

8 CONSERVATION AND OPEN SPACE

8.1 BIOLOGICAL RESOURCES

This section describes the plant communities, wildlife habitats, and special-status species that occur within Mariposa County. The wide range of habitat types in the County contributes to its biodiversity. Additionally, the rural nature of the County, combined with a large proportion of government land ownership, serve to protect these habitats where they might otherwise be lost.

The following sections describe the general biologic resources present in the County and identify the regulatory framework within which they are managed.

8.1.01 FACTORS AFFECTING LOCAL HABITATS

Mariposa County consists of rolling terrain interspersed with deep canyons, streams, and rivers. Mariposa County lies within three hydrologic basins on the western side of the Sierra Nevada as defined by the United States Geological Survey (USGS). These include the Merced River, Chowchilla/Fresno, and a cluster of streams known as the Lower Mariposa group of streams. The western portion of the County is of relatively low relief, with gently rolling hills that gradually increase toward the east. Moving eastward, the hills become more pronounced and the elevation quickly rises and falls through mountains and valleys. Elevations begin at approximately 300 feet in the west and rise to nearly 11,000 feet in the east. Most inhabited regions are below 5,000 feet.

Temperatures can range from freezing to over 100 degrees in various parts of the County, depending on topography. In addition, precipitation patterns range from 15 inches in the lower western areas, to 50 inches in the mountainous eastern areas. Winds are strongly affected by local topography. Northwest winds are dominant in the County, but topography often directs winds up and down valleys. Wind speeds range from light to moderate gusts, with occasional strong winds every few years. This variation in climates is a major contributor to the County's diverse habitats.

Mariposa County, in common with its surrounding region, is a fire-adapted habitat community. Wildfire has been a major physical factor in the development of Mariposa County vegetation types. Together with other biological and physical factors discussed here, fire is a major “shaper” of Sierra Nevada ecosystems (USDA, USFS, 2000).

8.1.02 MARIPOSA COUNTY BIOTIC COMMUNITIES

Plant communities and wildlife habitats are different but related concepts. Wildlife habitats may consist of a range of environments where plants play an integral role as primary producers. A plant community is usually a specific vegetation association that develops in a terrestrial environment as a function of physical factors, and less often, biological ones.

Consideration of a wildlife habitat is often different from that of a plant community. Therefore, the discussions of the plant communities in Mariposa County are presented separately from those of the County's wildlife habitats.

The plant community descriptions and nomenclature used in this section are based on Holland's *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland 1986) and *A Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). The project area supports 19 plant communities based on this nomenclature. Each of these plant communities is described below.

Figure 8-1 shows the generalized vegetation communities found in Mariposa County.

NORTHERN MIXED CHAPARRAL

Northern mixed chaparral communities are dense, often impenetrable shrublands dominated by ceanothus, chamise, manzanita, and scrub oaks that are adapted to periodic wildfire. The plants grow well in areas where repeated cycles of wildfire stimulate their ability to stump sprout. Annual herbs occur under the dense shrubs, but after wildfire burns off the shrub canopy, herbs may densely colonize the burns. Chaparrals are indigenous to south-facing, often rocky slopes of the foothills and lower slopes of the Sierra Nevada in Mariposa County.

MIXED MONTANE CHAPARRAL (MANZANITA, CEANOOTHUS, CHINQUAPIN, CANYON- AND HUCKLEBERRY OAK- DOMINATED FORESTS AND CHAPARRALS)

This plant community is composed of dense, often impenetrable shrublands dominated by ceanothus, chinquapin, scrub oaks and manzanita, all of which are adapted to periodic wildfire but recover more slowly than their lower elevation counterparts because snow is the primary type of precipitation where they grow. The plants grow well in areas where repeated cycles of wildfire stimulate their ability to stump sprout. Annual herbs are often absent or sparse under the dense shrubs but, after wildfire burns off the shrub canopy, herbs may densely colonize the burns. Montane chaparrals are indigenous to steep south-facing, often rocky slopes of the middle slopes of the Sierra Nevada in the coniferous forest zones. In Mariposa County, they are present mostly on lands managed by the Bureau of Land Management (BLM), National Park Service (NPS), and United States Forest Service (USFS).

VALLEY GRASSLAND (NEEDLEGRASS, SACATON, AND WILD RYE NATIVE GRASSLAND)

These are uncommon, native grassland prairies often associated with the Central Valley riparian forest of the Chowchilla and Merced rivers. They are also sod-forming grasslands that are adjacent to, or intercalated within freshwater marsh in seasonally flooded land, often on subalkaline to alkaline soils. Valley grassland also includes grasslands dominated by native needlegrass and annual fescues indigenous to clayey, better-drained sites bordering the foothill blue oak woodlands of the County. It does not include most of the rangeland of the county that is dominated by non-native European grasses.

Figure 8-1: Mariposa County General Vegetation

Do to the size of this image; Figure 8-1 has been created as a separate file

RUDERAL (INCLUDING AGRICULTURAL)

Croplands are located on flat to gently rolling terrain that is tilled prior to commencement of crop production (Zeiner, 1988). Due to the artificially controlled growth and harvesting regime, croplands do not conform to normal seral stages (i.e., growth stage of habitat). These habitats may either be annual or perennial depending upon the crop-rotation system and geographic location. Crops grown in the project region include apricots, dry-land grain, and grapes, among others.

Throughout California and in numerous locations in Mariposa County, areas of recent human disturbance become overgrown with ruderal vegetation. This may include one or more of the following species of forbs: yellow star thistle (*Centaurea solstitialis*) and other knapweeds (*Centaurea* spp.), tumble mustard (*Sisymbrium altissimum*), wild radish (*Raphanus sativa*), Russian thistle (*Salsola tragus*), cheeseweed (*Malva parviflora*), and knotweed (*Polygonum aviculare*). Non-native, European grasses also add to the mix. These include: ripgut brome (*Bromus diandrus*), wild oats (*Avena fatua*), Mediterranean barley (*Hordeum marinum* ssp. *gussoneanum*), Harding grass (*Phalaris aquatica*), dogtail fescue (*Cynosurus echinatus*), and Bermudagrass (*Cynodon dactylon*). Together, these forbs and grasses form plant communities in orchards or on vacant disturbed lands.

NON-NATIVE GRASSLAND

Non-native grassland is the most common grassland found in the County. It is situated within and at elevations below the blue-oak savanna belt of the lower Sierra Nevada foothills and terraces above the floor of the Central Valley. These are historic rangelands that were originally vegetated with native species prior to the Spanish colonization of the area. Non-native grasslands are usually dominated by non-native, European species of cultivated barley, Mediterranean barley, oats, annual fescues, Harding grass, brome-grasses, and bluegrasses, and non-native forbs. The County's non-native grasslands have been and continue to be important to the ranching and commodity crop production. Many of the County's Williamson Act parcels are in non-native grassland.

VERNAL POOLS

Vernal pools are swales and natural depressions on ancient terraces on the edge of the Central Valley, often found on Redding and San Joaquin series soils. The iron silicate hardpans of these natural features trap water from winter rains and hold it long enough to enable the growth of obligate wetland plant species, often unusual and rare, that form concentric circles of colorful windflowers. The microrelief of these soil series is hummocky, with mounds situated amidst moist to dry, and seasonally wet depressions. Vernal pools are highly regulated plant communities, often containing special status species of plants and animals that are under regulatory authority of the United States Fish & Wildlife Service California Department of Fish and Game and CalEPA's Central Valley Regional Water Quality Control Board.

MONTANE MEADOWS (WET AND DRY SUBALPINE AND ALPINE MEADOWS AND SEEPS, ALPINE LAKE AND STREAM EDGES, FENS, PEAT BOGS, AND SIERRA NEVADA FELL-FIELD)

Montane meadows are wet to dry areas having dense growth of native grasses, sedges, and/or forbs, or stunted Krummholz or taiga shrubs and small trees of the Sierra Nevada. Meadows form on fine-textured soils while the adjacent taiga is found on coarse soils derived from raw

rock. Meadows in the Sierra Nevada may be wet or dry. For example, the seasonally wet or dry meadows at Fish Camp have developed a distinct plant community adapted to the extremes in groundwater levels. This community contains corn lilies, camas, wild onions, Mariposa lilies, orchids, knotweeds, and marsh marigolds (County of Mariposa, 1983). At the other end of the spectrum are perennially waterlogged peat bogs and fens.

Some meadows are dry most of the time, especially alpine meadows having little or no available capillary water during the short growing season. All of the above types may blend into the other, or exist as separate, well-defined entities. Meadows of the varying types may form rings or edges around lakes, ponds, and streams. Meadows may, in fact, represent stages of forest succession beginning with a shallow subalpine lake, often ending with the passage of time in a climax lodgepole pine or whitebark pine forest.

FRESHWATER MARSH

Freshwater marshes are low to mid-elevation palustrine emergent wetlands often associated with the Chowchilla and Merced rivers, but also occurring elsewhere where hydric soils and local hydrology provide the basis for the growth of tall grasses, rushes, sedges, and tules. These are often sites where water flows are slow or where rivers have left behind oxbows. Cattle tanks, stock ponds, and reservoirs have also developed adjacent freshwater marshes. Freshwater marshes with outlets leading to rivers and streams are often jurisdictional wetlands. Marshes are critical in the uptake of dissolved phosphates and nitrates from aquatic habitats by plants. The plant life of these wetlands physically removes nutrients from wastewater and animal manure sources, and effectively trap sediments and toxicants.

GREAT VALLEY RIPARIAN WOODLAND (GREAT VALLEY COTTONWOOD-, MIXED-, AND OAK- RIPARIAN FORESTS, AND GREAT VALLEY WILLOW SCRUB)

Scrubs, woodlands, and low-elevation deciduous riparian forests exist at the lower elevations of Mariposa County, particularly along the major rivers and streams including the Chowchilla and Merced rivers, Bear Creek, Burns Creek, Mariposa Creek, and Miles Creek. These communities are dominated by box elders, Fremont cottonwoods (and to a lesser extent, black cottonwoods), valley oaks, and willows to varying degrees and have a diverse shrub and herb-dominated understory, depending upon the grazing regime. These riparian woodlands are among the scarcest in all of California, and are important wildlife corridors between the lowlands and Sierra foothills. Most are under the protection of the State of California under the provisions of 15 CCR 1600 et seq., and some are also under federal jurisdiction as forested or shrub-scrub wetland.

MONTANE BLACK COTTONWOOD RIPARIAN FOREST (MONTANE RIPARIAN SCRUBS)

On the floor of Yosemite Valley along the Merced River, along Big Creek, and adjacent to middle elevation lakes, rivers, and streams, riparian woodlands exist that are dominated by aspen, black cottonwoods, chokecherries, dogwoods, willows and often conifers such as lodgepole and Jeffrey pine. These woodlands are most often associated with high-flowing perennial streams in the Sierra Nevada portion of Mariposa County.

BLUE OAK AND FOOTHILL PINE WOODLAND

Fringing the Central Valley is a belt of oak, oak and pine savanna, and woodlands most often dominated by blue oak, but also including valley oak, interior live oak, and foothill pine. It intergrades with non-native grassland and chaparrals depending upon aspect and elevation. These woodlands are important transitional habitats for many of the wildlife species of the Sierra foothills and Central Valley.

INTERIOR LIVE OAK WOODLAND

This woodland is most often found on north facing slopes in the middle elevations of the County. It is dominated by interior live oak, western redbud, California buckeye and other chaparral species. The woodland often intergrades with chaparrals, blue oak, and ponderosa pine woodlands. Unlike the chaparrals on south-facing slopes, this woodland or scrubland recovers more quickly after wildfire, often achieving canopy closure within a decade or so.

VALLEY OAK WOODLAND

Often found at the edge of the Central Valley just below the blue oak and foothill pine belt of the Sierra Nevada foothills, this open non-native grassland is dotted with large valley oaks. In relatively few areas, the oaks become more numerous and form sparse woodland that often intergrades with blue and interior live oak. Valley oak woodland often is more common on the thick, alluvial soils of valley bottoms where moisture is more prevalent in the dry summer months, than on the surrounding hillsides dominated by blue oak.

PONDEROSA PINE FOREST (INCLUDING BLACK OAK FOREST)

At mid-elevations on the western slopes of the Sierra Nevada, often just above the blue-oak and foothill pine woodlands, is a coniferous or oak and pine dominated forest that includes tree species such as ponderosa pine, white fir and California black oak. This is probably the most common plant community at the resort elevations of the western Sierra Nevada. The summer visitor to the Sierra Nevada often notices the peculiar pungent odor of a common understory shrub of these forests known as mountain misery, together with the cooler mountain air encountered as one climbs out of the hot Central Valley.

BIG TREE FOREST

Relictual stands of the famous giant sequoia or Sierra big trees occur in Mariposa County. One stand is located near the South Gate (Highway 41) of Yosemite National Park. The other stands are scattered at mid-elevations in the Sierra Nevada, mostly to the south of Mariposa County. While often associated with the same tree, shrub, and herb species as Sierra white fir and ponderosa pine forest plant communities, big tree forest is regarded as a distinct plant community for planning purposes. In addition, the management of stands of giant sequoia is very often different from surrounding forestlands. Fire is required for cone opening and germination of seed.

According to the CNDDDB/Rarefind 2 database, big tree forest is an important natural community. In addition, the NPS lists the Sierra big tree as “Park Rare”, a Special Status Species.

SIERRAN MIXED CONIFER FOREST

Sierran mixed conifer forest plant community is often mixed with ponderosa pine forest at lower elevations or on south-facing slopes, montane chaparrals on steep, south-facing mountainsides and ridges, or with red-fir forests at higher elevations. Several species of timber trees occur here, often as mixed stands. These include ponderosa pine, sugar pine, white fir, Douglas fir, and to a lesser extent western juniper, incense cedar, Jeffrey pine, lodgepole pine, and red fir. Oaks and dogwoods also occur in these forests, as do chaparral species. Like the red fir forest, the Sierran mixed conifer forest is very important for timber extraction and wildlife habitat. Often the two forest uses conflict, as when a timber harvest is needed to thin overage stands often colonized by special status species.

LODGEPOLE PINE-WHITEBARK PINE FOREST

The higher elevations of Mariposa County just before the alpine zone host a sparsely forested taiga zone similar to the upper latitudes of northern Canada and Alaska. This is the zone of lodgepole pine and whitebark pine that, together with willow, often form stunted shrub-like hedges known as Krummholz around the margins of rock fields, streams, and lakes. Lower down on the mountain slopes the whitebark pines are replaced by lodgepole pines and fir, often red fir, but also including white fir and mountain hemlock, or western juniper. These lands are normally suitable for development with the exception of ski resorts or other forms of outdoor recreation, and possibly mining. Traditionally, grazing has been allowed in these areas, but in recent years, the federal stewards of most of these lands have closed the subalpine zone to all but light forms of land use, principally backpacking and cross-country skiing.

RED FIR FOREST

At the same or slightly higher elevations of the Sierra Nevada as the Sierran mixed conifer forest are dense, almost uniform stands of red fir. Where old growth stands exist, wildlife biodiversity is at its highest, complete with all trophic levels including predators such as the special status species of spotted owl and California wolverine. Red fir forests often have a sparse understory except where streams or lakes punctuate the landscape or where timber harvest lands, highways, rock outcrops, or natural windblown and felled stands of timber exist.

ALPINE ROCK FIELDS AND TUNDRA

At the highest elevations in the County in Yosemite National Park are the tundra-like or, more often-barren alpine rock fields of the high country. Windblown seed of sedges, rushes, grasses, and even forbs sometimes colonize microenvironments of this harsh climate zone. More often than not, lichens and mosses are the decomposers and primary producers of alpine rock fields and tundra. These arctic-like environments support a number of special status wildlife species including Sierra Nevada red fox and California wolverine.

ROCKSLIDES AND CLIFFS

The Pleistocene and Pliocene glaciers and the Merced River have cut enormous canyons on the western slope of the Sierra Nevada. Years of alternating freezing and thawing, and erosion from the elements, have created cliffs, massive piles of talus and scree, and deposits of house-sized blocks of rock on the canyon sides and floors. These specialized environments of the Sierra Nevada western slope have provided a substrate for plant associations and habitats for unusual fauna including endangered species of salamanders and

snails. They often support a diverse flora containing elements from adjacent plant communities, but also including mosses and lichens that are adapted to the microenvironments of unstable rock faces and crevices, and moving talus and screen.

8.1.03 WILDLIFE HABITATS

Wildlife habitat provides cover, food, and water necessary to meet the biological requirements of one or more individuals of an animal species. Changes in habitats and changes in essential habitat elements that relate to reproduction, foraging, and cover requirements may impact abundance, distribution, diversity, and interactions between wildlife species.

The wildlife habitats in the project area are identified utilizing the habitat classification system developed by the California Department of Fish and Game for the California Wildlife Habitat Relationships (CWHR) program. Table 8-1 identifies the CWHR habitat type that corresponds with each plant community found in the project area. The vegetative components of each wildlife habitat type generally correlate with the plant communities described above. The wildlife habitats in the project area are described in Table 8-1 in terms of the assemblage of wildlife species that they typically support. Deer Herd boundaries are shown in Figure 8-2.

Table 8-1: Plant Community/Wildlife Habitat Relationship System Habitat Type Comparison

Plant Community	Corresponding CWHR Habitat
Northern mixed chaparral	Mixed chaparral
Mixed montane chaparral	Montane chaparral
Valley grassland	Annual grassland
Non-native grassland	Annual grassland
Vernal pools	Annual grassland and Lacustrine
Montane meadows	Wet meadow
Freshwater marsh	Fresh emergent wetland
Great Valley riparian woodland	Valley foothill riparian
Montane black cottonwood riparian forest	Montane riparian
Blue oak and foothill pine woodland	Blue oak-foothill pine
Interior live oak woodland	Blue oak woodland and Montane hardwood
Valley oak woodland	Valley oak woodland
Ponderosa pine forest	Ponderosa pine
Big tree forest	Sierran mixed conifer
Sierran mixed conifer forest	Sierran mixed conifer
Lodgepole pine-whitebark pine forest	Lodgepole pine
Red fir forest	Red fir
Alpine rock fields and tundra	Alpine dwarf-shrub
Rockslides and cliffs	No corresponding type
Ruderal	Urban
Aquatic	Riverine
Aquatic	Lacustrine

Source: Mayer and Laudenslayer, Jr., 1988

MIXED CHAPARRAL

The mixed chaparral habitat type typically occurs below 5,000 feet on mountain ranges throughout California, with the exception of deserts (England, 1988). In the Sierra Nevada, this type occurs at middle and lower elevations along the western slope (England, 1988). Chaparral provides important cover, foraging, and breeding habitat for many wildlife species. Examples of wildlife species typically found in this community include western fence lizard (*Sceloporus occidentalis*), chaparral whipsnake (*Masticophis lateralis lateralis*), Northern Pacific rattlesnake (*Crotalus viridis oreganus*), California quail (*Callipepla californica*), wrentit (*Chamaea fasciata*), Bewick's wren (*Thryomanes bewickii*), California thrasher (*Toxostoma redivivum*), blue-gray gnatcatcher (*Polioptila caerulea*), long-eared chipmunk (*Tamias quadrimaculatus*), brush mouse (*Peromyscus boylii*), and black-tailed jackrabbit (*Lepus californicus*).

MONTANE CHAPARRAL

Montane chaparral occurs in middle to high elevation (3,000-10,000 feet) mountainous terrain (Risser and Fry, 1988). Along the lower elevation extent of its range, this type may intergrade with mixed chaparral (Risser and Fry, 1988). Montane chaparral provides summer range foraging areas, escape cover, and fawning habitat for black-tailed deer (*Odocoileus hemionus*) (Risser and Fry, 1988) and other wildlife species. Wildlife species that may be encountered in montane chaparral include northern alligator lizard (*Gerrhonotus coeruleus*), California mountain kingsnake (*Lampropeltis zonata*), mountain quail (*Oreortyx pictus*), calliope hummingbird (*Stellula calliope*), dusky flycatcher (*Empidonax oberholseri*), rock wren (*Salpinctes obsoletus*), green-tailed towhee (*Pipilo chlorurus*), California pocket mouse (*Chaetodipus californicus*), California mouse (*Peromyscus californicus*), heather vole (*Phenacomys intermedius*), little brown myotis bat (*Myotis lucifugus*), and pika (*Ochotona princeps*).

ANNUAL GRASSLAND

The annual grassland habitat type can be found throughout the Central Valley of California, in the coastal mountain ranges, and in scattered locations in southern California (Kie, 1988). Grasslands provide foraging and nesting habitat for a wide variety of wildlife species including seed eating birds, small mammals, amphibians and reptiles. Wildlife species typically associated with grasslands include Gilbert's skink (*Eumeces gilberti*), side-blotched lizard (*Uta stansburiana*), western meadowlark (*Sturnella neglecta*), savannah sparrow (*Passerculus sandwichensis*), deer mouse (*Peromyscus maniculatus*), western harvest mouse (*Reithrodontomys megalotis*), California vole (*Microtus californicus*), and black-tailed deer. Grasslands also provide important foraging habitat for raptors such as the American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), and red-tailed hawk (*Buteo jamaicensis*).

VERNAL POOLS AND SWALES

The ephemeral aquatic environments of vernal pools and swales (including adjacent ditches) often support special status species of plants and animals, under regulatory authority of the United States Fish & Wildlife Service, and California Department of Fish and Game. These include special status species of shrimp and wildflowers.

Figure 8-2: Deer Herd Boundaries

Do to the size of this image; Figure 8-2 has been created as a separate file

WET MEADOW

Wet meadows occur throughout nearly every forest type in the Sierra floristic province (Ratliff, 1988). In the Sierra Nevada, this habitat type typically occurs above 3,900 feet in the north and above 5,900 feet in the south (Ratliff, 1988). Following spring runoff, water remains at or near the surface for most of the growing season (Ratliff, 1988). Wet meadows provide resources for a number of wildlife species. These resources include water, foraging and breeding habitat, and cover (escape, resting, and thermal). Wildlife species associated with this community include Yosemite toad (*Bufo canorus*), western toad (*Bufo boreas*), mountain yellow-legged frog (*Rana muscosa*), western terrestrial garter snake (*Thamnophis elegans*), violet-green swallow (*Tachycineta thalassina*), willow flycatcher (*Empidonax traillii*), mountain bluebird (*Sialia currucoides*), broad-footed mole (*Scapanus latimanus*), Belding's ground squirrel (*Spermophilus beldingi*), long-tailed vole (*Microtus lonicaudus*), and porcupine (*Erethizon dorsatum*).

FRESH EMERGENT WETLAND

This habitat type may be found throughout California; however, wetlands are most prevalent below 7,500 feet (Kramer, 1988). Fresh emergent wetlands exist in various landform depressions or along the edge of rivers or lakes (Kramer, 1988, Wentz, 1981). This habitat type is among the most productive wildlife habitats in California (Kramer, 1988). Fresh emergent wetlands provide water, food, and cover for more than 160 species of birds (U.S. Comptroller General, 1979) and various amphibians, reptiles, and mammals (Kramer, 1988). Wildlife species that may inhabit this community include western aquatic garter snake (*Thamnophis couchi*), common garter snake (*Thamnophis sirtalis*), Pacific chorus frog (*Pseudacris regilla*), black phoebe (*Sayornis nigricans*), marsh wren (*Cistothorus palustris*), common yellowthroat (*Geothlypis trichas*), red-winged blackbird (*Agelaius phoeniceus*), long-tailed vole, and muskrat (*Ondatra zibethicus*).

VALLEY FOOTHILL RIPARIAN

This habitat type may be found in the Central Valley and the lower foothills of the Sierra Nevada (Grenfell Jr., 1988b). Valley foothill riparian habitat provides abundant food, cover, and breeding sites for wildlife in close proximity to water. These factors and the structural diversity of riparian woodlands are largely responsible for the high productivity of this habitat type. Bird species that are characteristic of this habitat include California quail, belted kingfisher (*Ceryle alcyon*), black-chinned hummingbird (*Archilochus alexandri*), downy woodpecker (*Picoides pubescens*), black phoebe, western wood-pewee (*Contopus sordidulus*), ruby-crowned kinglet (*Regulus calendula*), tree swallow (*Tachycineta bicolor*), spotted towhee (*Pipilo maculatus*), and song sparrow (*Melospiza melodia*). A number of species nest or roost in riparian habitats and feed in adjacent habitat types, such as annual grasslands. Riparian habitats also provide important feeding, resting, and nesting habitat for Neotropical migrant songbirds such as warblers, vireos, grosbeaks, and flycatchers. Other wildlife that may be found in this habitat type include California slender salamander (*Batrachoseps attenuatus*), California kingsnake (*Lampropeltis getulus californiae*), Pacific chorus frog, western aquatic garter snake, Virginia opossum (*Didelphis virginiana*), brush mouse, ringtail (*Bassariscus astutus*), and gray fox (*Urocyon cinereoargenteus*).

In addition to providing high value wildlife habitat, riparian corridors may provide local movement corridors between fragmented habitat patches and necessary habitat for migrant wildlife species such as Neotropical migrant songbirds. Due to the value and scarcity of

riparian woodlands, on both a state and region-wide scale, they are considered a sensitive habitat type and monitored closely by the California Department of Fish and Game.

Streamside valley foothill riparian habitat, and its often contiguous and always interconnected aquatic environment known as Central Valley drainage hardhead/squawfish stream, is a “special status” natural community according to CDFG.

MONTANE RIPARIAN

The montane riparian habitat type occurs in the Sierra Nevada in association with montane lakes, ponds, seeps, meadows, rivers, and other aquatic features (Grenfell Jr., 1988a). Resources provided by this habitat type are very similar to those provided by the valley foothill riparian habitat type. Wildlife species that may occur in montane riparian habitat types include: Pacific chorus frog, western toad, sharp-tailed snake (*Contia tenuis*), western aquatic garter snake, calliope hummingbird, winter wren (*Troglodytes troglodytes*), Cassin’s vireo (*Vireo cassinii*), orange-crowned warbler (*Vermivora celata*), MacGillivray’s warbler (*Oporornis tolmiei*), Wilson’s warbler (*Wilsonia pusilla*), song sparrow, water shrew (*Sorex palustris*), Sierra Nevada mountain beaver (*Aplodontia rufa californica*), Gray fox, snowshoe hare, bushy-tailed woodrat, and American mink (*Mustela vison*).

BLUE OAK WOODLAND

This habitat type can be found along the western foothills of the Sierra Nevada (Ritter, 1988a) typically occurring at elevations from 250 to 3,000 feet (Ritter, 1988a). The lack of a conifer component and typically a lack of a shrub component can be used to distinguish blue oak woodland from the blue oak-foothill pine habitat type (described below) (Verner, 1988). Oak trees and other hardwoods in this habitat type provide shelter, shade, and breeding habitat for wildlife, as well as acorns, which serve as an important food resource. Additionally, the abundant insect life found in the bark and foliage of oaks provides foraging opportunities for many bird species. Oak woodlands are also important to Neotropical migrant songbirds (i.e., warblers, vireos, and grosbeaks), providing feeding, resting, and nesting habitat. Examples of wildlife species found in this habitat type include western fence lizard, southern alligator lizard (*Gerrhonotus multicarinatus*), Pacific gopher snake (*Pituophis melanoleucus catenifer*), Anna’s hummingbird (*Calypte anna*), Nuttall’s woodpecker (*Picoides nuttallii*), acorn woodpecker (*Melanerpes formicivorus*), western scrub-jay (*Aphelocoma californica*), dark-eyed junco (*Junco hyemalis*), oak titmouse (*Baeolophus inornatus*), California pocket mouse, and brush mouse.

BLUE OAK-FOOTHILL PINE

The blue oak-foothill pine habitat type occurs at elevations between 500 and 3,000 feet, along the foothills of the Central Valley (Verner 1988). A wide range of wildlife species breed in this habitat type; however, no species is totally dependent upon it for breeding, cover, or foraging (Verner, 1988). The acorns produced by blue oaks serve as an important food source for a number of bird and mammal species (Verner, 1988). Wildlife species that may occur in this habitat type include western fence lizard, southern alligator lizard, Northern Pacific rattlesnake, northern flicker (*Colaptes auratus*), ash-throated flycatcher (*Myiarchus cinerascens*), bushtit (*Psaltriparus minimus*), white-breasted nuthatch (*Sitta carolinensis*), phainopepla (*Phainopepla nitens*), fringed myotis bat (*Myotis thysanodes*), brush rabbit (*Sylvilagus bachmani*), and coyote (*Canis latrans*).

VALLEY OAK WOODLAND

Remnant patches of valley oak woodland occur in the Sierra Nevada foothills typically occurs below 2,000 feet (Ritter, 1988b). Valley oak woodlands often intergrade with annual grasslands or border agricultural lands in the Central Valley and blue oak woodlands or blue oak-foothill pine habitat types along the foothills (Ritter, 1988b). Resources provided by this habitat type are very similar to those provided by other oak dominated habitat types. Examples of wildlife species that may be encountered in valley oak woodlands include arboreal salamander (*Aneides lugubris*), western fence lizard, southern alligator lizard, acorn woodpecker, white-breasted nuthatch, European starling (*Sturnus vulgaris*), black-throated gray warbler (*Dendroica nigrescens*), lark sparrow (*Chondestes grammacus*), house finch (*Carpodacus mexicanus*), California ground squirrel (*Spermophilus beecheyi*), deer mouse, and coyote.

MONTANE HARDWOOD

Montane hardwood habitats occur primarily west of the Sierra Nevada-Cascade crest, at elevations ranging from 300 feet along the coast to 9,000 feet (McDonald, 1988). Disseminators of acorns, such as Steller's Jay (*Cyanocitta stelleri*), as well as species that utilize acorns as a major food source, such as mountain quail (*Oreortyx pictus*) and band-tailed pigeon (*Columba fasciata*), are characteristic of this habitat type. Other wildlife species that may occur in the montane hardwood habitat type include Sierra Nevada salamander (*Ensatina eschscholtzii platensis*), rubber boa (*Charina bottae*), Lewis' woodpecker (*Melanerpes lewis*), western bluebird (*Sialia mexicana*), hermit thrush (*Catharus guttatus*), white-breasted nuthatch, Hutton's vireo (*Vireo huttoni*), Nashville warbler (*Vermivora ruficapilla*), Trowbridge's shrew (*Sorex trowbridgii*), California pocket mouse, and deer mouse. Black-tailed deer may forage on the foliage of several hardwoods to a moderate extent (McDonald, 1988).

PONDEROSA PINE

Ponderosa pine habitat occurs in the Sierra Nevada at elevations ranging from approximately 4,300 to 7,000 feet (Fitzhugh, 1988). Wildlife species that may be encountered in this habitat type include arboreal salamander, Sierra Nevada salamander, rubber boa, Hammond's flycatcher (*Empidonax hammondii*), western wood-pewee, Steller's jay, Townsend's solitaire (*Myadestes townsendi*), yellow-rumped warbler (*Denroica coronata*), Nashville warbler, black-throated gray warbler, dark-eyed junco, Trowbridge's shrew, California myotis bat (*Myotis californicus*), long-eared chipmunk, golden-mantled ground squirrel (*Spermophilus lateralis*), northern flying squirrel (*Glaucomys sabrinus*), and pinyon mouse (*Peromyscus truei*). Ponderosa pine may also be utilized as transitional or migratory habitat by black-tailed deer, and may be a very important to this species nutrition in migration holding areas (Fitzhugh, 1988).

SIERRAN MIXED CONIFER

The Sierran Nevada mixed conifer forest dominates the western middle slopes of the Sierra Nevada, generally ranging from 4,000 to 10,000 feet in elevation (Allen, 1988). Great varieties of food and cover resources are present due to the diversity of plant species associated with this habitat type (Allen, 1988). Wildlife species associated with this community include Sierra Nevada salamander, Pacific slender salamander (*Batrachoseps pacificus*), sagebrush lizard (*Sceloporus graciosus*), white-headed woodpecker (*Picoides albolarvatus*), Hammond's flycatcher, mountain chickadee (*Poecile gambeli*), red-breasted

nuthatch (*Sitta canadensis*), pygmy nuthatch (*Sitta pygmaea*), brown creeper (*Certhia americana*), pine siskin (*Carduelis pinus*), evening grosbeak (*Coccothraustes vespertinus*), golden-mantled ground squirrel, American marten (*Martes americana*), and long-tailed weasel (*Mustela frenata*).

LOGGEPOLE PINE

Lodgepole pine habitats are found in the Sierra Nevada typically above 7,900 feet in elevation (Bartolome, 1988). The low structural diversity associated with most lodgepole pine stands results in a relatively low number of wildlife species associated with them (Bartolome, 1988). A number of wildlife species found in the habitat type are associated with the meadow edge (Bartolome, 1988). Wildlife species typically associated with this habitat type include Williamson's sapsucker (*Sphyrapicus thyroideus*), dusky flycatcher, western wood-pewee, Clark's nutcracker (*Nucifraga columbiana*), red-breasted nuthatch, hermit thrush, yellow-rumped warbler, Cassin's finch (*Carpodacus cassinii*), red crossbill (*Loxia curvirostra*), Pine siskin, golden-mantled ground squirrel, lodgepole chipmunk (*Tamias speciosus*), yellow-bellied marmot (*Marmota flaviventris*), northern flying squirrel, Sierra Nevada red fox (*Vulpes vulpes necator*), American marten, and ermine (*Mustela erminea*).

RED FIR

Red fir habitat is found in the Mariposa County at about 9,000 feet in elevation (Barrett, 1988). Mature stands are typically monotypic, with very few other plant species present (Barrett, 1988). Red fir habitats provide food and cover for at least one season to a number of wildlife species (Barrett, 1988) such as the California spotted owl. Mariposa County red fir forestlands contain several California spotted owl protected activity centers (USDA, 2000). Other Wildlife species that may occur in this habitat type include rubber boa, Olive-sided flycatcher (*Contopus cooperi*), Hammond's flycatcher, white-headed woodpecker, red-breasted sapsucker (*Sphyrapicus ruber*), red-breasted nuthatch, golden-crowned kinglet (*Regulus satrapa*), hermit warbler (*Dendroica occidentalis*), pine grosbeak (*Pinicola enucleator*), Cassin's finch, evening grosbeak, American marten, Sierra Nevada red fox, ermine, and California wolverine (*Gulo gulo luteus*).

ALPINE DWARF-SHRUB

Alpine dwarf shrub is confined to the highest elevations, generally above timberline, in Sierra Nevada, generally above 8,500 feet (Benson, 1988). Due to its location above timberline the physical environment tends to be very harsh with only a brief growing season (Benson, 1988). Various shrubs and woody herbs may provide foraging opportunities for various wildlife species. Due to the low growing nature of this habitat, it primarily provides cover for small mammals and birds. Wildlife species typically associated with this habitat type include American pipit (*Anthus rubescens*), dark-eyed junco, dusky shrew (*Sorex monticolus*), Sierra Nevada red fox, California wolverine, pika, white-tailed jackrabbit (*Lepus townsendii*), alpine chipmunk (*Tamias alpinus*), yellow-bellied marmot, Belding's ground squirrel, mountain pocket gopher (*Thomomys monticola*), bushy-tailed woodrat (*Neotoma cinerea*), montane vole (*Microtus montanus*), and porcupine.

ROCKSLIDES AND CLIFFS

Although the California Wildlife-Habitat Relationships (CWHR) System does not contain a habitat type for rockslides and cliffs, these areas may provide various resources to wildlife. For instance, rockslides may provide various forms of cover (thermal, resting, and nesting)

and foraging opportunities for species such as the Merced Canyon shoulder band snail (*Helminthoglypta allynsmithi*). Cliffs may be utilized for nesting by birds such as white-throated swift (*Aeronautes saxatilis*). Examples of other wildlife species that may be associated with rockslides and cliffs include canyon wren (*Carthorses mexicanus*), rock wren, pika, and alpine chipmunk.

URBAN

A distinguishing characteristic of urban habitats is the mixture of native and exotic plant species. A variety of exotic ornamental tree, shrub, and perennial species are commonly planted around developed properties. Supplemental irrigation is used to maintain the health and appearance of the plants in most landscaped areas adjacent to development. Those native and introduced animal species that are tolerant of human activities often thrive in urban habitats. Examples of native birds that may forage and/or nest in landscaped areas are western scrub jay, American robin (*Turks migratorius*), northern mockingbird (*Mimus polyglottos*), and house finch (*Carpodacus mexicanus*). Non-native birds, such as European starling and house sparrow (*Passer domesticus*), are also commonly associated with these areas. Mammalian species, such as raccoon (*Procyon lotor*), Virginia opossum, and striped skunk (*Mephitis mephitis*), are likely to visit specific developed areas, trash bins for example, during nocturnal scavenging activities. Other wildlife species commonly associated with urban areas include western fence lizard, rock dove (*Columba livia*), barn swallow (*Hirundo rustica*), house mouse (*Mus musculus*), and black rat (*Rattus rattus alexandrinus*).

RIVERINE

Riverine environments are associated with various terrestrial vegetation communities. Riparian communities, such as Central Valley riparian woodland, line the banks of many rivers and streams. This habitat type often merges with lacustrine and fresh emergent wetland habitats (Grenfell Jr., 1988c). Riverine habitats provide resources for a large assemblage of wildlife species. Numerous insectivorous bird species, such as swallows, swifts, and flycatchers, forage above the water of rivers and streams (Grenfell Jr., 1988c). Various waterfowl, shorebird, and heron species may be observed foraging in the near-shore waters and along the shoreline of this habitat type (Grenfell Jr., 1988c). Other wildlife species that may be encountered include Kern brook lamprey (*Lampetra hubbsi*), Sacramento sucker (*Catostomus occidentalis*), Pacific chorus frog, foothill yellow-legged frog (*Rana boylei*), western pond turtle (*Clemmys marmorata*), spotted sandpiper (*Actitis macularia*), American dipper (*Cinclus mexicanus*), belted kingfisher, black phoebe, and northern rough-winged swallow (*Stelgidopteryx serripennis*).

LACUSTRINE

Lacustrine habitats occur in Mariposa County at virtually all elevations, ranging from permanently flooded lakes and reservoirs, to intermittent lakes, to small ponds (including vernal pools) (Grenfell Jr., 1988d). This habitat type may occur in association with any terrestrial habitats, as well as riverine and fresh emergent wetland habitats (Grenfell Jr., 1988d). This habitat type provides water, cover, foraging opportunities, and breeding habitat for numerous wildlife species. Wildlife species commonly associated with lacustrine habitats include mountain yellow-legged frog, western pond turtle, mallard (*Anas platyrhynchos*), common merganser (*Mergus merganser*), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), violet-green swallow, muskrat, and American mink.

8.1.04 SPECIAL-STATUS SPECIES

Special-status species are relatively rare entities either because they live in a limited habitat (such as salamanders indigenous to limestone caves), or because humans adversely affect their habitat. These species are protected in various ways by various federal, state, and local laws and regulations. Special status species are defined as:

- Animals that are legally protected or proposed for protection under the California Endangered Species Act (CESA) or Federal Endangered Species Act (FESA)
- Plants and animals defined as endangered or rare under the California Environmental Quality Act (CEQA)
- Animals designated as species of special concern by the U.S. Fish and Wildlife Service or California Department of Fish and Game
- Animals listed as “fully protected” in the Fish and Game Code of California (Sections 3511, 4700, 5050 and 5515)
- Plants listed in the California Native Plant Society’s *Inventory of Rare and Endangered Vascular Plants of California* (electronic version, 2000)
- Plants and wildlife listed by the United States Forest Service or Bureau of Land Management, as sensitive (Forest-Sensitive or BLM-Sensitive)
- Plants and wildlife

Table 8-2 presents a list of all special-status species that were identified by the USFS, USFWS, BLM, CNPS, CNDDDB, and other sources as potentially occurring in Mariposa County, or having the potential to be affected by activities occurring within the County. Additionally, Table 8-3 provides the current state, federal, or other agency species status designation, and a description of the habitat utilized by each of these species.

Table 8-2: Special-Status Plant and Lichen Species that may Occur in Mariposa County

Species	Status and General Occurrence			
	State ¹	Federal ²	CNPS ³	Plant Community and Substrate
Agrostis humilis Mountain bentgrass	--	--	2	Alpine boulder and rock fields, meadows, subalpine coniferous forest
Allium sanbornii var. congdonii Congdon’s onion	--	--	4	Chaparral and cismontane woodland on serpentine or volcanic substrates
Allium yosemitense Yosemite onion	SR	--/Forest Sensitive	1B	Broad-leaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest on rocky or metamorphic substrates
Allotropa virgata Sugar stick	--	Park Rare	--	Broad-leaved upland forest and mixed coniferous forest
Antirrhinum leptaleum Snapdragon	--	Park Rare	--	Small washes and ditches in disturbed sites

Table 8-2: Special-Status Plant and Lichen Species that may Occur in Mariposa County

Species	Status and General Occurrence			
	State ¹	Federal ²	CNPS ³	Plant Community and Substrate
Balsamorhiza macrolepis var. macrolepis Big-scale balsamroot	--	--/BLM Sensitive	1B	Chaparral, cismontane woodland, valley and foothill grassland, sometimes on serpentinite
Bolandra californica Sierra bolandra	--	--	4	Lower montane coniferous forest, upper montane coniferous forest; mesic and rocky.
Bruchea bolanderi Bolander's candle moss	--	--/Forest Sensitive	--	Lower montane coniferous forest, upper montane coniferous forest; meadows and stream banks.
Bulbostylis capillaris Thread-leaved beakseed	--	--	4	Lower montane coniferous forest, meadows, upper montane coniferous forest
Calandrinia breweri Brewer's calandrinia	--	--	4	Chaparral, coastal scrub on sandy or loamy burns
Calochortus clavatus var. avius Pleasant Valley mariposa lily	--	FSC	1B	Lower montane coniferous forest on the Josephine silt loam and volcanic substrates
Calycadenia hooveri Hoover's calycadenia	--	FSC	1B	Cismontane woodland, valley and foothill grassland, rocky
Calyptridium pulchellum Mariposa pussypaws	--	FT/Forest Sensitive	1B	Chaparral, cismontane woodland, sandy, gravelly, or scree on granitic or metamorphic substrates
Camissonia sierrae ssp. alticola Mono Hot Springs evening primrose	--	FSC/Fores t Sensitive	1B	Lower montane coniferous forest, upper montane coniferous forest, granitic, gravel, and sand pans
Camissonia sierrae ssp. sierrae Yosemite evening primrose	--	--	4	Cismontane woodland, lower montane coniferous forest
Carex albonigra Black and white sedge	--	Park Rare	--	Alpine boulder and rock fields, meadows, subalpine coniferous forest
Carex capitata Capitate sedge	--	Park Rare	--	Alpine boulder and rock fields, meadows, subalpine coniferous forest
Carex congdonii Congdon's sedge	--	Park Rare	4	Alpine boulder and rock fields, meadows, subalpine coniferous forest
Carex tompkinsii Tompkins's sedge	SR	--	4	Chaparral, cismontane woodland, lower montane coniferous forest, upper montane coniferous forest, sometimes granitic substrates
Castilleja campestris ssp. succulenta Succulent owl's clover	SE	FT	1B	Vernal pools, often acidic

Table 8-2: Special-Status Plant and Lichen Species that may Occur in Mariposa County

Species	Status and General Occurrence			
	State ¹	Federal ²	CNPS ³	Plant Community and Substrate
Castilleja foliolosa Indian paintbrush	--	Park Rare	--	Chaparral on dry rock slopes
Ceanothus fresnensis Fresno ceanothus	--	--	4	Cismontane woodland, lower montane coniferous forest
Cerastium beeringianum Alpine cerastium	--	Park Rare	--	Alpine boulder and rock fields, meadows, mossy turf on lakeshores and stream bank overhangs
Cinna bolanderi Bolander's woodreed	--	--	4	Meadows, upper montane coniferous forest, mesic stream sides
Clarkia australis Small's southern clarkia	--	--/Forest Sensitive/Park Rare	1B	Cismontane woodland, lower montane coniferous forest
Clarkia biloba ssp. australis Mariposa clarkia	----	--/BLM Sensitive/Forest Sensitive	1B	Chaparral, cismontane woodland
Clarkia lingulata Merced clarkia	SE	FSC/Forest Sensitive	1B	Chaparral, cismontane woodland
Clarkia rostrata Beaked clarkia	--	FSC/BLM Sensitive	1B	Cismontane woodland, valley and foothill grassland
Clarkia virgata Sierra clarkia	--	--	4	Cismontane woodland, lower montane coniferous forest
Claytonia megarhiza Fell-fields claytonia	--	--	2	Alpine boulder and rock field, subalpine coniferous forest (rocky or gravelly)
Collinsia childii Child's blue-eyed Mary	--	Park Rare	--	Cismontane woodland, lower montane coniferous forest
Collinsia linearis Linear-leaved collinsia	--	Park Rare	--	Cismontane woodland, lower montane coniferous forest on dry, metamorphic outcrops along the metamorphic-granitic contact zone
Collomia rawsoniana Flaming trumpet	--	FSC/Forest Sensitive	1B	Lower montane coniferous forest, meadows, riparian forest, mesic
Cryptantha mariposae Mariposa cryptantha	--	BLM Sensitive	1B	Chaparral (serpentine, rocky)
Cypripedium montanum Mountain lady's-slipper	--	--/Forest Sensitive	4	Broad-leaved upland forest, cismontane woodland, lower montane coniferous forest, North Coast coniferous forest
Downingia pusilla Dwarf downingia	--	--	2	Valley and foothill grassland (mesic), vernal pools
Epipactis gigantea Stream orchid	--	Park Rare	--	Cismontane woodland, lower montane coniferous forest in moist granitic ledges but also planted in landscaped areas
Erigeron mariposanus Mariposa daisy	--	--	1A	Cismontane woodland (extirpated)

Table 8-2: Special-Status Plant and Lichen Species that may Occur in Mariposa County

Species	Status and General Occurrence			
	State ¹	Federal ²	CNPS ³	Plant Community and Substrate
Eriogonum tripodum Tripod buckwheat	--	--	4	Chaparral and cismontane woodland often on serpentinite
Eriophyllum confertiflorum var. tanacetiflorum Tansy-leaved woolly sunflower	--	--	4	Cismontane woodland, lower montane coniferous forest
Eriophyllum congdonii Congdon's woolly sunflower	SR	--/Forest Sensitive	1B	Chaparral, cismontane woodland, lower montane coniferous forest, rocky, metamorphic substrates
Eriophyllum nubigenum Yosemite woolly sunflower	--	FSC/Forest Sensitive	1B	Chaparral, lower montane coniferous forest, upper montane coniferous forest, gravelly
Erythronium purpurascens Fawn lily	--	Park Rare	--	Riparian woodland at the eastern end of Yosemite Valley
Erythronium taylori Taylor's erythronium	--	Forest Sensitive	--	Upper montane coniferous forest; crevices and talus of north-facing cliffs
Fritillaria agrestis stinkbells	--	--	4	Chaparral, cismontane woodland, pinyon and juniper woodland, valley and foothill woodland, grassland, clay, sometimes serpentinite
Galium boreale ssp. septentrionale Northern bedstraw	--	Park Rare	--	Meadows, lower montane coniferous forest
Gentianella tenella ssp. tenella Dane's dwarf gentian	--	Park Rare	--	Upper montane meadows and moist seepage areas on rock; of north-facing crevices and cliffs
Githopsis pulchella ssp. serpentinicola Serpentine bluecup	--	--	4	Cismontane woodland (serpentinite or Ione geologic formation)
Heterotheca sessiliflora ssp. echioides Goldenaster	--	Park Rare	--	Valley and foothill woodland, grassland
Horkelia parryi Parry's horkelia	--	FSC/BLM Sensitive/Forest Sensitive	1B	Chaparral, cismontane woodland, especially Ione geologic formation
Hulsea brevifolia Short-leaved hulsea	--	--/Forest Sensitive	1B	Lower montane coniferous forest, upper montane coniferous forest, granitic or volcanic, gravelly or sandy substrates
Hydrothyria venosa Veined water lichen	--	--/Forest Sensitive	--	Lower montane coniferous forest, upper montane coniferous forest in cold, unpolluted streams
Ivesia unguiculata Yosemite ivesia	--	Park Rare	4	Meadows, subalpine coniferous forest, upper montane coniferous forest

Table 8-2: Special-Status Plant and Lichen Species that may Occur in Mariposa County

Species	Status and General Occurrence			Plant Community and Substrate
	State ¹	Federal ²	CNPS ³	
Jensia yosemitana Yosemite tarplant	--	--	3	Lower montane coniferous forest, meadows
Jepsonia heterandra Foothill jepsonia	--	--	4	Cismontane woodland, lower montane coniferous forest, rocky, metamorphic substrates
Juniperus communis Common juniper	--	Park Rare	--	Upper montane coniferous forest
Lepechinia calycina Pitcher sage	--	Park Rare	--	Chaparral, cismontane woodland
Leucothoe davisiae Sierra laurel	--	Park Rare	--	Lower montane coniferous forest, perennial wet (acidic) meadows
Lewisia congdonii Congdon's lewisia	SR	--/Forest Sensitive	1B	Chaparral, cismontane woodland, lower montane coniferous forest, upper montane coniferous forests, granitic or metamorphic, rocky mesic substrates
Lewisia disepala Yosemite lewisia	--	--/Forest Sensitive	1B	Lower montane coniferous forest, pinyon and juniper woodland, upper montane coniferous forest, granitic, sandy
Lilium humboldtii ssp. humboldtii Humboldt lily	--	--	4	Chaparral, cismontane woodland, lower montane coniferous forest
Linanthus serrulatus Madera linanthus	--	--	1B	Cismontane woodland, lower montane coniferous forest
Lindernia dubia var. anagallidea False pimpernel	--	Park Rare	--	Lower montane coniferous forest, perennial wet meadows
Lomatium congdonii Congdon's lomatium	--	FSC/BLM Sensitive	1B	Chaparral, cismontane woodland, serpentinite
Lupinus citrinus var. deflexus Mariposa lupine	ST	FSC	1B	Chaparral, cismontane woodland, granitic, sandy
Lupinus gracilentus Slender lupine	--	--	1B	Subalpine coniferous forest
Lupinus spectabilis Shaggyhair lupine	--	FSC/BLM Sensitive	1B	Chaparral, cismontane woodland, serpentinite
Meesia triquetra Mees's moss	--	--/Forest Sensitive	--	Lower montane coniferous forest, upper montane coniferous forest, perennial, wet (acidic) meadows
Meesia uliginosa Uliginose moss	--	--/Forest Sensitive	--	Lower montane coniferous forest, upper montane coniferous forest, perennial wet (acidic) meadows
Mimulus congdonii Congdon's monkeyflower	--	Park Rare	--	Montane coniferous forest, granitic soils in disturbed areas, seeps, runoff areas on slopes

Table 8-2: Special-Status Plant and Lichen Species that may Occur in Mariposa County

Species	Status and General Occurrence			
	State ¹	Federal ²	CNPS ³	Plant Community and Substrate
Mimulus filicaulis Slender-stemmed monkeyflower	--	FSC/BLM Sensitive/F orest Sensitive	1B	Cismontane woodland, lower montane coniferous forest, upper montane coniferous forest, meadows, vernal mesic
Mimulus gracilipes Slender-stalked monkeyflower	--	--/Forest Sensitive	1B	Chaparral, cismontane woodland, lower montane coniferous forest, decomposed granite often in burned or disturbed areas
Mimulus grayii Gray's monkeyflower	--	--	4	Lower montane coniferous forest, upper montane coniferous forest, mesic
Mimulus inconspicuus Small-flowered monkeyflower	--	Park Rare	4	Chaparral, cismontane woodland, lower montane coniferous forest, mesic
Mimulus laciniatus Cut-leaved monkeyflower	--	--	4	Chaparral, lower montane coniferous forest, upper montane coniferous forest, mesic, granitic
Mimulus palmeri Palmer's monkeyflower	--	Park Rare	--	Canyon live oak woodland, mesic
Mimulus pulchellus Pansy monkeyflower	--	--/Forest Sensitive/P ark Rare	1B	Lower montane coniferous forest, meadows, vernal mesic including gravelly depressions and vernal pools
Minuartia pusilla Dwarf sandwort	--	Park Rare	--	Chaparral, cismontane woodland, lower montane coniferous forest
Monardella candicans Sierra monardella	--	--	4	Chaparral, cismontane woodland, lower montane coniferous forest, sandy or gravelly
Myrica hartwegii Sierra sweet bay	--	Park Rare	--	Riparian scrub and woodland
Ophioglossum californicum California adder's tongue	--	--	4	Chaparral, valley and foothill grassland, margins of vernal pools
Orthotrichum spjutii Spjut's moss	--	--/Forest Sensitive	--	Upper montane coniferous forest; splash zone of large waterfalls
Penstemon azureus ssp. angustissimus Azure penstemon	--	Park Rare	--	Broadleaved upland forest, lower montane coniferous forest
Perideridia bacigalupii Bacigalupi's yampah	--	--	4	Chaparral, lower montane coniferous forest, serpentinite
Phacelia ciliata var. opaca Merced phacelia	--	FSC	1B	Valley and foothill grassland
Phacelia platyloba Broad-lobed phacelia	--	Park Rare	--	Canyon live oak woodland and chaparral
Phacelia tanacetifolia Tansy phacelia	--	Park Rare	--	Chaparral, lower montane coniferous forest, often sandy or gravelly open areas
Piperia colemanii Coleman's rein orchid	--	--	4	Chaparral, lower montane coniferous forest, often sandy

Table 8-2: Special-Status Plant and Lichen Species that may Occur in Mariposa County

Species	Status and General Occurrence			Plant Community and Substrate
	State ¹	Federal ²	CNPS ³	
Piperia leptopetala Narrow-petaled rein orchid	--	--	4	Chaparral, lower montane coniferous forest, often sandy
Pityopus californicus California pinefoot	--	--	4	Broadleaved upland forest, lower montane coniferous forest, North Coast coniferous forest, upper montane coniferous forest
Plagiobothrys torreyi var. torreyi Yosemite popcorn flower	--	--	1B	Lower montane coniferous forest, meadows
Potamogeton epihydrus ssp. nuttallii Nuttall's pondweed	--	--	2	Marshes and swamps
Rhynchospora alba White-beaked rush	--	--	2	Bogs and fens, meadows, marshes and swamps
Rhynchospora californica California-beaked rush	--	FSC	1B	Bogs and fens, lower montane coniferous forest, meadows (seeps), marshes and swamps
Rhynchospora capitellata Brownish-beaked rush	--	--	2	Lower montane coniferous forest, meadows, marshes and swamps, upper montane coniferous forest
Saxifraga mertensiana Wood saxifrage	--	Park Rare	--	Mossy rocks and moist cliffs
Scutellaria bolanderi Bolander's skullcap	--	Park Rare	--	Gravelly, mesic stream sides in oak woodland and coniferous forest
Sequoiadendron giganteum Giant sequoia	--	Park Rare	--	Big tree forest
Spiranthes porrifolia Ladies tresses	--	Park Rare	--	Wet meadows
Trichostema rubisepalum Hernandez bluecurls	--	--	4	Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, vernal pools, volcanic or serpentinite, gravelly substrates
Trifolium bolanderi Bolander's clover	--	FSC/Fores t Sensitive	1B	Lower montane coniferous forest, meadows, upper montane coniferous forest
Trillium angustipetalum Narrow-petaled wake robin	--	Park Rare	--	Lower montane coniferous forest, meadows, upper montane coniferous forest
Veronica cusickii Cusick's speedwell	--	--	4	Alpine boulder and rock field, meadows, subalpine coniferous forest, upper montane coniferous forest

Table 8-2: Special-Status Plant and Lichen Species that may Occur in Mariposa County

Species	Status and General Occurrence			
	State ¹	Federal ²	CNPS ³	Plant Community and Substrate
Whitneya dealbata Whitney's sunflower	--	Park Rare	--	Alpine boulder and rock field, meadows, subalpine coniferous forest, upper montane coniferous forest
Wyethia elata Hall's wyethia	--	Park Rare	4	Cismontane woodland, lower montane coniferous forest

¹State status data from Special Plants List, California Natural Diversity Data Base (CDFG 2000).

SE = State listed as Endangered.

ST = State listed as Threatened.

SR = State-listed as Rare.

²Federal status data from USDI, USFWS letter dated 3/12/01; USDI, BLM Special Status Species List, Folsom Planning Area received 31 January 2001; USDI, NPS Yosemite National Park Special Status Species – Plant Species list (USDI, NPS 2000); USDA, USFS, Sierra National Forest Sensitive Plant List dated April 2000; USDA, USFS, Stanislaus National Forest Sensitive Plant List dated June 2, 1998; CNDDDB (CDFG 2000).

BLM-Sensitive = Listed by the USDI, Bureau of Land Management as Sensitive

FE = Listed by the USDI, Fish & Wildlife Service as Endangered.

FT = Listed by the USDI, Fish & Wildlife Service as Threatened.

FSC = Listed by the USDI, Fish & Wildlife Service as a Species of Special Concern.

Forest Sensitive = Listed by the USDA, Forest Service (Sierra and/or Sierra National forests as Sensitive

Park Rare = Yosemite Park Rare; listed by the USDI, National Park Service as rare

³ California Native Plant Society (CNPS) Listing Categories (Skinner and Pavlik 1994).

List 1A Presumed extinct in California

List 1B Plants Rare, Threatened, or Endangered in California and elsewhere.

List 2 Plants Rare or Endangered in California; more common elsewhere.

List 3 Need more information.

List 4 Plants of limited distribution.

Source: Parsons, 2001

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
INVERTEBRATES			
Helminthoglypta allynsmith Merced Canyon shoulderband	--	FSC	Inhabits rockslides with shade and moisture within the Merced River canyon.

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
Monadenia circumcarinata Keeléd sideband (snail)	--	FSC/BLM -Sensitive	
Monadenia hillebrandi yosemitensis Yosemite Mariposa sideband (snail)	--	FSC	Known only from the Yosemite Valley, along the Merced River, Mariposa County. Inhabits rockslides with shade and moisture.
Monadenia mormonum Hairy Sierra sideband (snail)	--	BLM- Sensitive	
Branchinecta lynchi Vernal pool fairy shrimp	--	FT	Inhabits small, clear-water sandstone-depression pools and grassed swales, earth slump, or basalt-flow depression pools. Endemic to the grasslands of the Central Valley, Central Coast Mountains, and South Coast Mountains.
Lepidurus packardi Vernal pool tadpole shrimp	--	FE	Inhabits seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.
Linderiella occidentalis California linderiella fairy shrimp	--	FSC	Inhabits seasonal pools in unplowed grasslands with old alluvial soils underlain by hardpan or in sandstone depressions.
Stygobromus wengerorum Wengeror’s Cave amphipod	--	FSC	Known only from Bower Cave (the type locality), Mariposa County. Occurs approximately 65-125 feet below the surface of the cave lake.
Tetrix sierrana Sierra pygmy grasshopper	--	FSC	Known only from sugar pine, Madera County (type locality), at an elevation of 4,300-5,000 feet.
Atractelmis wawona Wawona riffle beetle	--	FSC	It occurs in the main stem and South Fork of the Merced River; however, little is known about this species.
Desmocerus californicus dimorphus Valley elderberry longhorn beetle	--	FT	Occurs only in the central valley of California, in association with blue elderberry. Egg laying typically occurs in blue elderberry stems that are 2-8 inches in diameter.
Hydroporus leechi Leech’s skyline diving beetle	--	FSC	Originally thought to be restricted to the waters of the San Francisco Bay area, it now appears to be far more widespread, occurring across much of the western United States.
Lytta molesta Molestan blister beetle	--	FSC	Inhabits the Central Valley of California, from Contra Costa to Kern and Tulare counties. This species was collected from dried vernal pools at one location.

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
Philotiella speciosa bohartorum Bohart's blue butterfly	--	FSC	Known from the foothills of the southern Sierra Nevada, near Briceburg, Mariposa County. Associated with pink spineflower bushes (probable food plant).
FISH			
Lampetra ayresi River lamprey	CSC	FSC	Ranges from the Sacramento-San Joaquin Delta region northward; however, it appears most numerous in the Sacramento and San Joaquin Rivers.
Lampetra hubbsi Kern brook lamprey	CSC	FSC	Inhabits waters of the San Joaquin River system and the Kern River. Spawning occurs in gravel-bottomed areas, the ammocoetes utilize muddy-bottomed areas to burrow and feed.
Lampetra tridentata Pacific lamprey	--	FSC	Most coastal streams and rivers of California.
Acipenser medirostris Green sturgeon	CSC	FSC	Primarily marine, this species seldom migrates inland beyond the estuaries of large rivers.
Oncorhynchus mykiss Central Valley steelhead	--	FT	Critical habitat was designated to include all river reaches accessible to listed steelhead in the Sacramento and San Joaquin Rivers and tributaries in California. The river reaches and estuarine areas of the Sacramento-San Joaquin delta are also included.
Oncorhynchus tshawytscha Central Valley fall/late fall-run chinook salmon	CSC	FC/FS	Breeding runs occur in the Sacramento River and its tributaries, river reaches and estuarine areas of the Sacramento-San Joaquin Delta are also utilized.
Hypomesus transpacificus Delta smelt	ST	FT	This species inhabits the Sacramento-San Joaquin Delta and seasonally inhabits the Suisun Bay, Carquinez Strait, and San Pablo Bay. This species is seldom found at salinities above 10 PPT, and is most often found at salinities below 2 PPT. Spawning appears to occur in side channels and sloughs in the middle reaches of the Delta.
Spirinchus thaleichthys Longfin smelt	CSC	FSC	This species prefers moderately saline water and may be found in major bays and estuaries from San Francisco Bay northward. It lives in the bay waters throughout the summer, moving into the lower reaches of the rivers that flow into these bays in the fall to spawn.
Lavinia symmetricus ssp. Red Hills roach	CSC	BLM- Sensitive	Inhabits small streams near Sonora, in areas with serpentine soils. Currently all CNDDDB records are from Tuolumne County.
Pogonichthys macrolepidotus Sacramento splittail	CSC	FT	Inhabits slow moving river sections and dead end sloughs. Requires flooded vegetation for spawning and foraging for young. Endemic to lakes and rivers of the Central Valley, but now confined to the Delta, Suisun Bay, and associated marshes.

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
AMPHIBIANS			
Ambystoma californiense California tiger salamander	CSC	FC	Annual grasslands and grassy understory of valley-foothill hardwood communities in central and northern California. Requires underground refuges, especially ground squirrel burrows, and vernal pools or other seasonal water sources for breeding.
Hydromantes brunus Limestone salamander	ST	FSC/FS	Limestone outcrops in foothill pine-chaparral belt along the Merced River and its tributaries. California buckeye serves as an indicator of optimal habitat.
Hydromantes platycephalus Mount Lyell salamander	CSC	FSC	Inhabits rock fields in mixed conifer, red fir, lodgepole pine, and subalpine communities, utilizing rock fissures, seeps, shade, and low-growing plants. Elevational range extends from 4,000 to 11,600 feet.
Scaphiopus hammondi Western spadefoot toad	CSC	FSC/BLM -Sensitive	Most commonly associated with grassland communities; however, valley-foothill hardwood woodlands may also be utilized. Breeding occurs in shallow temporary pools.
Bufo canorus Yosemite toad	CSC	FSC ³ /FS	Inhabits wet meadows in the central Sierra Nevada, between elevations of 6,400 and 11,300 feet.
Rana aurora draytonii California red-legged frog	CSC	FT	Lowlands and foothills in a variety of aquatic, riparian and upland environments, near permanent sources of water.
Rana boylei Foothill yellow-legged frog	CSC	FSC/FS/ BLM- Sensitive	Partially shaded, shallow streams with riffles and rocky substrates in a variety of vegetation communities.
Rana muscosa Mountain yellow-legged frog	CSC	FSC ³ /FS	Inhabits ponds, lakes, and streams associated with montane riparian, lodgepole pine, subalpine conifer, and wet meadow communities.
REPTILES			
Clemmys marmorata pallida Western pond turtle	CSC	FSC/FS/ BLM- Sensitive	Includes subspecies; C. m. marmorata and C. m. pallida. Aquatic habitats of ponds, marshes, rivers, streams, irrigation ditches that have abundant emergent or riparian vegetation. Basking sites and suitable upland egg-laying sites (sandy banks or grassy open fields) are needed.
Gambelia (=Crotaphytus) sila Blunt-nosed leopard lizard	SE	FE	Inhabits sparsely vegetated alkali, desert scrub, and grassland communities, typically in areas of low topographic relief.
Phrynosoma coronatum frontale California horned lizard	CSC	FSC/BLM -Sensitive	Found in a variety of habitats including scrubland, grassland, coniferous forest, and broadleaved forests. Common in lowlands along sandy washes where low shrubs provide cover.

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
Sceloporus graciosus graciously Northern sagebrush lizard	--	FSC/BLM -Sensitive	An inhabitant of sagebrush, montane chaparral, hardwood, pine and fir forest, pinon-juniper woodland, and Great Basin shrub communities.
BIRDS			
Phalacrocorax auritus Double-crested cormorant	CSC	--	Occurs along the coast and on inland lakes, in fresh, salt, and estuarine waters.
Botaurus lentiginosus American bittern	--	FSC	An inhabitant of fresh or saline emergent wetlands.
Ixobrychus exilis hesperis Least bittern	CSC	FSC	Inhabits large, fresh emergent wetlands, with dense emergent vegetation, such as cattails and tules.
Nycticorax nycticorax Black-crowned night heron	--	MB/BLM- Sensitive	Forages along the margins of lacustrine, large rivers, and fresh and saline emergent wetlands. Dense-foliaged trees and dense emergent wetlands are utilized for nesting and roosting.
Plegadis chihi White-faced ibis	CSC	FSC	Breeds in dense, fresh emergent wetlands; however, this species has declined in California and no longer breeds regularly. Fairly widespread during migration, foraging in fresh emergent wetlands, wet meadows, and irrigated or flooded pastures and croplands.
Branta canadensis leucopareia Aleutian Canada goose	--	FT	The Central Valley appears to be the main wintering ground of this subspecies. Typically forages in fields near their roosting areas (lakes and ponds).
Histrionicus histrionicus Harlequin duck	CSC	FSC/BLM -Sensitive	Breeds on large, turbulent mountain rivers. Previously breed throughout the Sierra; however, the only recent records are from the upper Mokelumne River in Amador and Calaveras counties.
Accipiter cooperi Cooper's hawk	CSC	--	Most commonly associated with dense stands of live oak, riparian deciduous or other forest communities near water.
Accipiter gentilis Northern goshawk	CSC	FSC/FS	Breeds and forages in mature stands of coniferous, mixed, and deciduous forest. Nest sites often associated with north-facing aspects.
Accipiter striatus Sharp-shinned hawk	CSC	--	Breeds in riparian deciduous, mixed conifer, black oak, ponderosa pine, and Jeffrey pine communities. During winter may be found in a wide variety of communities.
Aquila chrysaetos Golden eagle	CSC	--	Rolling foothills, mountain areas, grasslands, savannas, deserts, and early successional stages of forests and shrub communities. Cliffs and large trees are utilized for nesting.
Haliaeetus leucocephalus Bald Eagle	SE	FT/FPD	Breeds and roosts in remote coniferous forests in close proximity to a river, stream lake, reservoir, marsh, or other wetland area.

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
Pandion haliaetus Osprey	CSC	--	Uses large snags and open trees, primarily in ponderosa pine through mixed conifer community types, near large bodies of water.
Buteo regalis Ferruginous hawk	CSC	FSC/BLM -Sensitive	A winter migrant that commonly inhabits grasslands, prairies, and brushy open country.
Buteo swainsoni Swainson's hawk	ST	--	Typically breeds in stands with few trees in juniper-sage flats, riparian areas, and oak savannah. Requires adjacent suitable foraging areas, such as grasslands, or alfalfa or grain fields.
Falco peregrinus anatum American peregrine falcon	SE	FD	Inhabits open country, breeding near rivers, wetlands, lakes, or other aquatic features, nests on cliffs, banks, dunes, mounds, and human-made structures.
Falco columbarius Merlin	CSC	--	An uncommon winter migrant that inhabits a variety of communities ranging from annual grasslands to ponderosa pine and montane hardwood-conifer communities, but shows a preference towards open areas.
Falco mexicanus Prairie falcon	CSC	--	Inhabits dry, open terrain including annual and perennial grasslands, savannas, and rangeland. Breeding typically occurs in areas with canyons, cliffs, escarpments, and rock outcrops
Charadrius montanus Mountain plover	CSC	PT	Short grass plains, low rolling grass hills, freshly plowed agricultural fields, and newly sprouting grain fields. Often associated with short vegetation and bare ground.
Larus californicus California gull	CSC	--	Undisturbed, isolated islands in close proximity to foraging areas are required for breeding. Forages in a variety of environments including lakes, rivers, landfill dumps, and urban areas.
Asio flammeus Short-eared owl	CSC	FSC	A winter migrant in the western Sierra Nevada foothills; inhabiting open areas, such as annual and perennial grasslands, prairies, meadows, irrigated lands, and fresh emergent wetlands.
Strix nebulosa Great gray owl	SE	FS	A resident of mixed conifer and red fir forest communities, in or on edge of meadows. High canopy closure and large diameter snags are required.
Strix occidentalis occidentalis California spotted owl	CSC	FSC ³ /FS/ BLM- Sensitive	Typically breeds in stands of mixed coniferous forest containing a mixture of tree sizes with usually at least two canopy layers, and a total canopy coverage in excess of seventy percent (may be as low as thirty percent at high elevations). In southern California, usually associated with oak and oak-conifer communities.

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
Chaetura vauxi Vaux's swift	CSC	FSC	Prefers redwood and Douglas-fir communities; nests are typically placed in large hollow trees and snags. Forages high in the air over most communities; however, shows an apparent preference for foraging above rivers and lakes.
Cypseloides niger Black swift	CSC	FSC	Breeds in small colonies on cliffs behind or adjacent to waterfalls in deep canyons and on sea-bluffs above the surf.
Selasphorus rufus Rufous hummingbird	--	FSC	A post-breeding migrant during the summer in the Cascade Range and Sierra Nevada; spring migration occurs primarily in the lowlands and foothills. Inhabits a wide range of communities that provide nectar-producing flowers; examples include riparian, valley foothill hardwood, valley foothill hardwood-conifer, and high mountain meadows.
Melanerpes lewis Lewis' woodpecker	--	FSC	An uncommon, local winter resident that inhabits open oak savannas, broken deciduous, and coniferous communities.
Sphyrapicus ruber Red-breasted sapsucker	--	FSC	Preferred nesting habitats include montane riparian, montane hardwood-conifer, mixed conifer, and red fir, often in close proximity to meadows, clearings, lakes, and slow-moving streams.
Contopus cooperi Olive-sided flycatcher	--	FSC	A summer resident that utilizes a wide variety of forest and woodland habitats. Mixed conifer, montane hardwood-conifer, Douglas fir, redwood, red fir, and lodgepole pine are preferred nesting habitats.
Empidonax difficilis Pacific-slope flycatcher	--	FSC	A summer resident of warm, moist woodlands, including valley foothill and montane riparian, hardwood, and hardwood-conifer communities.
Empidonax traillii Willow flycatcher	SE	FS	A spring and fall migrant throughout much of the state, primarily utilizing riparian communities with dense willows. Previously bred throughout most of lowland and montane California. Breeding is now primarily limited to the Sierra Nevada and Cascade Ranges. Three subspecies of the willow flycatcher are recognized in California. The southwestern flycatcher (<i>E. t. extimus</i>), the northern limits of this subspecies range are represented by Kern and Inyo counties; little willow flycatcher (<i>E. t. brewsteri</i>) occurring along the west slope of the Sierra Nevada and <i>E. t. adustus</i> , which occurs east of the Sierra/Cascade crest (Craig et al. 1992).
Empidonax traillii brewsteri Little willow flycatcher	SE	FSC	In the central and southern Sierra Nevada, this species typically breeds in willow-dominated riparian vegetation along perennial streams in moist meadows or spring-fed or boggy areas.
Lanius ludovicianus Loggerhead shrike	CSC	FSC	Inhabits open areas with sparse shrubs, trees, and other perches.

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
Thryomanes bewickii Bewick's wren	--	FSC	Primarily a species of chaparral communities, including mixed and montane chaparral. However, may also utilize riparian communities as well as borders of woodlands and coniferous forests that contain a brushy understory.
Dendroica occidentalis Hermit warbler	--	FSC	A summer visitor and migrant, breeds in mature ponderosa pine, montane hardwood-conifer, mixed conifer, redwood, Douglas fir, red fir, and Jeffrey pine communities.
Dendroica petechia brewsteri California yellow warbler	CSC	--	Breeds in willow dominated riparian woodlands that may also include cottonwoods, alders, and sycamores; montane chaparral; and montane shrubbery in open coniferous forests.
Ammodramus savannarum Grasshopper sparrow	--	FSC	An uncommon and local, summer resident and breeder along the foothills and lowlands of the Cascade-Sierra Nevada crest. Associated with dry, dense grasslands, containing a variety of grasses, tall forbs, and scattered shrubs.
Amphispiza belli belli Bell's sage sparrow	CSC	FSC	Inhabits coastal sagebrush, chaparral, and dry foothills.
Spizella breweri Brewer's sparrow	--	FSC	Breeds in extensive shrub stands with moderate canopy coverage most commonly associated with sagebrush.
Agelaius tricolor Tricolored blackbird	CSC	FSC/BLM -Sensitive	Inhabits cattail marshes, marshy meadows, and rangeland. A highly colonial species, it is most numerous in the Central Valley and vicinity of California.
Carduelis lawrencei Lawrence's goldfinch	--	FSC	Inhabits valley foothill hardwood, valley foothill hardwood-conifer, and chaparral communities. Breeds in open oak or other arid woodland and chaparral communities, in close proximity to water.
MAMMALS			
Sorex lyelli Mount Lyell shrew	CSC	FSC	Very little is known about this species; all records are from the vicinity of Mt. Lyell. This species appears to favor riparian areas and other moist situations.
Antrozous pallidus Pallid bat	CSC	FS/BLM- Sensitive	Deserts, grasslands, shrublands, woodlands and forests in generally dry, open areas with rocky areas for roosting. Highly sensitive to disturbance of roosting sites.
Corynorhinus townsendii pallescens Pale Townsend's big- eared bat	CSC	FSC/FS/ BLM- Sensitive	Inhabits a wide variety of environments, but most common in mesic sites. Roosting, maternity, and hibernacula sites free from human disturbance are required.

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
Corynorhinus townsendii townsendii Pacific western big-eared bat	CSC	FSC/FS/BLM-Sensitive	Occupies the humid, coastal regions of northern and central California, in a wide variety of habitats. Roosts in caves, buildings, and mine tunnels. This species is highly sensitive to human disturbance at roosting, maternity, and hibernacula sites.
Euderma maculatum Spotted bat	CSC	FSC/BLM-Sensitive	Occurs in a variety of environments, ranging from deserts and grasslands to mixed conifer forests; roosts in rock crevices along cliffs or caves.
Myotis ciliolabrum Small-footed myotis bat	--	FSC/BLM-Sensitive	Inhabits relatively arid wooded and brushy uplands in close proximity to water, from sea level to about 8,900 feet. Maternity colonies may occur in buildings, caves and mines.
Myotis evotis Long-eared myotis bat	--	FSC/BLM-Sensitive	May be found in a variety of brush, woodland, and forest communities, from sea level to about 9,000 feet; shows a preference toward coniferous woodlands and forests. Nursery colonies located in buildings, crevices, spaces under bark, snags; night roosting in caves.
Myotis thysanodes Fringed myotis bat	--	FSC/BLM-Sensitive	May be found in a variety of environments; valley and foothill hardwood, hardwood-conifer and pinyon-juniper woodland provide optimal habitat. Maternity colonies and roosts located in caves, mines, buildings, and crevices
Myotis volans Long-legged myotis bat	--	FSC/BLM-Sensitive	This species is most commonly associated with woodland and forest communities above 4,000 feet. However, may also forage in chaparral, coastal scrub, Great Basin shrub habitats, and in early successional stages of woodlands and forests. Occurrence records ranges from sea level to 11,400 feet. Roosts in rock crevices, buildings, under tree bark, in snags, mines, and caves.
Myotis yumanensis Yuma myotis bat	CSC	FSC/BLM-Sensitive	Optimal environments include open forests and woodlands in proximity to bodies of water used for foraging; maternity colonies in caves, mines, crevices, and buildings
Eumops perotis californicus California mastiff-bat	CSC	FSC/BLM-Sensitive	Many open, semi-arid to arid habitats, including coniferous and deciduous woodlands, coastal scrub, grasslands, chaparral; roosts in crevices of cliff faces, in high buildings, and in trees and tunnels
Brachylagus idahoensis Pygmy rabbit	CSC	FSC	Inhabits sagebrush, bitterbrush, and pinyon-juniper communities in the Great Basin.
Lepus americanus tahoensis Sierra Nevada snowshoe hare	CSC	FSC	Frequents early successional stages of mixed conifer, red fir, lodgepole pine forests, and deciduous riparian communities at higher elevations.

Table 8-3: Special-Status Wildlife Species that May Occur in Mariposa County

Species	Status		Habitat Association
	State ¹	Federal ²	
Aplodontia rufa californica Sierra Nevada mountain beaver	CSC	FSC	In the Sierra Nevada and East Slope, associated with dense growth of small deciduous trees and shrubs, wet soil, and an abundance of forbs. Needs an abundant supply of water.
Dipodomys heermanni dixonii Merced kangaroo rat	--	FSC	Occurs in grassland and savanna communities; fine deep, well-drained soils are required for burrowing.
Perognathus inornatus San Joaquin pocket mouse	--	FSC/BLM -Sensitive	Inhabits dry, open grasslands or scrub areas on fine-textured soils below 2,000 feet in the Central and Salinas valleys.
Vulpes vulpes necator Sierra Nevada red fox	ST	FSC/FS	Inhabits a variety of communities from wet meadows to forested areas; preferring forests that are interspersed with meadows or alpine fell-fields. Dense vegetation and rocky areas provide cover and den sites.
Gulo gulo luteus California wolverine	ST	FSC/FS	Occurs in a variety of communities, including subalpine conifer, alpine dwarf-shrub, barren, mixed conifer, and lodgepole pine forests at or near timberline. Typically associated with areas of low human disturbance.
Martes americana American (pine) marten	--	FS	Prefers multi-storied, mature mixed coniferous forests with high canopy coverage and an abundance of large snags and downed woody debris. Riparian corridors may be used for foraging and as travel ways.
Martes pennanti pacificus Pacific fisher	CSC	FSC/FS/ BLM Sensitive	Prefers multi-storied, mature mixed coniferous forests with high (>50 percent) canopy coverage and an abundance of large snags and downed woody debris. Dense riparian corridors are utilized as dispersal corridors. Foraging often occurs in small (<2 acre) forest openings with significant ground cover.

¹State status data from California Natural Diversity Data Base (CDFG, 2000).

SE = State listed as Endangered.

ST = State listed as Threatened.

CSC = State Species of Special Concern.

²Federal status data from USFWS letter dated 3/12/01, BLM Special Status Species List, Folsom Planning Area received 31 January 2001; and CNDDDB (CDFG 2000).

BLM-Sensitive = Federally listed as BLM Sensitive by the BLM.

FE = Federally listed as Endangered.

PT = Officially proposed for Federal listing as Threatened

FT = Federally listed as Threatened.

FS = Forest Sensitive as determined by the Forest Service

FC = Federal Candidate to become a Proposed Species.

FSC = Federal Species of Special Concern

MB = Migratory Bird

³These species are under petition to be listed as Endangered, but have not been listed as such presently.

Source: Parsons 2001 Sources for habitat association information:
CNDDDB, 2000; USFWS, 2000 Craig et al. 1992;
Zeiner *et al.*, 1988; Zeiner *et al.*, 1990a, b' Stebbins, 1985;
McGinnis, 1984; Williams, 1986.

REGULATORY SETTING

FEDERAL ENDANGERED SPECIES ACT

The Federal Endangered Species Act (FESA) recognizes that many species of fish, wildlife, and plants are in danger of or threatened with extinction, and established a national policy that all federal agencies should work toward conservation of these species. The Secretary of the Interior and the Secretary of Commerce are designated in FESA as responsible for identifying endangered and threatened species and their critical habitats, carrying out programs for the conservation of these species, and rendering opinions regarding the impact of proposed federal actions on endangered species. FESA also outlines what constitutes unlawful taking, importation, sale, and possession of endangered species and specifies civil and criminal penalties for unlawful activities.

Biological assessments are required under Section 7(c) of FESA if listed species or critical habitat may be present in the area affected by any major construction activity conducted by, or subject to issuance of a permit from, a federal agency as defined in Part 404.02.

Section 9 of FESA prohibits the “take” of any fish or wildlife species listed under FESA as endangered or threatened. Take, as defined by FESA, means “to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such action.” However, Section 10 allows for the “incidental take” of endangered and threatened species of wildlife by non-Federal entities. Incidental take is defined by FESA as take that is “incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.” Section 10(a)(2)(A) requires an applicant for an incidental take permit to submit a “conservation plan” that specifies, among other things, the impacts that are likely to result from the taking and the measures the permit applicant will undertake to minimize and mitigate such impacts. Section 10(a)(2)(B) provides statutory criteria that must be satisfied before an incidental take permit can be issued.

WETLANDS AND OTHER JURISDICTIONAL WATERS OF THE UNITED STATES

The California Environmental Quality Act (CEQA) Guidelines (1994) state that affects on the environment that conflict with adopted environmental plans or goals are normally regarded as significant. A “no net loss of wetland acreage or value” policy is established within both the state and federal executive branches (California Wetlands Conservation Policy 1993). Ditching, draining, or other activities which could alter the characteristic physical, chemical, biological or public interest values (as defined by 40 CFR 230 Subparts C-F) associated with wetlands and other waters of the U.S. are considered impacts under Army Corps of Engineers authority.

AGRICULTURAL WETLANDS AND THE FOOD SECURITY ACT

Although regulatory authority under Section 404 rests with the Army Corps of Engineers (ACOE), the responsibility for determination of jurisdictional status on agricultural land is shared with the Natural Resource Conservation Service (NRCS) throughout the United States. The following information is provided regarding the NRCS program, because the ACOE may consider these issues in their actions. The 1985 “Swampbuster” provisions of the Food Security Act, and the 1996 amendments to the act, restrict federal farm benefits for farmers who convert wetlands to croplands. The NRCS is responsible for administering these provisions, including monitoring farming activity. Federal farm benefits may be withheld if provisions of the Food Security Act are not met. Exemptions may be granted for wetland conversions occurring prior to December 23, 1985, the date of adoption of the Swampbuster Provisions.

The NRCS National Food Security Act Manual, 3rd Edition, second amended version (1996) provides guidance for classifying wetlands on delineated agricultural land and identifies permissible activities under the various classifications during the course of certification of a wetland delineation. The NRCS types of delineated wetlands are:

- W (wetlands) - Areas that meet wetland criteria (hydric soils, hydrophytic vegetation, wetland hydrology) and are not altered by manipulation of groundwater and tillage;
- FW (farmed wetlands) - Farmed areas having wetland hydrology that have produced commodity crops since before 1985;
- FWP (farmed wetland pasture or hayland) - Pasture and hayland having wetland hydrology that have been managed for rangeland purposes since before 1985;
- CW (converted wetland) - Agricultural land farmed but not classified “NHEL” with manipulated wetland hydrology, converted without USDA permission after 1985;
- OW (other waters) - Waters of the U. S. defined in Part 33 of the Code of Federal Regulations (CFR), sub-part 328;
- PC (prior converted cropland) - Commodity croplands drained before 1985 that are not ponded for more than 15 consecutive days or 10 percent of the growing season;
- AW (artificial and irrigation-induced wetlands) - Areas formerly non-wetland but which now meet wetland criteria due to human activities, for example livestock ponds and rice fields;
- CWNA (converted wetlands for non-agricultural purposes), CWTE (converted wetland technical error), TP (third party conversion), CC (commenced conversion exemption determinations), WX (wetlands that have been manipulated but production not made possible) - Other NRCS technical categories defined in the 1996 Manual, and;
- NW (non-wetland) - Agricultural land that, under natural conditions does not meet the three wetland criteria (also termed “upland”) of soils, vegetation and hydrology.

WILD AND SCENIC RIVERS ACT

In 1987, Congress placed 122 miles of the Merced River under the Wild and Scenic Rivers Act. The National Park Service administers eighty-one of the 122 miles of the Merced Wild and Scenic River. The National Park Service prepared the Merced Wild and Scenic River

Comprehensive Management Plan/Final EIS to manage the area surrounding the river and maintain the river's qualities through proper use and protection of the surrounding resources.

The Wild and Scenic Rivers Act (Public Law 90-542, as amended) states the following:

“It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the river of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.”

The Wild and Scenic Rivers Act requires the Federal agency charged with administration of the designated component to prepare a comprehensive management plan to protect the river's values. The comprehensive management plan should include resource protection, development of lands and facilities, user capacities, and other management practices to ensure the "outstanding and remarkable values" of the river are protected under the regulations stated in the Wild and Scenic Rivers Act. In addition, the Federal agency is required to establish boundaries on each side of the river (which should average 320 acres per mile on both sides of the river) in which the Wild and Scenic Rivers Act applies. Boundary establishment ensures that future development maintains the river's outstanding qualities and does not result in changes to the river environment that produces highly negative effects. Each segment of the river is to be classified into one of three categories: Wild, Scenic, or Recreational. The portions of the Merced River near El Portal and Wawona are considered recreational, while the portions in the West Yosemite Valley and the Gorge are classified as scenic.

FOREST SERVICE MANUAL

The *Forest Service Manual* contains specific policy that calls for an assessment of risks of noxious weeds becoming established or spreading as a result of individual projects (USDA, 2000). The Forest Service Manual defines noxious weeds as: “those plant species designated as noxious weeds by federal or State law. Noxious weeds generally possess one or more of the following characteristics: aggressive and difficult to manage, poisonous, toxic, parasitic, a carrier or host of serious insects or disease, and generally non-native (USDA, 1998).”

The Forest Service Manual defines undesirable plants as: “plant species that are classified as undesirable, noxious, harmful, exotic, injurious, or poisonous, pursuant to State and federal laws, including those designated by the Secretaries of Agriculture or the Interior. Not included are species listed as endangered by the Endangered Species Act of 1973 or plants indigenous to an area where control measures are to be taken (USDA, 1998).”

CALIFORNIA FISH AND GAME CODE

The California Fish and Game Code defines “take” (Section 86) and prohibits “taking” of a species listed as threatened or endangered under the California Endangered Species Act (California Fish and Game Code Section 2080) or as fully protected (as defined in California Fish and Game Code Sections 3511, 4700, and 5050). “Take” means to hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill. Thus, state law prevents

any actions which would impact threatened or endangered species if they result in: a) direct mortality; b) permanent or temporary loss of occupied habitat that would result in mortality to or reduced productivity of at least one individual of the species; c) avoidance of biologically important habitat for substantial periods resulting in mortality to or reduced productivity of at least one individual of the species.

The CDFG regulates activities that may affect streambeds. Division 2, Chapter 6, Section 1601 of the California Fish and Game Code states that “...general plans sufficient to indicate the nature of a project for construction by, or on the behalf of, any governmental agency, state or local, and any public utility, of any project which will divert, obstruct or change the natural flow or bed, channel, or bank of any river, stream, or lake designated by the Department in which there is at any time an existing fish or wildlife resource or from which these resources derive benefit, or will use material from the streambeds designated by the Department, shall be submitted to the Department.” The CDFG has stated that their jurisdiction is any area that is within the 100-year floodplain. Impacts within this jurisdiction are considered significant.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Article 5, Section 15065 of the California Code of Regulations, the State CEQA Guidelines, requires that a lead agency prepare an EIR if:

“The Project has the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish and wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal, or eliminate important examples of the major periods of California history or prehistory.”

Rare or endangered species are defined in the CEQA Guidelines (Section 15380) as follows:

(a) “Species” as used in this section means a species or subspecies of animal or plant or variety of plant.

(b) A species of animal or plant is:

(1) “Endangered” when its survival and reproduction in the wild are in immediate jeopardy from one or more causes, including loss of habitat, change in habitat, overexploitation, predation, competition, disease, or other factors; or

(2) “Rare” when either:

(A) Although not presently threatened with extinction, the species is existing in such small numbers throughout all or a significant portion of its range that it may become endangered if its environment worsens; or

(B) The species is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and may be considered “threatened” as that term is used in the Federal Endangered Species Act.

(c) A species of animal or plant shall be presumed to be rare or endangered if it is listed in:

(1) Sections 670.2 or 670.5, Title 14, California Administrative Code; or

(2) Title 50, Code of Federal Regulations Sections 17.11 or 17.12 pursuant to the Federal Endangered Species Act as rare, threatened, or endangered.

(d) A species not included in any listing identified in subsection (c) shall nevertheless be considered to be rare or endangered if the species can be shown to meet the criteria in subsection (b).

Appendix G of the State CEQA Guidelines lists several criteria for use in an Initial Study for determining whether impacts are significant. Impacts on biological resources are potentially significant if the project would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal) through direct removal, filling, hydrological interruption, or other means;
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance; and/or
- Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved local, regional, or state habitat conservation plan.

CALIFORNIA ENDANGERED SPECIES ACT

The California Endangered Species Act (Fish and Game Code Sections 2050-2098) established a State policy to conserve, protect, restore, and enhance any endangered species or any threatened species and its habitat. The Fish and Game Commission is charged with establishing a list of endangered and threatened species. State agencies must consult with the Department of Fish and Game to determine if a proposed Project is likely to jeopardize the continued existence of any endangered or threatened species.

Section 2081 of the Fish and Game Code allows the “take” of a species listed as threatened or endangered by the California Endangered Species Act. Take is defined as any act that involves direct mortality or other actions that may result in adverse impacts when attempting to take individuals of a listed species. Under Section 2081, the State Department of Fish and Game may issue a permit to authorize take for scientific, educational or management purposes, or take that is incidental to otherwise lawful activities.

CALIFORNIA FISH AND GAME CODE NATIVE PLANT PROTECTION POLICY

The goals of the California Native Plant Protection Policy are as follows:

- The intent of the Legislature and the purpose of this chapter is to preserve, protect, and enhance endangered or rare plants of this state (Section 1900). For purposes of this Chapter, a ‘native plant’ means a plant that grows in a wild uncultivated state which is normally found native to the plant life of this state (Section 1901).
- The commission may adopt regulations governing the taking, possession, propagation, transportation, exportation, importation, or sale of any endangered or rare native plants. Such regulations may include, but shall not be limited to, requirements for persons who perform any of the foregoing activities to maintain written records and to obtain permits, which may be issued by the department (Section 1907).
- No person shall import into this state, or take, possess, or sell within this state, except as incident to the possession or sale of the real property on which the plant is growing, any native plant, or any part or product thereof, that the commission determines to be an endangered native plant or a rare native plant, except as otherwise provided in this chapter (Section 1908).
- All state departments and agencies shall, in consultation with the department, utilize their authority in furtherance of the purposes of this chapter by carrying out programs for the conservation of endangered or rare native plants. Such programs include, but are not limited to, the identification, delineation, and protection of habitat critical to the continued survival of endangered or rare native plants (Section 1911).

8.2 GEOLOGY AND SOILS

Mariposa County is located in central California on the western slopes of the central Sierra Nevada Mountains. Elevation in the County ranges from approximately 300 feet along the western boundary to over 10,000 feet in the mountainous eastern part. The western half of the County consists of gently sloping foothills with generally thin soils and hard underlying metamorphic bedrock. The northeastern half of the County (generally above Highway 49) consists of steep to extremely steep foothills and mountains that generally ramp upwards to the northeast to the crest of the Sierra Nevada range. To provide a framework for the following sections, map showing the major rock associations and fault zones is provided in **Error! Reference source not found.**

8.2.01 GEOLOGIC HISTORY

The oldest rocks found in the Sierra are metamorphosed marine sedimentary rocks of Ordovician age (435 to 500 million years old), found in the north-central part of the County. At that time, sediments slowly accumulated on an ancient ocean floor, eventually reaching thousands of feet in thickness while compressing the lower layers of sediment into rock. Periodically, underwater volcanic activity covered the ocean floor with pillow and sheet flow basalts.

In the Mesozoic Era (65 to 225 million years ago), the Pacific tectonic plate began sliding under the North American plate. This subsidence resulted in the deposition of thick

sequences of pillow basalts, chert and slate. Deep within the earth, extreme heat and pressure caused the Pacific plate to melt into molten rock, or magma. The magma rose upward within the Earth's crust and crystallized below the surface to form granitic rock along a linear belt that was to become the future Sierra Nevada. Some of the magma broke through to the surface, creating a string of volcanoes. Because of the high elevation of the Sierra Nevada, however, the volcanic and other rocks covering the granite were subject to rapid erosion and by Late Cretaceous time, about 70 million years ago, the granitic rocks became exposed at the Earth's surface.

In the Cenozoic Era, from 65 million years ago to the present, the continental crust east of the Sierra Nevada began to extend in an east-west direction, developing into a series of north-south-trending valleys and mountain ranges. Through a combination of uplift of the Sierran block and down dropping of the area to the east, the Sierra Nevada region acquired a tilted-block aspect with a long, gentle slope westward to the Central Valley. Four Ice Ages occurred in the Pleistocene, causing the advance and retreat of the glaciers that carved the Sierran crest and upper valleys into the landscape of today. The Sierras are currently continuing to uplift.

8.2.02 PHYSICAL GEOLOGY

The bedrock in the foothills and western portion of the County has a dominant northwest-oriented grain. Rock layering, texture, and faults are strongly controlled by this grain. The general geologic features of the County are described in the following sections.

FOOTHILLS FAULT SYSTEM

The Foothills Fault System has a total length of more than 200 miles along the western front of the Sierra Nevada foothills. It consists of two major parallel fault and fracture zones that trend northwest-southeast across Mariposa County: the Bear Mountains Fault Zone and the Melones Fault Zone. The Bear Mountains Fault Zone crosses the north Mariposa County line at Highway 132 near the northwest corner of Lake McClure. It trends south-southeast through the main pool of the lake near New Exchequer Dam, but appears not to continue more than a few miles to the southeast beyond the lake. The Melones Fault Zone also trends southeast across the County closely following Highway 49 from the area of Jamestown through Bear Valley to the town of Mariposa. It is a complex network of fracture zones parallel to and associated with the Mother Lode. The width of the zone of associated faults and fractures is several miles.

EARTHQUAKES

Hazards caused by earthquakes include ground shaking, surface fault rupture, ground failures such as landslides and liquefaction, and unusually large waves in standing water known as seiches.

The probability of earthquake occurrence on the Foothills Fault System is rated as low. The fault zone is classified as a "C" Zone under the Universal Building Code (CDMG Open-File Report 96-08, *Probabilistic Seismic Hazard Assessment for the State of California*). Historically, few earthquakes are known to have originated in Mariposa County, and these have been relatively minor. Only two are known; one occurred in 1954 and the second in 1974. Both caused only minor damage. The historic earthquake occurrences indicate that the area could experience rare earthquakes with magnitudes of up to 6.5 in the future.

In 1972, California adopted the Alquist-Priolo Earthquake Fault Zoning Act. This law requires that surface traces of active faults in California be delineated with regulatory zones. Structures proposed to be built in these zones must meet strict safety requirements. Two major fault zones have been mapped in Mariposa County: the Melones Fault Zone and the Bear Mountain Fault Zone. However, these are not considered to be active and are therefore not recognized as Alquist-Priolo zones by the State. Even though no active faults are known, there is a risk of earthquake from unrecognized or dormant faults that could be re-activated.

SLOPE STABILITY AND LANDSLIDES

Major drainages such as the Merced River originate in the Sierra Nevada and flow generally to the southwest perpendicular to the Sierra's ridgelines and intermountain valleys. These rivers have cut significant canyons through the ridges. Slopes along these canyons and cliffs in the mountainous eastern half of Mariposa County can be locally steep to precipitous. Such terrain is inherently susceptible to landslides and rock falls. This situation is accentuated where development creates over steepened slopes related to construction of highways, railroads, dams, and commercial centers. For example, the Highway 120 entrance to Yosemite Valley has repeatedly been subject to closure due to rock slides.

UNIQUE GEOLOGICAL FORMATIONS

BOWER CAVE

Bower Cave is located at the mouth of Marble Springs Gulch in the Bull Creek area of the north side of the County, south of Highway 120. It became part of the Stanislaus National Forest in 1990 and is a designated Historical Place by the National Park Service.

PENON BLANCO

Located near Coulterville, Penon Blanco is one of the richest and well-known vein-filled quartz fissures in the area.

MAY ROCK

May Rock is a large rock formation located near Bear Valley. It has been a prominent landmark in Mariposa County.

YOSEMITE NATIONAL PARK

Yosemite National Park is a world-renowned, 1,200 square-mile national park located in the mountainous eastern portion of Mariposa County. The park, which ranges from elevations of 2,000 in the west to over 13,000 feet in the eastern part of the County, contains numerous granite peaks such as El Capitan and Half Dome. Established as a National Park in 1890, Yosemite is designated as a World Heritage Site by UNESCO.

Rock types in Yosemite include ordinary granite, tonalite, diorite, pegmatite, and aplite (Alt and Hyndman). These granites often contain dark inclusions resulting from the intrusion of granite magma into older rocks. Many of these dark rocks contain traces of older sedimentary layers. Most of the rocks in Yosemite consist of various types of granite, all part of the Sierra Nevada batholith. The landscape is atypical of glaciated mountain valleys in that the valleys are much straighter, with higher and steeper walls than the usual glaciated valleyscape. This unusual formation is due in part to the types of fractures found in this particular granite. The fractures are vertical and very deep, which in turn created the steep valleys. As the glaciers froze and thawed, they broke away the granite in the fractures as the glaciers moved down slope.

8.2.03 SOILS

Soil is created primarily from the disintegration and decomposition of mineral rocks and the decomposition of organic matter mixed with these minerals. Soil consists of a combination of ground up rock fragments, decayed organic matter, water, and air. It is a natural resource that supports vegetation, wildlife and human activities.

Soil erosion rates, permeability limitations, and the shrink-swell potential are several of the primary concerns associated with soils. Soil erosion creates siltation in ponds, streams, and lakes, substantially modifies existing topography, decreases vegetation coverage and diversity, and destroys potential groundwater recharge areas. Soil permeability affects development potential in areas that rely on septic tanks and individual wells for water and wastewater services. Soil permeability also affects development potential and costs in areas with poor drainage. A soil's shrink-swell potential can affect development costs and capacity due to the potential for damage to concrete foundations and structures as the soil expands and contracts.

The Soil Conservation Service (SCS) of the U.S. Department of Agriculture mapped the soils in Mariposa County in 1974. The SCS released its findings in the 1974 publication *Soil Survey of Mariposa County*. The Soil Survey describes a broad classification of soils based on rock origins and specific physical characteristics found in the County. A "Soil Association" describes an area that has a distinctive pattern of soils or land types. The Soil Survey identified seven soil association types for the County (see Figure 8-4). These types are described in the following summaries (SCS, 1974):

AHWAHNEE-AUBERRY ASSOCIATION

This association is found primarily in the southeastern portion of the County, covering approximately 14 percent of the survey area. The soil is characterized as well drained, gently sloping to very steep sandy loams formed in material weathered from acid igneous rocks. These soils are used for annual pasture, rangeland, orchards, watershed, and wildlife habitat. Some areas are used for home sites and related non-farm uses. The vegetation that grows in this association is comprised mainly of annual grasses, forbs, oaks, and digger pine.

MUSICK-BOOMER-JOSEPHINE ASSOCIATION

This association is located mainly in the east-central part of the County and covers about 9 percent of the land. This area is used for woodland, watershed and limited grazing, in addition to scattered small orchards. The soil association is comprised of well drained, gently sloping to very steep sandy loams, loams, cobbly loams, and gravelly loams formed in material weathered from basic and acid igneous rocks and schist.

AUBURN-DAULTON ASSOCIATION

The Auburn-Daulton association is found scattered throughout approximately 42 percent of the survey area. These areas are used for range, but in less rocky areas with low slope, they can be used for dryland grain. The association is well- to excessively-drained with gently sloping to very steep loams and stony loams that formed in material weathered from schist and slate.

Figure 8-3: Rock Associations and Fault Zones Map

Do to the size of this image; Figure 8-3 has been created as a separate file

Figure 8-4: General Soils Map

Do to the size of this image; Figure 8-4 has been created as a separate file

MAYMEN-MARIPOSA ASSOCIATION

This association is found scattered throughout about 11 percent of northern half of the County. Maymen soils are used for limited range and Mariposa soils are used for limited woodland. Both soils are used for wildlife habitat and watershed. The soils are well drained moderately steep to extremely steep loams, gravelly loams, and gravelly silt loams formed in material weathered from schist and slate.

TRABUCO-SAN ANDREAS-COARSEGOLD ASSOCIATION

With coverage of about 9 percent of the County, this association is mainly Trabuco soils in the northern part of the survey area, and San Andreas and Coarsegold soils in the southern part of the survey area. The soils are used for pasture, range, wildlife habitat, and watershed. They are well drained gently sloping to steep clay loams, very fine sandy loams, and fine sandy loams formed in material weathered from basic igneous rocks and mica schist.

BLASINGAME-LAS POSAS ASSOCIATION

This association is scattered throughout 12 percent of the County. The soils are somewhat excessively drained and well drained, gently sloping to very steep loams and clay loams formed in material weathered from basic igneous rocks. They are used for annual range, watershed and wildlife habitat.

LOAMY ALLUVIAL LAND-CLAYEY ALLUVIAL LAND ASSOCIATION

These soils are found in small valleys throughout 3 percent of the survey area. The soils are well drained to somewhat poorly drained, gently sloping to strongly sloping sandy loams to clays formed in alluvium from a variety of materials. These land types are used primarily for annual range. At higher elevations, some small areas are used for orchards and pasture.

SEPTIC TANKS

A septic system is a method of individual on-site sewage disposal. The system is used for disposal of household wastewater in areas where public sewers or other wastewater systems are not available. The most common type of septic system consists of a septic tank with a leach field. The standard septic system uses a tank connected to a system of pipes that collects solids and distributes, or leaches, the wastewater underground over a large area. The leach field, where the wastewater "percolates" through the soil, is designed to ensure that the filtration through the soil is sufficient to clean the wastewater before it reaches potable water sources drawn from private wells or surface waters.

Proper operation of a septic tank leach field system depends, among other things, upon the selection of a site that possesses suitable soil characteristics and topography. Three specific variables affect a site's septic disposal capacity. These variables are: 1) slope, 2) soil depth, and 3) soil permeability.

Degree of slope impacts septic disposal capacity by affecting the rate at which wastewater percolates through the soil. In general, the greater the degree of slope, the faster that wastewater will percolate through the soil, reducing the potential time for cleansing wastewater through the process of filtration. On some steep slopes with marginal soils, the septage may "daylight" prior to proper percolation and filtration. This causes a health hazard and threatens to pollute watersheds.

Soil depths impact septic system capacity by varying the thickness of the soil layer through which wastewater filters. A too-shallow soil layer reduces the potential to clean wastewater through the process of filtration.

Finally, soil permeability impacts the effective use of a septic system by affecting the filtration potential of its leach field system. A soil that is too highly permeable will not provide enough opportunity to filter wastewater before it reaches potable water sources. A soil that is not permeable enough will not permit wastewater to adequately leach through the soil layer, reducing the filtration and cleansing potential of a septic leach field system. In addition, slow soil permeability in wet weather can cause the ground to saturate, allowing septage to rise to the surface, causing health and watershed pollution hazards.

Mariposa County, in common with many rural jurisdictions within the Sierra-Nevada foothills and mountains region, is an area that has rugged terrain and soil characteristics that severely limit the proper use of septic systems. Depending upon the degree that any

particular variable (slope, depth, or permeability) is limiting, special precautions (such as greater horizontal and/or vertical distances) may have to be taken to ensure the adequacy of individual septic disposal systems. For example, when installing a septic system, the slope should be less than 30 percent to minimize the hazard of surface erosion, effluent surfacing, soil movement, and improper flow distribution in the leach lines.

In 1975, the Regional Water Quality Control Board, Central Valley Region specified a minimum soil depth of five feet beneath the leaching trenches of a septic system. The U.S. Public Health Service (1972) recommended a minimum soil depth beneath the leaching trenches of at least four feet. Minimum cover over the leach lines should be 12 to 18 inches.

In addition to adequate soil depth, the soil's percolation rate, and therefore the opportunity for effective filtration of wastewater, is very important. A soil's percolation rate is directly related to the soil's porosity. Rapidly permeable coarse-textured or gravelly soils may allow contamination of groundwater supplies while very fine soil particles (clays) may be too tight to allow wastewater to pass through. Metamorphic rocks affect permeability of soil from the deposition of clay and silt. The decomposing metamorphic rock can produce areas of high clay content, inhibiting percolation and creating septic problems.

Soil depth and permeability have been inventoried in the Model Mountain County Development Program from the Soils Classification System of the Mariposa County Soil Survey. The system defines five characteristics of soil depth and permeability in terms of their potential constraints on septic systems. These characteristics are described below:

SOIL DEPTH CONSTRAINT CHARACTERISTICS

Septic Suitability Class A: Soils exhibiting MINIMUM constraint characteristics in effective soil depth. Effective soil depth of 60 inches or greater.

Septic Suitability Class B: Soils exhibiting MODERATE constraint characteristics in effective soil depth. Effective soil depth of 40 to 60 inches.

Septic Suitability Class C: Soils exhibiting HIGH constraint characteristics in effective soil depth. Effective soil depth of 24-40 inches.

Septic Suitability Class D: Soils exhibiting EXTREME constraint characteristics in effective soil depth. Effective soil depth of 24 inches or less.

SOIL PERMEABILITY CONSTRAINT CHARACTERISTICS

Septic Suitability Class A: Soils exhibiting MINIMUM constraint characteristics in permeability. Percolation range of 0 to 60 minutes per inch.

Septic Suitability Class B: Soils exhibiting MODERATE constraint characteristics in permeability. Percolation range of 61 to 100 minutes per inch.

Septic Suitability Class C: Soils exhibiting HIGH constraint characteristics in permeability. Percolation range of 101 to 300 minutes per inch.

Septic Suitability Class D: Soils exhibiting EXTREME constraint characteristics in permeability. Percolation range of 301 and over, minutes per inch.

Table 8-4 provides numerical information on the soil characteristics of Mariposa County in terms of a real suitability for septic systems.

Table 8-4: Soil Characteristics in Mariposa County

Septic Suitability Classification	Soil Depth		Permeability	
	Total Acres	Percentage	Total Acres	Percentage
A	19,531	4.14%	38,443	8.20%
B	24,926	5.29%	275,279	58.68%
C	162,524	34.48%	108,927	23.22%
D	264,432	56.09%	46,437	9.9%
Total Acreage	471,413	100.00%	469,086	100.00%

Source: Model Mountain County Development Program Document 1,
 Development Constraints Report, August 1980

According to the *Model Mountain County Development Program*, very little area in Mariposa County demonstrates the proper combination of minimum constraints. Although it appears that there is no single soil group that exhibits minimum permeability and soil depth characteristics, it should be noted that soils data are grouped to display the average characteristics of the soils. The grouping may create inclusions of specific soil types having minimum depth, permeability, and slope characteristics. According to the Resources Conservation District (RCD), a report delineating suitable areas for septic tanks should be available within the next ten years. Until that time, maps in the soil survey may be used to identify specific areas for suitability.

SHRINK-SWELL POTENTIAL

The shrink-swell potential of a soil describes the behavior of the soil when it comes into contact with moisture. The change in the volume of a soil is influenced by the clay mineralogy and percent clay content in the soil, as well as the amount of moisture change. The shrink-swell potential of soils needs to be taken into consideration as a design factor when planning building foundations, roads, and other structures. If the soil swells when in contact with moisture, then shrinks when the moisture evaporates, it has the potential to cause cracks in foundations, roads and other structures, creating potential human hazards and leading to property damage.

The three degrees of shrink-swell potential can be described as low, moderate, or high. Soils rated low in shrink-swell potential have few problems from shrinking and swelling and are more suitable for construction sites. The majority of the soils in Mariposa County have low to moderate shrink-swell potential. The Hillgate series, a light clay and clay loam, has a high shrink-swell potential, as do the Las Posas Clay, the Positas Clay, and the Trabuco Clay series.

EROSION

Although erosion is a natural component of the ecosystem, and is a primary factor in the shaping of the terrain of Mariposa County (

Figure 8-5), it is a process that has the potential for serious, harmful effects to people and property. The County's erosion rates vary with slope and soil characteristics, but are generally high in the foothill and mountain regions.

Human activities can significantly alter the natural processes of erosion and sedimentation by removing vegetation, loosening soil or altering drainage patterns. Wildfire, logging, conversion of forests to grazing land, construction, recreation, mining, overgrazing, and farming can cause accelerated erosion. These actions can result in soil loss, increased water runoff, and deposition of sediment in undesirable areas. Excessive sedimentation can reduce or degrade the aquatic habitats and water quality of lakes and streams while increasing the potential for flooding.

In Mariposa County, wildfire is one of the leading contributors to soil erosion. Although fire is often caused naturally, such as by lightning, man's activities greatly increase the potential frequencies and intensities of fire events. Wildfires burn the underbrush, thus exposing the soil to the elements. As soon as the first rains come, the water washes the newly exposed soil away. This situation is especially hazardous in areas with grades in excess of 50 to 80 percent. The runoff may in turn cause slumps, earth flows, landslides, and debris avalanches. Soil type and slope will largely determine the extent of these natural events.

Soil erosion on and around construction sites is another issue of concern. In the mid-1990's, the RCD received a grant from the Environmental Protection Agency to develop an agreement between the RCD, the County, and the Soil Conservation Service to create a grading ordinance to control construction erosion. The resulting ordinance provides the RCD with the authority to inspect construction sites to determine if a grading permit is required. Part of the permitting process requires a sediment and erosion control plan. While the RCD has not been able to fully document the success of this program, general observations conclude that construction-caused soil erosion has been largely controlled.

In addition to human activities, the County also has a high potential for accelerated erosion due to natural forces, with a combination of high rainfall rates, steep slopes and highly erosive soils providing the greatest erosion potential. Granite slopes, which are common in the County, are prone to accelerated erosion. Granite rock erodes through the expansion of a mineral named biotite, which causes a physical breakdown in the rock mantle. When the mantle is exposed to moving water and rock particles, the granite begins to wash away, usually bringing with it the decomposed remnants of biotite and feldspar.

Precipitation in the western part of the County is light, ranging from 12 to 35 inches annually (SCS, 1974). Rainfall rates increase rapidly to the eastward, becoming relatively heavy in the mountainous areas of the county, which may have up to 50 inches of rain per year. The process of water erosion of soil includes raindrop impact, which detaches soil particles and moves them a short distance; overland flow, which moves the particles greater distances; and stream flow, which transports the soil particles long distances. During the rainy season, the turbulent flows of mountain streams can carry considerable amounts of sediments downstream.

Utilizing the Soil Survey of Mariposa County, erosive soils have been inventoried in the *Model Mountain County Development Program* document by approximate acreage. Table 8-5 summarizes the acreage contained in each of these groupings.

Table 8-5: Erosion Potential in Mariposa County Soils

Erosion Potential Category	Acres	% of Total
Minimum	69,714	14.79%
Moderate	21,502	4.56%
High	221,823	47.05%
Extreme	158,374	33.60%
Total Acreage	471,413	100.00%

Source: Model Mountain County Development Program Document 1, Development Constraints Report, August 1980

Figure 8-5: Slopes of 15 Percent or Greater

Do to the size of this image; Figure 8-5 has been created as a separate file