

Wildlife

Affected Environment

Regulations and Policies Pertaining to Wildlife

Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds), issued in January 2001, restated the value of migratory birds and directed agencies to develop and implement memoranda of understanding with the U.S. Fish and Wildlife Service (USFWS) to protect them. The National Park Service (NPS) memorandum of understanding requires park units to restore and enhance migratory bird habitat and support conservation of migratory birds. Under the Migratory Bird Treaty Act of 1918, it is unlawful to kill, capture, buy, sell, import, or export migratory birds, eggs, feathers, or other parts. Additionally, under 36 *Code of Federal Regulations* (CFR) 2.2, the following wildlife protection measures are prohibited: the taking of wildlife; the feeding, touching, teasing, frightening, or intentional disturbing of wildlife nesting, breeding, or other activities; and possessing unlawfully taken wildlife or portions thereof.

Executive Order 13112 (“Invasive Species”), issued in February 1999, established the National Invasive Species Council. The Executive Order requires the creation of a Council of Departments to provide consultation to federal agencies in matters related to invasive species. Federal agencies whose actions may affect the status of invasive species are required to identify such actions, use relevant programs and authorities to prevent the introduction of invasive species; detect, respond, control, and monitor populations of such species; and provide for restoration of native species and habitats that were invaded. Additionally, federal agencies are not authorized to fund or carry out actions that are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere, unless the agency has determined and made public its determination that the benefits of such actions clearly outweigh the potential harm caused by invasive species; and that all feasible and prudent measures to minimize the risk of harm would be taken in conjunction with the actions. Federal agencies shall carry out actions that would potentially affect the status of invasive species in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan, and in cooperation with stakeholders, as appropriate.

Additional Federal and state laws and regulations to protect special status wildlife include:

- *Endangered Species Act (ESA)*
- *Migratory Bird Treaty Act*
- *Bald Eagle and Golden Eagle Protection Act*
- *Fish and Wildlife Coordination Act of 1934* (as amended)
- National Park Service Regulations and Policies (*NPS Organic Act of 1916*, *NPS Management Policies 2006* (NPS 2006), and *NPS Natural Resource Management Reference Manual 77*)
- North American Wildlife Conservation Model

- *California Endangered Species Act*
- *California Fish and Game Code* (for the protection of birds)

Refer to the *Regulations and Policies Pertaining to Special Status Species* in the Special Status Species Section for a discussion of federal and state laws and regulations pertaining to wildlife that are legally protected or designated “rare” under the Federal Endangered Species Act of 1973, California Endangered Species Act, or other regulations.

Yosemite National Park Regional Wildlife

Yosemite National Park, which is one of the largest and least-fragmented habitat blocks in the Sierra Nevada range, supports a diverse and abundant assemblage of wildlife. Its importance in protecting the long-term survival of certain species and the overall biodiversity of wildlife in the Sierra Nevada region was recognized in the reports prepared as part of the Sierra Nevada Ecosystem Project (UC Davis 1996). The Sierra Nevada Ecosystem Project included assessments of the Sierra Nevada headwaters of 23 major river basins in addition to the Merced River, from Eagle Lake in the north to the Mojave River in the south. As part of these assessments, much of the main stem of the Merced River corridor and the South Fork Merced River corridor were identified as an aquatic diversity management area (UC Davis 1996).

The Merced River corridor also plays an essential ecological role in linking wildlife habitats across the park’s landscape and gradients of elevation; it represents a critical migration corridor for many wildlife species. This fact forms an important part of the framework for this analysis. For wildlife populations to be viable, resources and environmental conditions must be sufficient for foraging, resting, cover, and dispersal of animals. Patterns, types, and amounts of resources must be sufficient for the needs of reproductive individuals on daily, seasonal, and yearly scales. Habitat must also be well-distributed over a broad geographic area to allow breeding individuals to interact spatially within and among populations, and a stable, relatively undisturbed riparian corridor supplies a mechanism for this kind of ecological connection.

Mammals

Approximately 85 native mammal species in 6 families inhabit Yosemite. There are 17 species of bats, 5 of which are either state or federal species of special concern (see the “Special Status Species” section of this chapter). Ungulates in the park include mule deer (*Odocoileus hemionus*) and the federal and state endangered Sierra Nevada bighorn sheep (*Ovis canadensis*). Bighorn sheep historically populated the Sierra Nevada crest and the Cathedral Range in Yosemite. It is highly unlikely that they currently occupy the Merced River corridor watershed (NPS 2011a), although some rams may occasionally enter the Merced River corridor. Bighorn sheep critical habitat, as (designated in 2008 by the USFWS, does not occur within the Merced River corridor. Currently, a recovery unit of approximately 40 animals is located at high elevations in the northeastern section of Yosemite and the adjacent Inyo National Forest. Growth of this population is critical for the species to reoccupy their former range in the park. Carnivores include black bears (*Ursus americanus*), bobcats (*Lynx rufus*), coyotes (*Canis latrans*), raccoons (*Procyon lotor*), mountain lions (*Puma concolor*), ringtails (*Bassariscus astutus*), weasels (*Mustela frenata*), and gray foxes (*Urocyon cinereoargenteus*). Yosemite’s largest mammal, the

grizzly bear (*Ursus arctos horribilis*), was extirpated from the region and from the state in the 1920s. Other mammal species that survive but are extremely rare are the fisher (*Martes pennanti*), wolverine (*Gulo gulo*) (possibly extirpated from the region), and Sierra Nevada red fox (*Vulpes vulpes necator*). A recent study (Espinoza et al. 2011) of habitat adjacent to the Merced River in Yosemite Valley predicted a total of 68 mammal species are expected to occur in this segment of the Merced River corridor.

Birds

Yosemite's wide range of elevations and habitats support a diversity of bird species. The 2011 study (Espinoza et al. 2011) on wildlife conditions within the Merced River corridor in Yosemite Valley predicted 218 bird species are expected to occur in Segment 2 of the Merced River corridor. Several bird species likely to have been reduced in Yosemite Valley by centuries of human activity are present in less disturbed areas. For example, Valley meadows are suitable habitat for great gray owls (*Strix nebulosa*), and the species persists in other meadows, although sightings in the Valley are very rare. Willow flycatchers (*Empidonax tarillii*) no longer nest in the park, including Yosemite Valley; the most recent observations within the Merced River corridor occurred in the 1970s (NPS 2011a). The spread of cowbirds into the Sierra Nevada has been associated with human disturbance and activities; brown-headed cowbirds (*Molothrus ater*) are common in Yosemite and can be found in large numbers at the park's stables and corrals, campgrounds, and residential areas (NPS 2011). Cowbirds are considered "nest parasites" that lay eggs in the nests of other bird species, thus adversely affecting their reproduction.

On a wider scale, apparent population declines have been detected in numerous other bird species in the Sierra Nevada, including in Yosemite. Possible causes for these declines include grazing, logging, fire suppression, development, recreational use, pesticides, habitat destruction on wintering grounds, and large-scale climate changes. Although the population declines result from decades of development, since the 1980s, park management has focused on reducing or reversing habitat effects associated with fire suppression, pesticide use, and other factors on park lands (Cardno ENTRIX 2011).

Fish

Most fish currently found in the Merced River and its tributaries in Yosemite have been introduced. Prior to trout-stocking for sport fishing, native fish in Yosemite were probably limited primarily to rainbow trout (*Oncorhynchus mykiss*) and the Sacramento sucker (*Catostomus occidentalis*), both of which are present only in the lower portions (i.e., Yosemite Valley and below) of the Merced River (Stillwater Sciences 2008). A series of glaciations eliminated all fish from the high country, and waterfalls remaining on all rivers after the glaciers retreated prevented repopulation by upstream migration. Fish native to the Merced River in El Portal and downstream include Sacramento pikeminnow (*Ptychocheilus grandis*), hardhead (*Mylopharodon conocephalus*), California roach (*Lavinia symmetricus*), and riffle sculpin (*Cottus gulosus*).

Although the upper watershed of the Merced River was stocked with a variety of nonnative trout until 1991, Yosemite streams are subject to tremendous fluctuations in flow; these fluctuations, combined

with severe climatic conditions, low nutrient availability associated with snowmelt over granitic watersheds, and lack of spawning habitat, have restricted natural sustainability of introduced fish in a majority of Yosemite's lakes. Fishery surveys conducted in the mid-1970s found 62 lakes with self-supporting fish populations and 195 lakes that supported little or no natural reproduction (NPS 1977). A more recent survey of lakes, ponds, marshes, and wet meadows was conducted in Yosemite from 2000 to 2002 (Knapp 2003). This survey found fish present in 245 of 2,655 bodies of water. These tended to be large, deep, lakes.

As discussed in the "Hydrology, Floodplains, and Water Quality" section of this chapter, until recently, trees that fell into the Merced River in nonwilderness areas were considered hazardous to bridges and humans and removed. This practice deprived fish and other aquatic organisms of important habitat and has altered natural river dynamics. Roads, ditches, utilities, and other structures in meadows have likely altered meadow hydrology, thus affecting water and nutrient flows into aquatic ecosystems. Fallen trees are now allowed to remain in most stretches of the river because of their value to aquatic and riparian ecosystems.

Reptiles and Amphibians

Compared to most mountain regions of the west, Yosemite has a particularly large number of native reptile and amphibian species: 14 snakes (one poisonous), 7 lizards, 1 turtle, 2 toads, 1 tree frog, 3 true frogs (1 extirpated, 1 nonnative, and 1 native), and 5 salamanders (including newt and ensatina). The 2011 study (Espinoza et al. 2011) on wildlife conditions within the Merced River corridor in Yosemite Valley predicted 10 amphibian species and 21 reptile species are expected to occur in Segment 2 of the Merced River corridor.

Amphibians in Yosemite have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellers 1996, Knapp 2003). These declines were first noticed in the 1970s but likely began much earlier with the introduction of nonnative fish into park watersheds. Foothill yellow-legged frogs (*Rana boylei*) likely were found in Yosemite Valley in the past but are now apparently extinct in the Valley (NPS 2011a). Significant factors in their disappearance probably include reduction in perennial ponds and wetlands and predation by bullfrogs (*Rana catesbeiana*). The fast-growing bullfrog tadpoles often out-compete native amphibians, while the large adult bullfrogs are generalist predators that consume a broad diversity of native species, including native amphibians (frogs, toads, salamanders), small mammals (including bats), reptiles (snakes and turtles), and birds.

At higher elevations, Sierra Nevada yellow-legged frogs (*Rana sierrae*) (previously named mountain yellow-legged frog) and Yosemite toads (*Anaxyrus canorus*) are still present in a number of areas but are severely reduced in population and range. During the 2000 to 2002 survey of lakes, ponds, marshes, and wet meadows in Yosemite, Sierra Nevada yellow-legged frogs were found in 282 of 2,655 bodies of water surveyed, and Yosemite toads were found in 74 of 2,655 bodies of water surveyed (Knapp, 2003). Foothill yellow-legged frogs have disappeared completely from the park, if not the entire Sierra Nevada; Espinoza et al. (2011a) did not detect foothill yellow-legged frogs during their survey efforts, nor has this species been detected in the valley since the late 1970s. The suitability of habitat for this species in Yosemite Valley is considered low because their distribution generally occurs at lower elevations at this latitude (Behler and King 2002, Lannoo 2005). In the status review of the Sierra Nevada yellow-legged

frog, the California Department of Fish and Game (CDFG) concluded that the introduction of nonnative fishes and the infectious disease chytridiomycosis caused by the amphibian chytrid fungus are the principal drivers of decline in this species. Research continues to identify the causes of amphibian declines in the Sierra Nevada; for Yosemite toads and foothill yellow-legged frogs, possible causes of decline include habitat loss, nonnative aquatic species (bullfrogs and fish), pesticides, and diseases.

Nonnative Wildlife Species

As with vegetation, the introduction of nonnative species has had significant adverse effects on native wildlife species in Yosemite National Park. Nonnative wildlife includes white-tailed ptarmigan (*Lagopus leucura*), wild turkey (*Meleagris gallopavo*), brown-headed cowbird, European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), cutthroat trout (*Oncorhynchus clarkii*), and bullfrog. Feral pigs (*Sus scrofa domesticus*) are regularly observed near the park and could potentially increase their range into the park's lower elevations, especially with climate change.

Introductions of fishes into the Merced River drainage of Yosemite probably began in the late 1800s with transfers of Lahontan cutthroat trout (*Oncorhynchus clarki henshawi*), coastal rainbow trout (*Oncorhynchus mykiss irideus*), and California golden trout (*Oncorhynchus aguabonita*) from nearby waters. Rainbow trout is the only trout species native to the Merced River; rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or have displaced, the original strain. Other species of trout not native to California, including brook trout, brown trout, and arctic grayling (*Thymallus arcticus*), have also been introduced into the Merced River drainage. Brown trout seems to have become well established and outnumbers rainbow trout in many areas (Stillwater Sciences 2008). Brook trout are found in the main stem and in large numbers in lakes and small streams of the Merced River watershed. Fish introductions in higher elevation lakes and streams, all of which were naturally fishless, have severely altered those ecosystems. The introduction of fish is considered the primary factor in decline of native Sierra Nevada yellow-legged frogs in the Sierra Nevada (Drost and Fellers 1996; Knapp 2003). The NPS discontinued fish stocking in Yosemite in 1991.

The sensitive balance of aquatic ecosystems in Yosemite Valley is likely being disrupted by the presence of nonnative bullfrog and signal crayfish (*Pacifastacus leniusculus*). Bullfrogs are voracious, nonnative predators that would eat anything smaller than themselves. Recent observations and eradication efforts in Yosemite Valley suggest that bullfrogs occupy standing and slow-moving water and lower meadow areas throughout the Valley. Signal crayfish are invasive generalist omnivores and avid predators on freshwater insects and the eggs and larvae of amphibians. Signal crayfish have also recently been observed in the Valley's meadows. The impact of bullfrogs and signal crayfish on native species in the park is not fully understood, but the two species have been implicated in the decline of native amphibian and reptile species. The NPS began bullfrog eradication efforts in 2005, which have succeeded in substantially reducing the local population (NPS 2011).

Wild turkeys, which were introduced widely in California by state authorities, are regularly observed in Yosemite along its western boundary. The impact of this species on park ecosystems is unknown but likely includes predation of small amphibians (i.e., salamanders) and eggs and young of ground-nesting birds (e.g., California quail), competition with native species for food, destruction of native

plants and reduction of their seedling reproduction rates (especially in oaks), soil and forest litter disturbance, and support of unnaturally high predator populations.

White-tailed ptarmigans were introduced as a game species to high elevation areas of east Yosemite, and they have become widespread in the park's alpine habitats. The impact of the ptarmigan has not been determined, but their herbivory likely affects native plants that have a very low rate of growth and productivity.

The European starling and house sparrow are two nonnative species found in El Portal, Yosemite Valley, and other developed areas that affect native bird species through competition for nest cavities, which is a limited resource. Both species are known to aggressively evict native bird species from occupied cavities. The existing development in El Portal has likely increased the abundance of both species by providing additional nesting sites and food sources.

Wildlife of the Merced River

Wildlife species that occur in the Merced River corridor are expected to be generally representative of the wildlife species expected to occur in the park as a whole (THOMPSON 1999). A recent wildlife assessment for the portion of the Merced River that flows through Yosemite Valley used California Wildlife Habitat Relationships models and validation tools to predict the presence of 317 different species (10 amphibians, 21 reptiles, 218 birds, and 68 mammals) in the Valley (NPS 2011). This study only looked at montane riparian and wet meadow habitat types in the Valley, so the total number of species that occur along the entire Merced River corridor is expected to be higher when species that occur only at higher or lower elevations are considered. **Table 9-58** provides an overview of the species associated with predominant habitat types across the entire Merced River corridor, including Yosemite Valley.

In the broadest sense, the presence and abundance of wildlife species at any site or area depend on the structure of the habitat available in that area. Habitat types broadly correlate with vegetation types (or plant associations/communities) or general stream classifications. For many wildlife species, there is an additional requirement for special habitat attributes, such as cliffs, caves, rocks, lakes or rivers, or other abiotic (nonliving) elements. In addition, many species have explicit habitat requirements for one or more elements of the biotic environment, such as large trees, large snags (standing dead trees), large downed logs, high degrees of canopy closure, or, for fish, pools, riffles, and undercut banks. As described in the "Vegetation and Wetlands" section of this chapter, altitude and topography influence vegetation patterns throughout the Merced River corridor. These changes in habitat structure correlate broadly with the changes in the composition and abundance of wildlife species present across the river's various altitudinal zones (i.e., alpine, subalpine, montane, valley, etc.).

Overlaid on the overall elevation pattern is a local topographic effect. Where the river flows through low-gradient reaches, the valleys tend to be broad and relatively flat and are dominated by denser and taller forests than in areas with steeper channel reaches. Thus, locations like Little Yosemite Valley, Yosemite Valley, and the Wawona area tend to have taller and more extensive forests than steeper sections. The broad valleys in the flat reaches also tend to be associated with lakes, saturated soils, and wetlands such as meadows. These wetter areas are important wildlife habitat elements and are

TABLE 9-58: SUMMARY OF CALIFORNIA WILDLIFE HABITAT RELATIONSHIP TYPES IN THE MERCED RIVER CORRIDOR^a

Habitat Type	Dominant Plant Species	Typical Wildlife Species	Amount of Watershed in Habitat type
Barren	Lichens, mosses	Mount Lyell salamander, gray-crowned rosy-finch, American pipit, rock wren, common raven, Belding's ground squirrel, American pika, yellow-bellied marmot	8%
Douglas-Fir ^b	Douglas-fir, sugar pine, ponderosa pine	See Sierran mixed conifer habitat type	<1%
Jeffrey Pine	Jeffrey pine, sugar pine, lodgepole pine, white fir, red fir, incense-cedar	Sagebrush lizard, northern goshawk, red-tailed hawk, golden eagle, mountain quail, Lewis' woodpecker, northern flicker, olive-sided flycatcher, western wood-pewee, Steller's jay, lodgepole chipmunk, golden-mantled ground squirrel, striped skunk, black bear, gray fox, fisher, bobcat, mule deer	5%
Juniper	Western juniper, Jeffrey pine, sagebrush	Sagebrush lizard, western rattlesnake, Say's phoebe, rock wren, common raven, common nighthawk, Townsend's solitaire, piñon mouse, bushy-tailed woodrat, coyote, black bear	<1%
Lacustrine	Algae, sedges	Sierra Nevada yellow-legged frog, western pond turtle, western aquatic garter snake, great blue heron, mallard, spotted sandpiper, Northern river otter, black bear, hardhead, foothill yellow-legged frog, western pond turtle	1%
Lodgepole Pine	Lodgepole pine, aspen, mountain hemlock	Sagebrush lizard, western terrestrial garter snake, northern goshawk, red-tailed hawk, American kestrel, white-throated swift, Williamson's sapsucker, olive-sided flycatcher, mountain chickadee, pine siskin, deer mouse, long-tailed vole, coyote, ermine, long-tailed weasel, black bear	12%
Montane Chaparral	Huckleberry oak, Sierra chinquapin, whitethorn ceanothus, fremont silktassel, bitter cherry	Gilbert's skink, southern alligator lizard, red-tailed hawk, California quail, mountain quail, bushtit, barn swallow, ruby-crowned kinglet, California ground squirrel, Botta's pocket gopher, coyote, California pocket mouse, striped skunk, black bear	<1%
Montane Hardwood-Conifer	Douglas-fir, incense-cedar, ponderosa pine, black oak, big-leaf maple	Western fence lizard, northern alligator lizard, sharp-shinned hawk, Cooper's hawk, calliope hummingbird, red-breasted sapsucker, olive-sided flycatcher, big brown bat, coyote, gray fox, long-tailed weasel, badger, striped skunk, black bear, Sierra Nevada red fox	<1%
Montane Hardwood	Canyon live oak, black oak, Douglas-fir, California laurel	Northern alligator lizard, red-tailed hawk, American kestrel, flammulated owl, Anna's hummingbird, red-breasted sapsucker, Steller's jay, northern flicker, white-throated swift, big brown bat, California ground squirrel, deer mouse, brush mouse, coyote, gray fox, long-tailed weasel, striped skunk, black bear	15%
Montane Riparian	White alder, black cottonwood, willow	Relictual slender salamander, Pacific chorus frog, sharp-tailed snake, red-tailed hawk, mountain quail, warbling vireo, western screech-owl, long-eared owl, belted kingfisher, cliff swallow, black phoebe, American dipper, song sparrow, mountain beaver, black bear, Sierra Nevada snowshoe hare	<1%

TABLE 9-58: SUMMARY OF CALIFORNIA WILDLIFE HABITAT RELATIONSHIP TYPES IN THE MERCED RIVER CORRIDOR^a (CONTINUED)

Habitat Type	Dominant Plant Species	Typical Wildlife Species	Amount of Watershed in Habitat type
Ponderosa Pine	Ponderosa pine, incense-cedar, Douglas-fir, white fir, canyon live oak, black oak, Jeffrey pine, sugar pine	Western fence lizard, western rattlesnake, sharp-shinned hawk, American kestrel, acorn woodpecker, violet-green swallow, barn swallow, yellow warbler, chipping sparrow, California ground squirrel, mountain pocket gopher, coyote, striped skunk, black bear, California spotted owl	19%
Red Fir	Red fir	Western terrestrial garter snake, red-tailed hawk, golden eagle, great gray owl, black swift, olive-sided flycatcher, red-breasted sapsucker, golden-mantled ground squirrel, deer mouse, bushy-tailed woodrat, coyote, long-tailed weasel, black bear, California spotted owl	14%
Subalpine Conifer	Mountain hemlock, lodgepole pine, bristlecone pine, oceanspray, willows	Mount Lyell salamander, Yosemite toad, mountain yellow-legged frog, golden eagle, dusky flycatcher, white-crowned sparrow, Wilson’s warbler, golden-mantled ground squirrel, deer mouse, long-tailed vole, yellow-bellied marmot, porcupine, coyote, ermine, black bear	7%
Sierran Mixed Conifer	White fir, Douglas-fir, ponderosa pine, incense- cedar, sugar pine, black oak	Western fence lizard, northern alligator lizard, red-tailed hawk, American kestrel, western wood-pewee, Hammond’s flycatcher, ruby-crowned kinglet, big brown bat, long-tailed vole, California ground squirrel, deer mouse, coyote, gray fox, ermine, striped skunk, black bear, Vaux’s swift, bald eagle, pallid bat, Pacific fisher	13%
Valley Foothill Riparian	Fremont cottonwood, white alder, willow, California grape	Gilbert’s skink, gopher snake, western rattlesnake, common merganser, red-shouldered hawk, cliff swallow, tree swallow, ash-throated flycatcher, American goldfinch, brush mouse, coyote, gray fox, striped skunk, black bear, Valley elderberry longhorn beetle	<1%
White Fir	White fir, sugar pine, incense-cedar	Western fence lizard, northern alligator lizard, sharp-shinned hawk, great horned owl, black swift, Steller’s jay, common raven, fox sparrow, dark-eyed junco, big brown bat, Botta’s pocket gopher, deer mouse, brush mouse, coyote, ermine, gray fox, striped skunk, American badger, black bear	3%
Wet Meadow	Sedges, rushes, willows	California newt, Yosemite toad, Sierra Nevada yellow-legged frog, California mountain kingsnake, western aquatic garter snake, Pacific chorus frog, mallard, great blue heron, common snipe, great gray owl, northern rough-winged swallow, mountain bluebird, common yellowthroat, California meadow vole, montane vole, western mastiff bat, yellow-bellied marmot, Sierra Nevada mountain beaver, black bear, ermine	1%
<p>^a Source of original information for California Wildlife Habitat Relationship types and areas within each type in the Merced River basin: www.biogeog.ucsb.edu/projects/snner/basins/merc_gapwhr.html. The maps and data files on which this summary was based have not been published.</p> <p>^b California Wildlife Habitat Relationship by convention does not assign this habitat type to the southern Sierra Nevada. The area assigned to this type likely should be assigned to the Sierra Mixed Conifer type.</p> <p>SOURCE: NPS 1997, 2010, and 2011.</p>			

associated with a number of the sensitive species known to occur in the park (see the “Special Status Species” section of this chapter).

Segment 1: Merced River Above Nevada Fall

The headwaters of the Merced River originate above 10,000 feet in elevation in the alpine zone—a zone typified by scant alpine dwarf-shrub, glacial lakes, alpine meadows, and high-velocity tributaries to the Merced River. There are no native fish in the upper Merced River watershed. Birds found in this habitat include American pipit (*Anthus rubescens*) and gray-crowned rosy-finch (*Leucosticte tephrocotis*); mammals include Mount Lyell shrew (*Sorex lyelli*), alpine chipmunk (*Neotamias alpinus*), mountain pocket gopher (*Thomomys monticola*), pika (*Ochotona princeps*), and white-tailed jackrabbit (*Lepus townsendii*). Species that are largely confined to this habitat type are frequently associated with nonliving (physical) attributes of the Sierra Nevada. For example, pikas only find suitable habitat near the uppermost parts of the Merced River basin and use rock crevices and talus slopes.

All fish species in the upper watershed of the Merced River above Yosemite Valley have been introduced. Rainbow trout and brown trout were commonly stocked in upper watershed lakes beginning in the late 1800s. Other species less commonly stocked include the American grayling (*Thymallus signifer tricolor*), cutthroat trout, brook trout, and golden trout. The cutthroat trout (probably Lahontan cutthroat trout) and golden trout are both special status species in their native watersheds in other locations of the Sierra Nevada range, but appear to have lost their genetic integrity through hybridization. Recent surveys indicate that rainbow trout and brown trout are the most abundant species in the Merced River corridor but that brook trout are most abundant in the watershed overall. In Washburn Lake, a popular wilderness fishing destination, rainbow trout make up approximately 20% of the lake’s fish population, while brown trout make up approximately 80% of the fish population.

These higher-elevation forest types have a sparse understory and experience severe winters. Seasonally, many species from lower elevations share this habitat: mule deer (*Odocoileus hemionus*), mountain lion (*Puma concolor*), and species such as the mountain chickadee (*Poecile gambeli*) and the brown creeper (*Certhia americana*).

As Jeffrey pine (*Pinus jeffreyi*) becomes more common (below about 7,500 feet), the wildlife habitats support more species and higher populations. The Jeffrey pine forest is more productive than the subalpine forests, largely due to the food value of the pine seeds. The seeds support a more complex small-mammal fauna, which in turn supports the Sierra Nevada’s most elusive predator—the fisher (*Martes pennanti*)—in addition to raptors, including northern goshawks (*Accipiter gentilis*) and great gray owls, all species recorded in or near the Merced River corridor (CDFG 2012). Bird species common to this zone include Cassin’s finch (*Haemorhous cassinii*), Townsend’s solitaire (*Myadestes townsendii*), Lincoln’s sparrow (*Melospiza lincolni*), and common raven (*Corvus Corax*). Mammals include Douglas squirrel (*Tamiasciurus douglasii*), northern flying squirrel (*Glaucomys sabrinus*), golden-mantled ground squirrel (*Callospermophilus lateralis*), porcupine (*Erethizon epixanthum epixanthum*), and long-tailed weasel.

As the river descends into Little Yosemite Valley, wildlife habitat is altered with increased human presence. Human alteration of habitat is most pronounced between Nevada Fall and the Little Yosemite Valley Backpackers Camping Area. Species adapted to human disturbance, such as black bear, (*Ursus americanus*) are relatively common. More reclusive or specialized species are rare or absent. Human use, such as pack stock and development in riparian areas, may also adversely affect aquatic habitat for Yosemite toad (NPS 2011a). On the whole, these affected areas represent a small portion of Segment 1 of the main stem.

Segment 2: Yosemite Valley

Yosemite Valley is a broad, U-shaped valley characterized by black oak woodland, lower montane mixed coniferous forest, a vigorous riparian corridor along the Merced River, low-elevation meadows, and areas of development (Cardno ENTRIX 2011). In Yosemite Valley, the Merced River is broad, shallow, and slow-moving (compared to other river stretches). Inside Yosemite, there are concentrated areas of human use that have affected wildlife and their habitats, especially in the east Valley. This is also where some of the most valuable and sensitive habitats are located or once existed. Meadow and riparian areas are highly productive, structurally diverse habitats that support high species diversity and provide important linkages between terrestrial and aquatic communities. The long history of development and human use in the Valley has resulted in fragmentation and reductions of these habitats, thus affecting their quality for wildlife. Recent park efforts, associated with fire management and meadow and riparian restoration projects, have begun to make improvements in Valley habitats (Cardno ENTRIX 2011).

Mammals (resident or transient) in Yosemite Valley include deer mouse (*Peromyscus maniculatus*), California ground squirrel (*Otospermophilus beecheyi*), western gray squirrel (*Sciurus griseus*), broad-footed mole (*Scapanus latimanus*), Botta's pocket gopher (*Thomomys bottae*), ringtail, raccoon, coyote, bobcat, mule deer, mountain lion, and black bear (NPS 2011). The heavy visitation to Yosemite Valley and its relatively high number of resident employees have led to many human/wildlife conflicts. The root of most of these problems is the availability of human food. Improperly stored food and garbage and deliberate feeding alter the natural behavior of wildlife and lead to property damage and threats to human safety. In 2011, over \$15,000 in property damage (110 incidents) was caused by black bears in the park (NPS 2011). Animals that become habituated to humans can lead to human-wildlife conflicts. These issues would escalate with higher visitation. Potential affected wildlife include bears, deer, coyotes, raccoons, mountain lions, and California ground squirrels. Roadkill of numerous species is likely proportional to the amount of vehicle traffic (K. Rodriguez, pers. comm).

In recent years, mountain lion sightings in Yosemite Valley have increased (NPS 2011b). These sightings, coupled with two human fatalities in California from mountain lion attacks in 1994, have caused concern. Lions are attracted to the unnaturally high prey populations that are supported by human food sources in developed areas. Further reduction of lion habitat from development or expanded human presence could affect lion populations and increase the chance of human-mountain lion encounters.

The Merced River widens and slows as it passes through Yosemite Valley. In general, habitat is characterized by a relatively wide channel, relatively low flows, and little riffle and pool habitat. The deposition and removal of soil and the force of flood waters in Segment 2 regularly disturb riparian vegetation. The park has historically cleared large woody debris from the Merced River to improve flow (to reduce flooding hazard), prevent bank erosion that might compromise park infrastructure, for visitor safety, to remove hazards to commercial rafting, and for aesthetic reasons. Since 1993, it has been park policy to allow woody debris in the Merced River to remain, sometimes with some manipulation in its placement, unless it causes a serious safety concern or threatens infrastructure. As a result, large woody debris in the channel is gradually returning through natural processes and active restoration (Cardno ENTRIX 2011). Undercut banks and exposed tree roots provide some refuge for young fish and other small organisms. The Merced River and its floodplain are connected in many areas, but some connections have been affected by development of trails, roads, and campgrounds in the first half of the 20th century.

Fisheries resources in Yosemite Valley have historically been low in species diversity. Species native to the Merced River in the Valley probably only included rainbow trout (that migrated into the area from the San Joaquin River) and the Sacramento sucker. Nonnative strains of rainbow trout and brown trout have been stocked throughout Segment 2 of the Merced River and currently dominate the fisheries of this area. The Sacramento sucker is still common here, and an occasional brook trout is reported from the area—probably a result of transport via the river from their more favorable habitat in higher tributaries (Stillwater Sciences 2008).

Riparian restoration efforts are underway along the banks of the Merced River in Yosemite Valley and are likely to have a positive effect on fish populations. The projects range from removal of bank revetment to restoration of riparian vegetation (Cardno ENTRIX 2011). In 1997 and 1998, surveys were conducted to examine the effects of riverbank restoration, with special attention to the presence of large woody debris and the association of fish to those areas. Rainbow trout density appeared higher at restoration sites, while brown trout and Sacramento sucker densities were higher at the control sites (USFWS 1999).

Segments 3 and 4: Merced Gorge and El Portal

Montane hardwood conifer (mixed conifer) is the predominant upland type adjacent to riparian areas at the elevation of Yosemite Valley and below in Segments 3 and 4. As such, its wildlife community includes species common to higher and lower elevations, leading to high species diversity.

The Merced River gorge (Segment 3) is a unique case of lower elevation habitat. It is lined with a narrow band of riparian vegetation along the river, bordered by a dense mosaic of chaparral and foothill woodland communities (chaparral/oak woodland zone) on the steep canyon walls. Birds commonly found in this zone include western scrub-jay (*Aphelocoma californica*), California towhee (*Melospiza crissalis*), Hutton's vireo (*Vireo huttoni*), California thrasher (*Toxostoma redivivum*), Bewick's wren (*Thryomanes bewickii*), oak titmouse (*Baeolophus inornatus*), wrentit (*Chamaea fasciata*), Nuttall's and acorn woodpeckers (*Picoides nuttallii* and *Melanerpes formicivorus*, respectively), and red-tailed hawk (*Buteo jamaicensis*). Mammals include western harvest mouse

(*Reithrodontomys megalotis*), dusky-footed woodrat (*Neotoma fuscipes*), spotted skunk (*Spilogale gracilis*), mule deer, and bobcat. More significantly, the rocky outcrops and associated crevices of the gorge probably harbor a high density of special status bat species (e.g., spotted bat (*Euderma maculatum*), western mastiff bat (*Eumops perotis*)) (CDFG 2012). Many of these species are also present in Yosemite Valley. Several bat species, such as Townsend's big-eared bat (*Corynorhinus townsendii*) and Yuma myotis (*Myotis yumanensis*), occasionally use human structures where they are vulnerable to impact (NPS 2011a).

Downstream of the Cascades area, the velocity increases as the river enters the gorge, heading toward El Portal. The relatively undisturbed riparian habitat, especially on the south side of the river, and the known presence of Valley elderberry longhorn beetle and adjacent California spotted owl habitat contribute to El Portal's biological resources (NPS 2011a). The river reach in El Portal is characterized by steep gradients, large boulders strewn throughout the channel, and frequent pools and cascading waterfalls. The north side of the canyon consists of foothill pine and oak woodland vegetation. The floodplain is minimal, if at all, in this reach. Fishes native to the Merced River below El Portal include rainbow trout, Sacramento sucker, Sacramento pikeminnow, hardhead, California roach (*Hesperoleucus symmetricus*), and the riffle sculpin. This reach of the river also supports introduced populations of smallmouth bass (*Micropterus dolomieu*), rainbow trout, and brown trout.

Segment 5: South Fork Merced River Above Wawona

The South Fork Merced River originates at an elevation of 10,500 feet and flows westward, supporting alpine and montane meadow and chaparral, coniferous, and deciduous forest habitats. These habitats are similar to those described for Segment 1 in the upper reaches of the Merced River.

Segments 6–8: Wawona Impoundment, Wawona, and South Fork Merced River Below Wawona

At Wawona, the South Fork Merced River meanders mainly through coniferous forest, with smaller areas of chaparral, broadleaf forest, and meadow. Big Creek, a tributary of the South Fork Merced River, meanders through Wawona Meadow before reaching the river. Wawona Meadow and the associated riparian habitats—intact vegetation consisting of aspens, willows, and alders—support the occasional willow flycatcher (NPS 2011a). Although willow flycatchers no longer nest in Yosemite National Park (Siegel et al. 2008), this species formerly occupied Wawona Meadow and they are occasionally observed as transient individuals.

The availability of snags and prey resources along the South Fork Merced River provide suitable nesting and foraging habitat for great gray owls year-round. Stream habitats support a sensitive invertebrate, the Wawona riffle beetle (CNDDDB 2012).

The South Fork Merced River supports self-sustaining populations of introduced brook, rainbow, and brown trout. There is less angler pressure on the South Fork Merced River than on the main stem due to difficulty of access and terrain. The significant presence of large woody debris, particularly in the uppermost reaches; dense riparian vegetation; overhanging trees; consistent riffle and pool habitat; waterfalls; and boulders all contribute to the quality of aquatic habitats.

Environmental Consequences Methodology

Proposed management actions under each alternative are evaluated in terms of the context, intensity, and duration of the impacts, as defined below, and whether the impacts are considered beneficial or adverse to the natural environment. Generally, the methodology for natural resource impact assessment follows direction provided in the *Council of Environmental Quality Regulations for Implementing the National Environmental Protection Act*, section 1508.27.

Four primary parameters are used to evaluate impacts: (1) the amount and distribution of wildlife habitat; (2) the integrity and quality of habitat (including past disturbance); (3) the relative importance of habitat as related to productivity; and (4) the potential for disturbance from human presence, including radiating impacts (the term “radiating impacts” is used to indicate that habitat quality diminishes as a negative function of the distance from development). Radiating impacts are especially pronounced in small habitat fragments. Impacts on the native plant communities and hydrologic processes that support wildlife habitat are assessed under the “Vegetation” and “Hydrology, Floodplains, and Water Quality” sections in this chapter. Analysis was based on the assumptions listed below.

- The greater the size of a biotic community and the stronger its links to neighboring communities, the more valuable it is to the integrity and maintenance of biotic processes. Development may potentially limit the size of a community and/or fragment and disassociate communities from each other.
- The more developed areas become, the less valuable they are as wildlife habitat. New development would increase human presence and increase the potential for disturbance in the area of the development. The potential for negative wildlife interactions (such as human injury from wildlife and the introduction of unnatural food sources) also would increase. The removal of development from an area would increase the value of the habitat. However, it is important to recognize that in some cases, existing development serves to concentrate visitor impact and reduce disturbance associated with dispersal of the same number of visitors. “Containment” of disturbance within a designated area may preserve integrity of habitat and prove more valuable to wildlife than dispersed use.
- The effects of human food and garbage on the behavior, distribution, and abundance of wildlife species would continue in existing developments and would begin in new developments.
- Disturbance in or near a river and its tributaries might reduce the productive capabilities of associated natural communities. Modifications to river form (including those that would constrain the river from migrating or changing course), soil compaction, loss of riparian vegetation, removal of woody debris, and accelerated erosion and sediment transport influence important habitat characteristics such as riffle/pool complexes, substrate type, location, and cover. These physical aspects often determine the composition of vegetative and aquatic communities. Decomposed organic material from meadow, wetland, and riparian vegetation provides the primary nutrient source to adjacent aquatic communities as it is transported to the river via seasonal surface water flows and leaves dropped into the water from riparian deciduous trees and shrubs. Modifications that prohibit surface or subsurface water flows into meadow and wetland habitats might cause instability in these habitats.

Removal of riparian vegetation and woody debris might alter or disrupt the critical link between terrestrial and aquatic ecosystems.

- Roads are generally barriers to wildlife and fragment habitat.
- Noise and light pollution negatively affect wildlife species.
- Development and impacts in riparian zones may influence critical water quality elements such as water temperature, suspended sediments, and nutrients. These elements interact in complex ways in aquatic systems and directly and indirectly influence patterns of growth, reproduction, and migration of aquatic organisms.
- Ecological restoration of native communities would involve some short-term adverse impacts (e.g., smoke from prescribed burning) but over time can successfully replicate natural processes.

This impact assessment considers the potential effects that implementation of the Merced Wild and Scenic River Comprehensive Management Plan (Merced River Plan) could have on wildlife resources. Information on wildlife habitats and species in the study area derives from the Yosemite Parkwide Vegetation Map (1997) and other studies, including the *2010 Assessment of Meadows in the Merced River Corridor, Yosemite National Park* (Ballenger et al. 2011), the *Merced River and Riparian Vegetation Assessment* (Cardno/Entrix 2011), and the *Wildlife Conditions Assessment for the Merced River Corridor in Yosemite Valley, Yosemite National Park* (Espinoza et al. 2011). Quantitative analysis was used wherever possible; however, when quantitative analysis was not feasible, qualitative analysis was used. Qualitative analysis relies substantially on professional judgment, supported by extrapolation of relevant research, where appropriate, to reach reasonable conclusions as to the context, intensity, duration, and type of potential impact.

- **Context.** The context of the impact considers whether the impact would be local, segmentwide, parkwide, or regional. For the purposes of this analysis, local impacts would be those that occur in a specific area within a segment of the river. This analysis further identifies if there are local impacts in multiple segments. Segmentwide impacts would consist of a number of local impacts within a single segment, or larger-scale impacts that would affect the segment as a whole. Parkwide impacts would extend beyond the river corridor and the study area in Yosemite National Park. Regional impacts would be those that extend to the Yosemite Sierra-wide. Context suggests that certain impacts depend upon the setting of the proposed action. For example, impacts that reduce the value of the Merced River in providing connectivity between habitat types could be minor if such connections are abundant in a given region, but could be moderate or major if they are not.
- **Intensity.** The intensity of the impact considers effects of an action on the size and integrity of native habitats, diversity, and species populations. These designations are used to describe both beneficial and adverse impacts. Negligible impacts would have no measurable or perceptible changes on wildlife habitat or populations. Minor impacts would be local within a relatively small area, and the impacts on the integrity of animal populations would not be expected to have an overall effect on natural community structure. Without further impacts, negative effects may be reversed, and habitat quality would recover. Moderate impacts would be clearly detectable on wildlife habitat and populations and would be sufficient to cause a change in the abundance, distribution, quantity, or integrity of species; community ecology (e.g., the numbers of different kinds of species present); or natural processes (e.g., hydrology).

Major impacts would be substantial and highly noticeable, with the potential for permanent landscape-scale changes in the distribution, diversity, or dynamics of species populations; community ecology; and natural processes. Impacts on wildlife are quantified where possible by determining the acreage of wildlife habitat types altered. The amount of each habitat type that would be directly affected is determined by a comparative analysis of habitat spatial data representing existing conditions and conditions under proposed management actions. Radiating impacts and effects associated with habitat distribution and patch size are also addressed quantitatively where baseline data are available to support such an analysis. Other potential direct and indirect effects on wildlife habitats, such as effects associated with invasive species or the potential for disturbance to wildlife populations due to increases in human activity, are analyzed qualitatively.

- **Duration.** A short-term impact would have an immediate effect on native habitat, diversity, and native populations but would not cause declines or increases in populations or diversity over time. Short-term impacts are normally associated with transitional types of activities, such as facility construction. Long-term impacts would lead to a loss or gain of native habitat, diversity, and species populations as exhibited by a decline or increase in species abundance, viability, and/or survival.
- **Type of Impact.** The type of impact considers whether the impact would be beneficial or adverse. Impacts are considered beneficial if an action causes no detrimental effect and results in an increase in the size or integrity of species populations or habitat components; reduces disturbance to native ecosystem processes; increases native species richness/diversity; or otherwise increases native habitat quantity and quality. Impacts are considered adverse if they reduce the size, integrity, or diversity of native habitat.

Environmental Consequences of Alternative 1 (No Action)

All River Segments

Alternative 1 (No Action) would be a continuation of current conditions and management. There would be no comprehensive changes to the management of the Merced River corridor. Under Alternative 1, the NPS would retain (and potentially revise) current management policies pertaining to wildlife. Current management plans that include goals to enhance wildlife habitat in the Merced River corridor (as described under “Affected Environment”) would continue to be implemented, resulting in long-term, beneficial effects throughout the Merced River corridor.

Impacts of Actions to Protect and Enhance River Values

As described in “Chapter 8: Alternatives,” impediments to channel free flow and their associated impacts would continue in all segments of the Merced Wild and Scenic River corridor. All riprap and abandoned infrastructure in the river channel and meadow floodplains would remain, which may continue to alter the free-flowing condition of the river and constrain the river from naturally migrating and changing course.

Although some large woody debris would be left in place in the river channel, the NPS would continue to remove large woody debris where there are threats to human safety or infrastructure. This action

would continue to influence habitat characteristics in the channel, such as riffle/pool complexes, cover for aquatic species, and stability of riverbanks.

Informal meadow trails would largely remain under Alternative 1 (No Action). Riparian habitat would continue to be protected at current levels. However, continued visitor presence along the sensitive riverbank of the Merced River would continue to cause local riverbank erosion and scouring effects associated with bridges would continue. Conifer encroachment would continue to be managed with fire reintroduction. Meadow habitat would continue to be protected and enhanced by the Invasive Plant Management Plan Update, which eradicates (or at least controls) invasive plant species; prevents new invasions; restores and maintains desirable species composition; enhances the visitor experience; and educates park staff, partners, and users in protecting meadow habitat. These ongoing riverbank erosion and scouring effects, except for the management of encroaching conifers, would result in continued impacts on meadow and riparian habitats, including habitat fragmentation, reduced productivity of riparian and adjacent aquatic communities, and potential disruption of connectivity between terrestrial and aquatic habitats.

Despite some ongoing impacts that would occur under Alternative 1, the NPS would also continue restoration projects to mitigate for impacts on biological values. Restoration projects would continue in several Yosemite Valley meadows such as Bridalveil, Cook's, and El Capitan meadows, as well as riverbank restoration at North Pines Campground. The NPS would also continue invasive species control, where such plants are present, and conifer removal from some meadows. These ecological management actions would increase habitat integrity by reducing fragmentation and providing connectivity between habitat communities, reducing erosion along riverbanks, enhancing habitat quality for terrestrial and aquatic wildlife, and continuing to promote good water quality. Thus, current ecological management actions under Alternative 1 would enhance biological values and result in long-term, minor, beneficial effects on aquatic and terrestrial wildlife throughout the Merced River corridor.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 1 (No Action) would perpetuate the kinds and amounts of use that exist today. No new structures would be constructed in the Merced River corridor under Alternative 1 (e.g., no new campsites would be built at the former Lower and Upper River Campgrounds; this area would be allowed to passively revert to natural conditions). Habitat for wildlife would improve over time in areas allowed to revert to natural conditions. New structures that would be constructed would be minor in nature; temporary; easily removed; not habitable; designed to support existing uses, systems, and programs; located in the existing building footprint; and not created solely for commercial purposes. Temporary housing for employees displaced primarily by the flooding in 1997 at Curry Village area and temporary housing at the Lost Arrow parking lot in Yosemite Village would continue as needed. Housing for NPS employees and park partner staff would remain in current locations and at current levels.

Many resource impacts derived from visitor and administrative use in all river segments would continue to be present. Informal trails, bicycle paths, campsites, roads, bridle paths, parking, staging areas, and trails would remain in some sensitive habitat areas, such as meadows and adjacent to

riparian habitat or within the 100-year floodplain. Traffic congestion, lack of parking spaces in high-use segments (e.g., Segments 2, 4 and 7), and improper parking adjacent to or on edges of meadows would continue to affect meadow habitats and terrestrial and aquatic wildlife. Traffic congestion, for example, would continue to affect wildlife species such as black bears from vehicle-bear collisions. To date, seventeen bears have been reported hit by vehicles in 2012 and nineteen bears were hit in 2011 (NPS 2012a). Some adverse impacts would be mitigated through continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use. Although some areas would be allowed to revert to natural conditions under Alternative 1 to benefit local wildlife (i.e., the former Lower and Upper River Campgrounds), overall current visitor use and facility management actions under Alternative 1 would result in long-term, minor, adverse impacts on biological values such as habitat integrity, contiguity, and quality for wildlife.

Segment 1: Merced River above Nevada Fall

Impacts of Actions to Protect and Enhance River Values

The continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, use of the wilderness trailhead quota system, and restrictions on amounts and locations of overnight use, would protect intact natural habitats, including the distribution, numbers, population composition, and interaction of native species. The NPS would continue efforts to monitor use, eliminate inappropriate uses (such as informal trails), and restore affected sites to natural conditions. Overall, habitat for wildlife in the Yosemite Wilderness within Segment 1 would remain undisturbed excluding trail corridors, as noted below, and no effect would result.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Wilderness above Nevada Fall would continue to be managed for wilderness-oriented experiences characterized by self-reliance and opportunities for solitude. Primary visitor activities would consist of hiking and overnight backpacking, with designated or dispersed camping.

Wildlife habitat adjacent to trail corridors would continue to be affected by ongoing use. Habitat in lightly used alpine areas would remain relatively undisturbed. Impacts in these Wilderness areas would be very minor associated with occasional noise, human presence, and some modification to habitat from vegetation loss and soil compaction along trail corridors. In subalpine areas, site-specific impacts would result from foot and stock traffic along trail corridors. These activities would include disturbances such as noise, human presence, stock presence and impacts to habitat such as vegetation trampling, soil compaction, and manure deposition by pack stock. If campground and trail use continues at current levels, adverse impacts could occur at scarcer wet-meadow habitats, thereby affecting wildlife species associated with these habitats. The small diversion dam at the top of Nevada Fall would remain in place, resulting in continued impacts on the free-flowing condition of the Merced River. However, as noted above, the NPS would continue to implement site-specific restoration projects to halt or reverse these adverse effects. Therefore adverse impacts on wildlife associated with trail use would be local, minor, and long term.

Coniferous forest habitats along the upper Merced River are structurally diverse and expected to continue to support a full community of associated wildlife species under Alternative 1, even with the continued local, long-term, minor, adverse impacts associated with popular dispersed campsites and visitor use areas. Further downstream (into Little Yosemite Valley), in areas with less understory vegetation, continued concentrated human use along the north side of the Merced River would also result in local, long-term, minor, adverse effects on wildlife habitat.

Although administrative and concessioner stock (horses and mules) are typically contained in corrals and pastures away from the Merced River, there would continue to be a minor, adverse impact on wildlife near these areas. For example, cowbirds tend to occur in areas of heavy horse use; this bird species has a detrimental effect on native songbird populations through brood parasitism. Likewise, the continued use of trails by horses and mules could increase cowbird parasitism, in addition to the adverse impact on water quality from trail runoff. Runoff can affect adjacent aquatic habitats by introducing unnaturally high levels of nutrients such as nitrogen. Horse and mule droppings could furthermore lead to the introduction of nonnative plant species and cause locally increased populations of insects such as flies. Based on these factors, adverse impacts on wildlife associated with concessioner stock would be local, minor, and long term under Alternative 1.

Continued concentrated human use would have a local, minor, adverse effect on wildlife in the vicinity of the Moraine Dome Camping Area, Merced Lake High Sierra Camp, Merced Lake Backpackers Camping Area, and Little Yosemite Valley Backpackers Camping Area through trampling of understory vegetation and disturbances, including noise, artificial light, and human presence (including the presence of human food and garbage). As discussed under the *Impacts of Actions to Protect and Enhance River Values* section above, stock presence and vegetation trampling, soil compaction, and pack stock manure along the trails would continue to adversely impact meadow and aquatic habitats in Segment 1. Concentrated use would continue local, minor, adverse impacts by locally reducing understory vegetation and downed wood (from firewood collection), thus directly disturbing wildlife and providing unnatural food sources. However, concentrated human use would continue to have a beneficial effect on the park's management of human/mountain lion encounters, which are more common when human use is dispersed (Beier 1991).

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Under Alternative 1 (No Action), fill material, compacted soils, and a network of roads at the former Pine and Oak units at Yosemite Lodge would remain in place and provide little or no suitable habitat for wildlife. Pack stock trail use within the ordinary high-water mark between Clark's Bridge and the Curry Village stables, and the placement of the Upper Pines Campground dump station and Camp 6 unimproved parking lot in proximity to the river would continue to impact riparian habitat and potentially contribute to water quality impacts. The river channel between Clark's Bridge and Sentinel Bridge would continue to widen and exhibit low channel complexity. Lack of designated river access from the Pohono Bridge to the Cascades Diversion Dam would continue to affect riparian habitat and riverbanks in this area. These practices would continue to be potential contributors to water quality impacts in localized areas of the river through accelerated erosion and sediment deposition in the river

and result in long-term, minor, adverse impacts on aquatic and terrestrial wildlife associated with riverine habitat (including meadows and riparian habitat adjacent to the river).

Aquatic habitats in Segment 2 have long been subject to large wood management, which results in the modification of the aquatic habitat through the selective removal or replacement of woody debris from the stream channel. This practice adversely affects natural stream dynamics, reduces habitat diversity for aquatic organisms, and adversely affects nutrient cycling in these habitats by removing a natural source of nutrient input. Large wood management would continue under current practices. Streambank destabilization in the vicinity of wood removal would continue, causing a local, long-term, minor, adverse impact on aquatic habitat for fisheries and wildlife.

Under Alternative 1, human-constructed ditches, informal trails, abandoned roadbeds and infrastructure, trails in inundated areas, and informal roadside parking in meadow habitat would continue to adversely affect meadows and wetlands in Yosemite Valley by altering the hydrology of these habitats. Conifer encroachment into meadows would continue to affect meadow hydrology. The former Upper River and Lower River campgrounds area is critical to providing hydrologic connectivity between Ahwahnee and Stoneman meadows; however, it is currently not functioning as a healthy riparian and floodplain ecosystem due to lost topography (graded landscape and filled drainages), compacted soils, existing (amphitheater) and abandoned infrastructure, and invasive plant infestations. These factors would continue impact meadow habitat and wildlife species using this habitat. Alternative 1 would allow the former Upper River and Lower River Campgrounds to passively revert to natural conditions, which would be beneficial to wildlife in the long-term.

As discussed in the “Vegetation and Wetlands” section of this chapter, meadow habitat acreage in Yosemite Valley has substantially diminished from levels present during pre-Euro-American times and has affected dependent wildlife species such as Pacific chorus frog and red-winged blackbird. The park has already instituted meadow restoration and prescribed burning programs that benefit meadow hydrology, plants, and wildlife, and these programs would continue under Alternative 1, thereby offsetting some of the adverse effects associated with habitat loss over time.

In forested habitats, encroachment of conifers into California black oak woodlands has altered species composition, abundance, and diversity. Encroachment would continue under Alternative 1 due to the inability to manage trees in and surrounding developed areas with prescribed fire. The encroachment of conifers into California black oak woodlands has affected the availability of acorns, an important seasonal food source for species such as black bears, mule deer, acorn woodpeckers, gray squirrels, and numerous small rodents. Furthermore, conifers provide less suitable habitat for species such as great-horned owls, yellow-rumped warbler, and western bluebird. This effect would be local, long term, minor, and adverse in Segment 2.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Under Alternative 1 (No Action), size, structure, productivity, and continuity (within habitat and between habitats) of wildlife habitats in Yosemite Valley would continue to be affected by existing improvements and visitor use. In general, adverse impacts on wildlife resources in Segment 2 under Alternative 1 would be local, minor, and long term.

The Merced River in Yosemite Valley would continue to provide for a diversity of river-related and other recreational opportunities. Overnight capacities, employee housing (including temporary housing), visitor day and administrative parking capacity, and administrative activities are well established and would remain as they are today. Most campsites in Valley campgrounds would be retained; the former Upper and Lower River campgrounds would be allowed to be passively restored to natural conditions. In general, parking demand in Yosemite Valley exceeds supply during peak-use periods, resulting in overflow parking on shoulders along roadways and sometimes in sensitive meadow habitats, thereby resulting in local, minor adverse impacts on wildlife that use these habitats.

Continued operation of overnight lodging units in the floodplain and heavy foot traffic associated with campgrounds, lodging, rafting operations, and picnic areas would continue to denude riparian habitat in localized areas. Heavily used areas in the Valley can approach the level of disturbance normally associated with an urban park. During reconnaissance surveys in 1998, for example, bird diversity at Yosemite Falls was characterized by a preponderance of disturbance-tolerant species. Earlier researchers at the park (Foin et al. 1977, cited in Knight and Gutzwiller 1995) found that more disturbance tolerant species such as Brewer's blackbirds and mountain chickadee increased in areas near visitor trails, while other species (e.g., dark-eyed junco) decreased. It is anticipated that these patterns would continue under Alternative 1.

Overall, continued use of improvements at current levels of intensity would have a segmentwide, long-term, moderate adverse effect on wildlife use of the riparian corridor and adjacent habitats in Yosemite Valley. Wildlife and their habitats are currently affected by the overall amount of noise, traffic, and human presence, and the effect would continue for riparian-dependent species (e.g., belted kingfisher, warblers, and flycatchers) at developments such as North and Lower Pines campgrounds and Camp 6. Wildlife habitat tends to be fragmented along the riparian zone in the east Valley because of developed campgrounds, parking lots, and roads. Habitat fragmentation would continue to restrict wildlife movement in this area under Alternative 1.

Segments 3 and 4: Merced Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Under Alternative 1 (No Action), the Merced River in El Portal would continue to be confined by riprap and levees, abandoned infrastructure and imported fill in floodplain habitat would remain, and Greenmeyer sand pit would continue to contain fill material that precludes natural flooding and development of riparian vegetation. Water quality may be affected by surface water runoff that transports sediment and automotive fluids from roadside parking areas between the Merced River and Foresta Road. These effects would continue to result in long-term, local, minor, adverse impacts on channel free-flow, water quality, riparian habitat development, and aquatic and terrestrial wildlife that inhabit these habitats.

Valley oaks in Segments 3 and 4 would continue to be affected by vehicles parking under the drip line of the trees. This practice compacts soil under the trees, thus affecting root health, water uptake, and soil aeration. Additionally, existing development and trampling in the vicinity limits the area where oak

seedlings can be recruited. Current practices would result in long-term, local, minor, adverse impacts on valley oak habitat, thereby affecting wildlife species that depend on this habitat type.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Montane hardwood conifer is the dominant habitat type in Segments 3 and 4, adjacent to riparian areas below Yosemite Valley. This habitat type is broadly transitional between upper-elevation forest types to chaparral and is thus the most important type for migratory wildlife and their associated predators. Access by wildlife to these habitats is affected on the north side of the Merced River by roads, employee lodging, and other human activities and existing development. In contrast, habitats on the south side of the river are relatively free of human made barriers or disturbances. These conditions would continue to occur under Alternative 1 (No Action), resulting in long-term, local, minor adverse impacts on wildlife resources in Segments 3 and 4 over the long term.

Visitor activities in Segments 3 and 4 include scenic driving along El Portal Road and river-related recreational activities. Visitor pass-through use would continue to be the majority of use in Segments 3 and 4. There are no overnight accommodations for park visitors in these segments that are on park land. Due to the low levels of visitor use and no overnight accommodations in Segments 3 and 4, the amount, distribution, and integrity of wildlife habitat would remain relatively intact and the potential for human disturbance from human-related activities and presence would remain low. Impacts from current actions to manage visitor use and facilities in Segments 3 and 4 would result in continued long-term, local, minor adverse impacts on wildlife habitat and wildlife species in these segments.

Segments 5–8: South Fork Merced River

Impacts of Actions to Protect and Enhance River Values

Continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use, would protect intact natural habitats, including the distribution, numbers, population composition, and interaction of native species. In general, long-term adverse impacts on wildlife resources in Segments 5– 8 through implementation of Alternative 1 (No Action) are considered to be local and minor. Habitats upstream and downstream of Wawona along the South Fork Merced River are relatively inaccessible and intact. Implementation of Alternative 1 would not substantially alter the form or function of these communities.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Visitor use in Segments 5 and 6 would remain very low, and river values would remain protected under Alternative 1 (No Action). Visitor activities in Segment 7 include river-related activities, picnicking, camping, lodging, education and interpretation at the Pioneer Yosemite History Center, special events at the Wawona Hotel, and golfing. Overnight accommodations are provided by the Wawona Hotel and Wawona Campground. Visitor activities in Segment 8 consist of day visitors swimming, hiking, or other participating in other river-related activities. There are no overnight lodging accommodations in Segment 8. Any future improvements to visitor facilities would occur in previously developed areas

(associated with the Wawona Store and bus stop). Riparian habitat restoration would be implemented at the Wawona Maintenance area, and roadside parking would be removed between the Wawona Store and Chilnualna Falls Road.

For the coniferous and deciduous forests adjacent to Wawona, habitat fragmentation caused by existing development and use would continue to affect wildlife under Alternative 1. With the continued use of these areas, this alternative would result in long-term, minor, adverse impacts on wildlife. Planned habitat restoration would mitigate for some of these adverse impacts, resulting in long-term, negligible, adverse impacts on wildlife.

The South Fork Merced River supports self-sustaining non-native populations of rainbow and brown trout. There is less pressure by anglers on the South Fork Merced River fisheries than on the main stem because of the difficult access and terrain. There would therefore be no effect on fisheries in the South Fork Merced River under Alternative 1.

Summary of Alternative 1 (No Action) Impacts

Past development and human activity in the Merced River corridor have in some cases adversely affected wildlife habitat. Under Alternative 1 (No Action), some adverse trends to wildlife habitat would continue to occur. These include a reduction in habitat quality for riparian and wet-meadow-dependent wildlife where these habitats are near or adjacent to existing developments and high visitor use areas; a trend toward a loss of habitat connectivity and increase in habitat fragmentation; an increase in human-related disturbance; and continued competition between native wildlife and nonnative species and disturbance-tolerant wildlife.

The NPS would continue to implement existing goals and policies (e.g., the 1916 *Organic Act*, *Yosemite Natural Resources Management Plan*, *Yosemite Vegetation Management Plan*, and *Invasive Plant Management Plan*) and make incremental improvements to wildlife habitat on a project-by-project basis, as opportunities and resource problems present themselves. For example, hampered by existing development and infrastructure, enhancement and reestablishment of oak woodland habitat would continue on a site-by-site basis rather than on a parkwide or Valleywide basis. Although substantial piecemeal improvements can take place under current direction, “reactive” resource management is not always effective at protecting sensitive resources over the long term. Therefore, effects on wildlife would continue to be adverse, segment-wide, moderate and long term, especially in areas of high human use such as Yosemite Valley, El Portal, and Wawona (Segments 2, 4, and 7). Other river segments would be less affected by Alternative 1, resulting in long-term, local, negligible adverse impacts.

Cumulative Impacts of Alternative 1 (No Action)

Cumulative impacts on wildlife discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with potential effects of Alternative 1 (No Action). The projects identified below include those that have the potential to affect local wildlife patterns (i.e., within the Merced River corridor) as well as large-scale or regional wildlife patterns.

Past Actions

Wildlife communities have been manipulated almost since the beginning of Yosemite National Park. Regional wildlife has been historically affected by logging, fire suppression, rangeland clearing, grazing, mining, draining, damming, diversions, and the introduction of nonnative species. Fur-bearing mammals were trapped by park rangers until 1925; lions were considered dangerous predators and controlled through the 1920s; and bears were artificially fed as a tourist attraction until 1940. Natural wildfires, with their generally beneficial effects on wildlife habitat, were routinely suppressed until 1972 (Wuerthner 1994). Past and ongoing activities include construction of dams, diversion walls, bridges, roads, pipelines, riprap, recreational use, buildings, campgrounds, and other recreational features.

Yosemite's mammal species that were once thriving within the park but are now extremely rare are the fisher, wolverine (possibly extinct), and Sierra Nevada red fox. Several bird species have probably been reduced in Yosemite Valley by human activity but are present in less disturbed areas of the park. Willow flycatchers no longer nest in Yosemite Valley for a variety of complex reasons, including parasitism by brown-headed cowbirds, destruction of riparian and meadow habitat, past cattle grazing, nest predation, and lack of a regionally sustainable population. On a wider scale, apparent population declines have been detected in numerous other bird species in the Sierra Nevada, including Yosemite. Possible causes for these declines include grazing, logging, fire suppression, development, recreational use, pesticides, habitat destruction on wintering grounds, and large-scale climate changes.

Amphibians in Yosemite have suffered population declines similar to those seen in the rest of the Sierra Nevada (Drost and Fellars 1996). Red-legged frogs likely were found in Yosemite Valley in the past but are now presumed extirpated. Significant factors in their disappearance probably include reduction in perennial ponds and wetlands, and predation by bullfrogs. At higher elevations, Sierra Nevada yellow-legged frogs and Yosemite toads are still present in a number of areas but are severely reduced in population and range. Foothill yellow-legged frogs are no longer found anywhere in Yosemite Valley, and may no longer be found in the park. However, one population of foothill yellow-legged frog occurs adjacent to the park boundary on the Tuolumne River, and there may be a small population in the park. Focused surveys have not been conducted to confirm this species' existence in the park. Research continues to identify the causes of Sierra Nevada-wide amphibian declines; possible causes include habitat destruction, nonnative fish, pesticides, and diseases. Most fish currently found in the Merced River and its tributaries in Yosemite have been introduced. Prior to trout stocking for sportfishing, native fish in Yosemite were probably limited to the rainbow trout and the Sacramento sucker, both of which were present only in the lower portions of the Merced River (i.e., Yosemite Valley and below). Rainbow trout introduced through stocking from other waters and fish hatcheries have now hybridized with, and/or has displaced, the original strain.

A list of past, present, and future projects and plans that could have a cumulative effect on wildlife are summarized in Appendix B. Past projects and plans that could have a cumulative effect on wildlife include the following:

- **Management and Restoration:** *South Fork and Merced Wild and Scenic River Implementation Plan*, Cascades Diversion Dam Removal, Cook's Meadow Ecological Restoration, Fern Springs Restoration, Happy Isles Dam Removal, Happy Isles Fen Habitat Restoration Project,

Happy Isles Gauging Station Bridge Removal, Lower Yosemite Fall Project, Merced River Ecological Restoration at Eagle Creek Project, Red Peak Pass Trail Rehabilitation

Present Actions

Current facility-related projects and plans that could have a cumulative effect on wildlife include the following:

- ***Facility Development:*** Crane Flat Utilities, *East Yosemite Valley Utilities Improvement Plan/Environmental Assessment*, Wahhoga Indian Cultural Center, Parkwide Communication Data Network, South Entrance Station Kiosk Replacement, Tioga Road Rehabilitation.

Beneficial impacts for present management and restoration actions are similar to those discussed for past actions. Specific examples of present projects and plans include the following:

- ***Management and Restoration:*** *Vegetation Management Plan*, General Ecological Restoration, *2004 Fire Management Plan/EIS*, Fuels reductions/forest rehabilitation projects (USFS), *Tuolumne Wild and Scenic River Comprehensive Management Plan*.

Reasonably Foreseeable Future Actions

Reasonably foreseeable future actions proposed in the region that could have a cumulative effect on regional wildlife include:

- Changing demographics of visitors in Yosemite
- Climate change
- Comprehensive Transportation Plan
- Concessioner Parking Lot Restoration
- Restoration of the Mariposa Grove Ecosystem
- Yosemite National Park Annual Fire Management Plan (Operational Fire Management Plan)
- *Yosemite Wilderness Stewardship Plan/EIS*

Planned restoration projects listed above would generally contribute towards beneficial cumulative effects to special status species by increasing the quantity and quality of affected habitats. Cumulative adverse effects are related to increased facilities, access, and regional population growth as well as changes in climate. Facility-related projects would in many cases have local, adverse effects on fish and wildlife due to construction activities (short term) and the direct loss of habitat (long term). Increased population and visitation to the region over time would also contribute towards adverse effects. Regional population growth and visitation primarily affects regional wildlife populations through habitat loss and fragmentation due to new housing and infrastructure and use. Examples of construction- and human-use-related effects on wildlife patterns include direct displacement of wildlife (e.g., replaced with structures); introduction of nonnative species that invade into adjacent natural areas and displace native species (e.g., spread by construction equipment and materials, vehicles, grazing animals, or backyard gardening); fragmentation of habitats, which decreases genetic diversity; alteration of natural patterns (e.g., fire suppression around structures, use of herbicides, the

introduction of night light); and increased erosion and sedimentation (e.g., during grading activities, overuse of trails). More importantly, some of the projects provide for increased residential growth adjacent to the park and would accommodate increased recreational development.

Changes in climate also pose a threat to several wildlife and fish. In particular, many amphibians would be affected by warming temperatures through increasing suitability for invasive competitors, pathogens, changes in hydrological patterns, and changes in snow pack and runoff. Many species would also be affected by increasing competition from other species (including invasives) as habitat for competitors becomes more suitable over time.

In total, regional development and growth could have a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. For species at higher elevations, the effects would somewhat be mitigated by resource protection planning and inherent spatial separation from impacts at lower elevation. In total, regional development and growth could have a net long-term, moderate, adverse effect on regional wildlife resources that would not be compensated by regional planning and restoration projects discussed above.

Wildlife communities have been manipulated almost since the beginning of the park, and these actions have had a mostly negative influence on wildlife and their habitats. Recent past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and rehabilitation projects and ecosystem management. Cumulative adverse effects would be related to habitat loss through development, regional population growth, and increased competition from nonnative species. Although general effects associated with Alternative 1 (No Action) would be negligible, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be regional, minor, adverse, and long term.

Environmental Consequences of Actions Common to Alternatives 2–6

All River Segments

Impacts of Actions to Protect and Enhance River Values

Hydrologic/Geologic Resource Actions. Specific restoration actions associated with hydrologic/geologic resources in all river segments and common to Alternatives 2-6 include removing 3,400 feet of riprap corridor-wide and revegetating with riparian plant species where needed. An additional 2,300 feet of riprap would be removed and replaced with bioengineered riverbank stabilization. Removal of riprap and replacement with bioengineered riverbank stabilization would allow for natural channel migration and promote riparian revegetation, and thus would have long-term, moderate, and beneficial impacts on wildlife corridorwide. Species that use riparian and riverine habitats would benefit the most from the removal of riprap and reestablishment of riparian habitat, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Because the removal of rip-rap and associated restoration actions involve heavy machinery, short-term, segmentwide, minor and adverse impacts associated with the restorative action may include noise associated with restoration activities, human presence, modification of habitat, and potential increase in sedimentation to the river. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity and over the long term, this restoration action would have moderate, beneficial impacts on wildlife in all river segments. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian vegetation reestablishes throughout the Merced River corridor.

Actions to protect and enhance river values common to Alternatives 2–6 include measures to improve hydrologic function and enhance ecological complexity throughout the Merced River corridor, restore the riverbanks and upland riparian communities, protect sensitive habitat areas, and minimize the risk of impacts on new and existing structures from flooding. The Merced River would be restored to natural river processes through the removal of riverbank riprap, revegetation of native plants, use of bioengineering techniques to stabilize riverbanks, removal of abandoned infrastructure within the river channel and meadow floodplains, and restoration of natural topography. The NPS would manage large woody debris according to the management plan, which allows for large wood to remain in the channel if it does not compromise visitor safety or infrastructure. In general, these actions would have a long-term, moderate, beneficial impact on fish and wildlife species that use the Merced River and its associated habitats.

In 1997 and 1998, surveys were conducted to examine the effects of riverbank restoration, with special attention to the presence of large woody debris and the association of fish with those areas. Rainbow trout density appeared higher at restoration sites, while the density of brown trout and Sacramento suckers was higher at the control sites (USFWS 1999). Implementation of these restoration actions would also improve hydrologic function, enhance natural stream dynamics, and increase ecological complexity of the river corridor and associated upland riparian habitat over the long term. Consequently, habitat quality would improve for terrestrial and aquatic wildlife species that use these intricately linked ecosystems.

Meadow and riparian habitat support numerous wildlife species and serve as a critical link between upland and aquatic habitats. Under Alternatives 2–6, the park would undertake certain measures to address ongoing upland and riparian habitat impacts. These measures include addressing informal trails and conifer encroachment into meadow areas through various restoration techniques, fencing and area closures, and providing visitor education and visual cues. Meadow and riparian habitats would be restored by revegetating denuded areas, protecting newly restored areas with fencing or natural barriers, installing signage to educate visitors, and developing or replacing trails and boardwalks to accommodate visitors while reducing vegetation trampling. Existing formal trails would be delineated and defined, and new development within 150 feet from the ordinary high-water mark of the Merced River would be prohibited. Facilities within 100 feet of the ordinary high-water mark would be removed or relocated to allow the floodplain to restore to natural conditions. Riverbank stabilization would be achieved with brush layering techniques and revegetation. These actions would have a moderate, long-term benefit on wildlife that use these habitat types.

Potential short-term, adverse impacts may also occur as a result of restoration actions, including disturbance associated with noise/vibrations from construction/restoration activities, temporary increases in suspended sediments, potential for accidental spill of chemicals, and modification to riverbank and channel habitat. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation where possible would reduce these short-term impacts to minor and adverse.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

As described above, corridor-wide, Alternatives 2-6 would prohibit new development within 150 feet from the ordinary high water mark of the Merced River and remove or relocate all campsites within 100 feet of the ordinary high water mark to allow for restoration activities. These actions would have long-term, moderate and beneficial effects upon wildlife associated with the Merced River and its habitats.

Segment 1: Merced River Above Nevada Fall

Impacts of Actions to Protect and Enhance River Values

As described for Alternative 1 (No Action), formal and informal trails in Segment 1 directly and/or indirectly affect habitats and associated wildlife in some areas. Heavy grazing by stock animals, vegetation trampling, soil compaction, and manure deposition adversely affect meadow habitat. For example, trampling and/or soil compaction of meadow habitat reduce habitat for voles, thereby reducing forage availability for California kingsnake. Alternatives 2-6 would include measures to restore and protect high-elevation meadows in Segment 1, such as prohibiting grazing at Merced Lake East Meadow and removing informal trails, trails through inundated areas, and trails that fragment meadow habitat. Denuded areas would be revegetated with native vegetation. Over time, these actions would have long-term, moderate, and beneficial impacts on wildlife species that use meadows, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with these actions may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting trails. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (trail construction and relocation) and over the long term, these management actions would have moderate, beneficial impacts on wildlife in Segment 1. Additionally, these actions would have a long-term, moderate, beneficial impact on fish because nonpoint sources of pollution (including sediments and nutrients) would be reduced or eliminated in localized areas of the watershed in Segment 1.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternatives 2–6 would provide for similar kinds of use that exist today in Segment 1, which focus on wilderness-oriented experiences characterized by self-reliance and opportunities for solitude. Primary activities in Segment 1 include hiking and overnight backpacking at designated camping areas or dispersed wilderness camping. The retention of designated camping areas would vary by alternative. Stock day rides would be prohibited under Alternatives 2–6 in Segment 1. Adverse impacts from visitor activities would be mitigated through continuation of current wilderness policies, including protection of natural processes, visitor education with an emphasis on Leave-No-Trace practices, and restrictions on amounts and locations of overnight use. Actions to prohibit stock day rides and limit camping and travel to within maintained trails and roadways would result in long-term, minor, beneficial impacts on wildlife as human interactions and potential impacts related to stock use are reduced.

Private boating, with undesignated and dispersed put-ins and take-outs, would be allowed in all wild segments under Alternatives 2–6. Continued put-in and take-out activities in undesignated and dispersed locations in Segment 1 would result in continued long-term, local, negligible, adverse impacts on riverbanks from erosion and trampling of riparian vegetation. These activities would result in long-term, local, negligible, adverse impacts on riparian and riverine habitats and wildlife species that inhabit these areas.

Total visitor use levels for Segment 1 would vary with the overnight capacities and use levels across Alternatives 2–6. However, administrative use levels for this segment would remain the same across Alternatives 2–6. These administrative uses would continue to have a long-term, negligible effect on wildlife in Segment 1.

Segment 2: Yosemite Valley*Impacts of Actions to Protect and Enhance River Values*

Restorative management actions that would occur in Segment 2 under Alternatives 2–6 include strategically placing large wood (log jams) to lessen the scouring from bridge structures, preventing riverbank erosion, restoring riparian habitat, and directing visitor use to resilient areas adjacent to the river. The free-flowing condition of the Merced River would be enhanced through the removal of former bridge footings and a river gauge base from the bed and banks of the river at the Happy Isles footbridge. The abandoned gauging station at the Pohono Bridge would also be removed and the riparian buffer would be restored to natural conditions. Water quality would be improved by relocating the Upper Pines Campground dump station. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-59**.

As summarized in table 9-59, approximately 151 acres of meadow, riparian, black oak woodland, coniferous forest, and floodplain habitats habitat would be restored in Segment 2 under Alternatives 2–6, resulting in direct benefits to fish and wildlife that use these habitat types. These actions would result in enhanced channel free flow, increased channel complexity, and restored riparian habitat segmentwide; in the long term, these impacts would be moderate and beneficial to

TABLE 9-59: HABITAT RESTORATION COMMON TO ALTERNATIVES 2–6 IN SEGMENT 2

Current WHR Habitat Type ^a	Acres	Proposed WHR Habitat Type	Acres (WHR Habitat Type Restored/Enhanced) ^b
Meadow	16	Meadow	18
Sparsely vegetated	2		
Black oak woodland	14	Black oak woodland	14
Coniferous forest	58	A mosaic of meadow, black oak, and open canopy coniferous forest	58
Coniferous forest	25	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	25
Development	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	32
Coniferous forest	32		
Total	151	Total	151
Abbreviation: WHR = Wildlife Habitat Relationships ^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. ^b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, and 2011.			

aquatic and terrestrial wildlife. Short-term, adverse impacts resulting from these actions are expected to be localized, resulting from potential increase in suspended sediments caused by in-water restoration activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would ensure these short-term impacts would be minor and adverse.

Meadow habitat integrity, extent, and hydrological connectivity to the Merced River would be enhanced through constructing wide box culverts, formalizing or removing shoulder parking, restoring natural topography, removing ditches and abandoned infrastructure, improving roadways and trails, and removing encroaching conifers. In addition, the NPS would decompact soils and revegetate denuded meadow and riparian habitat. Stream headcutting at Bridalveil Meadow would be addressed by planting live willow cuttings to stabilize disturbed areas, riverbanks, and the adjacent meadow. These actions would result in local, short-term, adverse impacts on wildlife related to increased noise during restoration activities, human presence, and modification or conversion of habitats. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation where possible would reduce these short-term impacts to minor and adverse. Collectively, these restorative and management actions would be expected to have segmentwide, moderate, and beneficial impacts on fish and wildlife over the long term by enhancing habitat integrity, reducing habitat fragmentation, and improving water quality.

Actions that specifically target the enhancement of cultural values, including restoration of traditionally used plant populations, implementing the invasive plant management program, removing informal trails, and removing encroaching conifers that compete with black oaks, would also benefit wildlife species that depend on native vegetation and black oak woodlands. Thus, restorative actions to enhance cultural values would result in local, long-term, minor, beneficial impacts on wildlife associated with black oak woodlands and native vegetation.

Biological Resource Actions.

Ahwahnee Meadow: Actions common to Alternatives 2-6 to protect and enhance river values at the Ahwahnee Meadow include restoring an impacted portion of the Ahwahnee Meadow to natural meadow conditions and removing the tennis courts from black oak woodland. Currently disjunct portions of Ahwahnee Meadow would be reconnected by selectively removing conifers to return approximately 5.65 acres of meadow habitat. Enhancing meadow connectivity would reduce meadow fragmentation and removal of the tennis courts from black oak woodland would allow for woodland habitat to be restored. Natural meadow topography would be restored by removing abandoned irrigation lines and fill, filling in ditches, and revegetating with native meadow species. Actions to restore Ahwahnee Meadow would have local, long-term, moderate, and beneficial impacts on wildlife due to an increased amount of meadow and oak woodland habitat, a reduction in habitat fragmentation, and enhanced habitat function (restored topography and hydrological connectivity).

Yosemite Valley Campgrounds: Common to Alternatives 2-6, the NPS would remove all campsites within 100 feet of the bed and banks of the Merced River in all Valley campgrounds and restore riparian habitat through the removal of asphalt parking spaces, base rock, and fill material. Soils would be decompacted and topography would be recontoured to natural conditions. Native riparian plant species would be used to revegetate denuded areas. Riparian habitat protection would be achieved through redirecting visitors to more stable and resilient areas, and installation of new fencing (or adjusting existing fencing) to protect newly restored riparian zones. Restoration of the 100 foot buffer of floodplain and riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, moderate, and beneficial impacts to fish and wildlife.

El Capitan Meadow: Common to Alternatives 2-6, the NPS would reroute the climber use trail at El Capitan to an appropriate upland area east of the current location to reduce impacts to El Capitan Meadow. Additionally, informal trails through meadow and oak woodland habitat would be removed and fencing or natural barriers and signs would be installed to keep visitors from trampling on native plants. Existing culverts would be replaced and additional culverts would be installed to improve water flow from at El Capitan to Northside Drive. Encroaching conifer saplings would be removed from El Capitan Meadow. Restoration of El Capitan Meadow would result in local, long-term, minor, and beneficial impacts on wildlife from reduction in trampling from foot traffic, increased hydrological connectivity, and reduced conifer encroachment into meadow habitat.

Additional actions common to Alternatives 2-6 in Yosemite Valley include formalizing parking and river access from the Pohono Bridge to the Diversion Dam, adding 150 feet of boardwalk to the west of the existing boardwalk at Sentinel Meadow, expanding fenced areas to protect wetlands on the north end of Stoneman Meadow near Lower Pines Campground, restoring 20 acres of floodplains at the western portion of former Lower Pines Campground, relocating parking from Devil's elbow to the

east of the current parking lot and delineating a formal trail to access the sandbar, focusing visitor use and river access at Housekeeping Camp to two resilient beach locations on the western edge of Housekeeping Camp and across the footbridge, designating formal river access at Cathedral Beach Picnic Area and restoring riparian habitat, and filling approximately 2,155 feet of ditches throughout Valley meadows that are currently not serving current operational needs. Restoration of meadow and riparian habitats through the removal of invasive plant species and replanting with native vegetation, selective removal of conifers that cause meadow fragmentation, removal of abandoned park facilities and infrastructure (e.g., tennis court and abandoned irrigation lines), and filling of ditches that no longer serve operational needs would result in segment-wide, long-term, moderate, and beneficial impacts on wildlife. Species that use meadows, riparian, and riverine habitats would benefit the most from these actions, including mammals, reptiles, amphibians, many bird species, and fish.

Because some of the actions described above will require heavy equipment to achieve restoration objectives, local, short-term, minor, and adverse impacts associated with restorative actions would occur. Impacts include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of select conifers, and removal of nonnative vegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

Hydrologic/Geologic Resource Actions. Restoration actions associated with hydrologic/geologic resources within Segment 2 and common to Alternatives 2-6 include removing an abandoned gauging station within the bed and banks of the Merced River in the vicinity of Pohono Bridge, removing former footbridge (footings) and former river gauge base from the Merced River at the Happy Isles area, and constructing eight constructed logjams in the channel between Clark's and Sentinel Bridges to address river widening and low channel complexity. Riparian restoration would follow after the removal of abandoned or antiquated infrastructure and features that restrict the free-flowing condition of the Merced River. Restoration of riparian habitat and enhancement of the free-flowing condition of the Merced River would have long-term, moderate, and beneficial impacts on wildlife in Yosemite Valley. Species that use riparian and riverine habitats would benefit the most from these actions, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish segment-wide as riparian habitat reestablish.

Short-term, adverse impacts associated with restorative actions common to Alternatives 2-6 may include noise associated with restoration activities, human presence, and modification of habitat as a result of revegetation and removal of infrastructure. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

Cultural Resource Actions. Specific actions to enhance cultural resources in Segment 2 and common to Alternatives 2-6 include removing campsite 208 and bear box from the East Valley Campground. Additionally, bathroom foot traffic at this campground would be rerouted away from the milling feature and the feature would be protected by fencing. The removal of campsite 208 and rerouting of foot traffic would have long-term, negligible, and beneficial impacts on wildlife. Short-term, local adverse impacts include noise associated with restoration activities and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

Scenic Resource Actions. Specific scenic resource actions in Segment 2 and common to Alternatives 2-6 include removing or selectively thinning conifers and in some cases burning undergrowth to maintain views within Yosemite Valley. Additionally, the NPS would selectively clear vegetation, remove invasive blackberry, restore grassland and oak habitat in the foreground to the view of El Capitan, repair riverbank erosion and thin conifers to open the view of Merced River in the vicinity of Clark’s Bridge, and address informal trail use and vegetation trampling in the El Capitan area.

Tree size can be used as an indicator to determine habitat suitability for many species of wildlife, including raptors and other bird species as well as mammals. According to the CWHR System, trees with a diameter at breast height (DBH) measuring 6 to 11 inches are considered pole trees, trees measuring between 11 and 24 inches are considered small trees, and trees measuring greater than 24 inches are medium to large trees. Certain species, such as the California spotted owl, great gray owl, and long-eared owl, prefer dense mature forests with high canopy closure. The presence of black oaks in a mature forest setting is also beneficial to the California spotted owl as well as mule deer. Therefore, actions that affect large diameter trees or oaks are more likely to impacts these species. The total maximum number of trees over 6 inches DBH that would be removed in Segment 2 across Alternatives 2 to 6 is summarized in table 9-60.

TABLE 9-60: MAXIMUM NUMBER OF TREES REMOVED COMMON TO ALTERNATIVES 2–6 IN SEGMENT 2

Species	<12 inches DBH	<20 inches DBH	<30 inches DBH	<40 inches DBH	<50 inches DBH	<60 inches DBH	<70 inches DBH	Total
Black Oak	1	1	5	0	0	0	0	7
Cedar	794	476	234	147	36	2	1	1,690
Douglas Fir	1	6	1	0	3	0	0	11
Dogwood	1	0	0	0	0	0	0	1
White Fir	49	33	34	15	5	1	0	137
Live Oak	7	3	0	0	0	0	0	10
Ponderosa	355	277	443	386	94	9	3	1,567
Total	1,208	796	717	548	138	12	4	3,423
SOURCE: NPS 2012b								

Specific actions that selectively remove trees smaller than 6 inches DBH occur at Cook's Meadow (south boardwalk), Stoneman Bridge, Devil's Elbow, Swinging Bridge, and the Vernal Fall foot bridge. Actions to selectively remove trees less than 6 inches in DBH would result in long-term, local, negligible, and adverse impacts on wildlife because seedlings, saplings, and pole trees generally provide lower habitat value for wildlife as compared to larger, mature trees with denser canopies.

Specific actions that remove primarily (50% or more) smaller trees measuring less than 20 inches DBH occur at the following locations: Ahwahnee Dining Room, Ahwahnee Solarium, Ahwahnee Lounge, Tunnel View, Southside Drive (Bridalveil approach via Roosevelt turnout), Valley View, Southside Drive at Roosevelt turnout, Bridalveil Fall hanging valley, Bridalveil Straight, Bridalveil Fall foot bridge, Sentinel Meadow boardwalk, Superintendent's Bridge, Hutching's View B, Chapel (Cook's and Sentinel Meadow area), Stoneman Meadow boardwalk, Happy Isles Bridge, El Capitan Meadow (east end 1), Southside Drive (Cathedral Spires turnout), Wosky Pond, Cathedral Beach at the El Capitan area, El Capitan Postage Stamp Scene, Four Mile Trailhead, Yosemite Falls View, and Lower Falls Bridge. The primary tree species that would be removed at the locations listed above include Cedar and Ponderosa pine. Because most trees removed are small in size, their contribution to wildlife habitat is not as significant as larger trees within a mature forest setting. Many terrestrial mammals, birds, and bat species prefer larger trees (sometimes with suitable cavities) for shelter, nesting, and foraging. Thus, the specific action to selectively remove conifers at the locations listed would result in local, long-term, and minor to negligible adverse impacts on wildlife.

Specific actions that remove primarily medium sized trees (50% or more trees are larger than 20 inches but less than 30 inches in DBH) occur at the Camp 6 Visitor Center benches. The removal of medium sized trees would result in local, long-term, and minor adverse impacts on wildlife. Medium sized trees (between 20 and 30 inches DBH) would provide habitat for many wildlife species, however, these trees are generally not large enough to support certain species that require mature forests, such as the California spotted owl.

Specific actions that remove primarily large trees (50% or more trees are greater than 30 inches DBH) occur at the following locations: Ahwahnee Meadow (at Peeling Domes), Bridalveil Fall footbridge, Curry Village Amphitheater, Curry Village Parking Area, Housekeeping Camp Bridge, Sentinel Beach, and Yosemite Lodge Portico. Removal of large trees measuring more than 30 inches in DBH would result in long-term, local, minor to moderate, and adverse impacts on wildlife, especially species that inhabit dense, mature forest habitats. The primary tree species that would be removed at the locations listed above include Cedar and Ponderosa pine.

In summary, specific scenic resource actions would remove approximately 3,423 trees, 59% of which would be small trees that measure less than 20 inches DBH. In addition, 20.5% of the total of trees removed would be medium in size (between 20 and 30 inches DBH), and 20.5% of the total of trees removed would be large or mature (more than 30 inches DBH). Only 4.5% of the total number of trees removed would be larger than 40 inches DBH.

The removal of trees less than 20 inches DBH would have a long-term, local, minor to negligible adverse impact on fish and wildlife. Some of the proposed tree removal, in addition to improving scenic views of iconic features of Yosemite Valley, would reduce conifer encroachment into meadow

and wetland habitats. Thus, species that use meadow, grassland, riparian, oak woodland, and riverine habitats may benefit from these actions. However, the removal of large trees, and especially trees measuring more than 30 inches DBH, would have local, long-term, minor to moderate adverse effects on wildlife species that rely on late-seral stage coniferous habitats for breeding and foraging.

In addition, these actions would result in short-term, adverse impacts associated with tree removal due to noise and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to negligible and adverse.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

The overall diversity of activities available to visitors in Yosemite Valley would remain consistent across Alternatives 2–6. Differences in alternatives consist of options for the enhancement, reduction or removal of facilities and services and related uses.

Actions common to Alternatives 2–6 to manage visitor use in Segment 2 include allowing private paddling, discontinuing several commercial services such as stock day rides and swimming pool operation, redesigning trails and boardwalks to improve pedestrian circulation, improving picnic areas, and creating an interpretive nature walk through Lower River Campground that emphasizes river-related natural processes. Some of these actions would result in short-term, local, minor, adverse impacts on wildlife as a result of trail construction and facility improvements, human presence, removal of vegetation, and ground disturbance. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. In the long term, removing vegetation to construct the interpretive trail would reduce habitat for wildlife locally; however, visitors would be educated on the natural river processes and what they can do to protect the river, vegetation communities, and wildlife habitat. Therefore, this action would result in a local, long-term, negligible impact on wildlife. Continued private paddling on the river in Segment 2 would result in continued long-term, minor, adverse impacts on localized areas of riverbanks, particularly at put-in and take-out locations. Reducing commercial services, such as stock day rides, would reduce impacts from stock use in riparian areas, thus effectively reducing the amount of vegetation trampling and erosion and sediment transport into the river over the long term in localized areas.

Actions to manage park facilities across Alternatives 2–6 in Yosemite Valley include the removal of a number of facilities in the Valley (e.g., the Boystown Housing area, Happy Isles Snack Stand, and the Curry Village Ice Rink). Actions that would remove and reduce facilities and services throughout the Valley would constitute a net reduction in total developed space in the park; combined with reductions in park visitor use at specific campgrounds, these management actions would reduce human disturbance to wildlife associated with the use of these facilities. Removal and restoration activities associated with these actions would result in short-term, local, adverse impacts on wildlife from construction-related noise and potential impacts on vegetation adjacent to the activity. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and

adverse. These actions would result in long-term, local, moderate, beneficial impacts on wildlife through reduction of human activities in the Valley, increased habitat for wildlife, and decreased potential for human-wildlife conflicts (especially with black bears).

Some park facilities and services would be retained or constructed, including the construction of new campsites and replacing temporary housing with permanent dormitories (e.g., permanent dormitories for park employees at Curry Village). Operation of current facilities and construction of new facilities would result in long-term, local, minor, adverse impacts on wildlife through human-related impacts (such as noise, human presence, trash, and food availability) and reduction in wildlife habitat. Habitat fragmentation and integrity may be affected, depending on the location of proposed new facilities.

Day parking capacity would vary by alternative in Segment 2. Additional parking would be added at Camp 6 across Alternatives 2-6; however, the amount would vary for each alternative. Actions to construct new parking would increase the total developed space in the park, increase human presence, and reduced habitat for wildlife. Thus, construction of new parking or expansion of existing parking lots would result in local, long-term, minor, adverse impacts on wildlife. In the short-term, adverse impacts on wildlife include construction-related activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), would mitigate these short-term impacts to minor and adverse.

Transportation-related actions in Yosemite Valley include removing some parking spaces and roadside parking, constructing a formal shuttle bus stop near Camp 4, and habitat restoration; these actions would result in short-term, local, minor, adverse impacts on wildlife. Adverse impacts include construction related noise and potential impacts on vegetation adjacent to the activity. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

Camp 6 and Yosemite Village. Actions in the Camp 6 and Yosemite Village areas that are common to Alternatives 2-6 include the relocation of visitor vehicle services and concessioner general office functions to other buildings and the removal of the existing garage structure and concessioner general office; and transportation actions that formalize parking and public movement in the Camp 6 and Village Sport Shop area.

Relocation of services and operations to other buildings would have no effect upon wildlife. Construction, activities associated with removing the existing garage structure and concessioner general office, as well as actions to formalize parking and public movement in the Camp 6 and Village Sport Shop area Camp 6 and Yosemite Village would result in direct, temporary and permanent losses of wildlife habitats and indirect effects related to construction activities. Direct losses of habitat are described in greater detail under each action alternative.

Outside of previously developed areas, impacts from these actions would occur primarily in ponderosa pine forest and, to a lesser extent, montane riparian habitats. Losses and disturbance to these wildlife habitats would occur through vegetation clearing, grading, site development, or other surface disturbance (e.g., driving over vegetation). Construction of new facilities may also require the removal of some trees, including the removal of mature conifer and hardwood trees, trees with cavities, and

snags. Tree removal would be minimized through site design, and, if possible, older trees and snags would be retained for habitat. In addition, potentially affected wildlife habitats at Camp 6 and Yosemite Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction.

The use of heavy equipment may result in direct effects to wildlife through injuries or death, specifically for small wildlife, such as songbirds, burrowing mammals, reptiles and amphibians. The use of heavy construction equipment and increased human presence may also indirectly affect wildlife by causing some species to relocate or avoid the area during construction. Construction activities would generate noise and ground vibrations, visual disturbance, and other disturbances associated with human presence. Species mortality, loss of suitable habitat, and/or abandonment of breeding sites would have an adverse impact on wildlife. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

As part of these actions, informal parking along Sentinel Drive and several structures in the floodplain would also be removed. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, these restoration management actions would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. This action would result in a localized, long-term, minor, beneficial impact to wildlife in Segment 2.

Yosemite Lodge & Camp 4. Actions in the Yosemite Lodge and Camp 4 areas that are common to Alternatives 2-6 include the removal of temporary employee housing and the reconstruction of new housing. Under all alternatives, the NPS Volunteer Office (former Wellness Center), post office, swimming pool, and snack stand would all be removed, and the convenience shop and nature shop would be re-purposed.

As described for actions at Camp 6 and Yosemite Village, re-purposing facilities would have no effect on wildlife. Construction and removal activities at Yosemite Lodge and Camp 4 would result in direct temporary and permanent losses of wildlife habitats similar to those described for Camp 6 and Yosemite Village. These losses would occur through vegetation clearing, grading, or other surface disturbance (e.g., driving over vegetation) and would occur entirely in ponderosa pine forest, a dominant habitat type in Segment 2. In addition, the wildlife habitats at Yosemite Lodge and Camp 4 experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, for the same reasons discussed above for the Camp 6 and Yosemite Village area, actions that are common to Alternatives 2-6 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

Segments 3 and 4: Merced Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Restorative management actions that would occur in Segment 4 under Alternatives 2–6 that may affect wildlife include developing best management practices for revetment construction and repair. Currently

the river is confined by riprap and El Portal Road in Segment 4; to improve the free flow of the river, the park would use vertical walls wherever possible and provide the California Department of Transportation (CalTrans) with best management practice recommendations when repair or replacement is necessary in Segment 4. Other management actions that would enhance the free-flowing condition of the Merced River in Segments 3 and 4 include the removal of abandoned infrastructure and imported fill at the Cascades Picnic Area, Abbieville, and Trailer Village. Additionally, the NPS would restore the Greenemeyer sand pit to natural conditions. The Odger’s fuel storage facility would be removed and the area restored. The types of habitat that would be affected by these restoration actions in Segment 4, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-61**.

TABLE 9-61: HABITAT RESTORATION COMMON TO ALTERNATIVES 2–6 IN SEGMENT 4

Current WHR Habitat Type ^a	Acres	Proposed WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Foothill broadleaf woodland	1	Valley oak woodland	1
Lower montane needleleaf	11	Riparian & floodplain	11
Total	12	Total	12
Abbreviation: WHR = Wildlife Habitat Relationships			
^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.			
^b Predominant type(s) and total amount of habitat that would be enhanced or restored.			
SOURCE: NPS 1997, 2010, and 2011.			

As summarized in table 9-61, approximately 12 acres of riparian, floodplain, and valley oak woodland habitat would be restored in Segment 4 under all Alternatives 2–6, thus resulting in direct benefits to fish and wildlife that use these habitat types. These management actions would also result in local, short-term, adverse impacts, which may include noise associated with repair or replacement activities, human presence, modification of habitat, and temporary increase in suspended sediments. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, implementation of these actions would improve the free-flowing condition of the Merced River and reduce localized scouring. Thus, these actions would have long-term, local, moderate, beneficial impacts on fish and other aquatic wildlife.

Biological Resource Actions. Specific restoration actions to protect and enhance river values within Segment 4 and common to Alternatives 2-6 include removing development, asphalt and imported fill at Abbieville and the Trailer Village in West El Portal. The NPS would recontour and plant native riparian plant species and oaks within the 150-foot riparian buffer. Restoration of riparian habitat in the Abbieville and Trailer Village areas would result in local, long-term, minor, and beneficial impacts on wildlife within West El Portal (Segment 4). Species that use riparian and oak woodland habitats would benefit the most from this action. Additionally, this action would have a long-term, minor, local, beneficial impact on fish as riparian habitat is established. Short-term, adverse impacts include noise associated with restoration activities, and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding

the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity and over the long term, this restoration action would have minor, beneficial impacts on wildlife in Segment 4.

Scenic Resource Actions. Scenic resource actions in Segment 3 and common to Alternatives 2-6 include selective removal of encroaching conifers at the Cascade Falls Viewpoint. Oak trees within this location would remain protected as an ethnographic ORV. The total maximum number of trees over 6 inches DBH that would be removed in Segment 3 across Alternatives 2 to 6 is summarized in table 9-62.

TABLE 9-62: MAXIMUM NUMBER OF TREES REMOVED COMMON TO ALTERNATIVES 2–6 IN SEGMENT 3

Species	<12 inches DBH	<20 inches DBH	<30 inches DBH	<40 inches DBH	<50 inches DBH	<60 inches DBH	<70 inches DBH	Total
Cedar	6	0	0	1	0	0	0	7
Live Oak	0	1	0	0	0	0	0	1
Ponderosa	1	1	1	0	0	0	0	3
Red Fir	3	0	0	0	0	0	0	3
Total	10	2	1	1	0	0	0	14
SOURCE: NPS 2012b								

As described previously in the Scenic Resource Actions under actions common to Alternatives 2-6 in Segment 2, tree DBH size provides information to determine which wildlife species may be supported by a particular ecosystem. Specific actions to selectively remove conifers in Segment 3 at the Cascade Falls Viewpoint would remove primarily (approximately 71%) smaller trees measuring less than 12 inches in DBH. Two large trees would be removed at Cascade Falls Viewpoint, including a Ponderosa pine (<30 inches DBH) and a cedar (<40 inches DBH). Because most trees removed are small in size, their contribution to wildlife habitat is not as significant as larger trees within a mature forest setting. Many terrestrial mammals, birds, and bat species prefer larger trees (sometimes with suitable cavities) for shelter, nesting, and foraging. Some tree removal, in addition to improving scenic views of features in Segment 3, would reduce conifer encroachment into meadow and wetland habitats. Thus, the specific action to selectively remove conifers at the Cascade Falls Viewpoint would result in local, long-term, and minor to negligible adverse impacts on wildlife. Short-term, adverse impacts associated with tree removal may include noise associated with restoration activities, human presence, and modification of habitat. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to negligible and adverse.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Visitor activities in Segments 3 and 4 primarily consist of scenic driving along Highway 140 enroute to Yosemite Valley, picnicking, rock-climbing, swimming, and fishing. Paddling activities would vary across Alternatives 2–6 in Segments 3 and 4. No overnight accommodations are provided in these

segments across Alternatives 2–6. An additional visitor restroom would be constructed in Old El Portal. Low-density employee housing would remain unchanged in Segment 3 and would increase in Segment 4 at El Portal Village Center. All housing redevelopment in this area will be outside the 100-year floodplain. All other redevelopment will be outside the 150-foot riparian buffer. An increase in housing and facilities development increases the total built environment in Segment 4. Although the additional housing units proposed at El Portal would be placed in nine vacant lots to infill the area, these developments would result in short-term impacts on wildlife from construction activities and human presence; in the long term, these actions would result in local, minor, adverse impacts on wildlife caused by increased disturbance from human presence and human-wildlife conflicts. Parking and public transportation would be consistent with actions proposed for Segment 2 and would apply throughout Alternatives 2–6.

Other visitor use management actions that would occur in Segment 3 under all Alternatives 2–6 that would potentially affect wildlife include selective removal of conifers that affect visitor views of Cascade Falls from El Portal Road. The removal, transport, and disposal of conifers, along with the subsequent restoration and monitoring associated with this work, would result in short- and long-term, local, adverse impacts, including noise associated with removal work, human presence, ground disturbance, removal of habitat, and potential sedimentation of adjacent aquatic habitat. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these impacts to minor and adverse. However, due to the selective removal of trees and abundance of similar habitat adjacent to removal sites, this measure would result in long-term, local, minor to negligible, and adverse impacts to wildlife species that depend on conifers for shelter and foraging.

Segments 5– 8: South Fork Merced River

Impacts of Actions to Protect and Enhance River Values

Biological Resource Actions. Specific restoration actions to protect and enhance river values within Segment 7 and common to Alternatives 2-6 include relocating two stock use campgrounds sites from the Wawona Stock Campground to the Wawona Stables. Actions common to Alternatives 2-6 to restore riparian and upland forested habitats at the Wawona Stock Campground in Segment 7 would have local, long-term, minor, and beneficial impacts on wildlife. Short-term, local, minor, and adverse impacts include noise associated with relocation activities and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity and over the long term, this restoration action would have minor, beneficial impacts on wildlife in Segment 7. Additionally, this action would have a long-term, minor to negligible, local, beneficial impact on fish as riparian habitat is established.

Hydrologic/Geologic Resource Actions. Restoration actions associated with hydrologic/geologic in Segment 6 and common to Alternatives 2-6 include retaining the current water collection and distribution system at the Wawona Impoundment and implementing the water conservation plan related to the minimum flow analysis for the South Fork Merced River. Keeping the current water

collection and distribution system would continue to reduce the flow of water during dry summer months. Additionally, the impoundment is located within the bed and banks of the river, which affect the free-flowing condition of the river. The excessive water withdrawals limit aquatic life within this segment of the Merced River. Thus, the action described above would have long-term, segmentwide, minor, and adverse impacts on wildlife, especially aquatic species that inhabit riverine habitat.

Cultural Resource Actions. Specific restoration actions related to cultural resources in Segment 7 and common to Alternatives 2-6 include removing 7 campsites from the Wawona Campground which currently cause potential impacts to the archeological site CA-MRP-168/329/H (Camp A.E. Wood). The removal of 7 campsites would increase wildlife habitat and reduce human presence at the Wawona Campground in Segment 7 and would have long-term, minor, and beneficial impacts on wildlife. Short-term, local, and adverse impacts include noise associated with restoration activities and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

Restoration management actions to improve water quality of the South Fork Merced River include relocating the Wawona Campground dump station away from the river and delineating the boundaries of the South Fork Picnic Area. River access improvements, such as adding formal river access points, constructing pathways and staircase, and installing fencing, would guide visitor access to more resilient areas and prevent riverbank erosion. The types of habitat that would be affected by these actions in Segment 7, as well as the types of habitat that would be enhance or restored, are summarized in table 9-63.

TABLE 9-63: HABITAT RESTORATION COMMON TO ALTERNATIVES 2–6 IN SEGMENT 7

Current WHR Habitat Type ^a	Acres	Proposed future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Coniferous forest	3	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	3
Total	3	Total	3
Abbreviation: WHR = Wildlife Habitat Relationships ^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. ^b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, and 2011.			

As summarized in table 9-63, approximately three acres of riparian habitat would be restored in Segment 7 under Alternatives 2–6 as a result of moving improvements away from the riparian zone. These actions would result in short-term, local, minor, adverse impacts on wildlife during construction activities. In the long term, these actions would allow for designated river access while reducing vegetation trampling and erosion in riparian habitat. Thus, in the long term, these actions would provide a minor, local, beneficial impact to wildlife.

The Wawona Maintenance area currently extends to the riverbank and affects riparian habitat by soil compaction, storage of nonnative fill material, and storage of vehicles and other supplies. To reduce riparian impacts and restore the area, the park would remove staged materials, abandoned utilities, vehicles, and the parking lot from the riparian buffer and restore a 150-foot-wide area to natural conditions. This action would result in short-term, local, adverse impacts on wildlife associated with abandonment and restoration activities (i.e., noise, ground disturbance, and human presence). Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, the action would restore habitat and in the long-term would provide minor, local, beneficial impacts to terrestrial and aquatic wildlife that use riparian and riverine habitat.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Visitor use in wilderness areas above Wawona (Segment 5) would remain very low and river values would remain protected across Alternatives 2–6. Generally, visitor activities would consist of occasional overnight backpacking, day hiking, and stock-assisted pack trips. Parking for access to Segment 5 is through day parking in the Wawona area (in Segment 7). There are no employee housing and very limited administrative uses in Segment 5. Due to the low amount of visitor and administrative use in Segment 5, wildlife habitat would remain relatively intact and undisturbed. The amount, distribution, and integrity of wildlife habitat would remain relatively unchanged from current conditions. Actions to manage visitor use and facilities in Segment 5 would be expected to result in long-term, local, negligible, adverse impacts on wildlife.

Visitor use is not allowed in Segment 6 due to water quality and safety concerns associated with the Wawona Impoundment. Visitor use in Segment 8 is very minimal, and river values would continue to be protected. Thus, wildlife habitat would remain relatively intact and relatively undisturbed by park visitors in Segments 6 and 8, with no resulting effects on wildlife.

Under Alternatives 2–6, the NPS would develop a wastewater collection system for the Wawona Campground to connect the facility to the existing wastewater treatment plant. The NPS would continue implementing the water conservation plan related to the minimum flow analysis for the South Fork Merced River and retain current water collection and distribution system associated with the Wawona Impoundment. Implementation of these actions would reduce water withdrawal rates and improve the free-flowing condition of the river and improve local water quality. While construction of the facility would result in local, short-term, minor, adverse impacts related to noise and human disturbance, these actions would result in a long-term, minor, local, beneficial impact on fish and other aquatic life as water quality is improved.

The NPS maintenance and administrative building complex would be redesigned and improved under Alternatives 2–6. Additional administrative facilities would be constructed. Employee housing capacity at the Wawona community or elsewhere outside of the Merced River corridor would remain unchanged. Regional bus service similar to that provided on the Highway 140 corridor would be introduced between Fresno and Yosemite Valley; existing bus service between Wawona and the Mariposa Grove and Wawona and Yosemite Valley would remain unchanged under Alternatives 2–6

but may expand under certain alternatives. The actions to manage visitor use, overnight accommodations, park facilities, employee housing, and public transportation would result in long-term, minor, adverse impacts on wildlife and their habitat. As previously discussed, human presence, recreational activities, and overnight lodging potentially affect wildlife by various means, including noise, traffic, introduction of human food, and impacts on riparian and riverine habitats.

Lastly, a redesign of the bus stop to accommodate visitor use in Wawona is proposed. In the short-term, wildlife and their associated habitat would be affected by construction activities, such as noise, ground disturbance, vegetation removal, and temporary increase in human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible, would reduce these short-term impacts to minor and adverse. Over the long-term, this action would have local, long-term, negligible, adverse impacts on wildlife.

Summary of Impacts Common to Alternatives 2–6

Many of the actions common to Alternatives 2–6 would address existing adverse habitat trends for fish and wildlife. This includes actions that are targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the NPS would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. Toward these ends, the NPS would remove abandoned infrastructure in or adjacent to the Merced River, remove or relocate facilities that contribute to erosion/sedimentation/water quality issues, strategically place large woody debris within the channel, and use best management practices for revetment construction and repair throughout the river corridor. To restore meadow and riparian habitat, the NPS would remove informal trails and abandoned infrastructures, selectively remove encroaching conifers, improve trails that are unstable or traverse through meadow/wet habitats, restrict or manage the use of pack stock, revegetate denuded areas, and install fencing and visual cues to direct the public away from sensitive areas. When totaled, approximately 151 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, and floodplain habitat would be restored or enhanced under actions common to Alternatives 2–6. In the long term, these measures would improve hydrologic connectivity of meadows and floodplains to the river, enhance habitat complexity in riparian and aquatic zones, reduce human and pack-related disturbances, and reduce nonnative species and conifer intrusion into sensitive habitat. Adverse effects from these actions would primarily be associated with the active construction phase, and would be local, short term, and minor or negligible.

While there would be some long-term effects on wildlife associated with the movement and construction of new facilities, these impacts would be offset by the proposed restoration actions, resulting in a net beneficial impact on wildlife corridorwide. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on wildlife and fish resources as habitats are restored and fragmentation and radiating impacts are reduced when compared to Alternative 1 (No Action). These effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

Environmental Consequences of Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration

Segment 1: Merced River Above Nevada Fall

Impacts of Actions to Protect and Enhance River Values

Merced Lake East Meadow near the Merced Lake Ranger Station has high levels of pack stock use, which contributes to lower vegetation cover and higher levels of bare ground. Under Alternatives 2, grazing would be permanently removed from the Merced Lake East Meadow. The park would require administrative pack stock passing through the Merced Lake area to rely on pellet feed that is packed into the site instead of allowing pack stock to graze in the meadow. This would help protect meadow vegetation from high levels of grazing by reducing the level of vegetation trampling by administrative pack stock and reducing the dispersal of manure and roll pits. These actions would have local, minor beneficial impacts to fish and wildlife species over the long term.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Actions to manage visitor use and facilities in Segment 1 under Alternative 2 would largely have beneficial impacts on wildlife over the long term. Little Yosemite Valley Backpackers Camping Area would be converted to dispersed camping to reduce crowding and congestion, designated camping at Moraine Dome Camping Area would be discontinued, and the Merced Lake High Sierra Camp would be closed (to allow for expansion of designated camping from Merced Lake Backpackers Camping Area into the existing footprint), and the flush toilet and water system would be replaced by a composter. The actions listed above would result in less human disturbance and enhanced wilderness character of these camping areas, including approximately 11 acres of meadow and subalpine restoration in these areas. Although dispersed camping may increase the chance of human/mountain lion encounters, which are more common when human use is dispersed (Beier 1991), dispersed camping would also reduce adverse impacts that are associated with concentrated human use, including noise and traffic congestion, heavy vegetation trampling and soil compaction, and the attraction of both native and nonnative wildlife scavenging for human food. Wildlife would also benefit from the overall reduction of the built environment, increase in habitat availability, and enhanced habitat quality.

Actions related to the conversion or removal of facilities, including converting Little Yosemite Valley Backpackers Camping Area and Moraine Dome Campground to dispersed camping and removing infrastructure that is incompatible with wilderness character (such as composting toilets, bear boxes, and other supporting infrastructures) and closing Merced Lake High Sierra Camp and restoring the area to natural conditions, would result in short-term, adverse impacts but long-term, beneficial impacts. Construction activities, including the demolition and removal of existing improvements, would result in short-term, local, adverse impacts on wildlife related to noise, potential for sediment discharge from disturbed soils, and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. In the long term, these actions are expected to reduce human-related impacts on wildlife and habitats, thus resulting in local, minor, beneficial impacts on wildlife.

In summary, total daily use levels in Segment 1 under Alternative 2 would be reduced. This reduction in overnight facilities and overnight visitors represents a reduction in human presence, human-related pressures on wildlife, and reduced future impacts on fish and wildlife habitat in localized areas of Segment 1. Collectively, actions to manage visitor use and facilities under Alternative 2 would result in long-term, local, minor, beneficial impacts on fish and wildlife in Segment 1.

Merced Lake High Sierra Camp. The actions in the Merced Lake High Sierra Camp area proposed under Alternative 2 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and the expansion of dispersed camping at Merced Lake Backpackers Camping Area into the High Sierra Camp footprint. As described above, construction activities associated with the demolition and removal of the Merced Lake High Sierra Camp would result in short-term, local, adverse impacts on wildlife related to noise, potential for sediment discharge from disturbed soils, and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Once completed, these actions would result in a local, long-term, minor, beneficial impact on fish and wildlife in Segment 1 by reducing stresses related to concentrated human use.

Segment 1 Impact Summary: Actions to restore river values and manage visitor use and facilities within Segment 1 would have local, long-term, minor, beneficial impacts on fish and wildlife.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Alternative 2 proposes substantial restoration actions in Segment 2 that would directly benefit fish and wildlife in the Merced River corridor over the long term. To enhance the free-flow character of the Merced River, address river widening issues, and increase river complexity, the NPS would remove bridges (Ahwahnee, Sugar Pine, and Stoneman bridges) and restore these areas to natural conditions; reroute or redesign trails and roadways; and construct constructed logjams in the river channel between Clark's and Sentinel bridges to enhance river complexity. These actions would directly benefit fish and wildlife associated with the aquatic habitats of the Merced River. Water quality in the river would also be improved by relocating parking lots, rerouting roads, removing fill material, and removing pack stock trails and associated Curry Village stables outside of the floodplain, and restoring meadow and floodplain ecosystems. Formalizing some areas for parking and river access and restricting parking and river access in other sensitive areas would benefit both riparian habitat establishment and water quality. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-64**.

As summarized in table 9-64, approximately 271 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored in Segment 2 under Alternative 2 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit the most from actions that remove overnight facilities and associated infrastructure (riprap, asphalt pads, trails) from the floodplain, including

TABLE 9-64: ALTERNATIVE 2 HABITAT RESTORATION IN SEGMENT 2

Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Barren	0	Meadow	20
Meadow	18		
Sparsely vegetated	2		
Lower montane broadleaf	16	Lower montane broadleaf	16
Lower montane needleleaf	75	A mosaic of meadow, black oak, and open canopy coniferous forest	75
Barren	9	Riparian & floodplain	152
Lower montane broadleaf	1		
Lower montane needleleaf	142		
Lower montane needleleaf	8	Riparian	8
Total	271	Total	271

Abbreviation: WHR = Wildlife Habitat Relationships

^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.

^b Predominant type(s) and total amount of habitat that would be enhanced or restored.

SOURCE: NPS 1997, 2010, and 2011.

selective campgrounds in Yosemite Valley, the former Upper and Lower Pines campgrounds, Housekeeping Camp, and Yosemite Lodge. Restoration of these areas and former campgrounds (e.g., former Upper and Lower Rivers Campgrounds) would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function in the 2-year to 10-year floodplains, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts. These actions would therefore have segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife. Like other restoration actions, these actions would also have short-term, adverse impacts on wildlife related to noise, human presence, and potential impacts on water quality during construction; adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), would reduce these short-term impacts to minor and adverse.

To increase the frequency of inundation in the riparian zone, meadows, and floodplain in the vicinity of El Capitan moraine, the park would mitigate for the removal of the terminal moraine through placement of large wood loading upstream of El Capitan moraine to Sentinel picnic area and constructed logjams in the channel. This would effectively restore water to meadows during high water events. This restorative action would result in local, short-term, adverse impacts on fish and wildlife, including noise associated with construction-related activities; ground disturbance; human presence; increases in sedimentation; and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, this action would also restore the 100-year floodplain and associated plant communities (meadows and riparian habitat), improve hydrological

connectivity of these communities to the river, and improve primary food production for fish. Thus, this restoration action would have a segmentwide, long-term, moderate, beneficial impact on fish and other aquatic species that use the Merced River and adjacent riparian habitat.

Under Alternative 2, the NPS would implement measures to restore and protect meadow and wetland habitat while providing adequate access to visitors. Currently, the location of some roads and trails bisect or otherwise cross through meadows and cause fragmentation, soil compaction, and vegetation trampling of valley meadows. Additionally, these roads and trails limit or disrupt meadow hydrologic connectivity. To address these issues, the park would remove and reroute trails outside of meadows and wetlands, consolidate trails where possible, and restore meadow contours and native vegetation. All informal trails would be removed and roadside parking would be reduced through alternative striping and consolidated parking where possible. Housing between the Yosemite Village Store and Ahwahnee Meadow would be removed and the area recontoured to historical topography; soils and native vegetation would be restored. The park would use restoration fencing to designate appropriate meadow access points and guide visitors toward boardwalks and viewing platforms to protect meadow habitat. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats, resulting in long-term benefits to wildlife that use these meadow systems.

Collectively, restoration actions proposed in Segment 2 under Alternative 2 would result in local, minor, short-term, adverse impacts on wildlife during construction but substantial long-term benefits. Potential minor, adverse impacts include noise related to restoration/removal activities, human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these actions would also enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection; enhancing channel free flow; and increasing channel complexity. Thus, when combined, the actions would result in segmentwide, long-term, moderate, beneficial impact on fish and wildlife that use these habitats, as habitat quality, quantity, and integrity are substantially improved and habitat disturbance is substantially decreased in Segment 2.

Biological Resource Actions.

Yosemite Valley Campgrounds: Under Alternative 2, specific restoration actions to enhance the river's biological values in Segment 2 include removing all campsites within 100 feet of the bed and banks of the Merced River and restoring 25.1 acres of floodplain/riparian habitat, and removing all informal trails and reducing roadside parking at El Capitan Meadow. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, moderate, and beneficial impacts to fish and wildlife.

El Capitan Meadow: In addition to actions common to Alternatives 2-6, the NPS would remove all informal trails and reduce roadside parking through alternative striping and consolidate parking to the west end of the meadow to reduce impacts to El Capitan Meadow. Restoration of El Capitan Meadow

and elimination of roadside parking adjacent to the meadow would result in local, long-term, minor, and beneficial impacts on wildlife from reduction in trampling from foot traffic and impacts to meadow habitat associated with roadside parking.

Ahwahnee Meadow: Specific actions under Alternative 2 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: rerouting or removing trails which traverse wetlands in the Ahwahnee meadow and consolidating trail use with the Housekeeping Footbridge trail where possible, removing 900 feet of Northside Drive and relocating the bike path to the south of Ahwahnee Meadow, and restoring meadow contours and native vegetation. Meadow restoration, trail rerouting and removal, and removal of a portion of Northside Drive would result in local, long-term, moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

Stoneman Meadow: Under Alternative 2, the park would restore Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through the Boys Town area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275'). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on meadow wildlife.

Former Upper and Lower Rivers Campgrounds: Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 2 include restoring 30 acres of the 10-year floodplain. Under Alternative 2, the park would remove the remaining asphalt, decompact soils of former roads and campsites, and re-establish seasonal channels and natural topography that have been filled. Additionally, the park would remove the Lower River amphitheater structure and fill. Following habitat restoration, temporary fencing would be installed to protect the restoration areas and to allow for recovery. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 2 may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

Hydrologic/Geologic Resource Actions. Under Alternative 2, restoration actions associated with hydrologic/geologic resources in Segment 2 include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6, removing the Stoneman, Ahwahnee, and Sugar Pine Bridges to enhance the free-flowing condition of the Merced River. Additionally, fill material would be removed and meadow and floodplain habitats would be restored. Southside Drive would be converted to a two-way road and the Sentinel intersection would be redesigned. Restoration of meadow, riparian and floodplain habitats and the removal or relocation of infrastructure that constrict the free-flowing condition of the river or are located in sensitive areas under Alternative 2 would have long-term, moderate, and beneficial impacts on wildlife within Yosemite Valley. Species that use meadow, riparian and riverine habitats would benefit the most from these actions, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 2 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (bridge removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

In addition to actions that are common to Alternatives 2–6, Alternative 2 would limit boating activities in Segment 2, remove the Curry Village stables and the Yosemite Lodge bicycle stand, and repurpose several park facilities. Some visitor amenities such as the Housekeeping Camp laundry, shower houses and restrooms, and grocery store would also be removed. Additionally, employee temporary housing at Curry Village would be removed and permanent housing would be constructed. Temporary housing at the Lost Arrow parking lot would be removed and parking spaces would be reestablished. Although some development would occur under Alternative 2, these actions in combination with restorative and management actions would result in minor, beneficial impacts on wildlife in localized areas of Segment 2.

Under Alternative 2 wayfinding between Happy Isles and the Mist Trail from the shuttle stop would be improved. Because inadequate wayfinding contributes to vegetation trampling, thus causing a large area of denuded vegetation in this area, improving wayfinding for visitors would facilitate for vegetation reestablishment over time. In the long term, this action would result in local, minor, beneficial impacts on wildlife by protecting riparian vegetation.

Actions to reduce visitor overnight capacities in the Valley, including the Housekeeping Camp, Yosemite Lodge, Curry Village, Backpacker's Campground, Upper Pines Campground, and North Pines Campground, would result in beneficial impacts on wildlife as human interactions and impacts are reduced. In addition, visitor day parking would be reduced and the Curry Orchard day parking area would be formalized. These actions are expected to have long-term, minor, beneficial impacts on wildlife

in Segment 2 with the restoration of Stoneman Meadow and additional formal accommodation for parking in the Valley; visitors would be less likely to park in undesignated areas and affect meadow and other habitats.

Curry Village & Campgrounds. Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Curry Village include the construction of 78 hard-sided units at Boys Town. The units would be constructed within previously developed areas as well as within habitats adjacent to the existing Curry Village site.

Construction activities at Curry Village would result in direct temporary and permanent losses of wildlife habitats as well as the redevelopment of existing developed areas (see **table 9-65**). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow habitat. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-65 below, only a small percentage of these wildlife habitats would be affected by the facility actions at Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, the wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts and disturbance. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-65: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 2

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment ^b	1.97	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

The use of heavy equipment during construction within ponderosa pine and wet meadow habitats may result in injuries or death to some species of wildlife, as described for actions common to Alternatives 2-6. Construction activities would also generate noise and increases in human presence, which may cause wildlife to relocate or avoid the area. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

Camp 6 and Yosemite Village. Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities and Northside Drive outside the 10-year floodplain. The Camp 6/Village Center Parking Area

would be formalized to include 550 designated parking spaces by redeveloping part of the current administrative footprint. In addition, 100 parking spaces would be added at Yosemite Village. Northside Drive would be rerouted south of the parking areas and out of the dynamic 10-year floodplain. Fill material would be removed from the floodplain and the area would be restored to meadow and floodplain ecosystems.

As noted in **table 9-66**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses of montane riparian and ponderosa pine forest habitat types. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-66, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-66: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 2

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Riparian	1.37	0.4%
Ponderosa Pine	9.03	0.5%
Redevelopment ^b	11.55	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction actions under Alternative 2 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

The rerouting of Northside Drive outside the 10-year floodplain at Camp 6 would result in the restoration of floodplain and meadow habitats. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, this restoration management action would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. Overall, this action would result in a localized, long-term, moderate, beneficial impact on wildlife in Segment 2.

Yosemite Lodge and Camp 4. Actions under Alternative 2 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the conversion of Yosemite Lodge to a day-use facility and the addition of 250 parking spaces; redevelopment west of Yosemite Lodge to provide

an additional 150 day use parking spaces and area for 15 tour buses; the removal of old and temporary housing at Highland Court and the Thousands Cabins; the conversion of Highland Court to a walk-in campground; and the relocation of the pedestrian crossing at Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts. The conversion of Yosemite Lodge to a day-use facility and the conversion of Highland Court to a walk-in campground would have a negligible effect on wildlife.

Like other proposed facility projects, construction activities at Yosemite Lodge and Camp 4 would result in direct temporary and permanent losses of wildlife habitats as well as redevelopment of existing disturbed areas (table 9-67). Impacts to wildlife habitats would occur entirely in ponderosa pine forest. This is a dominant habitat type in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-67, only a small percentage of this vegetation community would be impacted. In addition, potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-67: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 2

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	0.57	<0.1%
Ponderosa Pine	14.90	0.8%
Wet Meadow	0.12	<0.1%
Redevelopment ^b	3.69	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 2 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

In summary, reducing total daily visitor use by approximately 33%, total day visitors by 36%, and total overnight visitors by 26% in Yosemite Valley would result in a corresponding reduction in human-related impacts on wildlife, especially during the peak season (summer). It is likely that as visitor use is reduced and habitat is restored, the range of some species, including birds, amphibians, and mammals in particular, may expand into areas as they become more suitable for occupation. As summarized in table 9-68, actions to manage visitor use and facilities would result in the loss of approximately 32.37 acres of wildlife habitat primarily located near previously developed areas, resulting in a long-term, local, minor, adverse impacts to wildlife.

TABLE 9-68: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 2

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	0.57	<0.1%
Montane Riparian	1.37	0.4%
Ponderosa Pine	30.28	1.7%
Wet Meadow	0.15	<0.1%
Redevelopment ^b	17.21	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Facility removal and new construction actions would also result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 under Alternative 2 would result in the restoration of approximately 271 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in the loss of approximately 32.37 acres of wildlife habitat primarily located near previously developed areas, resulting in a long-term, local, minor, adverse impact to wildlife.

Segments 3 and 4: Merced Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

In addition to the actions common to Alternatives 2–6, the NPS would designate oak protection areas in the Odgers' fuel transfer center and parking lots adjacent to this area, thereby benefiting wildlife that use oak woodland habitats. New parking and building construction would be prohibited in the oak protection area. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore the area, thereby enhancing riparian and oak woodland habitats. Habitat that would be affected by these restoration actions would be in Segment 4, as summarized in **table 9-69**.

As summarized in **table 9-69**, approximately 13 acres of riparian, floodplain, and valley oak woodland habitat would be restored in Segment 4 under Alternative 2 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. While these actions would result in local, short-term, negligible, adverse impacts on wildlife during

TABLE 9-69: ALTERNATIVE 2 HABITAT RESTORATION IN SEGMENT 4

Current WHR Habitat Type ^a	Acres	Proposed future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Foothill broadleaf woodland	2	Valley oak woodland	2
Sparsely vegetated	2	Riparian & floodplain	11
Lower montane broadleaf	9		
Total	13	Total	13
Abbreviation: WHR = Wildlife Habitat Relationships ^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. ^b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, and 2011.			

restoration activities due to increased noise and human presence, in the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees and riparian habitat for habitat and food.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

In Segment 3, Alternative 2 would provide for similar kinds and amounts of visitor use that exists today. Thus, no additional beneficial or adverse impacts on wildlife would result from actions to manage visitor use and facilities under this alternative. River-related recreational activities, administrative activities, total day visitors, and parking/transportation activities would remain largely unchanged from today, and impacts on wildlife would be the same as that described for Alternative 1 (No Action).

In Segment 4, the kinds and amounts of use under Alternative 2 would be similar to today, including private boating, day visitors, and pass-through traffic. Visitor use would make up a minority of the use in Segment 4, although visitor pass-through traffic would be high during the peak summer season; therefore, impacts related to visitor use would be the same as described for Alternative 1.

Under Alternative 2, user capacity would mostly be affected by the increase in employee housing at El Portal. Under Alternative 2, NPS employee housing would be added to the El Portal village center and Rancheria Flat; employee parking would be added at these locations to accommodate the increase in employee housing. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. This increase in capacity in El Portal would be a function of the decrease in employee housing capacity in Yosemite Valley (Segment 2). As previously discussed in the “Environmental Consequences of Actions Common to Alternatives 2–6,” the addition of employee housing and park facilities development would increase the total built environment in Segment 4. Housing development at El Portal and Rancheria Flat would be expected to result in short-term impacts on wildlife from construction activities and human presence; while in the long-term, these actions would result in local, minor, adverse impacts on wildlife caused by increased disturbance from human presence and removal of habitat.

Segments 3 and 4 Impact Summary: Actions to protect and enhance river values within Segments 3 and 4 under Alternative 2 would result in the restoration of 13 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

Segments 5– 8: South Fork Merced River

Impacts of Actions to Protect and Enhance River Values

In addition to the impacts described under “Environmental Consequences of Actions Common to Alternatives 2–6,” actions specifically targeted to protect culturally sensitive areas would benefit wildlife as well, including the relocation or removal of campsites, stock campground sites that are in the 100-year floodplain or culturally sensitive areas. Actions to remove or relocate facilities would also result in habitat restoration in Segment 7; in particular, the removal of the Wawona Golf Course and the Wawona Hotel tennis courts and relocation of some campsites at the Wawona Campgrounds and Wawona stock camp would result in additional wet meadow and riparian habitat restoration. Most habitat that would be affected by these restoration actions is in Segment 7, as summarized in **table 9-70**.

TABLE 9-70: ALTERNATIVE 2 HABITAT RESTORATION IN SEGMENT 7

Current WHR Habitat Type ^a	Acres	Proposed WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Barren	40	Meadow	40
Lower montane needleleaf	3	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	3
Lower montane needleleaf	9	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	9
Total	52	Total	52

^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.
^b Predominant type(s) and total amount of habitat that would be enhanced or restored.

SOURCE: NPS 1997, 2010, AND 2011.

As summarized in table 9-70, approximately 52 acres of riparian, floodplain, and meadow habitats would be restored in Segment 7 under Alternative 2 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. The removal of the Wawona Golf Course and Wawona Hotel tennis courts, along with the removal of select campsites in the floodplain would result in local, long-term, moderate, beneficial impacts on wildlife as meadow and riparian habitat are restored and wildlife are subject to less human presence and human-related pressures.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 2 would result in similar kinds and amounts of use that exist today in Segment 5. Due to the low amount of visitor and administrative use in Segment 5, the amount, distribution, and integrity of wildlife habitat would remain relatively unchanged from current conditions under Alternative 2, and impacts would be the same as described for Alternative 1 (No Action).

Visitor use is not allowed in Segment 6 due to water quality and safety concerns associated with the Wawona Impoundment. Visitor use in Segment 8 is very minimal, and river values would continue to be protected. Thus, wildlife habitat would remain relatively intact and relatively undisturbed by park visitors in Segments 6 and 8, and would be the same under Alternative 2 as described for Alternative 1.

Within Segment 7, Alternative 2 would provide for reduced kinds and amounts of use compared to those that exist today to accommodate for higher levels of river restoration activity. Only private boating would be allowed, and boaters would be able to use designated put-in and take-out locations. The Wawona Golf Course and tennis courts would be removed to accommodate ecological restoration. Overnight capacities would remain unchanged from today for the Wawona Hotel; however, the Wawona Campground and Wawona stock camp would experience a reduction or relocation in campsites. Removal of campsites and park facilities would result in short-term, adverse impacts on fish and wildlife during construction, including noise associated with demolition, removal, and restoration activities; ground disturbance; human presence; habitat modification; and potential increase in suspended sediments to immediate areas of the Merced River. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, the removal of the Wawona Golf Course and tennis courts would reduce the built environment and increase the quantity of wildlife habitat in Wawona following restoration. Thus, in the long term, implementation of restorative actions following facility demolition would restore riparian and meadow habitat, reduce riverbank erosion, and result in local, long-term, moderate, beneficial impacts on aquatic and terrestrial wildlife.

Wawona Campground. Facilities actions at the Wawona Campground would involve removal of 32 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.

Segments 5, 6, 7 and 8 Impact Summary: Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 2 would result in the restoration of 52 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.

Summary of Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration

Many of the Alternative 2 actions would improve habitat conditions for fish and wildlife. This includes actions that are targeted to improve habitat quantity and quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments

and high visitor use areas. Additionally, the park would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with restoration actions that are common to Alternatives 2–6, up to approximately 347 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 2, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions the park would implement that would directly benefit fish and wildlife under Alternative 2 include the following:

- Remove facilities within the 100-year floodplain of the Merced River and restore riverbanks, meadows, and riparian habitat.
- Place restrictions on recreational access points to rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 32.37 acres of wildlife habitats under Alternative 2. Potential adverse effects from these actions would primarily be associated with the active construction or restoration phase and would be local, short term, and minor or negligible. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on wildlife and fish resources as habitats are restored and fragmentation and radiating impacts are reduced. These effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

Cumulative Impacts from Alternative 2: Self-Reliant Visitor Experiences and Extensive Floodplain Restoration

Cumulative impacts on wildlife discussed herein are based on analysis of past, present, and reasonably foreseeable actions in the Yosemite region in combination with Alternative 2 actions. The past, present, and reasonably foreseeable actions used for this evaluation are the same projects listed for Alternative 1 (No action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. Like those actions described for Alternatives 2–6, the actions with Alternative 2 under the Merced River Plan would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River corridor over the long term. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species that are associated with these habitat types are most likely to be affected cumulatively by actions proposed under Alternative 2.

Past actions have degraded and reduced the abundance and quantity of aquatic, meadow, and riparian habitats in the region. These past actions, especially at lower elevations from development and resource extraction, have resulted in changed fish and wildlife movement patterns over time as they seek areas with more suitable habitat conditions. Present and reasonably foreseeable future actions also have the potential to further reduce the extent or quality of these habitat types; however, potential effects to these habitat types are generally mitigated and/or compensated through habitat preservation and/or enhancement at an off-site location (including mitigation banks). These actions provide the most benefit when coordinated with larger, regional conservation strategies that protect intact corridors or provide links to other areas of suitable habitat. Because the actions proposed for Alternative 2 would further increase the habitat value of the Merced River corridor, it would contribute towards a long-term, cumulative, beneficial effect on fish and wildlife and may, in some cases, reverse local population declines for some species. Songbirds, reptiles, and amphibians in particular would benefit cumulatively from Alternative 2 because the quantity of preferred habitat (meadows and riparian) would see a net increase.

Environmental Consequences of Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration

Segment 1: Merced River Above Nevada Fall

Impacts of Actions to Protect and Enhance River Values

Under Alternatives 3, preliminary grazing capacities for the Merced Lake East Meadow would be developed. When the meadow recovers, administrative grazing at established capacities would be allowed. The meadow would be monitored annually for five years, and use levels would be adapted as needed. This adaptive management of grazing in the meadow would help protect meadow vegetation from the effects of high levels of grazing by reducing the level of vegetation trampling by administrative pack stock and reducing the dispersal of manure and roll pits, and would benefit habitat connectivity and meadow hydrology. These actions would result in long-term, local, minor beneficial impacts to fish and wildlife.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Like Alternative 2, Alternative 3 would reduce the amount of infrastructure and visitor use in Segment 1. While many of these actions would be similar to those described for Alternative 2, residual use (and correspondingly, human presence) would be higher with Alternative 3 than Alternative 2 but lower than current conditions. The Merced Lake High Sierra Camp would also be converted to a temporary outfitter camp to accommodate 15 people per night. Instead of dispersed camping, designated camping at Little Yosemite Valley would be reduced and the Merced Lake Backpackers Campground would be expanded into a portion of the former High Sierra Camping Area. Moraine Dome Camping Area would remain. Overall, wilderness zone capacities would be reduced from 150 to 75. These actions would have a local, minor, beneficial impact on wildlife over the long term as impacts related to visitor use are reduced, as described for Alternative 2.

Construction activities related to the removal of existing improvements with Alternative 3 would result in local, short-term, adverse impacts on wildlife, including noise related to removal of infrastructure

and human presence. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, over the long term, these actions would improve habitat quality and quantity, thus resulting in local, minor, beneficial impacts in wildlife.

Merced Lake High Sierra Camp. The actions in the Merced Lake High Sierra Camp area proposed under Alternative 3 involve the conversion of the area to designated Wilderness, removal of all infrastructure from the Merced Lake High Sierra Camp, and use of the former camp area as a temporary stock camp, resulting in approximately 11 acres of meadow and subalpine restoration in these areas. As discussed for Alternative 2, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Segment 1 by reducing stresses on wildlife from concentrated visitor use.

Segment 1 Impact Summary: Actions to manage visitor use and facilities within Segment 1 under Alternative 3 would have local, long-term, minor, beneficial impacts on wildlife.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Like Alternative 2, Alternative 3 would restore meadow, riparian and floodplain habitats and enhance the free flowing condition of the Merced River through the removal or relocation of infrastructure that constrict the natural channel migration. Alternative 3 would also improve water quality by relocating parking lots, rerouting roads, removing fill material, removing pack stock trails and associated Curry Village stables outside of the floodplain, and restoring meadow and floodplain ecosystems. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-71**.

As summarized in table 9-71, a total of 230 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be restored in Segment 2 under Alternative 3 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits on fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit the most from actions that remove overnight facilities and associated infrastructure (riprap, asphalt pads, trails) within a 150-foot buffer of the river, including selective campgrounds in Yosemite Valley, the former Upper and Lower Pines campgrounds, Housekeeping Camp, and the removal of four buildings at Yosemite Lodge. Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the 2-year to 10-year floodplains, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts. These actions would have segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife.

Restoration actions and effects on wildlife associated with the removal of Ahwahnee, Sugar Pine, and Stoneman bridges, restoration of Ahwahnee Meadow, Stoneman Meadow and Curry Orchard parking lot, Housekeeping Camp, El Capitan moraine, restoration of the area formerly occupied by the

TABLE 9-71: ALTERNATIVE 3 HABITAT RESTORATION IN SEGMENT 2

Current WHR Habitat Type ^a	Acres	Proposed Future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Barren	2	Meadow	21
Meadow	17		
Sparsely vegetated	2		
Lower montane broadleaf	16	Lower montane broadleaf	16
Lower montane needleleaf	68	A mosaic of meadow, black oak, and open canopy coniferous forest	68
Barren	7	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	105
Lower montane broadleaf	1		
Lower montane needleleaf	97		
Lower montane needleleaf	20	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	20
Total	230	Total	230
Abbreviation: WHR = Wildlife Habitat Relationships ^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. ^b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

Upper River and Lower River campgrounds, and rerouting of Valley Loop Trail would be the same as described for Alternative 2. While somewhat less habitat would be restored overall by Alternative 3 when compared to Alternative 2, these actions would nonetheless improve the quality and quantity of meadow and riparian habitats, thereby having a long-term, beneficial effect on the wildlife that use these habitat types when compared to Alternative 1 (No Action).

Species that use meadow, riparian, and riverine habitats would benefit the most from these actions, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 2 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (bridge removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

Under Alternative 3, the NPS would implement measures to restore and protect meadow and wetland habitat while providing adequate access to visitors, including specific measures to restore El Capitan Meadow. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats.

As discussed for other alternatives, these restoration actions would result in local, short-term, minor, adverse impacts on wildlife during the construction phase. Potential minor, adverse impacts include noise related to restoration/removal activities, human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these measures would enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection and enhancing channel free flow and increase channel complexity. Thus, when combined, the actions would result in segmentwide, long-term, moderate, beneficial impact on wildlife that use riparian and wetland habitats, as habitat quality, quantity, and integrity are substantially improved and habitat disturbance is substantially decreased in Segment 2.

Biological Resource Actions.

Yosemite Valley Campgrounds: Under Alternative 3, specific restoration actions to enhance the river's biological values in Segment 2 include removing all campsites within 150 feet of the bed and banks of the Merced River and restoring 12 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, moderate, and beneficial impacts to fish and wildlife.

El Capitan Meadow: In addition to actions common to Alternatives 2-6, the NPS would use restoration fencing and signing to designate appropriate meadow access points, remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, and beneficial impacts on wildlife from reduction of trampling from foot traffic that causes habitat fragmentation.

Ahwahnee Meadow: Similar to Alternative 2, specific actions under Alternative 3 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: rerouting or removing trails which traverse wetlands in the Ahwahnee meadow and consolidating trail use with the Housekeeping Footbridge trail where possible, removing 900 feet of Northside Drive and relocating the bike path to the south of Ahwahnee Meadow, and restoring meadow contours and native vegetation. Meadow restoration, trail rerouting and removal, and removal of a portion of Northside Drive would result in local, long-term, moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

Stoneman Meadow: Like Alternative 2, under Alternative 3 the park would restore Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through Boystown area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote

water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275 feet). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on meadow wildlife.

Former Upper and Lower Rivers Campgrounds: Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 3 are similar to Alternative 2, which include restoring 30 acres of the 10-year floodplain. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 3 may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

Hydrologic/Geologic Resource Actions. Specific restoration actions associated with hydrologic/geologic resources in Segment 2 under Alternative 3 is the same as Alternative 2, which include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6, and removing the Stoneman, Ahwahnee, and Sugar Pine Bridges to enhance the free-flowing condition of the Merced River. Additionally, fill material would be removed and meadow and floodplain habitats would be restored. Southside Drive would be converted to a two-way road and the Sentinel intersection would be redesigned.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 3 would substantially reduce the maximum daily visitation allowed in Segment 2 from current levels to allow for increased resource restoration and reduce crowding and congestion. Under Alternative 3, recreational activities would be reduced to allow for increased restoration along the river corridor. Beneficial effects on wildlife associated with reduced visitor use with this alternative would be similar to that described for Alternative 2.

Similarly to Alternative 2, employee temporary housing at Curry Village would be removed and permanent housing would be constructed under Alternative 3. Temporary housing at the Lost Arrow parking lot would be replaced by parking spaces. Camping opportunities would be reduced under Alternative 3 in Segment 2 when compared to current levels, from 477 sites to 466 sites. Reduction or removal in camping and lodging accommodations would occur at Lower and North Pines

campgrounds, Curry Village, Yosemite Lodge, Backpackers Campground (remove 25 sites and partially replace 16 sites outside of the 100-year floodplain), and Housekeeping Camp. Additional camping opportunities would be expanded at the Upper Pines Campground (recreational vehicle [RV] area), west of Backpackers Campground, and new sites near Camp 4 (Sunnyside Campground). These additional camping opportunities would have a negligible effect on wildlife because the campsites would be located in less sensitive habitats than those sites being removed. However, the removal of campgrounds at Backpackers Campground, North Pines Campground, and Lower Pines Campground would reduce human presence and human-related impacts on wildlife within the Merced River corridor, resulting in segmentwide, long-term, moderate, beneficial effects.

Day parking would be reduced from current supply. This reduction would be most prominent at Camp 6, Curry Orchard, and many formal and informal roadside parking areas. To compensate for the loss of parking, new parking spaces would be added to the west of the current Yosemite Lodge parking lot. These actions would occur in existing disturbed areas and would not result in adverse effects on wildlife. Over the long term, the removal of both formal and informal parking areas would have local, minor, beneficial impacts on wildlife.

Curry Village & Campgrounds. Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village and the rerouting of South Side Drive at Boys Town. Construction activities at Curry Village would result in direct temporary and permanent losses of wildlife habitats as well as the redevelopment of existing developed areas (table 9-72). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow. Ponderosa pine forest is one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-72 below, only a small percentage of the affected wildlife habitats would be affected by the facility actions at Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-72: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 3

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment ^b	1.97	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Effects related to construction activities, including potential displacement of individuals due to noise and human presence, as well as the potential for direct mortalities, would be similar to that described for Alternative 2. However, these adverse impacts are expected to only last for the duration of construction activities. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

Camp 6 and Yosemite Village. Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities and Northside Drive outside the 10-year floodplain. The Camp 6/Village Center Parking Area would be formalized to include 550 designated parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. Northside Drive would be rerouted south of the parking areas and north of the 10-year floodplain. Fill material would be removed from the floodplain and the area would be restored to meadow and floodplain ecosystems.

As noted in **table 9-73**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses of montane riparian and ponderosa pine forest habitat types. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-73**, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction activities under Alternative 3 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

TABLE 9-73: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 3

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Riparian	1.37	0.4%
Ponderosa Pine	9.03	0.5%
Redevelopment ^b	11.55	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

The rerouting of Northside Drive outside the 10-year floodplain would result in the restoration of floodplain and meadow habitats. As discussed under the Impacts of Actions to Protect and Enhance River Values section above, this restoration management action would improve hydrologic function and restore ecological integrity of the Merced River corridor in Segment 2 and associated plant communities. Overall, this action would result in a localized, long-term, moderate, beneficial impact on wildlife in Segment 2.

Yosemite Lodge and Camp 4. Actions under Alternative 3 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the relocation of the pedestrian crossing at Northside Drive and Yosemite Lodge Drive to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of wildlife habitats along with redevelopment of existing disturbed areas (table 9-74). Impacts to wildlife habitats would occur entirely in ponderosa pine forest, one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-74, only a small percentage of this habitat would be impacted. In addition, potentially affected habitat is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-74: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 3

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	0.08	<0.1%
Ponderosa Pine	14.80	0.8%
Redevelopment ^b	3.69	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 3 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

In summary, as shown in table 9-75, actions to manage visitor use and facilities would result in the loss of 31.66 acres of wildlife habitats primarily located near previously developed areas, resulting in long-term, local, minor, adverse impacts wildlife.

TABLE 9-75: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES – ALTERNATIVE 3

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	0.08	<0.1%
Montane Riparian	1.37	0.4%
Ponderosa Pine	30.18	1.7%
Wet Meadow	0.03	<0.1%
Redevelopment ^b	17.21	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Alternative 3 would also result in a net 37% reduction in total daily visitor use (also a reduction of 43% in total day visitors and 23% total overnight visitors) when compared to current levels, resulting in long-term benefits to wildlife and their habitat. As described for Alternative 2, this reduction in visitor use would significantly reduce human-related impacts on wildlife and their associated habitats throughout the Valley. Actions to significantly reduce overnight capacities would effectively reduce the built environment and human presence in the Valley. Restoration of habitat after removal of facilities and parking lots would increase the extent and contiguity of habitat for wildlife; limiting day use activities and roadside parking would reduce impacts on sensitive habitats such as riparian woodland and wet meadows; and reduction in overnight capacities would reduce human pressures on wildlife in general. Facility removal and new construction actions would result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 under Alternative 2 would result in the restoration of 230 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in the loss of 31.66 acres of wildlife habitats primarily located near previously developed areas, resulting in long-term, local, minor, adverse impacts wildlife.

Segments 3 and 4: Merced Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Under Alternative 3, the NPS would designate oak protection areas in the Odgers’ fuel transfer center and parking lots adjacent to the fuel transfer center. The amount of Valley Oak Woodland habitat restored in Segment 4 would be slightly less under Alternative 3 compared to Alternative 2, but otherwise the total amount of habitat restored would be similar. New parking and building construction would be prohibited within the oak protection area. In the existing parking lot at the fuel transfer center, no parking would be allowed within 10 feet of the base of the oak tree. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore the area. Habitat that would be affected by these restoration actions would occur in Segment 4, as summarized in **table 9-76**.

TABLE 9-76: ALTERNATIVE 3 HABITAT RESTORATION IN SEGMENT 4

Current WHR Habitat Type ^a	Acres	Proposed Future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Foothill broadleaf woodland	1	Valley oak woodland	1
Sparsely vegetated	2	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	12
Lower montane broadleaf	10		
Total	13	Total	13

Abbreviation: WHR = Wildlife Habitat Relationships

^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.

^b predominant type(s) and total amount of habitat that would be enhanced or restored.

SOURCE: NPS 1997, 2010, AND 2011.

As summarized in table 9-76, approximately 13 acres of riparian, floodplain, and valley oak woodland habitats would be restored in Segment 4 under Alternative 3 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. This action would result in local, short-term, negligible, adverse impacts on wildlife during restoration activities due to increased noise and human presence. In the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees for food and cover.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Impacts related to wildlife in Segment 3 under Alternative 3 would be the same as described for Alternative 2. In Segment 4, user capacity would be mostly affected by the increase in employee housing in El Portal and Rancheria Flat. While all new units would be built outside of the 100-year floodplain, they would fall within the Merced River corridor. This increase in housing capacity in El Portal is a function of the decrease in employee housing capacity in Yosemite Valley (Segment 2). As previously discussed under “Environmental Consequences of Actions Common to Alternatives 2–6,” the addition of employee housing and park facilities development would increase the total built

environment in Segment 4. Housing development at El Portal and Rancheria Flat would be expected to result in short-term, minor, adverse impacts on wildlife from construction activities and human presence. In the long term, these actions would result in local, minor, adverse impacts on wildlife from the increased disturbance from human presence.

Segments 3 and 4 Impact Summary: Actions to protect and enhance river values within Segments 3 and 4 under Alternative 2 would result in the restoration of 13 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

Segments 5– 8: South Fork Merced River

Impacts of Actions to Protect and Enhance River Values

In addition to the impacts described above under “Environmental Consequences of Actions Common to Alternatives 2–6,” actions specifically targeted to protect culturally sensitive areas and water quality of the South Fork Merced River would benefit wildlife as well, including the relocation or removal of campsites and stock campground sites that are within the 100-year floodplain or culturally sensitive areas. Under Alternative 3, the removal of facilities within the floodplain to accommodate habitat restoration would also result in beneficial effects on wildlife. Habitat that would be affected by these restoration actions on the South Fork Merced River would occur in Segment 7, as summarized in Table 9-77.

TABLE 9-77: ALTERNATIVE 3 HABITAT RESTORATION IN SEGMENT 7

Current WHR Habitat Type ^a	Acres	Proposed Future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Barren	40	Meadow	41
Lower montane needleleaf	1		
Lower montane needleleaf	7	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	7
Total	48	Total	48
Abbreviation: WHR = Wildlife Habitat Relationships ^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. ^b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-77, a total of approximately 48 acres of riparian and meadow habitats would be restored in Segment 7 under Alternative 3 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits on fish and wildlife that use these habitat types. The removal of select campsites within the floodplain as well as the Wawona Golf Course and tennis courts would result in local, long-term, minor, beneficial impacts on wildlife as riparian habitat is restored and wildlife are subject to less human presence and human-related pressures.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Like Alternative 2, Alternative 3 would provide for similar kinds and amounts of use that exist today in Segment 5. Due to the low amount of visitor and administrative use in Segment 5, wildlife habitat would remain relatively intact and undisturbed. The amount, distribution, and integrity of wildlife habitat would remain relatively unchanged from current conditions.

As described previously under Alternative 2, visitor use is not allowed in Segment 6 because of water quality and safety concerns associated with the Wawona Impoundment. Visitor use in Segment 8 is very minimal, and river values would continue to be protected under Alternative 3. Thus, wildlife habitat would remain relatively intact and relatively undisturbed by park visitors in Segments 6 and 8.

Under Alternative 3, Segment 7 would provide for reduced kinds and amounts of use compared to uses today to accommodate for higher levels of river restoration activity. The Wawona Golf Course and Store would be removed to accommodate ecological restoration; however, the sprayfield would remain. The tennis courts would be removed and commercial day rides would be discontinued; the stables in Wawona would be repurposed for another use. Overnight capacities would be reduced at the Wawona Campground, and two campsites at the Wawona stock camp would be relocated to the Wawona stables. Removal of commercial day rides would help to reduce the presence of parasitic bird species, reduce vegetation trampling and soil compaction, and allow for habitat restoration, thereby also benefiting wildlife in the long term. Actions to remove overnight accommodations and other park facilities would result in short-term, adverse impacts on aquatic and terrestrial wildlife during the construction phase, including noise associated with demolition, removal, and restoration activities; ground disturbance; human presence; habitat modification; and potential increase in suspended sediments to the South Fork Merced River in the vicinity of these actions. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, as described above, these actions would restore riparian habitat, reduce riverbank erosion, reduce the built environment, and reduce human presence and human-related pressures on wildlife. Thus, actions to manage visitor use and facilities in Segment 7 would result in local, long-term, moderate, beneficial impacts on wildlife.

Wawona Campground. Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.

Segments 5, 6, 7 and 8 Impact Summary: Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 3 would result in the restoration of 48 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.

Summary of Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration

Many of the actions proposed under Alternative 3 would restore aquatic and terrestrial habitats, thereby resulting in beneficial effects on fish and wildlife. This includes actions that are targeted to improve habitat quality for aquatic, riparian- and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with those restoration actions that are common to Alternatives 2–6, up to approximately 302 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 3, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions the park would implement that would directly benefit fish and wildlife under Alternative 3 include the following:

- Remove facilities within 150 feet of the ordinary high water mark of the Merced River and restore riverbanks, meadows, and riparian habitat.
- Redirect recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 31.66 acres of wildlife habitats under Alternative 3. Potential adverse effects from these actions would be associated with the active construction or restoration phase, and would be local, short-term, and minor or negligible. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on wildlife and fish resources as habitats are restored and fragmentation and radiating impacts are reduced. Like Alternative 2, these effects would be most pronounced in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively). Overall, while slightly less restoration is proposed under Alternative 3 than Alternative 2, it would have similar benefits when compared to Alternative 1 (No Action), especially related to human presence, as use levels would be even further reduced.

Cumulative Impacts from Alternative 3: Dispersed Visitor Experiences and Extensive Riverbank Restoration

The past, present, and reasonably foreseeable actions used for this evaluation are the same projects listed for Alternative 1 (No Action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. Like Alternative 2, the actions proposed under Alternative 3 would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River

corridor over the long term. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species that are associated with these habitat types are most likely to be affected beneficially by the proposed actions.

In general, past actions have degraded and reduced the abundance and quantity of aquatic, meadow, and riparian habitats in the region. These past actions, especially at lower elevations caused by development and resource extraction, have resulted in changed movement patterns of fish and wildlife over time as they seek areas with more suitable habitat conditions. Present and reasonably foreseeable future actions also have the potential to further reduce or degrade these habitat types. Because the actions proposed for Alternative 3 would further increase the habitat value of the Merced River corridor, this alternative would contribute toward a long-term, cumulative, beneficial effect on fish and wildlife and may, in some cases, offset or reverse local population declines for some species. Songbirds, reptiles, and amphibians in particular would benefit cumulatively from Alternative 3 because there would be a net increase in quantity of preferred habitat (meadows and riparian) compared to existing amounts.

Environmental Consequences of Alternative 4: Resource-Based Visitor Experiences and Targeted Riverbank Restoration

Segment 1: Merced River Above Nevada Fall

Impacts of Actions to Protect and Enhance River Values

Under Alternative 4, grazing would be eliminated and administrative pack stock would be required to carry pellet feed in Merced Lake East Meadow, as described for Alternatives 2. Beneficial effects to fish and wildlife would be the same as described for Alternative 2.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 4 would reduce the amount of infrastructure in Segment 1 of the Merced River corridor through the removal of the Merced Lake High Sierra Camp and associated infrastructure. This High Sierra Camp area would be restored to natural conditions and be designated wilderness. Some dispersed camping from the Merced Lake Backpackers Camp would be expanded into the former Merced Lake High Sierra Camp, and wilderness zone capacities would be reduced from 150 to 100. Designated camping areas in Little Yosemite Valley would be reduced and Moraine Dome would be continued along with the existing wilderness trailhead quota system. These actions would have local, short-term, minor, adverse impacts during the construction phase, and local, long-term, minor, beneficial impacts on wildlife if implemented. Adhering to mitigation measures provided MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), would ensure impacts related to construction would be minor and adverse.

Total daily use levels in Segment 1 under Alternative 4 are estimated at 295 overnight users (mostly concentrated at Little Yosemite Valley and Washburn Lake) and approximately 450 day visitors. Compared To Alternative 1 (No Action), in which daily use levels are estimated at 380 overnight users and approximately 450 day visitors, Alternative 4 would significantly reduce the number of overnight users by 85 users, or approximately 22%. The reduction in overnight facilities and overnight visitors

represents a reduction in human presence, human-related pressures on wildlife, and reduced future impacts on wildlife habitat in Segment 1. Collectively, actions to manage visitor use and facilities under Alternative 4 would result in local, long-term, minor, beneficial impacts on wildlife in Segment 1.

Merced Lake High Sierra Camp. The actions in the Merced Lake High Sierra Camp area proposed under Alternative 4 involve the conversion of the area to designated Wilderness, the closure of the Merced Lake High Sierra Camp, and restoration of the former camp area to natural conditions, including approximately 11 acres of meadow and subalpine restoration in these areas. Construction activities associated with the demolition and removal of the Merced Lake High Sierra Camp would result in short-term, local, adverse impacts on wildlife related to noise, potential for sediment discharge from disturbed soils, and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Once completed, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Segment 1 by reducing stresses on wildlife from concentrated human use.

Segment 1 Impact Summary: Actions to manage visitor use and facilities within Segment 1 under Alternative 4 would have local, long-term, minor, beneficial impacts on wildlife.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Actions proposed under Alternative 4 that would benefit fish and wildlife in the long term include the removal of the Sugar Pine and Ahwahnee bridges, relocating the Camp 6 parking lot away from the ordinary high-water mark, removing pack stock trails and associated Curry Village stables, and restoring meadow and floodplain ecosystems. While the overall amount of habitat with Alternative 4 that would be restored in Segment 2 would be less than that proposed under Alternatives 2 and 3, it would still be substantial. The types of habitat that would be affected by restoration actions are summarized in **table 9-78**.

As summarized in table 9-78, approximately 194 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be restored in Segment 2 under Alternative 4 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits on fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit from actions that remove overnight facilities and associated infrastructure (riprap, asphalt pads, trails) within 150 feet of the Merced River, including selective campgrounds and associated facilities in Yosemite Valley and at Housekeeping Camp. Restoration at the Ahwahnee Row and Tecoya concessioner employee housing area would be guided by a 50-foot setback from Indian Creek. The topography and habitat at the former Lower and Upper Rivers Campgrounds would also be restored. These restoration actions would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts. These actions would have segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife in Segment 2.

TABLE 9-78: ALTERNATIVE 4 HABITAT RESTORATION IN SEGMENT 2

Current WHR Habitat Type ^a	Acres	Proposed Future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Barren	2	Meadow	21
Meadow	17		
Sparsely vegetated	2		
Lower montane broadleaf	15	Lower montane broadleaf	15
Lower montane needleleaf	67	A mosaic of meadow, black oak, and open canopy coniferous forest	67
Lower montane broadleaf	1	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	46
Lower montane needleleaf	45		
Barren	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	45
Lower montane needleleaf	41		
Total	194	Total	194

Abbreviations: WHR = Wildlife Habitat Relationships

^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.

^b Predominant type(s) and total amount of habitat that would be enhanced or restored.

SOURCE: NPS 1997, 2010, AND 2011.

To enhance the development of riparian vegetation in the vicinity of El Capitan moraine, the park would replant the area upstream aggressively with native vegetation. However, when compared to Alternatives 2 and 3, this action would not directly mitigate for the channel incision upstream that has reduced the frequency of inundation within the riparian zone, meadows, and floodplain. This restorative action would result in local, short-term, adverse impacts on fish and wildlife associated with restoration-related activities, ground disturbance, human presence, increases in sedimentation, and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. This restoration action would be expected to have a local, long-term, minor, beneficial impact on fish and other aquatic species that use the Merced River and adjacent riparian habitat in Segment 2.

Under Alternative 4, the park would implement measures to restore and protect meadow by implementing actions that are similar to previous alternatives (Alternatives 2 and 3), but with less intensity. Currently, some roads and trails bisect or otherwise cross through meadows and cause fragmentation, soil compaction, and vegetation trampling of valley meadows. Additionally, these roads and trails limit or disrupt meadow hydrologic connectivity. To address these issues, the park would remove fill from wetlands and sensitive areas at Ahwahnee Meadow, install boardwalk in wet areas, and add culverts to improve hydrologic connectivity; however, existing roadways and trails would be retained. Stoneman Meadow would be restored by removing a portion of Southside Drive and realignment of the road; the Curry Orchard parking lot would be redesigned to promote water flow

from the cliff walls to Stoneman Meadow; boardwalk would be extended through wet areas to Curry Village. At El Capitan Meadow, all informal trails would be removed and restoration fencing would be used to designate appropriate meadow access points and guide visitors toward boardwalks and viewing platforms to protect meadow habitat, as described for Alternative 3. The Valley Loop Trail would be rerouted out of Slaughterhouse Meadow to an upland area. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats, resulting in beneficial effects on wildlife that use these habitats.

Collectively, these restoration actions would result in local, minor, short-term adverse impacts on wildlife in Segment 2. Potential minor, adverse impacts include noise- related to restoration/removal activities, human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1, and MM-WL-2, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these measures would also enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection; enhance channel free flow; and increase channel complexity. Thus, when combined, these actions under Alternative 4 would result in segmentwide, long-term, moderate, beneficial impacts on wildlife that use riparian and wetland habitats as habitat quality, quantity, and integrity are improved and habitat disturbance is decreased in Segment 2.

Biological Resource Actions.

Yosemite Valley Campgrounds: Like Alternative 3, specific restoration actions under Alternative 4 to enhance the river’s biological values in Segment 2 include removing all campsites within 150 feet of the bed and banks of the Merced River and restoring 12 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, moderate, and beneficial impacts to fish and wildlife.

El Capitan Meadow: In addition to actions common to Alternatives 2-6, Alternative 4 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. Alternative 4 would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, and beneficial impacts on wildlife from reduction of trampling from foot traffic that causes habitat fragmentation.

Ahwahnee Meadow: Specific actions under Alternative 4 in Segment 2 to enhance the river’s biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. However, unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 4. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term,

minor to moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

Stoneman Meadow: Like Alternatives 2 and 3, specific actions in Alternative 4 to enhance the biological values of the Merced River include restoring Stoneman Meadow by removing 1,335 feet of Southside Drive and re-aligning the road through Boystown area. The Orchard Parking Lot would be redesigned and engineering solutions would be applied to promote water flow and improve meadow health to increase drainage from the cliff walls to Stoneman Meadow. The meadow boardwalk would be extended through wet areas to Curry Village (up to 275'). Restoration of Stoneman Meadow and protection of sensitive wetland habitat would result in local, long-term, minor to moderate, and beneficial impacts on meadow wildlife.

Former Upper and Lower Rivers Campgrounds: Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds in Alternative 4 include restoring the topography of 16.5 acres of the floodplain. Alternative 4 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish channels that have been filled, place large box culverts under the road to allow water flow, and fence and close the riparian zone at former Upper River to protect the riverbank from trampling. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 4 may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

Hydrologic/Geologic Resource Actions. Under Alternative 4, specific restoration actions associated with hydrologic/geologic resources in Segment 2 include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6, removing the Ahwahnee and Sugar Pine Bridges to enhance the free-flowing condition of the Merced River, and mitigate for the scouring effects of Stoneman Bridge by placement of large wood. Additionally, riparian habitat would be restored where needed, and brush layering and a constructed logjam would be placed in the vicinity of the Stoneman Bridge. Drainage in this area would be improved by the addition of culverts. At the Ahwahnee Bridge, trails would be rerouted or connected to resilient areas (e.g., the north bank of the river). Restoration of riparian and floodplain habitats and enhancing the free-flowing condition of the river would have long-term, moderate, and beneficial impacts on wildlife within Yosemite Valley. Species that use riparian and riverine habitats would benefit the most from these actions, including mammals such as mule deer and

black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 4 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Under Alternative 4, the NPS would reduce the maximum daily visitation allowed in Yosemite Valley from current levels to allow for increased resource restoration and reduce crowding and congestion in Segment 2. However, Alternative 4 differs from Alternatives 2 and 3 because both commercial and private boating would be allowed in Segment 2 of the river corridor. Therefore, potential beneficial effects on fish and wildlife related to reductions in human disturbance would not be as substantial as with Alternatives 2 and 3.

In general, visitor use in Segment 2 under Alternative 4 would be reduced as a result of reducing or repurposing park facilities. The following facilities would be reduced or repurposed under Alternative 4: Curry Village stables (stock day rides would no longer be available), Yosemite Lodge Gift Shop and Nature Shop, and Housekeeping Camp shower houses and restrooms. The Housekeeping Camp Grocery Store would be removed. In addition, some Housekeeping Camp lodging units would be converted into a day use area. These actions would generally have local, minor, beneficial to negligible effects on wildlife related to a reduction in human disturbance.

In addition, Alternative 4 would create opportunities for picnicking adjacent to some parking areas such as Superintendent's House (Residence 1), Yosemite Village, Church Bowl, and Happy Isles. Private and commercial boating would be allowed in Segment 2; however, the location of use and amount of use would be limited to certain segments (and reaches within those segments) and regulated by a permit system. Compared to Alternative 1 (No Action), these actions would generally have local, minor to negligible, beneficial effects on fish and wildlife.

Alternative 4 would increase the capacity of overnight camping accommodations in Segment 2, mostly as a result of increases in individual and group camp sites. Additionally, permanent employee housing would be constructed at Yosemite Village and Curry Village, and new campgrounds would be constructed at the former Lower and Upper Rivers Campgrounds 150 feet away from the river. This increase in overnight camping accommodations and permanent employee housing would result in local, minor to moderate, adverse impacts on wildlife habitat and may increase human-wildlife conflicts in Segment 2, especially with black bears. The increase in capacity of overnight camping accommodations would require an increase in Wildlife Management staffing dedicated to the Bear Program and potentially impact Wildlife Management's funding for use on other ecologically-relevant issues and protection of special-status species. The increase in human-wildlife conflicts would be most

pronounced at the Upper Pines Campground, former Lower River and Upper River campgrounds, Boys Town, Curry Village stables, west of Yosemite Lodge, Camp 4, and west of Backpackers Campground (although 25 current campsites would be removed from the 100-year floodplain). Lodging capacity would decrease under Alternative 4; however, day parking would be reduced by removing parking spaces that are currently located within the 100-year floodplain and formal and informal roadside parking areas. To compensate for loss of parking, new parking spaces would be added west of the current Yosemite Lodge parking. The new parking areas would be constructed in previously disturbed areas and would not result in a loss of wildlife habitat, resulting in negligible effects.

Actions that remove or reduce park facilities under Alternative 4 would result in local, short-term, adverse impacts on fish through potential discharges of sediments and other pollutants during construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Removal of facilities located adjacent or within the 100-year floodplain would allow for natural reestablishment of riparian vegetation along the Merced River corridor and would have local, long-term, moderate, beneficial impacts on aquatic and terrestrial wildlife inhabiting these areas. In the long-term, wildlife would benefit from reduced human presence and human-related pressures (such as noise, human food, and vegetation trampling). Continued use of select facilities within the floodplain would result in continued minor, adverse impacts on riparian habitat and wildlife in limited areas of Segment 2.

Although construction of new campsites would occur outside of the dynamic 10-year floodplain, new development under Alternative 4 would result in local, short-term, minor, adverse impacts on aquatic wildlife and local, long-term, minor, adverse impacts on wildlife in Segment 2. Adverse impacts include noise associated with construction activities, human presence, and disturbance or minor habitat losses in each project area. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Long-term, adverse impacts would include effects associated with increased human presence. Likewise, actions to add day parking and picnic areas would have similar temporary and long-term impacts.

Curry Village & Campgrounds. Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village and the rerouting of South Side Drive at Boys Town. Construction activities at Curry Village would result in direct, temporary and permanent losses of wildlife habitats as well as redevelopment of existing developed areas (table 9-79). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow. Ponderosa pine forest is one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-79 below, only a small percentage of the affected wildlife habitats would be affected by the facility actions in Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-79: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 4

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment ^b	1.97	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Effects related to construction activities, including potential displacement of individuals due to noise and human presence, as well as the potential for direct mortalities, would be similar to that described for Alternative 2. However, these adverse impacts are expected to only last for the duration of construction activities. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

Camp 6 and Yosemite Village. Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area would be formalized with 750 designated parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. The intersection at Northside Drive and Village Drive (Camp 6 intersection) would be re-aligned to meet standards for a proper four-way intersection and improve performance. A three-way intersection at Sentinel Drive and the entrance to the parking area would be added to improve traffic flow and alleviate congestion. An entry road to Camp 6 parking lot from Sentinel Drive would be added to improve traffic flow and alleviate congestion at nearby intersections. On-grade pedestrian crossings with proper sight lines would be provided to alleviate pedestrian/vehicle conflicts.

As noted in **table 9-80**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses would primarily occur in ponderosa pine forest and, to a much lesser extent, montane riparian and wet meadow habitats. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-80**, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction activities under Alternative 4 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

TABLE 9-80: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 4

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Riparian	0.81	0.3%
Ponderosa Pine	12.22	0.7%
Wet Meadow	0.28	<0.1%
Redevelopment ^b	14.18	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Yosemite Lodge and Camp 4. Actions under Alternative 4 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 150 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of wildlife habitats along with redevelopment of existing disturbed areas (table 9-81). Impacts to wildlife habitats would occur entirely in ponderosa pine forest, one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-81, only a small percentage of this habitat would be impacted. In addition, potentially affected habitat is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-81: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 4

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	0.08	<0.1%
Ponderosa Pine	14.80	0.8%
Redevelopment ^b	3.69	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 4 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

In summary, as shown in table 9-82, actions to manage visitor use and facilities would result in the loss of 34.57 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

TABLE 9-82: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 4

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	0.08	<0.1%
Montane Riparian	0.81	0.3%
Ponderosa Pine	33.37	1.8%
Wet Meadow	0.31	<0.1%
Redevelopment ^b	19.84	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Under Alternative 4, total visitor use levels would reduce by 19% from the total visitors per day who visited Yosemite Valley in 2011. Total day use would reduce by 29%. Although there is an overall reduction in total visitor use levels in Segment 2 under Alternative 4, there is a net increase in the total overnight accommodations in Yosemite Valley by 7%. Thus, human-related impacts on wildlife in Segment 2, especially during the peak season (summer) would continue to be long-term, local, minor and adverse. Facility removal and new construction actions would result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, wildlife would also benefit from a combination of other actions to manage visitor use and park facilities in Segment 2. The overall reduction in maximum total daily visitation to the Valley from current levels, combined with restoration activities, would promote the recovery of riparian vegetation and reduce human-related pressures on wildlife in sensitive areas such as riparian habitats adjacent to the river corridor in Segment 2. The quality of wildlife habitat in Segment 2 would be improved in general under Alternative 4.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 under Alternative 4 would result in the restoration of 194 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities

would result in the loss of 34.57 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

Segments 3 and 4: Merced Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Under Alternative 4, the NPS would designate oak protection areas in the Odgers’ fuel transfer center and parking lots adjacent to the fuel transfer center to improve root health, water uptake, and soil aeration for oak trees. Parking within 10 feet of the base of oak trees would be prohibited. New parking and building construction would be prohibited within the oak protection area. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore the area. Habitat restoration actions that would occur in Segment 4 are summarized in **table 9-83**, and are similar to those described for Alternatives 2 and 3.

TABLE 9-83: ALTERNATIVE 4 HABITAT RESTORATION IN SEGMENT 4

Current WHR Habitat Type ^a	Acres	Proposed future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Foothill broadleaf woodland	1	Valley oak woodland	1
Sparsely vegetated	2	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	11
Lower montane broadleaf	9		
Total	12	Total	12

Abbreviation: WHR = wildlife Habitat Relationships
^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.
^b Predominant type(s) and total amount of habitat that would be enhanced or restored.
 SOURCE: NPS 1997, 2010, AND 2011.

As summarized in table 9-83, a total of approximately 12 acres of riparian, floodplain, and valley oak woodland habitats would be restored in Segment 4 under Alternative 4 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. This action would result in local, short-term, negligible, adverse impacts on wildlife during restoration activities due to increased noise and human presence. In the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees for habitat and food.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Like other alternatives, Alternative 4 would provide for similar kinds and amounts of use that exist today in Segment 3. Thus, no additional beneficial or adverse impacts on wildlife would result from actions to manage visitor use and facilities under Alternative 4.

In Segment 4, visitor day parking would be expanded at the Abbieville site; this area would primarily be used for visitor access to Yosemite Valley. The expanded parking area would be constructed within an existing disturbed area (Abbieville/Trailer Village), so impacts on wildlife habitat would be avoided. However, there would local, long-term, minor, adverse impacts on wildlife related to increased human disturbance.

Under Alternative 4, employee housing would be developed at El Portal Village Center and Rancheria Flat and new employee parking spaces would be added at these locations. While all new units would be built outside of the 100-year floodplain, they would fall within the river corridor. The addition of employee housing and park facilities development would increase the total built environment in Segment 4. Housing development at El Portal and Rancheria Flat would be expected to result in short-term impacts on wildlife from construction activities and human presence, while in the long term, these actions would result in local, minor, adverse impacts on wildlife caused by increased disturbance from human presence.

Segments 3 and 4 Impact Summary: Actions to protect and enhance river values within Segments 3 and 4 under Alternative 4 would result in the restoration of 12 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

Segments 5– 8: South Fork Merced River

Impacts of Actions to Protect and Enhance River Values

Compared to Alternatives 2 and 3, Alternative 4 would include less habitat restoration as the Wawona Golf Course and tennis courts would remain. Actions specifically targeted to protect culturally sensitive areas would benefit wildlife as well, including the relocation or removal of select campsites and stock campground sites that are within the 100-year floodplain or culturally sensitive areas. Effects on habitat as a result of restoration actions that would occur in Segment 7 are summarized in **table 9-84**.

TABLE 9-84: ALTERNATIVE 4 HABITAT RESTORATION IN SEGMENT 7

Current habitat type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Lower montane needleleaf	7	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	7
Total	7	Total	7
Abbreviation: WHR = Wildlife Habitat Relationships a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-84, a total of approximately seven acres of riparian habitat would be restored in Segment 7 under Alternative 4 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. The removal of select campsites within the floodplain would result in local, long-term, minor, beneficial impacts on wildlife as riparian habitat is restored and wildlife are subject to less human presence and human-related pressures.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 4 would provide for similar kinds and amounts of use that exist today in Segment 5. Visitor use is not allowed in Segment 6 due to water quality and safety concerns associated with the Wawona Impoundment. Visitor use in Segment 8 is very minimal, and river values would continue to be protected. Thus, wildlife habitat would remain relatively intact and relatively undisturbed by park visitors in Segments 5, 6, and 8.

Under Alternative 4, Segment 7 would provide for similar kinds and amounts of use compared to those that exist today. Unlike Alternatives 2 and 3, the Wawona Golf Course and Store would remain under Alternative 4. In addition, the Wawona Hotel tennis courts would remain. Therefore, impacts from these improvements would remain unchanged from the Alternative 1 (No Action). However, commercial day rides would be discontinued and the Wawona stables would be repurposed as campgrounds. Private boats would be allowed in Segment 7; however, limitations on location and amount of use would be applied. Overnight capacities would be reduced at the Wawona Campground and two campsites at the Wawona Stock Campground would be relocated to the Wawona stables. Additional day parking would be added for the Mariposa Grove outside of the river corridor. These actions would result in negligible effects on wildlife.

Removal of commercial day rides under Alternative 4 would help to reduce the presence of parasitic bird species, reduce vegetation trampling and soil compaction, and allow for habitat restoration. Actions to reduce overnight capacities would result in short-term, adverse impacts on aquatic and terrestrial wildlife, including noise associated with demolition, removal, and restoration activities; ground disturbance, human presence, habitat modification, and potential increase in suspended sediments to immediate areas of the Merced River in Segment 7. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. Continued operation of the Wawona Golf Course and Store, and the Wawona Hotel tennis courts would continue to contribute to the total built environment in Segment 7 of the river corridor. However, the Alternative 4 combined actions would restore riparian habitat, reduce riverbank erosion, reduce the overall built environment, and reduce human presence and human related pressures on wildlife. Thus, actions to manage visitor use and facilities in Segment 7 would result in local, long-term, minor, beneficial impacts on wildlife.

Wawona Campground. Facilities actions at the Wawona Campground would involve removal of 27 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.

Segments 5, 6, 7 and 8 Impact Summary: Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 4 would result in the restoration of seven acres of wildlife habitats, resulting in long-term, segmentwide, minor, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.

Summary of Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration

Several actions proposed under Alternative 4 would benefit fish and wildlife, including actions that are targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with restoration actions that are common to Alternatives 2–6, up to approximately 223 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 4, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions the park would implement that would directly benefit fish and wildlife under Alternative 4 include the following:

- Remove structures and restore riverbanks, meadows, and riparian habitat in targeted areas within the river corridor; riparian vegetation would be aggressively restored in some areas such as upstream of El Capitan moraine.
- Redirect recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day use parking space, lodging, and camping space.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 34.57 acres of wildlife habitats under Alternative 4. Potential adverse effects from these actions would primarily be associated with the active construction or restoration phase, and would be local, short term, and minor or negligible. When combined, the long-term effect of all of these measures would be a moderate, beneficial impact on wildlife and fish resources as habitats are restored and fragmentation and radiating impacts are reduced. While the expansion of overnight camping in Segment 2 would result in local, adverse impacts on wildlife due to loss of habitat, increased human-wildlife conflicts, and increased human presence in surrounding affected campgrounds, these impacts would be offset by an overall decrease in visitor use as well as an increase in habitat quality and quantity through restoration actions.

Cumulative Impacts from Alternative 4: Resource-based Visitor Experiences and Targeted Riverbank Restoration

The past, present, and reasonably foreseeable actions used for the Alternative 4 evaluation are the same projects listed for Alternative 1 (No Action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. The actions under Alternative 4 would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River corridor over the long term. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species that are associated with these habitat types would be most likely to be affected cumulatively by the proposed actions. While some localized increases in habitat disturbance would occur, overall visitor use would decrease and habitats would be restored.

Wildlife communities have been manipulated by human development and population growth throughout the region for decades, and these actions have in many cases negatively influenced wildlife and wildlife habitat. The cumulative effects of past, present, and future reasonably foreseeable actions would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration and enhancement projects and ecosystem management, generally carried out by federal, state, and local public agencies as well as privately owned and managed conservation lands, open space, and mitigation banks. Adverse cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Each of the aforementioned projects (listed under Alternative 1) has the potential to have substantial site-specific adverse effects on wildlife resources during construction (short term) and by direct displacement of resources (long term). In total, regional development and growth would contribute towards a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. When these effects are combined cumulatively with the effects of restoration projects and other actions under Alternative 4, conditions for fish and wildlife populations in the study area would improve over time. While Alternative 4 would cumulatively contribute beneficial impacts, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative would be long term, minor, and beneficial.

Environmental Consequences of Alternative 5: Enhanced Visitor Experiences and Essential River Bank Restoration

Segment 1: Merced River Above Nevada Fall

Impacts of Actions to Protect and Enhance River Values

Under Alternative 5, grazing in Merced Lake East Meadow would be managed as described for Alternatives 3. Beneficial effects to fish and wildlife would be the same as described for Alternative 3.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 5 would accommodate the same kinds and amounts of use that exist today in Segment 1. Visitor use would continue to focus on wilderness-oriented experiences characterized by self-reliance and opportunities for solitude. Private boating by permit would be allowed under Alternative 5.

Overnight capacities at Merced Lake High Sierra Camp would be reduced; additionally, the flush toilets would be converted to composting toilets. All other zone capacities would remain similar to current levels along with the existing wilderness trailhead quota system. These actions would have local, long-term, minor, beneficial impacts on fish and wildlife in Segment 1.

Total daily use levels in Segment 1 under Alternative 5 are estimated at 362 overnight users and approximately 450 day visitors. Compared with Alternative 1 (No Action), with an estimated 380 overnight users and approximately 450 day visitors daily, Alternative 5 would reduce the number of overnight users by 18 users, or approximately 5%. The slight reduction in overnight facilities and overnight visitors represents a reduction in human presence, human-related pressures on wildlife, and reduced future impacts on wildlife habitat in Segment 1. Collectively, actions to manage visitor use and facilities under Alternative 5 would result in local, long-term, minor beneficial impacts on wildlife in Segment 1. The removal and conversion of existing improvements would result in local, short-term, adverse impacts on wildlife, including noise related to removal of infrastructures and human presence. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse.

Merced Lake High Sierra Camp. The actions in the Merced Lake High Sierra Camp area proposed under Alternative 5 involve retention of the Merced Lake High Sierra Camp, reducing the capacity to 42 beds, and replacing the flush toilets with composting toilets. These actions would result in a local, long-term, negligible, beneficial impact on wildlife in Segment 1 by reducing stresses on wildlife from visitor use and presence of infrastructure.

Segment 1 Impact Summary: Actions to manage visitor use and facilities within Segment 1 under Alternative 5 would have local, long-term, negligible, beneficial impacts on wildlife.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Alternative 5 proposes substantial restoration actions that would directly benefit fish and wildlife in Segment 2. The free-flowing condition of the Merced River would be enhanced by the removal of the Sugar Pine Bridge and the associated multi-use paved trail connecting Sugar Pine Bridge and Ahwahnee Bridge. Hydrological impacts of the Stoneman and Ahwahnee bridges would be mitigated with strategic placement of large wood on riverbanks, brush layering, and constructed logjams to address scouring. Water quality would be improved by relocating the Camp 6 parking lot away from the ordinary high-water mark and restoring riparian vegetation. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-85**.

As summarized in **table 9-85**, a total of approximately 182 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be restored in Segment 2 under Alternative 5 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands,

TABLE 9-85: ALTERNATIVE 5 HABITAT RESTORATION IN SEGMENT 2

Current WHR Habitat Type ^a	Acres	Proposed Future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Meadow	16	Meadow	18
Sparsely vegetated	2		
Lower montane broadleaf	15	Lower montane broadleaf	15
Lower montane needleleaf	65	A mosaic of meadow, black oak, and open canopy coniferous forest	65
Lower montane broadleaf	1	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	44
Lower montane needleleaf	41		
Barren	2		
Barren	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	40
Lower montane needleleaf	36		
Total	182	Total	182

Abbreviation: WHR = Wildlife Habitat Relationships

^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.

^b Predominant type(s) and total amount of habitat that would be enhanced or restored.

SOURCE: NPS 1997, 2010, AND 2011.

riparian habitat, and riverine ecosystems would benefit from actions that remove select overnight and employee housing facilities within 100 feet of the ordinary high-water mark, including select camp sites at Backpackers Campground, Housekeeping Camp, Lower Pines Campground, and North Pines Campground. Approximately 20 acres of land within 150 feet of the ordinary high-water mark of the Merced River would be restored to riparian and floodplain habitat at the former Lower River Campground. Restoration at the Ahwahnee Row and Tecoya concessioner employee housing area would be guided by a 50-foot setback from Indian Creek. To enhance the development of riparian vegetation in the vicinity of El Capitan moraine, the park would replant the area aggressively with native vegetation, as described for Alternative 4. Restoration of these areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts.

These actions would also result in local, short-term, adverse impacts on fish and wildlife during construction from ground disturbance, effects associated with human presence, increases in sedimentation, and potential for incidental spills to reach aquatic habitats (including the Merced River). Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. When completed, these actions would have segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife.

In addition to actions to restore riparian and aquatic habitat associated with the Merced River, Alternative 5 includes measures to restore and protect meadows by implementing actions that are similar to Alternatives 2–4, but only in essential areas that require restoration. Currently, some roads and trails bisect or otherwise cross through meadows and cause fragmentation, soil compaction, and vegetation trampling of Valley meadows. Additionally, these roads and trails limit or disrupt meadow hydrologic connectivity. To address these issues, the park would remove fill from wetlands and sensitive areas at the Ahwahnee Meadow, install boardwalk in wet areas, and add culverts to improve hydrologic connectivity (roadways and trails would be retained under Alternative 5). Stoneman Meadow would be restored by removing roadside parking and unnatural fill material, extending fencing to protect wetlands, and the Curry Orchard parking lot would be redesigned to promote water flow from the cliff walls to Stoneman Meadow. Fencing would be installed along the northern perimeter of El Capitan Meadow, and boardwalks and viewing platforms would be installed to reduce habitat fragmentation. Boardwalks would be constructed at the Valley Loop Trail to reduce impacts on wet meadow habitat in Slaughterhouse Meadow. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats. Collectively, these restoration actions would result in local, short-term, minor, adverse impacts on wildlife. Potential minor, adverse impacts include noise related to restoration/removal activities, effects associated with human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these measures would also enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection; enhance channel free flow; and increase channel complexity. Thus, when combined, the Alternative 5 actions would result in segmentwide, long-term, minor to moderate, beneficial impacts on wildlife that use riparian and wetland habitats in Segment 2 as habitat quantity and quality is improved in several areas. Additionally, the removal of select campgrounds within 100 feet of the ordinary high-water mark of the Merced River would reduce human presence and human-related impacts on riparian and aquatic wildlife species in localized areas in Segment 2.

Biological Resource Actions.

Yosemite Valley Campgrounds: Specific restoration actions under Alternative 5 to enhance the river’s biological values in Segment 2 include removing all campsites within 100 feet of the bed and banks of the Merced River and restoring 6.5 acres of floodplain/riparian habitat, and designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, minor to moderate, and beneficial impacts to fish and wildlife.

El Capitan Meadow: In addition to actions common to Alternatives 2-6 and similar to Alternative 4, Alternative 5 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. Alternative 5 would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Conifers that block views of El Capitan from the roadside would be selectively removed. Restoration of El Capitan Meadow and rerouting or removal

of informal trails would result in local, long-term, minor to moderate, and beneficial impacts on wildlife from reduction of trampling from foot traffic that causes habitat fragmentation.

Ahwahnee Meadow: Similar to Alternative 4, specific actions under Alternative 5 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. Unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 5. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term, minor to moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

Stoneman Meadow: Specific actions in Alternative 5 to enhance the biological values of the Merced River include restoring Stoneman Meadow by redesigning the Orchard Parking Lot. Through engineering solutions, Alternative 5 would promote water flow by increasing drainage from the cliff walls of the parking lot to Stoneman Meadows, thus improving meadow health. Improving hydrological connectivity between the Orchard Parking Lot cliff walls and Stoneman Meadow would result in local, long-term, minor, and beneficial impacts on meadow habitat and associated meadow wildlife.

Former Upper and Lower Rivers Campgrounds: Specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds under Alternative 5 include restoring 35.6 acres of riparian and floodplain habitat at Lower Rivers Campground. Alternative 5 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish channels that have been filled, place large box culverts under the road to allow water flow, and fence and close the riparian zone at former Upper River to protect the riverbank from trampling. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 5 may include noise associated with restoration activities, human presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

Hydrologic/Geologic Resource Actions. Under Alternative 5, specific restoration actions associated with hydrologic/geologic resources in Segment 2 include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6, removing the Sugar Pine Bridge and berm to enhance the free-

flowing condition of the Merced River, and mitigate for the scouring effects of Stoneman Bridge by placement of large wood. Additionally, riparian habitat would be restored where needed, and brush layering and a constructed logjam would be placed in the vicinity of the Stoneman Bridge. Drainage in this area would be improved by the addition of culverts. At the Ahwahnee Bridge, trails would be rerouted or connected to resilient areas (e.g., the north bank of the river). Restoration of riparian and floodplain habitats, and enhancing the free-flowing condition of the river would have long-term, moderate, and beneficial impacts on wildlife within Yosemite Valley. Species that use riparian and riverine habitats would benefit the most from these actions. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 5 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 5 would maintain similar kinds and amounts of visitor use and facilities in Yosemite Valley to those that exist today, with a few services and facilities reduced or eliminated (e.g., discontinue commercial day horseback rides from the Curry Village Stables, remove the Boystown Housing area, Happy Isles Snack Stand, and the Ice Rink). Overnight accommodations would increase and day parking and transit options would be expanded. Overall, Alternative 5 would accommodate the peak use levels during the summer season similar to current levels.

Overnight capacities would increase in the Valley under Alternative 5. This increase would affect wildlife in the vicinity of Upper Pines Campground, former Upper River Campground, west of Backpackers Campground (although 15 current campsites would be removed from the 100-year floodplain), and in the vicinity of Camp 4 (Sunnyside Campground). Additionally, permanent employee housing would be constructed at Yosemite Village and Curry Village. These actions would result in both short- and long-term, local, minor, adverse impacts on wildlife related to increased human disturbance and human-wildlife conflicts, minor habitat loss (most actions would occur in existing disturbed areas), and increased radiating impacts. The increase in capacity of overnight camping accommodations would require an increase in Wildlife Management staffing dedicated to the Bear Program and potentially impact Wildlife Management's funding for use on other ecologically-relevant issues and protection of special-status species.

Day parking capacity would be expanded and formalized to provide additional parking spaces; most day parking would be provided at existing designated parking areas, but a new overflow parking area (the West Valley Overflow Parking Area) would be constructed in West Yosemite Valley, west of Cathedral Picnic Area and south of Southside Drive. While the construction of this new facility would not affect any sensitive habitats for wildlife, it would result in a substantial increase in visitor use and disturbance in an area that currently does not experience high levels of visitor use (when compared to East Yosemite Valley). Therefore, construction of this facility would result in local, long-term,

moderate, adverse impacts on wildlife. In addition, the NPS proposes the construction of new roundabout at the Bank 3-way intersection and a new pedestrian underpass at the Yosemite Falls intersection under Alternative 5. These actions would result in minor habitat loss near existing roadways and other improved areas, resulting in local, long-term, minor impacts on wildlife. In addition, construction activities would result in increased human presence, noise, and potential for sediment discharges immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these impacts to minor and adverse.

Curry Village & Campgrounds. Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village, including the construction of 98 hard-sided units, and the rerouting of South Side Drive at Boys Town. The units would be constructed within previously developed areas as well as within habitats adjacent to the existing Curry Village site.

Construction activities at Curry Village would result in direct, temporary and permanent losses of wildlife habitats as well as the redevelopment of existing developed areas (see table 9-86). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow. Ponderosa pine forest is one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-86 below, only a small percentage of these wildlife habitats would be affected by the facility actions at Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts and disturbance. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-86: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 5

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment ^b	1.97	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Effects related to construction activities, including potential displacement of individuals due to noise and human presence, as well as the potential for direct mortalities, would be similar to that described for Alternative 2. However, these adverse impacts are expected to only last for the duration of

construction activities. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

Camp 6 and Yosemite Village. Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/Village Center Parking Area would be formalized with 850 designated parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. Northside Drive would be re-routed to the south of the Yosemite Village day-use parking area. A pedestrian underpass and a roundabout at the Village Drive/Northside Drive (Camp 6) intersection would be constructed to address traffic congestion and pedestrian/vehicle conflicts. A three-way intersection at Sentinel Drive and the entrance to the parking area would be added to improve traffic flow and alleviate congestion at nearby intersections.

As noted in **table 9-87**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses would primarily occur in ponderosa pine forest and, to a much lesser extent, montane riparian and wet meadow habitats. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-87**, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-87: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 AND YOSEMITE VILLAGE – ALTERNATIVE 5

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Riparian	0.81	0.3%
Ponderosa Pine	12.22	0.7%
Wet Meadow	0.28	<0.1%
Redevelopment ^b	14.18	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related activities under Alternative 5 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

Yosemite Lodge and Camp 4. Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 300 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of wildlife habitats along with redevelopment of existing disturbed areas (table 9-88). Impacts to wildlife habitats would occur in ponderosa pine forest, one of the dominant wildlife habitats in Segment 2, as well as in montane hardwood habitat. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-88, only a small percentage of this habitat would be impacted. In addition, potentially affected habitat is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts such as vegetation trampling and soil compaction. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-88: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 5

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	1.73	<0.1%
Ponderosa Pine	15.47	0.9%
Redevelopment ^b	3.69	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 5 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

In summary, as shown in table 9-89, actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

Total daily visitor use in Yosemite Valley would decrease slightly under Alternative 5 (by 5%) compared to current levels. Total day visitors would decrease by 14%; however, total overnight visitors would increase by 16% in the Valley under Alternative 5. Continued levels of total visitors in Segment 2 of the river corridor would maintain human-related impacts on wildlife, especially during the peak season (summer). An increase in overnight visitor use would increase human-related impacts on wildlife in

TABLE 9-89: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 5

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	1.73	<0.1%
Montane Riparian	0.81	0.3%
Ponderosa Pine	34.04	1.9%
Wet Meadow	0.31	<0.1%
Redevelopment ^b	19.84	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Segment 2, and would continue to be long-term, local, minor and adverse. Facility removal and new construction actions would result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Thus, actions to maintain total daily use and to increase the number of overnight visitors in Segment 2 would have segmentwide, long-term, minor, adverse effects on wildlife through human disturbance to habitats and increased human-wildlife conflicts.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 under Alternative 5 would result in the restoration of 182 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

Segments 3 and 4: Merced Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Restoration and enhancement actions in Segments 3 and 4 under Alternative 5 would be similar to those described for Alternative 4. The park would designate oak protection areas in the Odgers’ fuel transfer center and parking lots adjacent to the fuel transfer center to improve root health, water uptake, and soil aeration for oak trees. New parking and building construction would be prohibited within the oak protection area. Parking within 10 feet of the base of oak trees would be prohibited. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore valley oak woodland habitat. Habitat restoration actions that would occur in Segment 4 are summarized in **table 9-90**.

TABLE 9-90: ALTERNATIVE 5 HABITAT RESTORATION IN SEGMENT 4

Current WHR Habitat Type ^a	Acres	Proposed Future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Foothill broadleaf woodland	1	Valley oak woodland	1
Lower montane broadleaf	11	Riparian & floodplain	11
Total	12	Total	12
Abbreviation: WHR = Wildlife Habitat Relationships ^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. ^b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-90, approximately 12 acres of riparian, floodplain, and valley oak woodland habitats would be restored in Segment 4 under Alternative 5 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. This action would result in local, short-term, negligible, adverse impacts on wildlife during restoration activities from increased noise and human presence. In the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees for habitat and food.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 5 would provide for similar kinds and amounts of use that exist today in Segment 3. Thus, no additional beneficial or adverse impacts on wildlife would result from actions to manage visitor use and facilities under Alternative 5. Impacts would be similar to those described for Alternative 1 (No Action).

In Segment 4, Alternative 5 would introduce additional visitor use with the development of a remote parking area and increase in employee housing throughout El Portal. Impacts associated with the construction and operation of these improvements would be the same as described for Alternative 4. Thus, actions to manage visitor use and park facilities in Segment 4 under Alternative 5 would collectively result in local, long-term, minor, adverse impacts on wildlife.

Segments 3 and 4 Impact Summary: Actions to protect and enhance river values within Segments 3 and 4 under Alternative 5 would result in the restoration of 12 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

Segments 5– 8: South Fork Merced River

Impacts of Actions to Protect and Enhance River Values

Under Alternative 5, restoration actions would be limited to actions specifically targeted to protect culturally sensitive areas and relocating two stock use campground sites that are within the 100-year floodplain or culturally sensitive areas to the Wawona Maintenance area. Restoration actions that would occur in Segment 7 are summarized in **table 9-91**.

TABLE 9-91: ALTERNATIVE 5 HABITAT RESTORATION IN SEGMENT 7

Current habitat type	Acres	Proposed Future Habitat Type	Acres restored or enhanced
Lower montane needleleaf	3	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	3
Total	3	Total	3
Abbreviation: WHR = Wildlife Habitat Relationships ^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. ^b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, and 2011.			

Approximately three acres of riparian habitat would be restored in Segment 7 under Alternative 5 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. The relocation of campsites within the floodplain would result in local, long-term, minor, beneficial impacts on wildlife as riparian habitat is restored and wildlife are subject to decreased human presence.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 5 would result in the same effects on wildlife as described for Alternative 4 in Segments 5, 6, and 8. While recreation-related activities would be somewhat higher under Alternative 5 than under Alternative 4, these segments do not experience as much concentrated use, and effects on wildlife would be negligible.

Under Alternative 5, Segment 7 would provide for similar kinds and amounts of use compared with current uses. The Wawona Golf Course and Store and the Wawona Hotel tennis courts would remain under Alternative 5. Commercial day rides would continue and private boats would be allowed in Segment 7; however, limitations on location and amount of use would be applied. Overnight capacities would be slightly reduced at the Wawona Campground, and two campsites at the Wawona stock camp would be relocated to the Wawona stables. Additional day parking would be added for the Mariposa Grove outside of the river corridor. Daily use levels associated with Segment 7 under Alternative 5 are estimated at 14,384 people per day for all users (similar to Alternatives 3 and 4), with visitor use representing the majority at 13,443 people per day. The reduction in day use and total daily visitor numbers would reduce human-related pressures on wildlife in general.

The removal of overnight capacities would result in short-term, adverse impacts on aquatic and terrestrial wildlife, including noise associated with demolition, removal, and restoration activities; ground disturbance; effects associated with human presence; habitat modification; and potential increase in suspended sediments to the Merced River in Segment 7. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. In the long term, removal of some campsites at the Wawona Campground and relocation of the stock use campsites would allow for habitat restoration, which would benefit wildlife.

Continued operation of the park facilities in Segment 7 would contribute to the total built environment in Segment 7. Combined actions under Alternative 5 would restore some riparian habitat and reduce riverbank erosion, slightly reduce the overall built environment, and slightly reduce human presence and human-related pressures on wildlife. Thus, actions to manage visitor use and facilities in Segment 7 would result in local, long-term, minor, beneficial impacts on wildlife.

Wawona Campground. Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.

Segments 5, 6, 7 and 8 Impact Summary: Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 5 would result in the restoration of three acres of wildlife habitats, resulting in long-term, segmentwide, minor, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.

Summary of Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration

Many of the Alternative 5 actions would improve habitat conditions for fish and wildlife, including actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, Alternative 5 includes measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with restoration actions that are common to Alternatives 2–6, up to approximately 197 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 5, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions under Alternative 5 that would benefit fish and wildlife include the following:

- Remove facilities in targeted areas near the Merced River and restore riverbanks, meadows, and riparian habitat; riparian vegetation would be aggressively restored in some areas such as the vicinity of El Capitan moraine.
- Restrict recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage total visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats. Alternative 5 would not significantly change the total daily visitation rates to Yosemite Valley from current rates; however, it would increase total overnight visitation rates by 16%. Thus, human-related pressures to wildlife and wildlife habitat in Segment 2 may increase compared to current conditions. The management of parking areas (reducing informal parking) and overnight use would reduce ongoing impacts on habitat related to human disturbance. In addition, the construction of new parking and campground areas would result in both short-term and long-term, local, adverse effects on wildlife. The construction of a new parking area in West Yosemite Valley would have the greatest impact of proposed facilities because it would introduce additional human activity in a location that does not currently experience heightened use. Adverse effects from Alternative 5 associated with restoration activities would be limited to the construction or restoration phase and would be local, short term, and minor or negligible. However, the collective long-term effect of restorative measures and construction of new facilities outside of the floodplain and sensitive habitats would be minor and beneficial to fish and wildlife as habitats are restored and the quality, quantity, and integrity of habitat in the Merced River corridor is improved. Like Alternatives 2-4, these effects would be most prominent in areas of high human use, such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

Cumulative Impacts from Alternative 5: Enhanced Visitor Experiences and Essential Riverbank Restoration

The past, present, and reasonably foreseeable actions used for evaluating Alternative 5 are the same projects listed for Alternative 1 (No Action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. The Alternative 5 actions would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River corridor over the long term. These actions are focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species that are associated with these habitat types would be most likely to be affected cumulatively beneficially by the proposed actions.

Wildlife communities have been manipulated by human development and population growth throughout the region for decades, and these actions have negatively influenced wildlife and wildlife habitat. The cumulative effects of past, present, and future reasonably foreseeable cumulative effects would be mixed, combining both adverse and beneficial effects. Cumulative beneficial effects on wildlife include habitat restoration, enhancement projects, and ecosystem management, generally carried out by federal, state, and local public agencies as well as privately owned and managed conservation lands, open space, and mitigation banks. Adverse cumulative adverse effects would be related to increased facilities, regional growth, and visitor demand. Each of the aforementioned projects (listed under Alternative 1) has the potential to have substantial site-specific adverse effects on wildlife resources during construction (short term) and by direct displacement of resources (long term). In total, regional development and growth would contribute toward a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. When these effects are combined cumulatively with the effects of restoration projects and other actions under Alternative 5, conditions for fish and wildlife populations in the study area would remain stable or improve from higher habitat quality along the Merced River. Although general effects associated with Alternative 5 would be

beneficial, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative, would be long term and negligible.

Environmental Consequences of Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration

Segment 1: Merced River Above Nevada Fall

Impacts of Actions to Protect and Enhance River Values

Under Alternative 6, grazing in Merced Lake East Meadow would be managed as described for Alternatives 3. Beneficial effects to fish and wildlife would be the same as described for Alternative 3.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 6 would accommodate the same kinds and amounts of use that exist today in Segment 1. Visitor use would continue to focus on wilderness-oriented experiences characterized by self-reliance and opportunities for solitude. Primary visitor use in Segment 1 would include hiking, private boating, and overnight backpacking. Private boating by permit would be allowed under Alternative 6. Overnight capacities at Merced Lake High Sierra Camp would be maintained at current levels; additionally, the flush toilets would be converted to composting toilets. All other zone capacities would remain similar to current levels along with the existing wilderness trailhead quota system. Collectively, actions to maintain similar kinds and levels of use as current levels would result in impacts similar to that described for Alternative 1 (No Action): continued local, long-term, minor, adverse impacts on wildlife in Segment 1.

Merced Lake High Sierra Camp. The actions in the Merced Lake High Sierra Camp area proposed under Alternative 6 involve retention of the Merced Lake High Sierra Camp and replacing the flush toilets with composting toilets. Actions to maintain similar kinds and levels of use as current levels would result in continued local, long-term, minor, adverse impacts on wildlife within Segment 1 through ongoing stresses related to concentrated human use.

Segment 1 Impact Summary: Actions to manage visitor use and facilities within Segment 1 under Alternative 6 would have local, long-term, minor, adverse impacts on wildlife.

Segment 2: Yosemite Valley

Impacts of Actions to Protect and Enhance River Values

Alternative 6 would result in the lowest amount of habitat being restored when compared with Alternatives 2, 3, 4, and 5, although the amount proposed is still substantial. The free-flowing condition of the Merced River would be enhanced with strategic placement of large wood on riverbanks to address scouring and the addition of brush layering and constructed logjams. Alternative 6 includes measures to fill in the cutoff channel before the Sugar Pine Bridge and place large wood below Sugar Pine Bridge to reduce scour. Additionally, culverts would be installed along Northside

Drive to improve drainage. Water quality would be enhanced by moving the unimproved parking lot at Camp 6 away from the river and rerouting the stock use trail from Curry Village stables to Happy Isles north of the existing trail. These actions would all directly benefit fish and wildlife associated with the Merced River over the long term. The types of habitat that would be affected by these restoration actions in Segment 2, as well as the types of habitat that would be enhanced or restored, are summarized in **table 9-92**.

TABLE 9-92: ALTERNATIVE 6 HABITAT RESTORATION IN SEGMENT 2

Current WHR Habitat Type ^a	Acres	Proposed Future WHR Habitat Type ^a	Acres (WHR Habitat Type Restored/Enhanced) ^b
Meadow	16	Meadow	18
Sparsely vegetated	2		
Lower montane broadleaf	15	Lower montane broadleaf	15
Lower montane needleleaf	58	A mosaic of meadow, black oak, and open canopy coniferous forest	58
Lower montane broadleaf	1	Riparian & floodplain: cottonwood, willow, mix of upland deciduous & coniferous forest	29
Lower montane needleleaf	28		
Barren	4	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	36
Lower montane needleleaf	32		
Total	156	Total	156

Abbreviation: WHR = Wildlife Habitat Relationships

^a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values.

^b Predominant type(s) and total amount of habitat that would be enhanced or restored.

SOURCE: NPS 1997, 2010, AND 2011.

As summarized in table 9-92, approximately 156 acres of meadow, riparian, black oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be restored in Segment 2 under Alternative 6 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. Wildlife species inhabiting wetlands, riparian habitat, and riverine ecosystems would benefit the most from actions that remove select overnight camping and lodging facilities within 100 feet of the ordinary high-water mark, including campsites at Backpackers Campground, Housekeeping Camp, Lower Pines Campground, and North Pines Campground; redesign Yosemite Lodge out of the 100-year floodplain; and restore 11.6 acres of riparian habitat. Approximately 16.5 acres of land within 150 feet of the ordinary high-water mark of the Merced River would also be restored to riparian and wetland habitat at the former Upper and Lower River campgrounds. Restoration at the Ahwahnee Row and Tecoya concessioner employee housing area would be guided by a 50-foot setback from Indian Creek. Restoration actions within these select areas would prevent further riverbank erosion, provide hydrologic connectivity for meadows and riparian habitats, reduce vegetation trampling, enhance the hydrologic function within the floodplain, enhance water quality, increase the amount of wildlife habitat, increase productivity in riparian and aquatic ecosystems, and reduce human presence and human-related impacts. These

actions would result in segmentwide, long-term, moderate, beneficial effects on aquatic and terrestrial wildlife in Segment 2.

To enhance the development of riparian vegetation in the vicinity of El Capitan moraine, the park would increase large wood loading upstream of the El Capitan moraine to Sentinel Beach Picnic Area and place large wood and constructed logjams in the channel, as described for Alternative 2. This restoration action would be expected to have a local, long-term, minor, beneficial impact on fish and other aquatic species that use the Merced River and adjacent riparian habitat in Segment 2.

Under Alternative 6, the park would implement measures to restore and protect meadows by implementing actions that are similar to Alternatives 2–5 but only in select areas that require restoration. Currently, some roads and trails bisect or otherwise cross through meadows and cause fragmentation, soil compaction, and vegetation trampling of Valley meadows. Additionally, these roads and trails limit or disrupt meadow hydrologic connectivity. To address these issues, the park would remove fill from wetlands and sensitive areas at Ahwahnee Meadow, install boardwalk in wet areas, and add culverts to improve hydrologic connectivity (roadways and trails would be retained under Alternative 6). Stoneman Meadow health would be improved by redesigning and engineering the Curry Orchard parking lot to promote water flow from the cliff walls to Stoneman Meadow. Fencing would be installed along the northern perimeter of El Capitan Meadow, and boardwalks and viewing platforms would be installed to reduce habitat fragmentation. Boardwalks would be constructed at the Valley Loop Trail also to reduce impacts on wet meadow habitat in Slaughterhouse Meadow. Select conifer trees in El Capitan Meadow would be removed. These actions would collectively improve meadow and wetland habitat integrity, increase the extent of meadows over time, and enhance contiguity of meadow habitats as well as hydrological connectivity between meadow, riparian, and floodplain habitats.

Collectively, these restoration actions would result in local, minor, short-term adverse impacts to wildlife in Segment 2. Potential minor, adverse impacts include noise related to restoration/removal activities, effects associated with human presence, and removal of vegetation or alteration of habitat that is in or immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. However, implementation of these measures would enhance meadow and riparian habitat quality by reducing fragmentation, soil compaction, vegetation trampling, erosion, and hydrological disconnection and enhance channel free flow and increase channel complexity. Thus, when combined, the actions would result in segmentwide, long-term, minor to moderate, beneficial impact to wildlife that use riparian and wetland habitats in Segment 2. Additionally, the removal of select campgrounds within the 100 feet of the ordinary high-water mark of the river under Alternative 6 would slightly reduce human presence and human-related impacts on riparian and aquatic wildlife species.

Biological Resource Actions.

Yosemite Valley Campgrounds: Like Alternative 5, specific restoration actions under Alternative 6 to enhance the river's biological values in Segment 2 include removing all campsites within 100 feet of the bed and banks of the Merced River and restoring 6.5 acres of floodplain/riparian habitat, and

designating river access at the North Pines Campground. Restoration of riparian habitat throughout Yosemite Valley would result in segment-wide, long-term, minor to moderate, and beneficial impacts to fish and wildlife.

El Capitan Meadow: Alternative 6 would install restoration fencing along the northern perimeter of El Capitan Meadow to designate appropriate meadow access points along boardwalks and viewing platforms. The NPS would remove all informal trails in sensitive and frequently inundated areas and in areas that trails incise meadow and promote habitat fragmentation. Additionally, Alternative 6 would selectively remove conifers that block the views of El Capitan from the roadside. Restoration of El Capitan Meadow and rerouting or removal of informal trails would result in local, long-term, minor to moderate, and beneficial impacts on wildlife from reduction of trampling from foot traffic that causes habitat fragmentation. Selective removal of conifers would result in local, long-term, minor, and adverse impacts on wildlife because there is abundant similar habitat nearby.

Ahwahnee Meadow: Similar to Alternatives 4 and 5, specific actions under Alternative 6 in Segment 2 to enhance the river's biological values at the Ahwahnee Meadow include: removing fill in sections of trails that passes through meadow and wetland habitats and replace the trails with boardwalk. Unlike Alternatives 2 and 3, Northside Drive and the adjacent bike path would remain under Alternative 6. Hydrological connectivity between both sides of Northside Drive would be enhanced by increasing the number of culverts. Trail improvement and meadow restoration would result in local, long-term, minor to moderate, and beneficial impacts on wildlife at the Ahwahnee Meadow as wetland fragmentation and vegetation trampling is reduced, and wetland connectivity to the river is enhanced.

Stoneman Meadow: Like Alternative 5, specific actions in Alternative 6 to enhance the biological values of the Merced River include restoring Stoneman Meadow by redesigning the Orchard Parking Lot. Through engineering solutions, Alternative 6 would promote water flow by increasing drainage from the cliff walls of the parking lot to Stoneman Meadows, thus improving meadow health. Improving hydrological connectivity between the Orchard Parking Lot cliff walls and Stoneman Meadow would result in local, long-term, minor, and beneficial impacts on meadow habitat and associated meadow wildlife.

Former Upper and Lower Rivers Campgrounds: Like Alternative 5, specific actions to enhance biological values of the Merced River at the Former Upper and Lower Rivers Campgrounds under Alternative 6 include restoring the topography of 16.5 acres of the floodplain. Alternative 6 would remove remaining asphalt, decompact soils of former roads and campsites and re-establish channels that have been filled, place large box culverts under the road to allow water flow, and fence and close the riparian zone at former Upper River to protect the riverbank from trampling. Restoration of the Former Upper and Lower Rivers Campgrounds would result in local, long-term, moderate, and beneficial impacts on wildlife inhabiting riparian and riverine habitats, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors.

Short-term, adverse impacts associated with restorative actions at the Yosemite Valley campgrounds, El Capitan, Ahwahnee, and Stoneman meadows, and at the Former Upper and Lower Rivers Campgrounds under Alternative 6 may include noise associated with restoration activities, human

presence, and modification of habitat as a result of rerouting or formalizing trails, removal of campsites and fill, and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse. However, these adverse impacts are expected to only last for the duration of the restoration activity (campsite removal and habitat restoration) and over the long term, these restoration actions would have moderate, beneficial impacts on wildlife in Segment 2.

Hydrologic/Geologic Resource Actions. Under Alternative 6, restoration actions associated with hydrologic/geologic resources in Segment 2 include moving unimproved parking areas out of sensitive floodplain habitat at Camp 6 and mitigate for the scouring effects of Stoneman Bridge by placement of large wood. Additionally, riparian habitat would be restored where needed, and brush layering and a constructed logjam would be placed in the vicinity of the Stoneman Bridge. Drainage in this area would be improved by the addition of culverts. The Sugar Pine and Ahwahnee Bridges would be retained under Alternative 6; however, channel complexity would be enhanced around the bridges by installation of constructed logjams and placement of large wood below Sugar Pine Bridge. The cut off channel before Sugar Pine Bridge would be filled in. Alternative 6 would restore riparian and floodplain habitat through the removal or relocation of infrastructure that constrict the free-flowing condition of the river or are located in sensitive areas and revegetation. Thus, specific actions under Alternative 6 would have long-term, moderate, and beneficial impacts on wildlife within Yosemite Valley. Species that inhabit riparian and riverine habitats would benefit the most from these actions, including mammals such as mule deer and black bear, reptiles such as garter snake, amphibians such as Pacific chorus frog, and many bird species such as songbirds and raptors. Additionally, these actions would have a long-term, moderate, beneficial impact on fish as riparian habitat establishes and the free flowing condition of the river is enhanced in Segment 2.

Short-term, local, minor, and adverse impacts associated with restorative actions under Alternative 6 may include noise associated with restoration activities, human presence, and modification of habitat as a result of bridge removal and revegetation. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation where possible would reduce these short-term impacts to minor and adverse.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 6 would maintain kinds and amounts of visitor use and facilities in Yosemite Valley compared to current levels. Overnight accommodations would increase and day parking and transit options would be expanded. Overall, Alternative 6 would accommodate peak use levels during the summer season. Actions related to overnight camping would be similar to those described for Alternatives 4 and 5, with additional expansions. Facility expansions or construction are proposed at Upper Pines Campground, former Lower River Campground, former Upper River Campground, west of Yosemite Lodge, Camp 4, and the area west of Backpackers Campground (although 15 current campsites would be removed from the 100-year floodplain). A new campground would be constructed at Eagle Creek. Additionally, permanent employee housing would be constructed at Yosemite Village and Curry Village. These actions would result in both short- and long-term, minor, adverse impacts on

wildlife in Segment 2 related to increased human disturbance, human-wildlife conflicts, minor habitat loss (most actions would occur in existing disturbed areas), and increased radiating impacts.

In general, visitor activities would be enhanced to promote direct connection to the river. Certain activities that are not part of the recreational ORV would be reduced or discontinued, including commercial stock day rides at the Curry Village Stables (discontinued). Commercial boating opportunities would be available. The Curry Village stables and Yosemite Lodge bicycle stand would remain in service, while the Yosemite Lodge Nature Shop would be repurposed and the Gift Shop would be reduced. The Housekeeping Camp facilities would be retained. Private and commercial boating would be allowed in the Valley and limited to designated areas under a quota system. These actions would have a negligible effect on wildlife in Segment 2.

Day-visitor parking capacity would be expanded and formalized; most day-visitor parking would be provided at existing designated parking areas or in repurposed previously disturbed areas. Actions that would affect wildlife habitat include the construction of new roundabouts at Camp 6, Bank 3-way intersection, and Sentinel crossover and a new pedestrian underpass at the Yosemite Falls intersection. Additionally, the West Valley Overflow Parking Area would be developed south of Southside Drive to meet demand for day use parking in the El Capitan Area of Segment 2. These actions would result in minor habitat loss near existing roadways and other improved areas, resulting in local, long-term, minor impacts on wildlife. In addition, construction activities would result in increased human presence, noise, and potential for sediment discharges immediately adjacent to affected areas. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these impacts to minor and adverse.

Curry Village & Campgrounds. Actions under Alternative 6 in Segment 2 related to managing visitor use and facilities at Curry Village include the reorganization of Curry Village, including the construction of 98 hard-sided units, and the rerouting of South Side Drive at Boys Town. The units would be constructed within previously developed areas as well as within habitats adjacent to the existing Curry Village site.

Construction activities at Curry Village would result in direct, temporary and permanent losses of wildlife habitats as well as the redevelopment of existing developed areas (**table 9-93**). Outside of previously developed areas, impacts to wildlife habitats would primarily occur in ponderosa pine forest and, to a much lesser extent, wet meadow habitat. Ponderosa pine forest is one of the dominant wildlife habitats in Segment 2. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-93 below, only a small percentage of these wildlife habitats would be affected by the facility actions at Curry Village. Impacts to wet meadow habitat would occur in a small meadow area currently disconnected from the larger Stoneman Meadow to the north by Happy Isle Loop Road. In addition, wildlife habitats at Curry Village are adjacent to already developed areas, and therefore currently experience high levels of visitation and human-related impacts and disturbance. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-93: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CURRY VILLAGE & CAMPGROUNDS – ALTERNATIVE 6

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Ponderosa Pine	6.35	0.4%
Wet Meadow	0.03	<0.1%
Redevelopment ^b	1.97	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Effects related to construction activities, including potential displacement of individuals due to noise and human presence, as well as the potential for direct mortalities, would be similar to that described for Alternative 2. However, these adverse impacts are expected to only last for the duration of construction activities. Adhering to proposed mitigation measures presented MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these localized, short-term impacts to minor and adverse.

Camp 6 and Yosemite Village. Actions under Alternative 6 in Segment 2 related to managing visitor use and facilities at Camp 6 and Yosemite Village include measures to formalize and relocate parking facilities 150 feet away from the river in order to facilitate riparian restoration goals. The Camp 6/ Village Center Parking Area would be formalized with 850 designated parking spaces by redeveloping part of the current administrative footprint. 100 parking spaces would be added at Yosemite Village. A pedestrian underpass and two roundabouts (one at the Village Drive/Northside Drive intersection and one at the Sentinel Drive/Northside Drive intersection) would be constructed to address traffic congestion and pedestrian/vehicle conflicts. A three-way intersection would be added at Sentinel Drive and the entrance to the parking area to improve traffic flow and alleviate congestion.

As noted in **table 9-94**, over half of the area affected by the above actions would occur at sites that are already developed. Outside of those sites, the actions at Camp 6 and Yosemite Village would result in direct temporary and permanent losses would primarily occur in ponderosa pine forest and, to a much lesser extent, montane riparian and wet meadow habitats. Losses to these habitat types would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in **table 9-94**, only a small percentage of these wildlife habitats would be impacted by the actions at Camp 6 and Yosemite Village. The potentially affected wildlife habitats are adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 6 at Camp 6 and Yosemite Village would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

TABLE 9-94: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT CAMP 6 & YOSEMITE VILLAGE – ALTERNATIVE 6

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Riparian	0.81	0.3
Ponderosa Pine	12.22	0.7
Wet Meadow	0.28	0.09
Redevelopment ^b	14.18	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Yosemite Lodge and Camp 4. Actions under Alternative 5 in Segment 2 related to managing visitor use and facilities at Yosemite Lodge and Camp 4 include: the removal of old and temporary housing at Highland Court and the Thousands Cabins; the construction of two new concessioner housing areas and the construction of 78 employee parking spaces; redevelopment west of Yosemite Lodge to provide an additional 300 day use parking spaces and area for 15 tour buses; relocation of existing tour bus drop off area to Highland Court to provide 3 bus loading/unloading spaces; and the construction of a pedestrian underpass to alleviate pedestrian/vehicle conflicts.

Like other proposed facility projects, construction activities at Yosemite Lodge would result in direct temporary and permanent losses of wildlife habitats along with redevelopment of existing disturbed areas (table 9-95). Impacts to wildlife habitats would occur in ponderosa pine forest, one of the dominant wildlife habitats in Segment 2, as well as in montane hardwood habitat. Losses would occur through vegetation clearing, grading, site development or other surface disturbance (e.g., driving over vegetation). As shown in table 9-95, only a small percentage of this habitat would be impacted. In addition, potentially affected habitat is adjacent to already developed areas, and therefore experience high levels of visitation and human-related impacts. Therefore, losses in habitat, while long-term, would be local, adverse and minor.

TABLE 9-95: HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES AT YOSEMITE LODGE AND CAMP 4 – ALTERNATIVE 6

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	1.73	<0/1%
Ponderosa Pine	15.47	0.9%
Redevelopment ^b	3.69	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Like actions at Curry Village, construction activities would result in short-term, temporary impacts to wildlife. For the same reasons discussed above for the Curry Village area, construction-related actions under Alternative 6 at Yosemite Lodge and Camp 4 would result in local, short-term, minor, adverse impacts to wildlife in Segment 2.

In summary, as shown in table 9-96, actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats, resulting in long-term, local, minor, adverse impacts to wildlife.

TABLE 9-96: SUMMARY OF HABITAT IMPACTS FROM ACTIONS TO MANAGE VISITOR USE AND FACILITIES IN SEGMENT 2 – ALTERNATIVE 6

WHR Habitat Type	Acres	Percent of Habitat Type Affected in Segment ^a
Segment 2		
Montane Hardwood	1.73	<0.1%
Montane Riparian	0.81	0.3%
Ponderosa Pine	34.04	1.9%
Wet Meadow	0.31	<0.1%
Redevelopment ^b	19.84	N/A
^a This is a comparison of the acres of habitat impacted to the total acres of that habitat type in the segment. ^b Redevelopment refers to existing developed areas that will be rebuilt. SOURCE: NPS 2012c		

Alternative 6 would accommodate an increase in total daily use by approximately 4% compared to total visitors per day who visited the Valley in 2011. Additionally, total day use in the Valley would decrease by 7%, but total overnight visitation would increase by 33%. Increased daily use and overnight use levels in Segment 2 of the Merced River corridor would increase human-related impacts on wildlife, especially during the peak season (summer). Human-wildlife conflicts with certain species, such as black bears, would potentially increase due to the increase in traffic resulting from an increase in total daily use and overnight use. Facility removal and new construction actions would result in local, short-term, adverse impacts on fish and wildlife through potential discharges of sediments and other pollutants during removal activities, removal of habitats, and disturbances associated with construction activities.

Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of vegetation, where possible, would reduce these short-term impacts to minor and adverse. Thus, actions to increase the number of overnight and day visitors in Segment 2 would have segmentwide, long-term, minor to moderate, adverse effects on wildlife. Conversely, actions that remove or reduce certain kinds of visitor use activities would result in local, long-term, negligible to minor, beneficial impacts on wildlife. When these increased accommodations for visitor use are combined with the proposed restoration actions, long-term, minor, adverse impacts on wildlife from human presence and human-related pressures (such as noise, human food availability, wildlife fatalities from traffic, and vegetation trampling) would result in Segment 2.

Segment 2 Impact Summary: Actions to protect and enhance river values within Segment 2 under Alternative 6 would result in the restoration of 156 acres of wildlife habitats, resulting in long-term, segmentwide, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats and additional use over existing conditions, resulting in long-term, segmentwide, minor, adverse impacts to wildlife.

Segments 3 and 4: Merced Gorge and El Portal

Impacts of Actions to Protect and Enhance River Values

Actions under Alternative 6 in Segments 3 and 4 would be similar to those described for Alternatives 3–5. The park would designate oak protection areas in the Odgers’ fuel transfer center and parking lots adjacent to the fuel transfer center to improve root health, water uptake, and soil aeration for oak trees. New parking and building construction would be prohibited within the oak protection area. Parking within 10 feet of the base of oak trees would be prohibited. The park would also remove nonnative fill, decompact soils, treat invasive plants, and plant native understory plant species to restore valley oak woodland habitat. Habitat restoration actions that would occur in Segment 4 are summarized in table 9-97, and would be the same as proposed for Alternative 5.

TABLE 9-97: ALTERNATIVE 6 HABITAT RESTORATION IN SEGMENT 4

Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Foothill broadleaf	1	Valley oak woodland	1
Lower montane broadleaf	11	Lower montane broadleaf	11
Total	12	Total	12
Abbreviation: WHR = Wildlife Habitat Relationships a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-97, a total of approximately 12 acres of riparian, floodplain, and valley oak woodland habitats would be restored in Segment 4 under Alternative 6 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits on fish and wildlife that use these habitat types. This action would result in local, short-term, negligible, adverse impacts on wildlife during restoration activities due to increased noise and human presence. In the long term, this action would result in local, minor, beneficial impacts on wildlife species that depend on oak trees for habitat and food.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

In Segment 3, Alternative 6 would provide for similar kinds and amounts of use that exist today. Thus, no additional beneficial or adverse impacts on wildlife would result from actions to manage visitor use and facilities under Alternative 6. In Segment 4, Alternative 6 would introduce additional visitor use with the development of a remote parking area and increase in employee housing throughout

El Portal. These actions would be the same as described for Alternative 4, although housing levels would be somewhat less, resulting in correspondingly less impact related to human disturbance. The addition of a remote parking lot and high-density employee housing would result in an increase in the built environment in Segment 4. Additional human presence and traffic (from park employees and day visitors) would increase disturbance to wildlife and potentially increase human-related pressures on wildlife. Thus, actions to manage visitor use and park facilities would collectively result in local, long-term, minor, adverse impacts on wildlife.

Segments 3 and 4 Impact Summary: Actions to protect and enhance river values within Segments 3 and 4 under Alternative 6 would result in the restoration of 12 acres of wildlife habitats, resulting in long-term, local, moderate, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in short-term, local, minor, adverse impacts to wildlife.

Segments 5– 8: South Fork Merced River

Impacts of Actions to Protect and Enhance River Values

Under Alternative 6, the same restoration actions are proposed as described for Alternative 5: implementing actions specifically targeted to protect culturally sensitive areas, relocating two stock use campground sites that are within the 100-year floodplain or culturally sensitive areas to the Wawona Maintenance area, and removing some camp sites from the Wawona Campground that are either in culturally sensitive areas or within the 100-year floodplain. Restoration actions that would occur in Segment 7 are summarized in table 9-98, and would be the same as those proposed under Alternative 5.

TABLE 9-98: ALTERNATIVE 6 HABITAT RESTORATION IN SEGMENT 7

Current Habitat Type	Acres	Proposed Future Habitat Type	Acres Restored or Enhanced
Lower montane needleleaf	3	Riparian: cottonwood, willow, mix of upland deciduous & coniferous forest	3
Total	3	Total	3
Abbreviation: WHR = Wildlife Habitat Relationships a Current habitats that would be enhanced, converted (primarily through the removal of encroaching conifers in meadow systems), or restored by actions to protect and enhance river values. b Predominant type(s) and total amount of habitat that would be enhanced or restored. SOURCE: NPS 1997, 2010, AND 2011.			

As summarized in table 9-98, a total of approximately three acres of riparian habitat would be restored in Segment 7 under Alternative 6 (this includes restoration actions common to Alternatives 2-6), resulting in direct benefits to fish and wildlife that use these habitat types. The relocation and removal of campsites within the floodplain would result in local, long-term, minor, beneficial impacts on wildlife as riparian habitat is restored and wildlife are subject to decreased human presence.

Impacts of Actions to Manage User Capacities, Land Use, and Facilities

Alternative 6 would result in largely the same effects on wildlife as described for Alternative 4 in Segments 5, 6, and 8. While recreation-related activities would be somewhat higher than under this alternative, Segments 5, 6, and 8 do not experience as much concentrated use and effects on wildlife would be negligible.

Alternative 6 proposes the same management actions as Alternative 5 in Segment 7. The Wawona Golf Course and Store and the Wawona Hotel tennis courts would remain under Alternative 6. Commercial day rides would continue, and private boats would be allowed in Segment 7. Overnight capacities at the Wawona Campground would remain essentially unchanged, with the exception of campsites that would be removed due to impacts to archeological resources and two campsites at the Wawona stock camp that would be relocated to the Wawona stables. Day parking capacity would not deviate from Alternatives 2–5.

Daily use levels associated with Segment 7 under Alternative 6 would be similar to Alternative 3–5. The reduction in day use and total daily visitor numbers would reduce human-related pressures on wildlife in general. A slight reduction in overnight capacities would result in short-term, adverse impacts on aquatic and terrestrial wildlife, including noise associated with demolition, removal, and restoration activities; ground disturbance; effects associated with human presence; habitat modification; and potential increase in suspended sediments to the South Fork Merced River in Segment 7. Adhering to proposed mitigation measures MM-HYD-1, MM-VEG-1, MM-WL-1 to MM-WL-7, as applicable (see Appendix C), and avoiding the removal of riparian vegetation, where possible, would reduce these short-term impacts to minor and adverse. In the long term, removal of some campsites at the Wawona Campground and relocation of the stock use campsites would allow for habitat restoration, which would benefit wildlife. Continued operation of the park facilities in the Segment 7 would continue to contribute to the total built environment in Segment 7 of the river corridor. Combined actions in Alternative 6 would restore some riparian habitat and reduce riverbank erosion, slightly reduce the overall built environment, and reduce human presence and human-related pressures on wildlife. Thus, actions to manage visitor use and facilities in Segment 7 would result in local, long-term, minor, beneficial impacts on wildlife.

Wawona Campground. Facilities actions at the Wawona Campground would involve removal of 13 sites that are either within the 100-year floodplain or in culturally sensitive areas. This would reduce visitor use in this area, resulting in a decrease of vegetation trampling. Overall, these actions would result in a local, long-term, minor, beneficial impact on wildlife in Wawona.

Segments 5, 6, 7 and 8 Impact Summary: Actions to protect and enhance river values within Segments 5, 6, 7 and 8 under Alternative 6 would result in the restoration of three acres of wildlife habitats, resulting in long-term, segmentwide, minor, beneficial impacts on wildlife. Actions to manage visitor use and facilities would result in long-term, local, minor, beneficial impacts to wildlife.

Summary of Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration

Under Alternative 6, the park would provide additional peak season capacity for visitors while restoring habitat for fish and wildlife. This includes actions targeted to improve habitat quality for aquatic, riparian-dependent, and meadow-dependent fish and wildlife where these habitats are near or adjacent to existing developments and high visitor use areas. Additionally, the park would implement measures to enhance the ecological complexity of riparian and aquatic habitat in targeted areas, increase channel free flow, improve water quality, and reduce erosion and scouring. When combined with restoration actions that are common to Alternatives 2–6, up to approximately 170 acres of meadow, riparian, black oak woodland, valley oak woodland, coniferous forest, broadleaved forest, and floodplain habitats would be enhanced or restored under Alternative 6, thereby benefiting fish and wildlife in the Merced River corridor that use these habitat types. Notable actions under Alternative 6 include the following:

- Remove selected facilities within the 100-year floodplain of the Merced River and restore targeted areas of riverbanks, meadows, and riparian habitat; restoration of habitat would be achieved through passive and active restoration techniques and through design and engineered solutions.
- Redirect recreational use of rivers and riverbanks to reduce riverbank erosion.
- Remove, restore, relocate, or repurpose park facilities to efficiently use park facilities and reduce the built environment in the park; some facilities would be built to accommodate visitors or employees.
- Manage for the increase in total daily visitors to the park and visitor demands for day parking space, lodging, and camping space.
- Construct new overnight accommodations to compensate for those removed for restoration activities; expand overnight accommodations above existing conditions.
- Enhance meadow, riparian, and river hydrologic function, complexity, and connectivity.
- Improve the free flow, complexity, and water quality of the Merced River.

Actions to manage visitor use and facilities would result in the loss of 36.89 acres of wildlife habitats. Alternative 6 would accommodate additional peak visitor use in the Valley. Thus, human-related pressures to wildlife and wildlife habitat would also increase. In addition, the construction of new parking, transportation improvements (roundabouts), and campground areas would result in both short- and long-term, adverse effects on wildlife. Adverse effects from Alternative 6 associated with restoration activities would be limited to the construction or restoration phase, and would be local, short term, and minor or negligible. The long-term effect of these measures would collectively be minor and adverse on fish and wildlife as human-related pressures continue to increase and affect habitat quality. Like Alternatives 2-5, these effects would be most prominent in areas of high human use such as Yosemite Valley and Wawona (Segments 2 and 7, respectively).

Cumulative Impacts from Alternative 6: Diversified Visitor Experiences and Selective Riverbank Restoration

The past, present, and reasonably foreseeable actions used for evaluating Alternative 6 are the same projects listed for Alternative 1 (No Action); a descriptions of past, present, and reasonably foreseeable future projects and plans is summarized in Appendix B. The restoration actions under Alternative 6 would generally contribute to beneficial impacts on fish and wildlife associated with the Merced River corridor over the long term. These actions would be focused on restoring and improving aquatic, meadow, and riparian habitat quality within the Merced River corridor; therefore, fish and wildlife species associated with these habitat types would be most likely to be affected cumulatively by the proposed actions. Actions that would retain current facilities or services and construct new facilities would generally contribute to adverse impacts on fish and wildlife in the river corridor over the long term. Because actions under Alternative 6 would allow for higher amounts of visitor use, more park facilities and services would be retained within the floodplain of the river. Additionally, new or extended parking spaces, roadway improvements, and campsites would be constructed to accommodate increase in visitor demand for day parking and camping opportunities.

As described previously, wildlife communities have been manipulated by human development and population growth throughout the region for decades, and these actions have negatively influenced wildlife and wildlife habitat. In total, regional development and growth would contribute towards a net long-term, moderate, adverse effect on wildlife associated with the Merced River corridor. When these effects are combined cumulatively with the effects of restoration projects and other actions in Alternative 6, conditions for fish and wildlife populations in the study area would remain the same or slightly worsen over time. While the cumulative contribution associated with Alternative 6 would be minor and adverse, the overall cumulative effect of other past, present, and reasonably foreseeable actions, in combination with this alternative, would also be long term, minor, and adverse.

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