. Accordingly, mitigation will focus on avoiding killing or injuring frogs in construction areas. This impact is similar to Impact 4.2-6 described for the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-6 would reduce this impact to a less-than-significant level.

Impact 4.2-22 Significant—Potential disturbance of northwestern pond turtle habitat.

Surveys conducted for the Restoration Project indicate that northwestern pond turtle occurs in the project area. Construction activities could temporarily degrade habitat for this species at Inskip Diversion Dam/South Powerhouse and South Diversion Dam sites. Restoration activities in these areas could disturb pond and other open water habitats and basking sites required by northwestern pond turtles. In addition, during construction, individual turtles could be killed. Because this species has declined throughout its range, the short-term potential for mortality is considered significant. Accordingly, mitigation will focus on avoiding killing or injuring turtles in construction areas. This impact is similar to Impact 4.2-7 described for the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-7 would reduce this impact to a less-than-significant level.

Impact 4.2-23 Significant—Potential disturbance of breeding habitat for yellow-breasted chat.

During surveys for the Restoration Project, yellow-breasted chats were detected and are considered to be breeding at two sites in the project area: Darrah Springs Feeder and Coleman Diversion Dam/Inskip Powerhouse. No construction is proposed at Darrah Springs under this alternative; however, construction at the Coleman Diversion Dam/Inskip Powerhouse could potentially remove riparian scrub habitat required by this species for breeding and cover. Impacts on this habitat during the breeding season could also result in destruction of active nests and mortality of individual chats or their eggs. Yellow-breasted chat is an uncommon species in California; it is restricted to a habitat type (riparian scrub) that has declined substantially over past decades; and local breeding populations are considered to be declining. For these reasons, impacts resulting from removal or disturbance of occupied breeding habitat and the potential for mortality of individuals or nests are considered significant. This impact is similar to Impact 4.2-8 described for the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impacts 4.2-1 and 4.2-8 would reduce this impact to a less-than-significant level.

Impact 4.2-24 Significant—Potential disturbance to nesting raptors.

Two nonlisted special-status raptors, osprey and golden eagle, are known or have potential to nest in the Restoration Project area. One active osprey nest was found during surveys; moreover, although no active golden eagle nests were found, suitable golden eagle nesting habitat exists throughout the project area. Construction activities occurring in the immediate vicinity of active nests could cause abandonment of nests and potentially result in death of young or eggs. Osprey and golden eagle are locally and regionally uncommon species, and the abandonment of active nests could affect local and regional breeding populations. Therefore, this impact is considered significant. This impact is similar to Impact 4.2-9 described for the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-9 would reduce this impact to a less-than-significant level.

Impact 4.2-25 Significant—Potential disturbance of bats in canal tunnels and on rocky cliffs and outcrops along canyon walls.

Construction activities may disturb special-status bats using tunnels near the South and Inskip Diversion Dams for roosting, breeding, migration, and hibernation habitat. In addition, construction activities may disturb bats that use the rocky cliffs and outcrops along canyon walls at Eagle Canyon and Wildcat Diversion Dams and other areas with potential bat habitat. Although bats were not identified to the specific level during surveys, several species of bats that could be using the tunnels for roosting, breeding, migration, and hibernation habitat are state species of special concern, federal species of concern, and Western Bat Working Group species of high priority. Construction disturbances could affect reproductive success, result in the abandonment of maternity sites, or disturb hibernating colonies. Disturbance at sites that support colonies or large concentrations of roosting bats could result in local population declines. This impact, therefore, is considered significant. This impact is similar to Impact 4.2-10 described for the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-10 would reduce this impact to a less-than-significant level.

Impact 4.2-26 Less than Significant—Potential disturbance of foraging bald eagles along Battle Creek.

No bald eagle nests were found or are known to occur in the immediate vicinity of the project area. However, bald eagles may forage along North Fork and South Fork Battle Creek during the winter nonbreeding season (October through February). Breeding bald eagles that nest in the surrounding area, but outside the project area, may also use Battle Creek as foraging habitat during the breeding season (March through September). Overall use of the project area by bald eagles appears to be low; during all field surveys only two bald eagles were detected flying over the project area, and none were found foraging or roosting in the project area.

In the short term, construction noise disturbance and helicopter flights associated with restoration activities could temporarily displace roosting or foraging bald eagles. However, because of the low number of bald eagles apparently using the project area and the extent of available habitat throughout the project region, this level of possible displacement is not expected to disrupt overall bald eagle use of the area, affect individual eagles' ability to forage successfully, or affect reproductive effort during any construction year. This impact is therefore considered less than significant.

Impact 4.1-27 Beneficial—Increase in quantity of amphibian habitat resulting from increased minimum instream flows.

The prescribed minimum instream flow releases are generally 5–20 times greater under the No Dam Removal Alternative than under the FERC license. As discussed in the preceding section (Section 4.1, Fish), these increases in minimum instream flows would significantly affect the amount of wetted habitat

available² (Thomas R. Payne and Associates 1998a). Such increases would benefit animal species using aquatic habitat for foraging or reproduction, such as northwestern pond turtle, foothill yellow-legged frog, and salamanders. In general, aquatic habitat would increase within the mainstem and forks of Battle Creek under the No Dam Removal Alternative. In no case does the No Dam Removal Alternative provide less habitat for these organisms.

Increased wetted habitat would likely lead to corresponding increases in the production of periphyton and aquatic macroinvertebrates, which form the basis of the food chain in stream ecosystems. These organisms provide a primary food source for animal species inhabiting aquatic habitats, such as northwestern pond turtle, foothill yellow-legged frog, and salamanders. Aquatic insects that metamorphose into aerial and terrestrial insects would contribute to the food supply of certain insectivorous wildlife, such as willow flycatcher and several bat species. Furthermore, wildlife species that prey on amphibians, such as green heron and common merganser, would also benefit from increased wetted habitat.

Six Dam Removal Alternative

The Six Dam Removal Alternative would remove Eagle, Wildcat, South, Coleman, Soap Creek Feeder, and Lower Ripley Creek Feeder Diversion Dams. Wildcat Canal and South Canal would also be removed. Fish screens and fish ladders would be constructed at the North Battle Creek Feeder and Inskip Diversion Dams. Those dams that are not removed would increase flow releases to levels identified in the 1999 MOU (Appendix D). The Six Dam Removal Alternative would also construct a bypass facility at the Inskip Powerhouse, and would construct tailrace connectors between South Powerhouse and Inskip Canal and between Inskip Powerhouse and Coleman Canal to prevent North Battle Creek water from mixing with South Battle Creek water. The Asbury Diversion Dam spill gates would be reoperated and a new gaging system installed to ensure an instream flow release of 5 cfs.

Impacts on the botanical, wetland, and wildlife resources resulting from the construction of fish screens and ladders at North Battle Creek Feeder and Inskip Diversion Dams and the removal of Eagle Canyon, Wildcat, South, Soap Creek Feeder, Lower Ripley Creek Feeder, and Coleman Diversion Dams would be similar to those described for the Five Dam Removal Alternative (Proposed Action). The proposed construction areas are assumed to be the same for each site as under the Five Dam Removal Alternative. The following impacts are associated with the Six Dam Removal Alternative. Total acreage of biological communities and waters of the United States potentially affected for the Six Dam Removal Alternative are summarized in Table 4.2-4.

² Habitat changes of greater than or equal to 10% of maximum weighted usable area were considered significant in this analysis.

Impact 4.2-28 Significant—Potential disturbance or loss of 7.2 acres of woody riparian vegetation and associated wildlife habitat.

Like the Five Dam Removal Alternative, the Six Dam Removal Alternative could result in the temporary disturbance or permanent removal of woody riparian vegetation and associated wildlife habitat (Table 4.2-4). This impact is similar to Impact 4.2-1 described for the Five Dam Removal Alternative and is considered significant. Implementing the General Environmental Protection Measures and Mitigation Measures for Impact 4.2-1 would reduce this impact to a less-than-significant level.

Impact 4.2-29 Significant—Potential introduction of noxious weeds or spread of existing noxious weeds.

Construction activities associated with the Six Dam Removal Alternative could introduce or spread noxious weeds into currently uninfested areas, possibly resulting in displacement of special-status plants, alteration of habitat for special-status wildlife, or substantial reduction of species diversity or abundance. Plants or seeds of noxious weeds may be dispersed on construction equipment if appropriate measures are not implemented. This impact is similar to Impact 4.2-2 described for the Five Dam Removal Alternative and could result in a substantial reduction or elimination of species diversity or abundance and is therefore considered significant. Implementing the General Environmental Protection Measures and Mitigation Measures for Impact 4.2-2 would reduce this impact to a less-than-significant level.

Impact 4.2-30 Significant—Potential loss or disturbance of 12.1 acres of waters of the United States (including wetlands).

Under the Six Dam Removal Alternative, construction activities could result in disturbing 12.1 acres of waters of the United States, resulting in short-term (temporary) and/or long-term (permanent) impacts on wetland communities (Table 4.2-4). As described for the Five Dam Removal Alternative, some additional acreage of waters of the United States may be incidentally filled or disturbed during construction of access roads and establishment of staging areas. The estimated acreage of disturbance or fill material that would be placed into waters of the United States will be determined after detailed design specifications are provided by Reclamation and before obtaining Section 404 Clean Water Act permits. An additional assessment of impacts will be conducted by a wetland ecologist after construction activities are complete. This postconstruction assessment will be used to quantify unanticipated impacts on waters of the United States.

Reclamation will implement measures as part of the project to avoid and minimize impacts on waters of the United States. Although these measures would minimize the extent of potential impacts, some disturbance or loss of waters of the United States would be necessary in order to construct the Restoration Project.

Because the proposed project could result in the placement of fill material into waters of the United States, this impact would be considered significant. Implementing the General Environmental Protection Measures; Mitigation

Measures for Impact 4.4-1 in Section 4.4, Water Quality; Mitigation Measures for Impact 4.7-1 in Section 4.7, Geology and Soils; and the Mitigation Measure for Impact 4.2-3 would reduce this impact to a less-than-significant level.

Impact 4.2-31 Significant—Potential loss or disturbance of common upland woodland and forest communities and associated wildlife habitat.

The Six Dam Removal Alternative could result in the loss or disturbance of common woodland and forest communities, including gray pine/oak, blue oak, and/or live oak woodland, and westside ponderosa forest (Table 4.2-4). As described for the Five Dam Removal Alternative, most of the plant communities contain native oaks that could be removed during construction of access roads, staging areas, and other project features. These activities could result in short-term or long-term impacts on the oak woodlands and other common plant communities in the Restoration Project area. The estimated acreage of disturbance or loss of these communities will be determined after detailed design specifications are provided by Reclamation. An additional assessment of impacts will be performed by a plant ecologist after construction activities are complete. This postconstruction assessment will be used to quantify unanticipated impacts on the plant communities.

Oak woodland provides important foraging habitat for several species of wildlife, including mammals, birds, and reptiles. A variety of raptors use oak woodland habitat for nesting. The removal of these woodland habitats could result in the substantial loss or degradation of a plant community and associated wildlife habitat and the disruption of natural wildlife movement corridors. Therefore, this impact is considered significant. This impact is similar to Impact 4.2-4 described under the Five Dam Removal Alternative and is considered significant. Implementing the General Environmental Protection Measures and the Mitigation Measures for Impact 4.2-4 would reduce this impact to a less-than-significant level.

Impact 4.2-32 Significant—Potential disturbance to valley elderberry longhorn beetle habitat.

Seventeen elderberry shrubs capable of providing habitat for valley elderberry longhorn beetle occur in the project area. Most of these shrubs are along roadsides and would be subject to either direct or indirect disturbance from road improvement activities. Some of the shrubs, such as those near the Eagle Canyon Diversion Dam, are in the immediate vicinity of project features. USFWS considers any ground-disturbing activity within 100 feet of an elderberry shrub within the range of valley elderberry longhorn beetle to be a potential take of the species (as defined under the federal Endangered Species Act). Because valley elderberry longhorn beetle is federally listed and because construction activities could directly or indirectly affect elderberry shrubs potentially resulting in take of this species, this impact is considered significant. This impact is similar to Impact 4.2-5. Implementing the Mitigation Measures for Impact 4.2-5 would reduce this impact to a less-than-significant level.

Impact 4.2-33 Significant—Potential disturbance of foothill yellow-legged frog habitat.

Surveys conducted for the Restoration Project indicate that foothill yellow-legged frog occurs in the project area. Construction activities could temporarily degrade foothill yellow-legged frog habitat at Lower Ripley Creek Feeder Diversion Dam, Inskip Diversion Dam/South Powerhouse, Soap Creek Feeder, and South Diversion Dam. Restoration activities in these areas could disturb the shallow, rocky substrate required by foothill yellow-legged frogs and increase flows in areas that have been constrained by dam operations for many years. In addition, during construction, individual frogs could be killed. The overall effects of the project, however, are considered beneficial to this species because the process of restoring the affected drainages will ultimately return them to an approximation of their former natural conditions. Nonetheless, because this species has declined throughout its range, and in particular throughout the Sierra Nevada, the short-term effects of the project are considered significant. Accordingly, mitigation will focus on avoiding killing or injuring frogs in construction areas. This impact is similar to Impact 4.2-6 described under the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-6 would reduce this impact to a less-than-significant level.

Impact 4.2-34 Significant—Potential disturbance of northwestern pond turtle habitat.

Surveys conducted for the Restoration Project indicate that northwestern pond turtle occurs in the project area. Construction activities could temporarily degrade habitat for this species at Lower Ripley Creek Feeder Diversion Dam, Inskip Diversion Dam/South Powerhouse, Soap Creek Feeder, and South Diversion Dam. Restoration activities in these areas could disturb the pond and other open water habitats and basking sites required by northwestern pond turtles as well as increasing flows in areas that have been constrained by dam operations for many years. In addition, individual turtles could be killed during construction. The overall effects of the project, however, are considered beneficial to this species because the process of restoring the affected drainages will ultimately return them to an approximation of their former natural conditions. Nonetheless, because this species has declined throughout its range, the short-term potential for mortality is considered significant. Accordingly, mitigation will focus on avoiding killing or injuring turtles in construction areas. This impact is similar to Impact 4.2-7 described for the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-7 would reduce this impact to a less-than-significant level.

Impact 4.2-35 Significant—Potential disturbance of breeding habitat for yellow-breasted chat.

During surveys for the Restoration Project, yellow-breasted chats were detected and are considered to be breeding at two sites in the project area: Darrah Springs Feeder and Coleman Diversion Dam/Inskip Powerhouse. No construction is proposed at Darrah Springs under this alternative; however, construction at the Coleman Diversion Dam/Inskip Powerhouse could potentially remove riparian scrub habitat required by this species for breeding and cover. Impacts on this habitat during the breeding season could also result in destruction of active nests

and mortality of individual chats or their eggs. Yellow-breasted chat is an uncommon species in California; it is restricted to a habitat type (riparian scrub) that has declined substantially over past decades; and local breeding populations are considered to be declining. For these reasons, impacts resulting from removal or disturbance of occupied breeding habitat and the potential for mortality of individuals or nests are considered significant. This impact is similar to Impact 4.2-8 described under the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impacts 4.2-1 and 4.2-8 would reduce this impact to a less-than-significant level.

Impact 4.2-36 Significant—Potential disturbance to nesting raptors.

Two nonlisted special-status raptors, osprey and golden eagle, are known or have potential to nest in the Restoration Project area. One active osprey nest was found during surveys; moreover, although no active golden eagle nests were found, suitable golden eagle nesting habitat exists throughout the project area. Construction activities occurring in the immediate vicinity of active nests could cause abandonment of nests and potentially result in death of young or eggs. Osprey and golden eagle are locally and regionally uncommon species, and the abandonment of active nests could affect local and regional breeding populations. Therefore, this impact is considered significant. This impact is similar to Impact 4.2-9. Implementing the Mitigation Measures for Impact 4.2-9 would reduce this impact to a less-than-significant level.

Impact 4.2-37 Significant—Potential disturbance of bats in canal tunnels and on rocky cliffs and outcrops along canyon walls.

Construction activities may disturb special-status bats using tunnels near the South and Inskip Diversion Dams for roosting, breeding, migration, and hibernation habitat. In addition, construction activities may disturb bats that use the rocky cliffs and outcrops along canyon walls at Eagle Canyon and Wildcat Diversion Dams and other areas with potential bat habitat. Although bats were not identified to the specific level during surveys, several species of bats that could be using the tunnels for roosting, breeding, migration, and hibernation habitat are state species of special concern, federal species of concern, and Western Bat Working Group species of high priority. Construction disturbances could affect reproductive success, result in the abandonment of maternity sites, or disturb hibernating colonies. Disturbance at sites that support colonies or large concentrations of roosting bats could result in local population declines. This impact, therefore, is considered significant. This impact is similar to Impact 4.2-10 described under the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-10 would reduce this impact to a less-than-significant level.

Impact 4.2-38 Less than Significant—Possible loss of woody riparian vegetation along the South and Wildcat Canals from cessation of flows.

Under the Six Dam Removal Alternative, the South and Wildcat Diversion Dams would be removed, and flows to the canals would be restored to the original Battle Creek channel. This impact is similar to Impact 4.2-11 described for the

Five Dam Removal Alternative and is considered less than significant. No mitigation is required.

Impact 4.2-39 Less than Significant—Potential disturbance of foraging bald eagles along Battle Creek.

No bald eagle nests were found or are known to occur in the immediate vicinity of the project area. However, bald eagles may forage along North Fork and South Fork Battle Creek during the winter nonbreeding season (October through February). Breeding bald eagles that nest in the surrounding area, but outside the project area, may also use Battle Creek as foraging habitat during the breeding season (March through September). Overall use of the project by bald eagles appears to be low; during all field surveys only two bald eagles were detected flying over the project area, and none were found foraging or roosting in the project area.

The long-term impacts of the project are considered beneficial to bald eagles because the area will be restored to its pre-dam condition, allowing greater movement of fish and creating natural pools. In the short term, construction noise disturbance and helicopter flights associated with restoration activities could temporarily displace roosting or foraging bald eagles. However, because of the low number of bald eagles apparently using the project area and the extent of available habitat throughout the project region, this level of possible displacement is not expected to disrupt overall bald eagle use of the area, affect individual eagles' ability to forage successfully, or affect reproductive effort during any construction year. This impact is therefore considered less than significant.

Impact 4.2-40 Beneficial—Reduction of artificial flow fluctuations and increased survival of amphibians.

Powerhouses, canals, and reliable fish screens are all subject to planned and unplanned outages as part of preventative maintenance and in response to malfunctions. The outages are typically infrequent and of short duration; during outages, water intended to go to the power canals is instead released to Battle Creek below the dam. At the end of outages, the water is again diverted into canals, thereby reducing the flow in the stream channel.

Amphibians typically found in streams like Battle Creek are capable of colonizing areas that are wetted for relatively short periods of time (e.g., several weeks). When the stream below the diversion dams receives all the canal flow during an outage, transitory habitat is created along edges of the stream channel that may remain wet long enough to be colonized by amphibians. When outages end and diversion of flows from the creek resume, the ramping rate may not be slow enough to allow the early amphibian life stages (i.e., eggs and tadpoles) to follow the receding water back to the normally wetted part of the stream.

To some extent the natural hydrograph creates seasonally transitory habitat, but habitat use patterns by amphibians have evolved with the relatively predictable seasonal changes in hydrology, and the rate at which these types of flows recede is generally slower than the ramping rate controlled by the dams. Removal of

diversion dams would eliminate potential for unseasonal changes in transitory habitat in North Fork and South Fork Battle Creek and its tributaries. This would benefit the early life stages of amphibians that may inhabit transitory aquatic habitat.

Under the No Action Alternative, flow reductions below the dams could be abrupt and have the potential to cause stranding or isolation of juvenile fish in the stream channel as the stream margin is dewatered (DFG pers. comm. 2001) and, by extension, the stranding or isolation of early amphibian life stages. Such stranding may cause mortality to amphibians. Under the present FERC license there is no requirement governing the rate of flow changes.

The ramping rate specified in the Six Dam Removal Alternative for dams that would remain in place should improve the survival of early amphibian life stages occupying transient habitat during flow reductions by slowly ramping down the water surface elevation in the stream when returning power canals to service following outages. Improved survival of early amphibian life stages should benefit amphibian populations downstream from dams, as well as populations of species that prey on amphibians.

Impact 4.1-41 Beneficial—Increase in quantity of amphibian habitat resulting from increased minimum instream flows.

The prescribed minimum instream flow releases are generally 5–20 times greater under the Six Dam Removal Alternative than under the FERC license. As discussed in the preceding section (Section 4.1, Fish), these increases in minimum instream flows would significantly affect the amount of wetted habitat available³ (Thomas R. Payne and Associates 1998a). Such increases would benefit animal species using aquatic habitat for foraging or reproduction, such as northwestern pond turtle, foothill yellow-legged frog, and salamanders. In general, aquatic habitat would increase within the mainstem and forks of Battle Creek under the Six Dam Removal Alternative. In no case does the Six Dam Removal Alternative provide less habitat for these organisms. Although not modeled by T. R. Payne and Associates (1998a), the wetted areas of the section of Soap, Lower Ripley, and Baldwin Creeks would also increase dramatically, as the required minimum instream flows would increase from 0 cfs at each of these sites.

Increased wetted habitat would likely lead to corresponding increases in the production of periphyton and aquatic macroinvertebrates, which form the basis of the food chain in stream ecosystems. These organisms provide a primary food source for animal species inhabiting aquatic habitats, such as northwestern pond turtle, foothill yellow-legged frog, and salamanders. Aquatic insects that metamorphose into aerial and terrestrial insects would contribute to the food supply of certain insectivorous wildlife, such as willow flycatcher and several bat species. Furthermore, wildlife species that prey on amphibians, such as green heron and common merganser, would also benefit from increased wetted habitat.

³ Habitat changes of greater than or equal to 10% of maximum weighted usable area were considered significant in this analysis.

Impact 4.1-42 Beneficial—Substantial increase in quantity of bat roosting habitat in the South Canal tunnels due to termination of water flow through the tunnels.

Removal of the South Diversion Dam and associated facilities would result in termination of water flow through the South Canal tunnels. The resultant dry tunnels would potentially provide substantially increased roosting habitat for cave-dwelling bats. The actual use of the tunnels would depend on the new microclimate conditions established after the water flow is stopped.

Three Dam Removal Alternative

The Three Dam Removal Alternative would remove Eagle, Wildcat, and Coleman Diversion Dams. Wildcat Canal would also be removed. Fish screens and fish ladders would be constructed at the North Battle Creek Feeder, South, and Inskip Diversion Dams. Those dams that are not removed would increase flow releases to levels required by AFRP. The Three Dam Removal Alternative would not include construction of a bypass facility at the Inskip Powerhouse; however, this alternative would construct tailrace connectors between South Powerhouse and Inskip Canal, and between Inskip Powerhouse and Coleman Canal to prevent North Battle Creek water from mixing with South Battle Creek water. The Asbury Diversion Dam spill gates would be reoperated and a new gaging system installed to ensure an instream flow release of 5 cfs.

Impacts on the botanical, wetland, and wildlife resources resulting from the construction of fish screens and ladders and the removal of Wildcat, South, and Coleman Diversion Dams would be similar to those described for the Five Dam Removal Alternative (Proposed Action). The proposed construction areas are assumed to be the same for the North Battle Creek Feeder, Eagle Canyon, Wildcat, South, Inskip, and Coleman Diversion Dam sites as under the Five Dam Removal Alternative. However, under the Three Dam Removal Alternative, no construction is anticipated at Soap Creek Feeder, Lower Ripley Creek Feeder, or along the South Canal because these facilities would not be removed but would remain in their current conditions.

The Restoration Project area would experience somewhat lesser long-term benefits to riparian habitat under the Three Dam Removal Alternative than under the Five Dam Removal Alternative because flows would continue to be diverted along South Canal rather than returned to the main stream channel in South Fork Battle Creek. In addition, flow reductions below the remaining diversion dams could be abrupt and have the potential to cause stranding or isolation of early amphibian life stages. Such stranding may cause mortality to amphibians.

The following impacts are associated with the Three Dam Removal Alternative. Total acreage of biological communities and waters of the United States potentially affected for the Three Dam Removal Alternative are summarized in Table 4.2-5.

Impact 4.2-43 Significant—Potential disturbance or loss of 6.0 acres of woody riparian vegetation and associated wildlife habitat.

Like the Five Dam Removal Alternative, the Three Dam Removal Alternative could result in the temporary disturbance or permanent removal of woody riparian vegetation and associated wildlife habitat (Table 4.2-5). This impact is similar to Impact 4.2-1 described for the Five Dam Removal Alternative and is considered significant. Implementing the General Environmental Protection Measures and Mitigation Measures for Impact 4.2-1 would reduce this impact to a less-than-significant level.

Impact 4.2-44 Significant—Potential introduction of noxious weeds or spread of existing noxious weeds.

Construction activities associated with the Three Dam Removal Alternative could introduce or spread noxious weeds into currently uninfested areas, possibly resulting in displacement of special-status plants, alteration of habitat for special-status wildlife, or substantial reduction of species diversity or abundance. Plants or seeds of noxious weeds may be dispersed on construction equipment if appropriate measures are not implemented. This impact is similar to Impact 4.2-2 described under the Five Dam Removal Alternative and could result in a substantial reduction or elimination of species diversity or abundance. This impact is therefore considered significant. Implementing the General Environmental Protection Measures and the Mitigation Measures for Impact 4.2-2 would reduce this impact to a less-than-significant level.

Impact 4.2-45 Significant—Potential loss or disturbance of 11.6 acres of waters of the United States (including wetlands) during construction.

Under the Three Dam Removal Alternative, construction activities could result in the loss or disturbance of approximately 11.6 acres of waters of the United States (including wetlands), resulting in short-term (temporary) and/or long-term (permanent) impacts on wetland communities (Table 4.2-5). As described for the Five Dam Removal Alternative, some additional acreage of waters of the United States may be incidentally filled or disturbed during construction of access roads and establishment of staging areas. The estimated acreage of disturbance or fill material that would be placed into waters of the United States will be determined after detailed design specifications are provided by Reclamation and before obtaining Section 404 Clean Water Act permits. An additional assessment of impacts will be conducted by a wetland ecologist after construction activities are complete. This postconstruction assessment will be used to quantify unanticipated impacts on waters of the United States.

Reclamation will implement measures as part of the project to avoid and minimize impacts on waters of the United States. Although these measures would minimize the extent of potential impacts, some disturbance or loss of waters of the United States would be necessary in order to construct the Restoration Project.

Because the proposed project could result in the placement of fill material into waters of the United States, this impact would be considered significant. This

impact is similar to Impact 4.2-3 described under the Five Dam Removal Alternative and is considered significant. Implementing the General Environmental Protection Measures; Mitigation Measures for Impact 4.4-1 in Section 4.4, Water Quality; Mitigation Measures for Impact 4.7-1 in Section 4.7, Geology and Soils; and the Mitigation Measure for Impact 4.2-3 would reduce this impact to a less-than-significant level.

Impact 4.2-46 Significant—Potential loss or disturbance of common upland woodland and forest communities and associated wildlife habitat.

The Three Dam Removal Alternative could result in the loss or disturbance of common woodland and forest communities, including gray pine/oak, blue oak, and/or live oak woodland, and westside ponderosa forest (Table 4.2-5). As described for the Five Dam Removal Alternative, most of the plant communities contain native oaks that could be removed during construction of access roads, staging areas, and other project features. These activities could result in short-term or long-term impacts on the oak woodlands and other common plant communities in the Restoration Project area. The estimated acreage of disturbance or loss of these communities will be determined after detailed design specifications are provided by Reclamation. An additional assessment of impacts will be performed by a plant ecologist after construction activities are complete. This postconstruction assessment will be used to quantify unanticipated impacts on the plant communities.

Oak woodland provides important foraging habitat for several species of wildlife, including mammals, birds, and reptiles. A variety of raptors use oak woodland habitat for nesting. The removal of these woodland habitats could result in the substantial loss or degradation of a plant community and associated wildlife habitat and the disruption of natural wildlife movement corridors. Therefore, this impact is considered significant. This impact is similar to Impact 4.2-4 described under the Five Dam Removal Alternative and is considered significant. Implementing the General Environmental Protection Measures and the Mitigation Measure for Impact 4.2-4 would reduce this impact to a less-than-significant level.

Impact 4.2-47 Significant—Potential disturbance to valley elderberry longhorn beetle habitat.

Seventeen elderberry shrubs capable of providing habitat for valley elderberry longhorn beetle occur in the project area. Most of these shrubs are along roadsides and would be subject to either direct or indirect disturbance from road improvement activities. Some, such as those near the Eagle Canyon Diversion Dam, are in the immediate vicinity of project features. USFWS considers any ground-disturbing activity within 100 feet of an elderberry shrub within the range of valley elderberry longhorn beetle to be a potential take of the species (as defined under the federal Endangered Species Act). Because valley elderberry longhorn beetle is federally listed and because construction activities could directly or indirectly affect elderberry shrubs potentially resulting in take of this species, this impact is considered significant. This impact is similar to Impact

4.2-5. Implementing the Mitigation Measures for Impact 4.2-5 would reduce this impact to a less-than-significant level.

Impact 4.2-48 Significant—Potential disturbance of foothill yellow-legged frog habitat.

Surveys conducted for the Restoration Project indicate that foothill yellow-legged frog occurs in the project area. Construction activities could temporarily degrade foothill yellow-legged frog habitat at the Inskip Diversion Dam/South Powerhouse and South Diversion Dam sites. Restoration activities in these areas could disturb the shallow, rocky substrate required by foothill yellow-legged frogs and increase flows in areas that have been constrained by dam operations for many years. In addition, individual frogs could be killed during construction. The overall effects of the project, however, are considered beneficial to this species because the process of restoring the affected drainages will ultimately return them to an approximation of their former natural conditions. Nonetheless, because this species has declined throughout its range, and in particular throughout the Sierra Nevada, the short-term effects of the project are considered significant. Accordingly, mitigation will focus on avoiding killing or injuring frogs in construction areas. This impact is similar to Impact 4.2-6 described for the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-6 would reduce this impact to a less-than-significant level.

Impact 4.2-49 Significant—Potential disturbance of northwestern pond turtle habitat.

Surveys conducted for the Restoration Project indicate that northwestern pond turtle occurs in the project area. Construction activities could temporarily degrade habitat for this species at the Inskip Diversion Dam/South Powerhouse and South Diversion Dam sites. Restoration activities in these areas could disturb the pond and other open water habitats and basking sites required by northwestern pond turtles, and increase flows in areas that have been constrained by dam operations for many years. In addition, individual turtles could be killed during construction. The overall effects of the project, however, are considered beneficial to this species because the process of restoring the affected drainages will ultimately return them to an approximation of their former natural conditions. Nonetheless, because this species has declined throughout its range, the short-term potential for mortality is considered significant. Accordingly, mitigation will focus on avoiding killing or injuring turtles in construction areas. This impact is similar to Impact 4.2-7 described under the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-7 would reduce this impact to a less-than-significant level.

Impact 4.2-50 Significant—Potential disturbance of breeding habitat for yellow-breasted chat.

During surveys for the Restoration Project, yellow-breasted chats were detected and are considered to be breeding at two sites in the project area: Darrah Springs Feeder and Coleman Diversion Dam/Inskip Powerhouse. No construction is proposed at Darrah Springs under this alternative; however, construction at the Coleman Diversion Dam/Inskip Powerhouse could potentially remove riparian scrub habitat required by this species for breeding and cover. Impacts on this

habitat during the breeding season could also result in destruction of active nests and mortality of individual chats or their eggs. Yellow-breasted chat is an uncommon species in California; it is restricted to a habitat type (riparian scrub) that has declined substantially over past decades; and local breeding populations are considered to be declining. For these reasons, impacts resulting from removal or disturbance of occupied breeding habitat and the potential for mortality of individuals or nests are considered significant. This impact is similar to Impact 4.2-8 described for the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impacts 4.2-1 and 4.2-8 would reduce this impact to a less-than-significant level.

Impact 4.2-51 Significant—Potential disturbance to nesting raptors.

Two nonlisted special-status raptors, osprey and golden eagle, are known or have potential to nest in the Restoration Project area. One active osprey nest was found during surveys; moreover, although no active golden eagle nests were found, suitable golden eagle nesting habitat exists throughout the project area. Construction activities occurring in the immediate vicinity of active nests could cause abandonment of nests and potentially result in death of young or eggs. Osprey and golden eagle are locally and regionally uncommon species, and the abandonment of active nests could affect local and regional breeding populations. Therefore, this impact is considered significant. This impact is similar to Impact 4.2-9. Implementing the Mitigation Measures for Impact 4.2-9 would reduce this impact to a less-than-significant level.

Impact 4.2-52 Significant—Potential disturbance of bats in canal tunnels and on rocky cliffs and outcrops along canyon walls.

Construction activities may disturb special-status bats using tunnels near the South and Inskip Diversion Dams for roosting, breeding, migration, and hibernation habitat. In addition, construction activities may disturb bats that use the rocky cliffs and outcrops along canyon walls at Eagle Canyon and Wildcat Diversion Dams and other areas with potential bat habitat. Although bats were not identified to the specific level during surveys, several species of bats that could be using the tunnels for roosting, breeding, migration, and hibernation habitat are state species of special concern, federal species of concern, and Western Bat Working Group species of high priority. Construction disturbances could affect reproductive success, result in the abandonment of maternity sites, or disturb hibernating colonies. Disturbance at sites that support colonies or large concentrations of roosting bats could result in local population declines. This impact, therefore, is considered significant. This impact is similar to Impact 4.2-10 described under the Five Dam Removal Alternative. Implementing the Mitigation Measures for Impact 4.2-10 would reduce this impact to a less-than-significant level.

Impact 4.2-53 Less than Significant—Possible loss of woody riparian vegetation along the Wildcat Canal from cessation of flows.

Under the Three Dam Removal Alternative, the Wildcat Diversion Dam would be removed, and flows to the Wildcat Canal would be restored to the original channel along North Fork Battle Creek. This impact is similar to Impact 4.2-11

described under the Five Dam Removal Alternative and is considered less than significant. No mitigation is required.

Impact 4.2-54 Less than Significant—Potential disturbance of foraging bald eagles along Battle Creek.

No bald eagle nests were found or are known to occur in the immediate vicinity of the project area. However, bald eagles may forage along North Fork and South Fork Battle Creek during the winter nonbreeding season (October through February). Breeding bald eagles that nest in the surrounding area, but outside the project area, may also use Battle Creek as foraging habitat during the breeding season (March through September). Overall use of the project by bald eagles appears to be low; during all field surveys only two bald eagles were detected flying over the project area, and none were found foraging or roosting in the project area.

The long-term impacts of the project are considered beneficial to bald eagles because the area will be restored to its pre-dam condition, allowing greater movement of fish and creating natural pools. In the short term, construction noise disturbance and helicopter flights associated with restoration activities could temporarily displace roosting or foraging bald eagles. However, because of the low number of bald eagles apparently using the project area and the extent of available habitat throughout the project region, this level of possible displacement is not expected to disrupt overall bald eagle use of the area, affect individual eagles' ability to forage successfully, or affect reproductive effort during any construction year. This impact is therefore considered less than significant.

Impact 4.2-55 Beneficial—Reduction of artificial flow fluctuations and increased survival of amphibians.

Powerhouses, canals, and reliable fish screens are all subject to planned and unplanned outages as part of preventative maintenance and in response to malfunctions. The outages are typically infrequent and of short duration; during outages, water intended to go to the power canals is instead released to Battle Creek below the dam. At the end of outages, the water is again diverted into canals, thereby reducing the flow in the stream channel.

Amphibians typically found in streams like Battle Creek are capable of colonizing areas that are wetted for relatively short periods of time (e.g., several weeks). When the stream below the diversion dams receives all the canal flow during an outage, transitory habitat is created along edges of the stream channel that may remain wet long enough to be colonized by amphibians. When outages end and diversion of flows from the creek resume, the ramping rate may not be slow enough to allow the early amphibian life stages (i.e., eggs and tadpoles) to follow the receding water back to the normally wetted part of the stream.

To some extent the natural hydrograph creates seasonally transitory habitat, but habitat use patterns by amphibians have evolved with the relatively predictable seasonal changes in hydrology, and the rate at which these types of flows recede is generally slower than the ramping rate controlled by the dams. Removal of

diversion dams would eliminate potential for unseasonal changes in transitory habitat in North Fork and South Fork Battle Creek and its tributaries. This would benefit the early life stages of amphibians that may inhabit transitory aquatic habitat.

Under the No Action Alternative, flow reductions below the dams could be abrupt and have the potential to cause stranding or isolation of juvenile fish in the stream channel as the stream margin is dewatered (DFG pers. comm. 2001) and, by extension, causing stranding or isolation of early amphibian life stages. Such stranding may cause mortality to amphibians. Under the present FERC license there is no requirement governing the rate of flow changes.

The ramping rate specified in the Three Dam Removal Alternative for dams that would remain in place should improve the survival of early amphibian life stages occupying transient habitat during flow reductions by slowly ramping down the water surface elevation in the stream when returning power canals to service following outages. Improved survival of early amphibian life stages should benefit amphibian populations downstream from dams, as well as populations of species that prey on amphibians.

Impact 4.1-56 Beneficial— Substantial increase in quantity of amphibian habitat resulting from increased minimum instream flows.

The prescribed minimum instream flow releases are generally 5–20 times greater under the Three Dam Removal Alternative than under the FERC license. As discussed in the preceding fisheries section, these increases in minimum instream flows would significantly affect the amount of wetted habitat available⁴ (Thomas R. Payne and Associates 1998a). Such increases would benefit animal species using aquatic habitat for foraging or reproduction, such as northwestern pond turtle, foothill yellow-legged frog, and salamanders. In general, aquatic habitat would increase within the mainstem and forks of Battle Creek under the Three Dam Removal Alternative. In no case does the Three Dam Removal Alternative provide less habitat for these organisms.

Increased wetted habitat would likely lead to corresponding increases in the production of periphyton and aquatic macroinvertebrates, which form the basis of the food chain in stream ecosystems. These organisms provide a primary food source for animal species inhabiting aquatic habitats, such as northwestern pond turtle, foothill yellow-legged frog, and salamanders. Aquatic insects that metamorphose into aerial and terrestrial insects would contribute to the food supply of certain insectivorous wildlife, such as willow flycatcher and several bat species. Furthermore, wildlife species that prey on amphibians, such as green heron and common merganser, would also benefit from increased wetted habitat.

⁴ Habitat changes of greater than or equal to 10% of maximum weighted usable area were considered significant in this analysis.

Cumulative Impacts

The area for analyzing cumulative impacts on botanical, wetland, and wildlife resources (collectively referred to as biological resources in this cumulative impact analysis) was determined to be Tehama and Shasta Counties and the surrounding watershed of Battle Creek. The area within these counties and the Battle Creek watershed represent the probable area in which project effects on biological resources could interact with other development and have significant cumulative effects on sensitive biological resources.

This cumulative impacts analysis considered the following factors to determine if the Restoration Project would result in significant cumulative impacts on biological resources:

- historical and current known distribution of special-status species and sensitive biological communities within Tehama and Shasta Counties and statewide;
- extent of sensitive biological resources protected on public lands and current known threats to these resources on private lands (e.g., proposed development, current agricultural practices, and land management practices); and
- documented impacts associated with approved or pending future projects within the counties and Battle Creek watershed (including proposed modifications at the Coleman National Fish Hatchery).

Based on these evaluation criteria, the Restoration Project would not have a cumulatively significant impact on biological resources that are known to occur in Shasta and Tehama Counties and the surrounding watershed. No additional mitigation is required beyond that proposed for each potential impact described above.

Table 4.2-1. Plant Communities and Associated Wildlife Habitats Observed at the Restoration Project Sites¹

| Restoration Project Site | Annual Grassland | Mixed Chaparral | Live Oak Woodland | Blue Oak Woodland/Savanna | Gray Pine/Oak Woodland | Westside Ponderosa Pine Forest | Emergent Wetland | Seasonal Wetland | Emergent Scrub Wetland | Groundwater Seep | Riparian Forest/Riparian Scrub |
|--|------------------|-----------------|-------------------|---------------------------|------------------------|--------------------------------|------------------|------------------|------------------------|------------------|--------------------------------|
| North Battle Creek Feeder Diversion Dam | | | X | | X | X | | | | | X |
| Eagle Canyon Diversion Dam | | | X | | | | | | | X | X |
| Wildcat Diversion Dam/Wildcat Pipeline | X | X | | X | | | | | | | X |
| Coleman Diversion Dam/Inskip Powerhouse ² | X | | X | X | X | | X | X | X | | X |
| Lower Ripley Creek Feeder | X | | | X | | | | | | | X |
| Inskip Diversion Dam/South Powerhouse | X | | X | | | | X | X | | | X |
| Soap Creek Feeder Diversion Dam | X | X | X | X | X | | | | | | X |
| South Diversion Dam/South Battle Creek Canal | | X | | | X | | | | | | X |

Notes:

¹ This table does not include plant communities and associated wildlife habitats observed in existing access roads or potential staging areas.

² The Coleman Diversion Dam/Inskip Powerhouse site includes plant community and associated wildlife habitat observations at the Penstock Junction Box.

Table 4.2-2. Biological Communities and Waters of the United States Potentially Affected by the Five Dam Removal Alternative

| Restoration Project Site | Biological Communities (acres) | | | | | | Waters of the United States (acres) | | | | |
|---|--------------------------------|---------------------------|------------------------|-------------------|-----------------|--------------------------------|-------------------------------------|------------------|--------------------|-------------------|------------------|
| | Annual Grassland | Blue Oak Woodland/Savanna | Grey Pine/Oak Woodland | Live Oak Woodland | Mixed Chaparral | Riparian Forest/Riparian Scrub | Emergent Wetland | Seasonal Wetland | Perennial Drainage | Seasonal Drainage | Groundwater Seep |
| North Battle Creek Diversion Dam | 1.8 | 0.0 | 0.0 | 1.5 | 1.5 | 0.4 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |
| Eagle Canyon Diversion Dam | 0.0 | 0.3 | 0.7 | 1.4 | 0.4 | 1.3 | 0.0 | 0.0 | 1.1 ^a | 0.0 | 0.5 |
| Wildcat Diversion Dam | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.2 ^b | 0.0 | 0.0 |
| Wildcat Canal | 0.2 | 2.5 | 1.7 | 0.0 | 1.3 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| South Diversion Dam | 0.0 | 0.0 | 0.2 | 3.5 | 0.2 | 0.4 | 0.0 | 0.0 | 4.4 ^c | 0.0 | 0.0 |
| South Battle Creek Canal | 0.1 | 24.8 | 0.0 | 11.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| Soap Creek Feeder | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Inskip Diversion Dam-South Powerhouse | 4.5 | 2.9 | 0.3 | 7.8 | 0.0 | 0.1 | 0.0 | 0.6 | 1.8 ^a | 0.0 | 0.0 |
| Lower Ripley Creek Feeder | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 | 0.3 ^d | 0.0 | 0.0 |
| Coleman Diversion Dam-Inskip Powerhouse | 4.6 | 19.1 | 0.3 | 0.4 | 0.0 | 1.2 | 0.1 | 0.0 | 2.1 ^a | 0.1 | 0.0 |
| Total Acres Affected | 11.2 | 49.6 | 3.4 | 25.9 | 3.4 | 7.2 | 0.1 | 0.6 | 10.7 | 0.2 | 0.5 |

^a Partially refers to South Fork of Battle Creek; total acres extend beyond detail area.

^b Partially refers to North Fork of Battle Creek; total acres extend beyond detail area.

^c Partially refers to South Fork of Battle Creek, or Soap Creek; total acres extend beyond detail area.

^d Partially refers to Ripley Creek; total acres extend beyond detail area.

Table 4.2-3. Biological Communities and Waters of the United States Potentially Affected by the No Dam Removal Alternative

| Restoration Project Site | Biological Communities (acres) | | | | | | Waters of the United States (acres) | | | | |
|---|--------------------------------|---------------------------|------------------------|-------------------|-----------------|--------------------------------|-------------------------------------|------------------|--------------------|-------------------|------------------|
| | Annual Grassland | Blue Oak Woodland/Savanna | Grey Pine/Oak Woodland | Live Oak Woodland | Mixed Chaparral | Riparian Forest/Riparian Scrub | Emergent Wetland | Seasonal Wetland | Perennial Drainage | Seasonal Drainage | Groundwater Seep |
| North Battle Creek Diversion Dam | 1.8 | 0.0 | 0.0 | 1.5 | 1.5 | 0.4 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |
| Eagle Canyon Diversion Dam | 0.0 | 0.3 | 0.7 | 1.4 | 0.4 | 1.3 | 0.0 | 0.0 | 1.1 ^a | 0.0 | 0.5 |
| Wildcat Diversion Dam | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.2 ^b | 0.0 | 0.0 |
| Wildcat Canal | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| South Diversion Dam | 0.0 | 0.0 | 0.2 | 3.5 | 0.2 | 0.4 | 0.0 | 0.0 | 4.4 ^c | 0.0 | 0.0 |
| South Battle Creek Canal | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Soap Creek Feeder | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Inskip Diversion Dam-South Powerhouse | 4.5 | 2.9 | 0.3 | 7.8 | 0.0 | 0.1 | 0.0 | 0.6 | 1.8 ^A | 0.0 | 0.0 |
| Lower Ripley Creek Feeder | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Coleman Diversion Dam-Inskip Powerhouse | 4.6 | 19.1 | 0.3 | 0.4 | 0.0 | 1.2 | 0.1 | 0.0 | 2.1 ^A | 0.1 | 0.0 |
| Total Acres Affected | 10.9 | 22.3 | 1.7 | 14.6 | 2.1 | 4.1 | 0.1 | 0.6 | 10.3 | 0.1 | 0.5 |

^a Partially refers to South Fork of Battle Creek; total acres extend beyond detail area.

^b Partially refers to North Fork of Battle Creek; total acres extend beyond detail area.

^c Partially refers to South Fork of Battle Creek, or Soap Creek; total acres extend beyond detail area.

Table 4.2-4. Biological Communities and Waters of the United States Potentially Affected by the Six Dam Removal Alternative

| Restoration Project Site | Biological Communities (acres) | | | | | | Waters of the United States (acres) | | | | |
|---|--------------------------------|---------------------------|------------------------|-------------------|-----------------|--------------------------------|-------------------------------------|------------------|--------------------|-------------------|------------------|
| | Annual Grassland | Blue Oak Woodland/Savanna | Grey Pine/Oak Woodland | Live Oak Woodland | Mixed Chaparral | Riparian Forest/Riparian Scrub | Emergent Wetland | Seasonal Wetland | Perennial Drainage | Seasonal Drainage | Groundwater Seep |
| North Battle Creek Diversion Dam | 1.8 | 0.0 | 0.0 | 1.5 | 1.5 | 0.4 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |
| Eagle Canyon Diversion Dam | 0.0 | 0.3 | 0.7 | 1.4 | 0.4 | 1.3 | 0.0 | 0.0 | 1.1 ^a | 0.0 | 0.5 |
| Wildcat Diversion Dam | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.2 ^b | 0.0 | 0.0 |
| Wildcat Canal | 0.2 | 2.5 | 1.7 | 0.0 | 1.3 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| South Diversion Dam | 0.0 | 0.0 | 0.2 | 3.5 | 0.2 | 0.4 | 0.0 | 0.0 | 4.4 ^c | 0.0 | 0.0 |
| South Battle Creek Canal | 0.1 | 24.8 | 0.0 | 11.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.1 | 0.0 |
| Soap Creek Feeder | 0.0 | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Inskip Diversion Dam-South Powerhouse | 4.5 | 2.9 | 0.3 | 7.8 | 0.0 | 0.1 | 0.0 | 0.6 | 1.8 ^a | 0.0 | 0.0 |
| Lower Ripley Creek Feeder | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.2 | 0.0 | 0.0 | 0.3 ^d | 0.0 | 0.0 |
| Coleman Diversion Dam-Inskip Powerhouse | 4.6 | 19.1 | 0.3 | 0.4 | 0.0 | 1.2 | 0.1 | 0.0 | 2.1 ^a | 0.1 | 0.0 |
| Total Acres Affected | 11.2 | 49.6 | 3.4 | 25.9 | 3.4 | 7.2 | 0.1 | 0.6 | 10.7 | 0.2 | 0.5 |

^a Partially refers to South Fork of Battle Creek; total acres extend beyond detail area.

^b Partially refers to North Fork of Battle Creek; total acres extend beyond detail area.

^c Partially refers to South Fork of Battle Creek, or Soap Creek; total acres extend beyond detail area.

^d Partially refers to Ripley Creek; total acres extend beyond detail area.

Table 4.2-5. Biological Communities and Waters of the United States Potentially Affected by the Three Dam Removal Alternative

| Restoration Project Site | Biological Communities (acres) | | | | | | Waters of the United States (acres) | | | | |
|---|--------------------------------|---------------------------|------------------------|-------------------|-----------------|--------------------------------|-------------------------------------|------------------|--------------------|-------------------|------------------|
| | Annual Grassland | Blue Oak Woodland/Savanna | Grey Pine/Oak Woodland | Live Oak Woodland | Mixed Chaparral | Riparian Forest/Riparian Scrub | Emergent Wetland | Seasonal Wetland | Perennial Drainage | Seasonal Drainage | Groundwater Seep |
| North Battle Creek Diversion Dam | 1.8 | 0.0 | 0.0 | 1.5 | 1.5 | 0.4 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 |
| Eagle Canyon Diversion Dam | 0.0 | 0.3 | 0.7 | 1.4 | 0.4 | 1.3 | 0.0 | 0.0 | 1.1 ^a | 0.0 | 0.5 |
| Wildcat Diversion Dam | 0.0 | 0.0 | 0.2 | 0.0 | 0.0 | 0.7 | 0.0 | 0.0 | 0.2 ^b | 0.0 | 0.0 |
| Wildcat Canal | 0.2 | 2.5 | 1.7 | 0.0 | 1.3 | 1.9 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| South Diversion Dam | 0.0 | 0.0 | 0.2 | 3.5 | 0.2 | 0.4 | 0.0 | 0.0 | 4.4 ^c | 0.0 | 0.0 |
| South Battle Creek Canal | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Soap Creek Feeder | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Inskip Diversion Dam-South Powerhouse | 4.5 | 2.9 | 0.3 | 7.8 | 0.0 | 0.1 | 0.0 | 0.6 | 1.8 ^a | 0.0 | 0.0 |
| Lower Ripley Creek Feeder | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA | NA |
| Coleman Diversion Dam-Inskip Powerhouse | 4.6 | 19.1 | 0.3 | 0.4 | 0.0 | 1.2 | 0.1 | 0.0 | 2.1 ^a | 0.1 | 0.0 |
| Total Acres Affected | 11.1 | 24.8 | 3.4 | 14.6 | 3.4 | 6.0 | 0.1 | 0.6 | 10.3 | 0.1 | 0.5 |

^a Partially refers to South Fork of Battle Creek; total acres extend beyond detail area.

^b Partially refers to North Fork of Battle Creek; total acres extend beyond detail area.

^c Partially refers to South Fork of Battle Creek, or Soap Creek; total acres extend beyond detail area.

Table 4.2-6. Special-Status Plants Documented as Potentially Occurring and/or Observed during the 2000 Survey in the Restoration Project Area

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | | Distribution | Habitat Association | Occurrence in Restoration Project area | Period of Identification ² |
|--|---------------------------|-------|------|---|--|--|--|
| | Federal | State | CNPS | | | | |
| State- and Federally Listed Plants | | | | | | | |
| Boggs Lake hedge-hyssop ³ <i>Gratiola heterosepala</i> | – | E | 1B | Fresno, Lake, Lassen, Madera, Modoc, Placer, Sacramento, Shasta, San Joaquin, Solano, and Tehama Counties; also in Oregon | Shallow water, vernal pools, marshes, and lake margins (below 3,940 feet elevation) | Not observed during surveys | April–June |
| Slender Orcutt grass ³ <i>Orcuttia tenuis</i> | T | E | 1B | Lake, Lassen, Plumas, Sacramento, Shasta, Siskiyou, and Tehama Counties | Vernal pools (660 to 5,760 feet elevation) | Not observed during surveys | May–July |
| CNPS List 2 and 1B Plants | | | | | | | |
| Dimorphic snapdragon <i>Antirrhinum subcordatum</i> | – | – | 1B | Colusa, Glenn, Lake, and Tehama Counties | Chaparral, lower conifer forest, and sometimes on serpentine (980 to 2,600 feet elevation) | Not observed during surveys | April–July |
| Big-scale balsamroot <i>Balsamorhiza macrolepis</i> var. <i>macrolepis</i> | – | – | 1B | Alameda, Butte, Mariposa, Napa, Placer, Santa Clara, and Tehama Counties | Cismontane woodland, valley and foothill grassland, and sometimes serpentine (below 4,600 feet elevation) | Not observed during surveys | March–June |
| Silky cryptantha ³ <i>Cryptantha crinita</i> | SC | – | 1B | Shasta and Tehama Counties | Cismontane woodland, lower conifer forest, riparian forests, riparian woodland, and gravelly areas with valley foothill grasslands (490 to 990 feet elevation) | Known from several occurrences along the edge of Battle Creek; no populations documented during 2000 field surveys | April–May |
| Dwarf downingia <i>Downingia pusilla</i> | – | – | 2 | Merced, Mariposa, Napa, Placer, Sacramento, Solano, Sonora, Stanislaus, and Tehama Counties | Vernal pools and other seasonally wet places in valley and foothill annual grasslands (490 feet elevation) | Not observed during surveys | March–May |
| Four-angled spikerush <i>Eleocharis quadrangularis</i> | – | – | 2 | Butte, Merced, and Tehama Counties | Marshes and swamps with seasonally or permanently saturated soils (below 1,600 feet elevation) | Not observed during surveys | July–September |
| Brandegee’s eriastrum <i>Eriastrum brandegeae</i> | SC | – | 1B | Colusa, Glenn, Lake, Santa Clara, Tehama, and Trinity Counties | Chaparral, and cismontane woodland on volcanic soil (2,600 to 3,300 feet elevation) | Not observed during surveys | May–August |

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | | Distribution | Habitat Association | Occurrence in Restoration Project area | Period of Identification ² |
|---|---------------------------|-------|------|--|--|---|--|
| | Federal | State | CNPS | | | | |
| Adobe-lily <i>Fritillaria puriflora</i> | SC | – | 1B | Butte, Colusa, Glenn, Lake, Napa, Plumas, Solano, and Tehama Counties | Chaparral, cismontane woodland, and clayey foothill valley grasslands (below 1,640 feet elevation) | Not observed during surveys | February–April |
| Red Bluff dwarf rush ³ <i>Juncus leiospermus</i> var. <i>leiospermus</i> | – | – | 1B | Butte, Shasta, and Tehama Counties | Vernal pools and other seasonally wet sites in chaparral, oak woodland, and annual grassland (900 to 1,620 feet elevation) | Not observed during surveys | March–May |
| Legenere <i>Legenere limosa</i> | SC | – | 1B | Lake, Napa, Placer, Sacramento, San Mateo, Solano, Sonoma, Stanislaus, and Tehama Counties | Vernal pools (below 490 feet elevation) | Not observed during surveys | May–June |
| Red-flowered lotus <i>Lotus rubriflorus</i> | SC | – | 1B | Colusa, Stanislaus, and Tehama Counties | Cismontane woodland and foothill valley grassland (±660 feet elevation) | Not observed during surveys | April–June |
| Ahart's paronychia ³ <i>Paronychia ahartii</i> | SC | – | 1B | Butte, Shasta, and Tehama Counties | Well-drained rocky outcrops, often vernal pool edges, volcanic uplands (below 1,650 feet elevation) | Not observed during surveys | April–June |
| White-stemmed pondweed* <i>Potamogeton praelongus</i> | – | – | 2 | Lassen, Plumas, Shasta, and Sierra Counties; also in Washington and Oregon | Marshes and swamps with deep water (lakes) (5,900 to 9,800 feet elevation) | Not observed during surveys | July–August |
| Eel-grass pondweed <i>Potamogeton zosteriformis</i> | – | – | 2 | Contra Costa, Lake, Lassen, Modoc, and Shasta Counties; also in Washington and Oregon | Marshes and swamps (below 4,300 feet elevation) | Not observed during surveys | June–July |
| Sanford's arrowhead <i>Sagittaria sanfordii</i> | SC | – | 1B | Butte, Del Norte, Fresno, Kern, Merced, Marin, Orange, Sacramento, Shasta, San Joaquin, Tehama, and Ventura Counties | Slow-moving water often within saltwater and freshwater marshes (above 990 feet elevation) | Not observed during surveys | May–August |
| Water bulrush <i>Scirpus subterminalis</i> | – | – | 2 | Butte, Plumas, Tehama, El Dorado, Del Norte, and Humboldt Counties; also in Oregon | Lake margins, ponds, and marshes (2,460 to 7,385 feet elevation) | Not observed during surveys | July–August |
| Marsh skullcap <i>Scutellaria galericulata</i> | – | – | 2 | Plumas, Placer, Nevada, El Dorado, and Shasta Counties | Wet meadows, marshes, and stream banks in montane conifer forest (3,275 to 6,895 feet elevation) | Not observed during surveys | June–September |

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | | Distribution | Habitat Association | Occurrence in Restoration Project area | Period of Identification ² |
|--|---------------------------|-------|----------------|--|--|--|--|
| | Federal | State | CNPS | | | | |
| Canyon Creek stonecrop <i>Sedum paradisum</i> | SC | – | 1B | Shasta and Trinity Counties | Broad-leaved upland forest, chaparral, lower montane conifer forest, and subalpine conifer forest on granitic outcrops (980 to 4,600 feet elevation) | Not observed during surveys | May–June |
| Obtuse starwort ³ <i>Stellaria obtusa</i> | – | – | 2 | Butte, Glenn, Humboldt, and Tuolumne Counties; also in Idaho, Oregon, and Washington | Mesic areas in upper montane conifer forest (5,250 to 6,500 feet elevation) | Not observed during surveys | July |
| Western compton <i>Silene occidentalis</i> ssp. <i>longistipitata</i> | – | – | 1B | Butte, Plumas, Shasta, and Tehama Counties | Chaparral and lower montane conifer forest (3,280 to 6,565 feet elevation) | Not observed during surveys | July–August |
| CNPS List 3 and 4 Plants | | | | | | | |
| Henderson's bent grass ³ <i>Agrostis hendersonii</i> | – | – | 3 | Butte, Calaveras, Merced, and Shasta Counties; also in Oregon | Valley and foothill grasslands and vernal pools (3,000 to 3,500 feet elevation) | Not observed during surveys | April–May |
| Sanborn's onion <i>Allium sanbornii</i> var. <i>sanbornii</i> | – | – | 4 | Butte, Calaveras, El Dorado, Nevada, Placer, Tehama, and Yuba Counties; also in Oregon | Gravelly areas on serpentinite substrates in chaparral, oak woodland, and lower montane coniferous forest (980 to 4,495 feet elevation) | Not observed during surveys | May–September |
| Depauperate milk-vetch ⁴ <i>Astragalus pauperculus</i> | – | – | 4 | Butte, Placer, Shasta, Tehama, and Yuba Counties | Open, vernal moist, volcanic clay soils in oak woodland and annual grassland (490 to 1,970 feet elevation) | 27 occurrences documented at 6 Restoration Project sites | March–May |
| Marsh claytonia <i>Claytonia palustris</i> | – | – | 4 | Butte, Fresno, Plumas, Siskiyou, Tehama, and Tulare Counties | Montane marshes, meadows, springs, and stream banks (3,280 to 8,205 feet elevation) | Not observed during surveys | June–August |
| Hot rock daisy <i>Erigeron inornatus</i> var. <i>calidipetris</i> | – | – | 4 | Butte, Modoc, Plumas, Shasta, and Tehama Counties | Sandy, volcanic soils in lower montane conifer forest (3,600 to 4,600 feet elevation) | Not observed during surveys | June–September |
| Butte County fritillary ³ <i>Fritillaria eastwoodiae</i> | – | – | 3 ⁵ | Butte, Shasta, Tehama, and Yuba Counties | Chaparral, cismontane woodland, and lower montane conifer forest (1,640 to 4,900 feet elevation) | Not observed during surveys | March–May |
| Woolly meadowfoam ⁴ <i>Limnanthes floccosa</i> ssp. <i>floccosa</i> | – | – | 4 | Butte, Lake, Shasta, Tehama, and Trinity Counties; also in Oregon | Vernal pools, moist meadows, and other seasonally wet habitats in oak woodland and valley and foothill annual grassland (33 to 1,320 feet elevation) | 14 occurrences documented at 3 Restoration Project sites | March–June |

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | | Distribution | Habitat Association | Occurrence in Restoration Project area | Period of Identification ² |
|---|---------------------------|-------|------|---|---|---|--|
| | Federal | State | CNPS | | | | |
| Shield-bracted monkeyflower ⁴ <i>Mimulus glaucescens</i> | – | – | 4 | Butte, Colusa, Lake, and Tehama Counties | Seeps and other wet places in foothill woodland and foothill annual grassland (below 1,970 feet elevation) | 19 occurrences documented at 4 Restoration Project sites | March–May |
| Bidwell's knotweed ⁴ <i>Polygonum bidwelliae</i> | – | – | 4 | Butte, Shasta, and Tehama Counties | Thin volcanic soils of openings in chaparral, oak woodland, and valley and foothill grasslands (195 to 3,940 feet elevation) | One occurrence documented in the Restoration Project | April–June |
| Pale yellow stonecrop <i>Sedum laxum</i> ssp. <i>flavidum</i> | – | – | 4 | Glenn, Humboldt, Shasta, Siskiyou, Tehama, and Trinity Counties | Serpentine or volcanic outcrops in broad- leaved upland forest, chaparral, cismontane woodland, and lower montane conifer forest (2,600 to 6,500 feet elevation) | Not observed during surveys | May–July |

¹ Status explanation:

Federal

T = Listed as threatened under the Federal Endangered Species Act

SC = Species of concern; species for which existing information indicates it may warrant listing but for which substantial biological information to support a proposed rule is lacking

– = No listing

State

E = Listed as endangered under the California Endangered Species Act

– = No listing

CNPS

1B = List 1B species: rare, threatened, or endangered in California and elsewhere

2 = List 2 species: rare, threatened, or endangered in California but more common elsewhere

3 = List 3 species: plants about which more information is needed to determine their status

4 = List 4 species: plants of limited distribution

² Period of Identification refers to the expected flowering period for the species. This period is considered a guide for the best time to survey for the species.

³ Species identified in the CNDDDB search (DFG 2000)

⁴ Species was located during spring and summer 2000 field surveys

⁵ *Fritillaria eastwoodiae* was recently listed as a CNPS List 3 species because of taxonomic problems; however, it could possibly be relisted as a CNPS List 1B species.

Table 4.2-7. Special-Status Wildlife Documented or Identified as Potentially Occurring in the Restoration Project Area

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | Distribution | Habitat Association | Occurrence in the Restoration Project area |
|---|---------------------------|-------------|---|---|--|
| | Federal | State, WBWG | | | |
| Insects | | | | | |
| Valley elderberry longhorn beetle <i>Desmocerus californicus dimorphus</i> | FT, FS | – | Streamside habitats below 3,000 feet throughout the Central Valley | Riparian and oak savanna habitats with elderberry shrubs (the host plant) | Not observed during surveys; no CNDDDB record |
| Amphibians | | | | | |
| California red-legged frog <i>Rana aurora draytonii</i> | FT | SSC | Along the coast and coastal mountain ranges of California from Marin to San Diego County and in the Sierra Nevada from Tehama to Fresno County | Permanent and semipermanent aquatic habitats, such as creeks and coldwater ponds, with emergent and submergent vegetation; may estivate in rodent burrows or cracks during dry periods | Not observed during surveys; no CNDDDB record |
| Foothill yellow-legged frog <i>Rana boylei</i> | SC, FS | SSC | In the Klamath, Cascade, north Coast, south Coast, Transverse, and Sierra Nevada Ranges up to approximately 6,000 feet elevation | Creeks or rivers in woodlands or forests with rock and gravel substrate and low overhanging vegetation along the edge; usually found near riffles with rocks and sunny banks nearby | 7 occurrences documented at 3 Restoration Project sites. |
| Cascades frog <i>Rana cascadae</i> | SC, FS | SSC | In the Shasta-Trinity region east to the Modoc Plateau and south to the Lassen area and the upper Feather River system | Seasonal and permanent ponds and streams; oviposition habitat is open, shallow water in unshaded areas | Not observed during surveys; no CNDDDB record |
| Reptiles | | | | | |
| Northwestern pond turtle <i>Clemmys marmorata marmorata</i> | SC, FS | SSC | From the Oregon border of Del Norte and Siskiyou Counties south along the coast to San Francisco Bay, inland through the Sacramento Valley, and on the western slope of the Sierra Nevada | Occupies ponds, marshes, rivers, streams, and irrigation canals with muddy or rocky bottoms and with watercress, cattails, water lilies, or other aquatic vegetation in woodlands, grasslands, and open forests | 1 occurrence documented in the Restoration Project area |
| Birds | | | | | |
| White-tailed kite <i>Elanus leucurus</i> | – | FP | Lowland areas west of the Sierra Nevada from the head of the Sacramento Valley south, including coastal valleys and foothills, to western San Diego County | Low foothills or valley areas with valley or live oaks, riparian areas, and marshes near open grasslands | Not observed during surveys; no CNDDDB record |

Table 4.2-7. Continued

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | Distribution | Habitat Association | Occurrence in the Restoration Project area |
|--|---------------------------|----------------|--|---|---|
| | Federal | State, WBWG | | | |
| Bald eagle <i>Haliaeetus leucocephalus</i> | FT | SE, FP | Nests in Siskiyou, Modoc, Trinity, Shasta, Lassen, Plumas, Butte, Tehama, Lake, and Mendocino Counties and in the Lake Tahoe Basin; reintroduced into central coast; winter range includes the rest of California, except the southeastern deserts, very high altitudes in the Sierra Nevada, and east of the Sierra Nevada south of Mono County | In western North America, nests and roosts in coniferous forests within one mile of a lake, reservoir, stream, or the ocean | 2 occurrences documented at Restoration Project area |
| Osprey ² <i>Pandion haliaetus</i> | – | SSC | Nests along the north coast from Marin to Del Norte County, east through the Klamath and Cascade Ranges, and in the upper Sacramento Valley; important inland breeding populations at Shasta Lake, Eagle Lake, and Lake Almanor, and small numbers elsewhere south through the Sierra Nevada; winters along the coast from San Mateo to San Diego County | Nests in snags, trees, or utility poles near the ocean, large lakes, or rivers with abundant fish populations | 1 occurrence documented at Restoration Project area; several seen flying overhead. |
| Sharp-shinned hawk ² <i>Accipiter striatus</i> | – | SSC | Permanent resident in the Sierra Nevada, Cascade, Klamath, and north Coast Ranges at mid-elevations and along the coast in Marin, San Francisco, San Mateo, Santa Cruz, and Monterey Counties; winters over the rest of the state except at very high elevations | Dense-canopy ponderosa pine or mixed conifer forest and riparian habitats | Observed during spring and fall migrations at various locations along access roads and Restoration Project sites. |
| Cooper's hawk ² <i>Accipiter cooperii</i> | – | SSC | Throughout California except high altitudes in the Sierra Nevada; winters in the Central Valley, southeastern desert regions, and plains east of the Cascade Range | Nests in a wide variety of habitat types, from riparian woodlands and digger pine-oak woodlands through mixed conifer forests | 1 occurrence documented at Restoration Project area |
| Northern goshawk <i>Accipiter gentilis</i> | SC, FS | SSC | Permanent resident in the Klamath and Cascade Ranges, in the north Coast Ranges from Del Norte to Mendocino County, and in the Sierra Nevada south to Kern County; winters in Modoc, Lassen, Mono, and northern Inyo Counties | Nests and roosts in older stands of red fir, Jeffrey pine, ponderosa pine, lodgepole pine, Douglas fir, and mixed conifer forests | Not observed during surveys; one CNDDDB record |
| Golden eagle <i>Aquila chrysaetos</i> | – | SSC, FP | Foothills and mountains throughout California; uncommon non-breeding visitor to lowlands such as the Central Valley | Nest on cliffs and escarpments or in tall trees overlooking open country; forages in annual grasslands, chaparral, and oak woodlands with plentiful medium- and large-sized mammals | Several occurrences documented at Restoration Project area |

Table 4.2-7. Continued

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | Distribution | Habitat Association | Occurrence in the Restoration Project area |
|--|---------------------------|----------------|---|--|---|
| | Federal | State, WBWG | | | |
| American peregrine falcon <i>Falco peregrinus anatum</i> | D- SC/FS | SE, FP | Permanent resident along the north and south Coast Ranges; may summer in the Cascade and Klamath Ranges and through the Sierra Nevada to Madera County; winters in the Central Valley south through the Transverse and Peninsular Ranges and the plains east of the Cascade Range | Nests and roosts on protected ledges of high cliffs, usually adjacent to lakes, rivers, or marshes that support large prey populations | One adult was observed circling high over the road at South Diversion Dam during raptor surveys; no CNDDDB record |
| Prairie falcon <i>Falco mexicanus</i> | | SSC | Permanent resident in the south Coast, Transverse, Peninsular, and northern Cascade Ranges, the southeastern deserts, Inyo-White Mountains, foothills surrounding the Central Valley, and in the Sierra Nevada in Modoc, Lassen, and Plumas Counties; winters in the Central Valley, along the coast from Santa Barbara to San Diego County, and in Marin, Sonoma, Humboldt, Del Norte, and Inyo Counties | Nests on cliffs or escarpments, usually overlooking dry, open terrain or uplands | Not observed during surveys; no CNDDDB record |
| Western burrowing owl <i>Athene cucularia hypugea</i> | SC | SSC | Lowlands throughout California, including the Central Valley, northeastern plateau, southeastern deserts, and coastal areas; rare along south coast | Level, open, dry, heavily grazed or low-stature grassland or desert vegetation with available burrows | Not observed during surveys; no CNDDDB record |
| California spotted owl <i>Strix occidentalis occidentalis</i> | SC, FS | SSC | Sierra Nevada from Lassen County south to northern Kern County, and in the Transverse, Peninsular, and southern coastal mountains | Mature forest with suitable nesting trees; in southern California, occurs in oak and oak-conifer habitats in addition to mature conifer forest | Not observed during surveys; no CNDDDB record |
| Long-eared owl <i>Asio otus</i> | – | SSC | Permanent resident east of the Cascade Range from Placer County north to the Oregon border, east of the Sierra Nevada from Alpine to Inyo County; scattered breeding populations along the coast and in southeastern California; winters throughout the Central Valley and southeastern California | Nests in abandoned crow, hawk, or magpie nests, usually in dense riparian stands of willows, cottonwoods, live oaks, or conifers | Not observed during surveys; no CNDDDB record |
| Black swift <i>Cypseloides niger</i> | – | SSC | Breeds locally in the Sierra Nevada and Cascade Range, the San Gabriel, San Bernardino, and San Jacinto Mountains; and in coastal bluffs from San Mateo County south to near San Luis Obispo County | Nests in moist crevices or caves on sea cliffs above the surf or on cliffs behind or adjacent to waterfalls in deep canyons | Not observed during surveys; no CNDDDB record |
| Vaux's swift <i>Chaetura vauxi</i> | – | SSC | Coastal belt from Del Norte County south to Santa Cruz County and in mid-elevation forests of the Sierra Nevada and Cascade Range | Nests in hollow, burned-out tree trunks in large conifers | 1 occurrence documented at Restoration Project area |

Table 4.2-7. Continued

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | Distribution | Habitat Association | Occurrence in the Restoration Project area |
|--|---------------------------|----------------|---|---|---|
| | Federal | State, WBWG | | | |
| Little willow flycatcher <i>Empidonax traillii brewsteri</i> (<i>E. t. adustus</i> could occur as a rare migrant) | SC, FS | SE | Summers along the western Sierra Nevada from El Dorado to Madera County, in the Cascade and northern Sierra Nevada in Trinity, Shasta, Tehama, Butte, and Plumas Counties, and along the eastern Sierra Nevada from Lassen to Inyo County | Riparian areas and large wet meadows with abundant willows; usually found in riparian habitats during migration | 3 occurrences at 3 Restoration Project sites |
| Purple martin <i>Progne subis</i> | – | SSC | Coastal mountains south to San Luis Obispo County, west slope of the Sierra Nevada, and northern Sierra and Cascade Ranges; absent from the Central Valley except in Sacramento; isolated, local populations in southern California | Nests in abandoned woodpecker holes in oaks, cottonwoods, and other deciduous trees in a variety of wooded and riparian habitats; also nests in vertical drainage holes under elevated freeways and highway bridges | Not observed during surveys; no CNDDDB record |
| Loggerhead shrike <i>Lanius ludovicianus</i> | SC | SSC | Resident and winter visitor in lowlands and foothills throughout California; rare on coastal slope north of Mendocino County, occurring only in winter | Prefers open habitats with scattered shrubs, trees, posts, fences, utility lines, or other perches | Not observed during surveys; no CNDDDB record |
| California yellow warbler <i>Dendroica petechia brewsteri</i> | | SSC | Nests in all of California except the Central Valley, the Mojave Desert region, and high altitudes in the Sierra Nevada; winters along the Colorado River and in parts of Imperial and Riverside Counties | Nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral; may also use oaks, conifers, and urban areas near stream courses | Not observed during surveys; no CNDDDB record |
| Yellow-breasted chat <i>Icteria virens</i> | – | SSC | Nests locally in coastal mountains and Sierra Nevada foothills, east of the Cascades in northern California, along the Colorado River, and very locally inland in southern California | Nests in dense riparian habitats dominated by willows, alders, Oregon ash, tall weeds, blackberry vines, and grapevines | 4 occurrences documented at Restoration Project sites |
| Mammals | | | | | |
| Spotted bat <i>Euderma maculatum</i> | SC | HP | Throughout California; mostly in foothills and mountains and desert regions of southern California | Found in arid deserts and grasslands through mixed conifer forests; roosts in rock crevices | Not observed during surveys; no CNDDDB record |
| Western red bat <i>Lasiurus blossevillii</i> | – | HP | Scattered throughout California's lower elevations | Found in riparian and wooded habitats; day roosts in trees, within the foliage. | Not observed during surveys; no CNDDDB record |
| Fringed myotis <i>Myotis thysanodes</i> | SC | HP | Throughout California, except the southeastern deserts and the Central Valley | Found in a wide variety of habitats from low desert scrub to high-elevation coniferous forests; day and night roosts in caves, mines, trees, buildings, and rock crevices | Not observed during surveys; no CNDDDB record |

Table 4.2-7. Continued

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | Distribution | Habitat Association | Occurrence in the Restoration Project area |
|---|---------------------------|----------------|---|---|---|
| | Federal | State, WBWG | | | |
| Long-eared myotis <i>Myotis evotis</i> | SC | – | Throughout California, except the southeastern deserts and the Central Valley | Occurs primarily in high-elevation coniferous forests, but also found in mixed hardwood/conifer, high desert, and humid coastal conifer habitats | Not observed during surveys; no CNDDDB record |
| Small-footed myotis <i>Myotis ciliolabrum</i> | SC | – | Sierra Nevada; south Coast, Transverse, and Peninsular Ranges; and the Great Basin | Open stands in forests and woodlands, as well as shrublands and desert scrub; uses caves, crevices, trees, and abandoned buildings | Not observed during surveys; no CNDDDB record |
| Long-legged myotis <i>Myotis volans</i> | SC | HP | Mountains throughout California, including ranges in the Mojave Desert | Most common in woodlands and forests above 4,000 feet, but occurs from sea level to 11,000 feet | Not observed during surveys; no CNDDDB record |
| Yuma myotis <i>Myotis yumanensis</i> | SC | – | Common and widespread throughout most of California, except the Colorado and Mojave Deserts | Found in a wide variety of habitats from sea level to 11,000 feet, but uncommon above 8,000 feet; optimal habitat is open forests and woodlands near water bodies | Not observed during surveys; no CNDDDB record |
| Pallid bat <i>Antrozous pallidus</i> | – | SSC, HP | Throughout California, primarily at lower elevations and mid-elevations | Occurs in a variety of habitats from desert to coniferous forest; most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California; relies heavily on trees for roosts | Not observed during surveys; no CNDDDB record |
| Townsend's big-eared bat <i>Plecotus townsendii</i> | SC | SSC, HP | Throughout California, from low desert to mid-elevation montane habitats | Roosts in caves, tunnels, mines, and dark attics of abandoned buildings; buildings must offer cavelike spaces to be suitable; highly sensitive to disturbance at roost sites | Not observed during surveys; no CNDDDB record |
| Sierra Nevada Mountain beaver <i>Aplodontia rufa</i> | – | SSC | Throughout the Klamath, Cascade, and Sierra Nevada mountains and the north Coast Ranges in Del Norte and Humboldt Counties; Sierra Nevada populations scattered and local | Slopes of ridges or gullies with abundant moisture, thick undergrowth, and soft soil for burrowing | Not observed during surveys; no CNDDDB record |
| Ringtail <i>Basariscus astutas</i> | – | FP | Little information on distribution and abundance; apparently occurs throughout the state except for the southern Central Valley and the Modoc Plateau | Occurs primarily in riparian habitats, but also known to occur in most forest and shrub habitats from lower elevations to mid-elevations | 1 occurrence observed near North Battle Creek Feeder (2002 surveys); no CNDDDB record |
| Pacific fisher <i>Martes pennanti pacifica</i> | SC, FS | SSC | Coastal mountains from Del Norte to Sonoma County, east through the Cascades to Lassen County, and south in the Sierra Nevada to Kern County | Late-successional coniferous forests and montane riparian habitats | Not observed during surveys; no CNDDDB record |

Table 4.2-7. Continued

| Common Name <i>Scientific Name</i> | Legal Status ¹ | | Distribution | Habitat Association | Occurrence in the Restoration Project area |
|---|---------------------------|----------------|--|--|--|
| | Federal | State, WBWG | | | |
| American badger <i>Taxidea taxus</i> | – | – | Statewide except for the northwestern corner in Del Norte County and parts of Humboldt and Siskiyou Counties | Typically found in open areas with scattered shrubs and trees; also found in open forests, particularly ponderosa pine | 1 occurrence observed near the town of Manton (2002 surveys); no CNDDDB record |

¹ Status explanation:

| | | | | | | | |
|----------|----|---|---------------------------------------|--------|-----|---|--|
| Federal: | FE | = | Federally listed as endangered | State: | FP | = | State fully protected |
| | FS | = | U.S. Forest Service sensitive species | | SE | = | State-listed as endangered |
| | FT | = | Federally listed as threatened | | SSC | = | Species of special concern |
| | SC | = | Species of concern | | ST | = | State-listed as threatened |
| | D | = | Delisted, monitor for 5 years | | – | = | No listing |
| | – | = | No listing | | HP | = | Western Bat Working Group (WBWG) High Priority |

² This species is not considered to be a state species of special concern in the Draft List of California Bird Species of Special Concern (DFG and PRBO 2001). This list is currently under review by the DFG and Point Reyes Bird Observatory Advisory Committee.

Table 4.2-8. Elderberry Shrub Survey Results at the Restoration Project Sites, April 17, 2003

| Shrub # | Stems 1–3 inches | Stems 3–5 inches | Stems >5 inches | Exit Holes Present |
|---------------|------------------|------------------|-----------------|--------------------|
| 1 | 0 | 0 | 1 | No |
| 2 | 4 | 1 | 3 | No |
| 3 | 0 | 0 | 1 | No |
| 4* | 0 | 0 | 1 | No |
| 5 | 5 | 3 | 0 | No |
| 6 | 2 | 0 | 0 | No |
| 7 | 1 | 2 | 0 | No |
| 8 | 0 | 1 | 0 | No |
| 9 | 3 | 4 | 0 | No |
| 10 | 3 | 0 | 1 | No |
| 11** | 1 | 0 | 0 | No |
| 12 | 3 | 0 | 2 | No |
| 13 | 3 | 0 | 1 | No |
| 14 | 1 | 0 | 2 | No |
| 15, 16, 17*** | | | | |
| Total | 26 | 11 | 12 | |

* Could not see base shrub; however, shrub appeared to have two large trunks coming from one base.

** Many small stems sprouting from larger dead shrub.

*** Three elderberry shrubs could not be surveyed because they were in the middle of large blackberry shrubs and could not be accessed.