

## **E - ENVIRONMENTAL RESOURCES**

### **4.0 BOTANICAL RESOURCES**

#### **4.1 Applicable Laws, Ordinances, Regulations, Statutes, and Plans**

Botanical resources in California are protected by a variety of federal, state, and local laws, ordinances, regulations, and statutes. In addition, numerous comprehensive plans and programs have been developed that include detailed policies and guidelines for management of botanical resources present in the vicinity of the Project. These laws, ordinances, regulations, statutes, programs, and plans, and their application to botanical resources in the Project area are summarized below.

##### **4.1.1 Eldorado National Forest Land and Resource Management Plan, as Amended**

The Eldorado National Forest (ENF) Land and Resource Management Plan (LRMP), as amended by the Sierra Nevada Forest Plan Amendment (SNFPA), is discussed in Section E1.1.1. The LRMP addresses fish, botanical, and wildlife resources and associated management strategies throughout the ENF, including the Project area. The LRMP includes a discussion of what kinds and amounts of fish, wildlife, and plant habitat should be protected in the ENF, and a list of Management Indicator Species (MIS) whose presence on ENF lands directs habitat protection and management practices. The management practices are then listed with standards and guidelines for their implementation.

##### **4.1.2 Desolation Wilderness Management Guidelines**

The 63,960-acre Desolation Wilderness was established pursuant to the Federal Wilderness Act in 1969. Several Project features are located within the boundaries of Desolation Wilderness including Rubicon Reservoir, Rubicon Dam, and the 0.2-mile-long Rubicon Tunnel, which conveys water from Rubicon Reservoir to Rockbound Lake, a non-Project facility. Resource management guidelines for Desolation Wilderness are identified in the Desolation Wilderness Management Guidelines Final Environmental Impact Statement (USDA 1998c).

##### **4.1.3 Clean Water Act Section 404 Dredge and Fill Permit**

Section 404 of the Clean Water Act (CWA) deals with the permit(s) required for dredge and fill. This program is discussed in Section E1.1.2. These permits require that the United States Army Corps of Engineers (USACE) consult with the United States Fish and Wildlife Service (USFWS) regarding potential impacts of dredge and fill activities on biological resources, which include botanical resources.

##### **4.1.4 Federal Endangered Species Act**

The Federal Endangered Species Act (ESA) is discussed in Section E3.1.4. The official federal list of endangered and threatened plants has been reviewed (Federal Register, 50 CFR 17.11) and six federally-listed species have been identified that may occur in the Project area:

- Layne's ragwort (*Senecio layneae*) (Threatened)
- Pine Hill flannel bush (*Fremontodendron californicum* ssp. *decumbens*) (Endangered)
- El Dorado bedstraw (*Galium californicum* ssp. *sierrae*) (Endangered)
- Pine Hill ceanothus (*Ceanothus roderickii*) (Endangered)
- Stebbin's morning glory (*Calystegia stebbinsii*) (Endangered)
- Sacramento Orcutt grass (*Orcuttia viscida*) (Endangered)

The first five listed species have a very high potential of occurring on the Pine Hill gabbro formation, which is crossed by the Project transmission line in western El Dorado County. Sacramento Orcutt grass occurs in the Project area, but has low potential to occur within the Project area due to lack of suitable habitat. For a further discussion, see Section 6, Federal Threatened and Endangered Species.

#### 4.1.5 Fish and Wildlife Coordination Act

The Fish and Wildlife Coordination Act (FWCA) is discussed in Section E3.1.5, and pertains to botanical resources as well as aquatic resources.

#### 4.1.6 Federal Protection of Wetlands

Former President Carter issued Executive Order 11990 for the protection of wetlands in 1977. The order requires federal agencies to avoid undertaking or providing assistance for new construction located in wetlands unless the head of the agency finds that there is no practicable alternative to such construction and that the proposed action includes all practicable measures to minimize harm to wetlands that may result from such use. Before making this finding, the head of the appropriate federal agency must take into account economic, environmental, and other pertinent factors. Specifically, each agency shall consider factors relevant to the proposal's effect on the survival and quality of the wetlands. These factors include:

1. Public health, safety, and welfare, including water supply, quality, recharge and discharge, pollution, flood, and storm hazards, and sediment and erosion
2. Maintenance of natural systems, including conservation and long term productivity of existing flora and fauna, species and habitat diversity and stability, hydrologic utility, fish, wildlife, timber, and food and fiber sources
3. Other uses of wetlands in the public interest, including recreational, scientific, and cultural

The term "wetlands," as defined by the USACE, includes those areas that are inundated by surface or groundwater with a frequency sufficient to support and under normal circumstances do or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction. Note that Executive Order 11990 does not apply to the issuance of permits, licenses, or allocations to private parties for activities involving wetlands on non-federal lands by federal agencies.

#### 4.1.7 Federal Prevention of Introduction of Invasive Species

Executive Order 13112, signed on February 3, 1999, is intended to prevent the introduction of invasive species and provide for their control, as well as to minimize the economic, ecological, and human health impacts that invasive species cause. An "invasive species" is a species: 1) that is non-native (or alien) to the ecosystem under consideration and 2) whose introduction causes or is likely to cause economic or environmental harm, or harm to human health. Alien species that do not meet the second criteria are not considered to be invasive species. Invasive species typically have high reproductive rates, disperse easily, can tolerate a wide range of environmental conditions, and often lack predators in their new environments. As a result, invasive species may out-compete native species for prey, breeding sites, or other life requisites. They may also prey upon native species, spread pathogens and parasites, or alter the genetic make up of closely related species. Wilcove et al. (1998) estimate that invasive species have contributed to the placement of 35 to 46 percent of the plants and animals on the Endangered Species List.

All Federal land and water management agencies within the United States Department of Agriculture (USDA) and United States Department of Interior (USDO) have authority to control and manage invasive species as well as restore affected areas on their lands and waters. Federal agencies also work in partnership with states and private landowners to control invasive species on public lands. Under Executive Order 13112, federal agencies whose actions may affect the status of invasive species are required to: 1) identify such actions; 2) use relevant programs and authorities to prevent, control, monitor, and research such species; and 3) not authorize, fund, or carry out actions that they believe are likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere. Federal agencies must pursue these duties in consultation with the Invasive Species Council, consistent with the Invasive Species Management Plan. This order also establishes an Invasive Species Council, which provides national leadership regarding invasive species. The Council oversees the implementation of this order and ensures that federal agency activities concerning invasive species are coordinated, complementary, cost-efficient, effective, and rely on existing organizations already in place that address invasive species issues.

Executive Order 13112 directed the National Invasive Species Council, a top-level organization comprised of the secretaries of the United States Cabinet departments, to prepare an invasive species management plan (National Invasive Species Council 2001). Key objectives of the Plan that could relate to the Project are: 1) identify pathways (e.g., connecting waterways) by which invasive species move and develop mechanisms to reduce this movement; 2) improve coordination among federal, state, and local agencies for the control of invasive species; and 3) develop and issue recommendations for restoration of native species in habitats that have been invaded. Among other tasks, the Plan directs federal resource agencies to institute systematic monitoring surveys by January 2003 of locations where introductions of invasive species typically occur, including reservoirs, utility rights-of-way, and recreation sites.

#### 4.1.8 Noxious Weed Act

Public Law 93-629 (7 U.S.C. 2801 et seq.; 88 Stat. 2148), enacted January 3, 1975, established a federal program to control the spread of noxious weeds. Under this law, the Secretary of Agriculture was given the authority to designate plants as noxious weeds by regulation, and the movement of all such weeds in interstate or foreign commerce was prohibited except under permit. The Secretary was also given authority to inspect, seize, and destroy products and to quarantine areas, if necessary, to prevent the spread of such weeds. In addition, the Secretary was authorized to cooperate with other federal, state, and local agencies, farmers associations and private individuals in measures to control, eradicate, or prevent or retard the spread of such weeds.

Section 1453 of Public Law 101-624 (a.k.a. the 1990 Farm Bill), enacted November 28, 1990 (104 Stat 3611), amended the Act by requiring each federal land managing agency to: 1) designate an office or person adequately trained in managing undesirable plant species to develop and coordinate a program to control such plants on the agency's land; 2) establish and adequately fund this plant management program through the agency's budget process; and 3) complete and implement cooperative agreements (requirements for which are provided) with each state regarding undesirable plants on agency land and establish integrated management systems (as defined in the section) to control or contain undesirable plants targeted under the cooperative agreements. The law also requires that any environmental assessments or impact statements that may be required to implement plant control agreements must be completed within one year of the time the need for the document is established.

#### 4.1.9 Sacramento River-San Joaquin River Water Quality Control Plan

The Sacramento River-San Joaquin River Water Quality Control Plan (Basin Plan) is discussed in Section E2.1.6. The plan specifies that designated beneficial uses of the Middle Fork American River (MFAR) and South Fork American River (SFAR) include wildlife habitat, which is defined by the Regional Water Quality Control Board (RWQCB) to include wetlands and vegetation, among other resources.

#### 4.1.10 California Endangered Species Act

The CESA is discussed in Section E3.1.7. The California Natural Diversity Database (CNDDB) and California Native Plant Species (CNPS) databases were reviewed and seven state-listed species that may occur in the Project area were identified:

- Layne's ragwort (*Senecio layneae*) (Rare)
- Pine Hill flannel bush (*Fremontodendron californicum* ssp. *decumbens*) (Rare)
- El Dorado bedstraw (*Galium californicum* ssp. *sierrae*) (Rare)
- Pine Hill ceanothus (*Ceanothus roderickii*) (Rare)
- Stebbin's morning glory (*Calystegia stebbinsii*) (Endangered)
- Sacramento Orcutt grass (*Orcuttia viscida*) (Endangered)
- Tahoe yellow cress (*Rorippa subumbellata*) (Endangered)

The first five species have a very high potential of occurring in the Project area. These five species are known to occur on the Pine Hill gabbro formation, which is crossed by the Project transmission line and the SFAR in western El Dorado County. The last two state-listed species, Sacramento Orcutt grass and Tahoe yellow cress occur in the Project area, but have low potential to occur within the Project area due to lack of suitable habitat.

#### 4.1.11 California Fish and Game Code Section 1601 Streambed Alteration Agreement

Section 1601 of the California Fish and Game Code relates to the Department's Streambed Alteration Agreement program and is discussed in Section E1.1.3. These regulations require that the California Department of Fish and Game (CDFG) assess the impacts of activities in the streambed on biological resources, which include botanical resources.

#### 4.1.12 California Native Plant Protection Act

The California Native Plant Protection Act (CNPPA) regulates taking, importing, possessing, or selling plant species designated by the California Fish and Game Commission as rare or endangered (Fish and Game Code Sec. 1908), within the state. The CNPPA establishes definitions for rare and endangered plant species. According to the CNPPA, a species is rare when, "...although not presently threatened with extinction, it is in such small numbers throughout its range that it may become endangered if its present environment worsens; a species is endangered when...its prospects of survival and reproduction are in immediate jeopardy from one or more causes" (Fish and Game Code Sec. 1901). The CNPPA applies to all land within California, except where the taking or selling is incidental to the possession or sale of the real property on which the plant is growing (Fish and Game Code Sec. 1908). The CNPPA does not apply to the regulation of agricultural operations or management practices; to timber harvest plans and mining assessment work pursuant to state and federal laws; to clearing activities by the owner of the land in a canal, lateral ditch, building site, road, or other right-of-way; or to the provision of the public services by a public agency or public utility. However, if the landowner was notified by CDFG of the presence of a rare or endangered species, the landowner must give the CDFG 10 days of notice before destroying protected plants, to allow for salvage.

#### 4.1.13 California Wetlands Conservation Policy

Former Governor Pete Wilson signed Executive Order W-59-93, creating the nation's first statewide comprehensive wetlands program. The goal of the California Wetlands Conservation Policy is to establish a policy framework and strategy that will: 1) ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetland acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property; 2) reduce procedural complexity in the administration of state and federal wetland conservation programs; and 3) encourage partnerships to make landowner incentive programs and cooperative planning effort the primary focus of conservation and preservation.

#### 4.1.14 El Dorado County General Plan

The EDC General Plan is discussed in Section E3.1.11, as it pertains to botanical resources.

#### 4.1.15 Sacramento County General Plan

The Sacramento County General Plan is discussed in Section E3.1.12, as it pertains to botanical resources.

#### 4.1.16 Federal Power Act

The Federal Power Act, in particular sections 4(e), 10(j) and 18 of the act, are described in Section E1.1.4.

### **4.2 Overview**

#### 4.2.1 Historical Trends

The discovery of gold at Sutter's Mill on the South Fork American River in 1848 marks the beginning of land use activities that have shaped the Sierra Nevada mountains and foothills landscape into what we see today (University of California 1996). Along with new prosperity in the Sierra Nevada came a demand for wood and food products to support the mining industry and a growing population.

The timber industry thrived in support of the mining industry. The focus of timber harvesting was the high quality wood products provided by the pine-dominated (ponderosa, Jeffrey, and sugar) Sierra Nevada forests. Early timber and mining activities and the increasing number of human inhabitants contributed to forest fires on a scale that exceeded the natural fire regimes. The combination of these activities produced forests that were dominated by white fir and Douglas-fir following timber harvest or converted to shrub-dominated vegetation following fire.

Mining activities, timber harvest and log transportation in streambeds contributed to a historic reduction of riparian vegetation along stream reaches in the Sierra Nevada (University of California 1996). The degree to which these activities have influenced the riparian vegetation cannot be precisely determined due, in most cases, to the lack sufficient documentation of pre-existing conditions.

Grazing by cattle and sheep in the foothill and montane Sierra Nevada landscape in the late 1800s is believed to have initiated the reduction in native perennial herbaceous species. Over grazing and the introduction of non-native European annual grasses that thrive in disturbed, over-grazed sites are the primary factors behind the decline of many native perennial herbaceous species (University of California 1996).

The early 20<sup>th</sup> century saw the establishment of the National Forest System and the era of regulated use of the of the Sierra Nevada landscape by government agencies. The primary focus of early regulations was the production of timber resources. The policy of fire suppression was instituted to protect the timber resources and has been in practice for the last 80 to 100 years following the era of human-caused forest fires in the late 1800s and early 1900s. This policy has contributed to the maintenance of white fir and Douglas fir-dominated, mixed conifer forests present at mid-elevations in the general Project area today. Wildland fire prior to the onset of

European occupation is widely believed to have occurred more frequently and on a smaller scale thereby reducing woody fuel in a gradual way. Today, a tremendous fuel load in the dense Sierran mixed conifer forests creates the potential for disturbance on a large, intensive scale through catastrophic wildland fire. The 1992 Cleveland fire is a prime example of a large scale, catastrophic fire.

By the 1950s, the mining and grazing land uses were in decline relative to other forestland uses (University of California 1996). However, the increasing human population of California and Nevada helped increase the demand for wood products and water resources, and created a greater demand for more recreation opportunities. In addition, the demand for electricity brought about the development and construction of the Project and other hydroelectric projects along the western slope of the Sierra Nevada, primarily in the 1940s and 1950s. These land uses have resulted in construction of access roads, campground developments and boat ramps at reservoirs, fishing, horse-packing and hiking trails, and establishment of transmission line rights-of-way. These land uses and increasing urbanization, especially in the Sierra Nevada foothills, have resulted in modern vegetation, as a whole, that has fewer historical components including the following sensitive vegetation communities: riparian, open ponderosa pine stands, old growth forests, vernal pools, late successional conifer forest, valley oak woodland, and perennial grasslands.

The ground disturbance associated with these types of land uses has created a habitat conducive to invasive and noxious weed establishment. Native, undisturbed vegetation is generally resistant to the establishment of most noxious and invasive weed species. However, once the native vegetation is fragmented and the ground is disturbed it becomes prime habitat for noxious and invasive weed species. These disturbed areas are likely to be invaded when weed seeds are introduced by forest users and other natural dispersal mechanisms. Noxious and invasive weeds are problematic typically because they are toxic in some way to livestock or they are invasive and out compete native plant species and displace native vegetation. Historical and current land use also has affected certain plant species in the Sierra Nevada mountains and foothills. A plant species typically achieves special status because it is restricted in its distribution and its habitat or survival is threatened, usually by a combination of land uses. Special status species and noxious and invasive weeds therefore are managed with ever-increasing intensity as the different land uses continue to affect their habitats and distributions.

In the past several decades, the introduction of various federal, state, and local statutes, comprehensive plans and management practices has established a set of rules by which to protect key botanical resources in the Sierra Nevada mountains and foothills.

#### 4.2.2 Current Status

The vegetation information provided below is based on the *CalVeg GeoBook* (USDA 2000a) that provides vegetation mapping for the northern Sierra Nevada mountains and foothills utilizing the CalVeg classification scheme. The main source of existing information for the Project was obtained from the Botanical Resources Inventory Report (KEA Environmental 2000). The Botanical Resources Inventory Report (hereafter referred to as the “2000 botanical inventory”) includes vegetation descriptions, field-verified vegetation mapping within the Project area

around many of SMUD's facilities, the results of special-status plant and noxious weed surveys, vegetation community data collection at 45 representative plots, and mapping of botanical resources. The 2000 botanical inventory covered botanical resources within the Project area at reservoir margins, powerhouses, adits, Gerle Canal, major access roads, some aboveground penstocks and narrow lengths of stream reaches where the streams intersect the reservoirs. Stream reaches, as discussed below, and transmission line corridors were not surveyed in detail in 2000. The river reach vegetation descriptions are based on portions of river reaches surveyed in detail, general observations of river reaches made during the 2000 botanical inventory, review of the CalVeg vegetation map, and review of the ENF meadow inventory data.

The following sections provide a summary of current findings from existing information about botanical resource within the Project area including the results of the 2000 botanical inventory. The botanical resources specific to key project river reaches and facilities are summarized in Section E4.3.

#### 4.2.2.1 Vegetation Types

Twenty-six vegetation communities and two other designations (wet areas including shoreline, riverside, riparian, and seeps, as well as barren/rocky areas) were identified in the geographical area during the 2000 botanical inventory and appraisal of the CalVeg vegetation map. These plant communities are described below. Common plant names are used in the vegetation descriptions and generally follow Hickman (1993), Weedan (1996), and Abrams (1940, 1944, 1951; Abrams et al. 1960). The scientific names follow Hickman (1993).

##### DouglasFir/Pine Alliance

The Douglasfir/Pine Alliance is characterized by abundant Douglasfir in the tree layer with ponderosa pine relatively more abundant on warmer aspects. Sugar pine is widely distributed and locally abundant. Some stands have Douglasfir and ponderosa pine forming a dense tree layer with a shrub understory layer comprised of species that are often more abundant in chaparral alliances. Canyon live oak is abundant or common as a shrub or secondary tree layer, as are black oak, California nutmeg, bigleaf maple, and California bay. The shrub layer can be dense with conifer and oak regeneration as well as hazelnut, mock orange, wood rose, serviceberry, poison oak, California buckeye, whiteleaf manzanita, and California nutmeg. The shaded herb layer includes species such as woodland brome grass, tall trisetum, western fescue, imbricate sword fern, and licorice fern.

##### Ponderosa Pine Alliance

In this alliance, ponderosa pine is the dominant tree-layer species, and typically with a very open canopy. The understory has scattered canyon live oak and an herb layer dominated by annual bromes and fescues. This stand has an herb layer similar to dryer stands of the Black Oak Alliance with mustang clover, pink chorizanthe, annual lupine, toothed lotus, purple clarkia, rattlesnake weed, elegant brodiaea, glabrous cats ear, and goldenback fern.

##### DouglasFir Alliance

This alliance exhibits frequent transitions to the Douglasfir/Pine and Canyon Live Oak Alliances and generally occurs on north aspect slopes and is shaded and moist. Douglasfir overtops an

abundant secondary tree layer of canyon live oak, and a shrub layer comprised primarily of bigleaf maple, hazelnut, whiteleaf manzanita, wood rose, tan oak, deerbrush, black oak, thimbleberry, and mountain dogwood. Common herb layer species include Hartweg's iris, multistemmed sedge, Hooker fairy bells, western fescue, Geyer's onion grass, wood strawberry, white flowered hawkweed, and imbricate sword fern.

#### Mixed Conifer/Pine Alliance

The Mixed Conifer/Pine Alliance typically has abundant white fir and Douglasfir, and lesser amounts of incense cedar, sugar pine, Jeffrey pine, and ponderosa pine in the tree layer. The understory often consists of shrubby tan oak, mountain dogwood, serviceberry, and hazelnut. Less abundant shrub-layer species include bracken fern, thimbleberry, wood rose, *Vaccinium* sp., and deerbrush. The herb layer may be dense in places with single flowered clintonia, trail plant, creeping snowberry, white veined wintergreen, elegant piperia, Hooker's fairy bells, and rattlesnake plantain.

#### Mixed Conifer/Fir Alliance

Mixed Conifer/Fir Alliance stands have multi-layered tree canopies and a highly variable shrub and herb-layer cover. White fir is almost always the most abundant tree-layer species, followed by Jeffrey pine, incense cedar, and sugar pine. Lodgepole pine is an important tree-layer species adjacent to wet areas. Red fir is rare in Mixed Conifer/Fir Alliance stands and restricted to the coolest sites. Ponderosa pine is common but not an important component of most stands. It is abundant where it has been planted around recreation facilities and for reforestation projects. Western white pine, western juniper, and mountain hemlock also occur in stands at higher elevations.

In stands with more open tree layers, shrub cover increases with species such as mountain whitethorn, greenleaf manzanita, bush chinquapin, bitter cherry, Sierra coffeeberry, canyon live oak, and, at higher elevations, huckleberry oak and cream bush. The herb layer under dense canopies is sparse, with Ross's sedge, multi-stemmed sedge, bracken fern, western fescue, and prince's pine. Mesic versions of dense stands also include herb-layer species like woolly violet (an ENF watch-list species), rattlesnake plantain, wood strawberry, trail marker, thimbleberry, Lemmon's silene, little prince's pine, bleeding hearts, and kelloggia. Very mesic stands may have dense shrub layers with western azalea and Sierra laurel. Some wet, forested sites have an herb-layer component that includes triangle-leaf butterweed, enchanter's nightshade, columbine, bishop's cap, common monkey flower, smooth yellow violet, small tiger lily, sheep sorrel, common mouse ear chickweed, white flowered bog orchid, double honeysuckle, thimbleberry, broad leaved lupine, pretty face, rosy everlasting, mountain spiraea, Gray's lovage, parsley fern, wandering daisy, mountain fly honeysuckle, smooth yellow violet, mountain alder, western blueberry, California corn lily, and Scouler's willow.

Under less dense tree canopies on dry, well-drained sites, the herb layer becomes more abundant and diverse with common species being Orcutt's brome, dogbane, Sierra lotus, western wallflower, blue wildrye, creeping snowberry, squirreltail grass, Nelson's needlegrass, and western needlegrass. Some stands with rocky or bedrock exposures have mountain whitethorn, mountain misery, greenleaf manzanita, canyon live oak, Newberry's penstemon, Hooker's fairy bells, Solomon's seal, and a greater pine component in the tree layer.

Stands with coarse, granitic sand substrates and very open tree canopies support Thurber's needlegrass, western needlegrass, woolly sunflower, squirreltail, gay penstemon, awned onion grass, mountain misery, Brewer's fleabane, Lassen fleabane, Newberry's penstemon, naked stemmed buckwheat, mahala mat, Bolander's bedstraw, mountain naverettia, hemizonella, and common cryptantha.

#### White Fir Alliance

This alliance occurs as inclusions within many parts of the Mixed Conifer/Fir Alliance and often occurs in cool depressions. White fir is the dominant tree species in this alliance.

#### Lodgepole Pine Alliance

The Lodgepole Pine Alliance grows in nearly pure stands of lodgepole pine along some reservoir and meadow margins. The shrub layer is often dense with bracken fern, California corn lily, triangle-leaf butterweed, narrow-leaved lotus, smooth yellow violet, and one-sided wintergreen. In drier areas, stands have the shrub-layer species more characteristic of the Huckleberry Oak Alliance.

In dense stands, the herb layer is very sparse, with low cover and few species, including little prince's pine and wood rush. More diverse herb layers may also include naked stemmed buckwheat, tinker's penny, sticky cinquefoil, small tiger lily, dogbane, sheep sorrel, *Arabis* sp., and green-headed rush. Other stands have nearly monotypic shrub layers with red huckleberry or bracken fern.

In some areas, Lodgepole Pine Alliance stands that have a shallow water table support lush and rather diverse understories containing columbine, mountain maple, meadow rue, red paintbrush, Gray's lovage, nodding arnica, large-leaved lupine, smooth yellow violet, broad-petaled strawberry, California corn lily, trifold bedstraw, rosy everlasting, sweet cicely, leather fern, lesser star tulip, kelloggia, white-flowered hawkweed, Parish's yampah, green-headed rush, triangle-leaf butterweed, wandering daisy, small tiger lily, one-sided wintergreen, and narrow-leaved lotus. Stands at the wettest reservoir margins support creeping buttercup, sheep sorrel, small-fruited bulrush, sedges, and rushes.

#### Foothill Pine Alliance

This alliance occurs in the Sierra Nevada foothills and typically forms an open, sparse tree layer that overtops several different shrub-dominated alliances. Shrub-layer species include shrub forms of interior live oak and canyon live oak, chamise, California buckeye, toyon, coffeeberry, wedgeleaf ceanothus, and whiteleaf manzanita.

#### Black Oak Alliance

The Black Oak Alliance often occurs as large continuous stands with black oak as the dominant tree species, particularly in locations where conifers have been historically removed. Tree regeneration includes Douglas fir, ponderosa pine, incense cedar, black oak, canyon live oak, and sugar pine and is often the dominant shrub-layer component. Other shrub-layer species include whiteleaf manzanita, poison oak, greenleaf manzanita, bitter cherry, Sierra plum, Sierra coffeeberry, deerbrush, mock orange, keckiella, and *Ribes* sp. The herb layer is typically sparse with sweet cicely, western fescue, Sierra milkwort, and imbricate swordfern. Mesic microsites

support lush herb layers comprised of blue wildrye, Harford's onion grass, Geyer's onion grass, multi-stemmed sedge, Hartweg's iris, hairy honeysuckle, large flowered agoseris, capitate gilia, and woodland brome grass. Litter cover is generally dense at 65 to 100 percent comprised of primarily black oak leaves.

#### White Alder Alliance

In the Project area, this alliance is characterized by tall white alder trees forming a sparse and patchy canopy along some perennial and intermittent drainages. The Canyon Live Oak Alliance and Douglas fir/Pine Alliance closely abut the White Alder Alliance to provide dense shade over some creeks. The White Alder Alliance species include white alder, rhubarb, Himalayan blackberry, cut-leaved blackberry, panicgrass, California bay, St John's wort, common rush, California blackberry, sheep sorrel, arroyo willow, miner's dogwood, bigleaf maple, western boykinia, serviceberry, common monkey flower, scarlet monkey flower, alpine lily, and sedges.

#### Mixed Hardwoods Alliance

This alliance occurs in the Sierra Nevada foothills. The tree layer includes any combination of canyon live oak, interior live oak, black oak, and blue oak. Inclusions of lower elevation chaparral species include *Ceanothus* sp., chamise, California coffeeberry, toyon, hollyleaf redberry, and poison oak.

#### Blue Oak Alliance

This alliance is abundant in portions of the Sierra Nevada foothills. Blue oak occurs in open to nearly continuous canopies. Foothill pine and valley oak can be frequent tree-layer species in some stands. Shrub-layer cover is highly variable and may include wedgeleaf ceanothus, interior live oak, linearleaf goldenbush, and birchleaf mountain mahogany. The herb layer is most often dominated by introduced annual grasses and can have a significant component of annual herbs as well.

#### Valley Oak Alliance

The CalVeg map shows small sections of this alliance in the vicinity of the western portion of the Project area. This riparian alliance is dominated by valley oak and likely can be found in some of the wider river valley bottoms in the Sierra Nevada foothills.

#### Willow Alliance

This alliance is dominated by shrub and/or tree growth forms of willow (*Salix* sp.). It is typically found in small clumps along reservoir margins and seep areas throughout the Project area. The most common willow species are likely to be arroyo willow, narrow-leaf willow, Pacific willow, and red willow. No large Willow Alliance patches were observed during the 2000 botanical inventory.

#### Chamise Alliance

This alliance occurs at certain areas in the Sierra Nevada foothills. Chamise often dominates xeric sites, including ridgetops and south aspects. Chamise grows in nearly pure stands with minor associates including wedgeleaf ceanothus, toyon, whiteleaf manzanita, poison oak, and interior live oak.

### Canyon Live Oak Alliance

The Canyon Live Oak Alliance is most abundant in the main river canyons along SFAR and Silver Creek, especially on south-aspect slopes. In some areas, the Canyon Live Oak Alliance stands grow on north-aspect slopes and have a very dense shrub layer. The dominant cover consists of tree and shrub forms of canyon live oak. Abundant shrub-layer species include deer brush, California buckeye, toyon, bigleaf maple, chaparral broom, and mock orange. Open areas support an herb layer composed of onion grass, bluegrass, blue wildrye, bur chervil, white flowered hawkweed, as well as annual brome and fescue species. Mesic understory species include thimbleberry, goose grass, miner's lettuce, hairy honeysuckle, manroot, mountain misery, and lady fern.

Canyon Live Oak Alliance stands growing on north aspect slopes generally have dense, tall canopies with mesic and often multi-layered understories. On north aspects Canyon Live Oak Alliance stands occur on the lowest, steeper slopes above reservoirs, but below the more abundant Douglas fir/Pine Alliance. Scattered large conifers, Douglas fir, ponderosa pine, and foothill pine are consistent components of a taller, sparse overstory layer. The shrub layer is dense with bigleaf maple, hazelnut, California bay, wood rose, poison oak, canyon live oak, mock orange, California buckeye, gooseberry, and California nutmeg. The herb layer is shaded and comprised of draperia, Harford's onion grass, wood fern, California sword fern, imbricate sword fern, fragile fern, heuchera, licorice fern, and hedge parsley.

Warmer aspects support large Canyon Live Oak Alliance stands with more open canopies, grassy openings, tall moss-covered canyon live oak trees, and moss-covered rock outcrops. The shrub layer on these aspects is dense to sparse with toyon, mock orange, Douglas fir, whiteleaf manzanita, deerbrush, keckiella, hollyleaf coffeeberry, Sierra coffeeberry, California buckeye, and interior live oak. Grass-dominated openings include Nuttall's fescue, rattail, annual bromes, hedgehog dogtail, goldenback fern, polygala, hairy honeysuckle, woolly sunflower, wild hyacinth, climbing bedstraw, small headed clover, rattlesnake weed, and California melic. Adjacent rock outcrops include mosses, hens and chickens, silver leaved lotus, and bush monkey flower. Some stands have an abundant poison oak component along with occurrences of Fremont's silktassel, foothill ash, virgin's bower, and California nutmeg. Herb layer species include *Fritillaria* sp., starflower, globe lily, Harford's onion grass, retrorse agoseris, tree clover, Hartweg's tauschia, and soap root.

### Foothill Mixed Chaparral

This alliance occurs in the Sierra Nevada foothills and generally in small areas on mesic slopes among other more widespread chaparral vegetation types. A wide variety of *Ceanothus* species, chamise, Fremont's silk tassel, and birch leaf mountain mahogany are common associates.

### Northern Mixed Chaparral Alliance

At certain locations, this alliance is especially diverse, with many shrub species forming a dense shrub layer. Characteristic shrub species include hoary coffeeberry, deer brush, chaparral broom, scotch broom, poison oak, mock orange, toyon, black oak, whiteleaf manzanita, keckiella, California buckeye, and interior live oak. Tall emergent tree cover is sparse with ponderosa pine, foothill pine, and canyon live oak. The herb layer provides dense cover below shrubs in more mesic areas on certain north aspect slopes.

At other locations, this alliance may mix with the White Leaf Manzanita Chaparral Alliance. These two alliances differ in their shrub layer, with the latter dominated solely by whiteleaf manzanita. The Northern Mixed Chaparral Alliance has a shrub layer that includes deerbrush, mock orange, Sierra coffeeberry, black oak, canyon live oak, keckiella, and whiteleaf manzanita. These alliances often have emergent trees including black oak, Douglas-fir, canyon live oak, incense cedar, and ponderosa pine. The herb layer for both alliances is similar with mountain misery, Lemmon's stipa, western morning glory, azure penstemon, soap plant, wild hyacinth, mountain monardella, slender tarweed, and annual grasses.

Rocky openings in the shrub layer of this alliance are representative of the ENF Sensitive Lava Cap Community. Mustang mint, awned slender wheatgrass, pussy paws, Parry's knotweed, pretty face, tuberous sanicle, western thistle, white and yellow monkey flower, racemose phacelia, mountain navarettia, toothed horkelia, William's clarkia, and Purpus's phacelia are closely associated with the lava cap community.

#### Interior Live Oak Alliance

At lower elevations of the Project, this alliance occurs where interior live oak takes on a true tree growth form especially on north aspects. Foothill pine, California buckeye, poison oak, whiteleaf manzanita, blue oak, and black oak are common associates.

At higher elevations, interior live oak occurs as large shrubs and frequently is associated with canyon live oak. The shrub layer is often dominated by large interior live oak shrubs. Toyon, whiteleaf manzanita, poison oak, chaparral broom, hollyleaf coffeeberry, canyon live oak, black oak, California buckeye, and foothill pine may be common and locally abundant. Western virgin's bower, hairy honeysuckle, and climbing bedstraw often vine through the shrubs, and the abundant herb layer often includes annual bromes and fescues, mustang clover, twining brodiaea, small-headed clover, filago, blue dicks, slender tarweed, hairy clover, and short pod lotus.

This alliance has many inclusions of rock outcrop, with associated plant species including hen and chickens, capitate gilia, brachypodium, branching phacelia, California melic, rattlesnake weed, hedge parsley, purple clarkia, pink chorizanthe, golden back fern, poison oak, and pterostegia.

#### Montane Mixed Chaparral Alliance

In certain areas, the Montane Mixed Chaparral Alliance shrub layer is dominated by canyon live oak and greenleaf manzanita, with whiteleaf manzanita and/or mountain whitethorn abundant in some stands. Other frequently occurring shrubs include California coffeeberry, serviceberry, Fremont's silktassel, Sierra plum, deerbrush, and Sierra gooseberry. Common herb-layer species include bluegrass, mountain streptanthus, imbricate swordfern, lace fern, hemizonella, Torrey's mimulus, mountain monardella, fringe pod, rock daisy, Gray's lupine, Indian's dream, Bridge's cliff brake, *Lomatium* spp., Stebbin's phacelia, hens-and-chickens, rhomboid clarkia, Pleasant Valley mariposa lily, naked buckwheat, Sierra sedum, awned slender wheatgrass, cheat grass, rattail, Nuttall's vulpia, California skullcap, soap plant, Sierra morning glory, and gay penstemon.

### Montane Mixed Shrub Alliance

This alliance is nearly indistinguishable from the Montane Mixed Chaparral Alliance in many areas within the Project area. Greenleaf manzanita and mountain whitethorn are dominant species in the shrub layer with lesser amounts of bush chinquapin, bitter cherry, black oak, Sierra coffeeberry, Scouler's willow, and huckleberry oak. Some stands have large or small (ponderosa pine plantation) emergent conifers. The herb layer is much the same as that found in the open mixed-conifer stands. Most Montane Mixed Shrub Alliance vegetation in the area seems to be the result of tree canopy removal by wildfire. Some additional herb layer species include mountain monardella, white-stemmed stickleaf, Nevada stickleaf, soap plant, large flowered collomia, and hastate leaf phacelia.

### Huckleberry Oak Alliance

Huckleberry oak is the dominant shrub species of this alliance. Pinemat manzanita, mountain whitethorn, greenleaf manzanita, wedgeleaf ceanothus, Scouler's willow and cream bush, are common associates. Western juniper, white fir, Jeffrey pine, and lodgepole pine are scattered within this alliance. Common herbaceous species include Parry's rush, gay penstemon, King's arenaria, Douglas' silene, Quick's phacelia, Stebbins' phacelia (ENF sensitive species), western needlegrass, Ross' sedge, Wright's buckwheat, bear valley eriogonum, hoary buckwheat, Lemmon's keckiella, mountain streptanthus, Bridges cliff brake, Torrey's lupine, three toothed horkelia, nodding scorzonella, and pussy paws. Slender muhly, short grass sedge, Clement's bulrush, Kellogg's knotweed, and Parish's yampah may grow in coarse, granitic sandy depressions among the shrubs.

In addition to huckleberry oak, the shrub layer at some locations includes lesser abundance of Sierra coffeeberry, greenleaf manzanita, bitter cherry, pine mat manzanita, and mountain whitethorn. Some of the oaks in the shrub layer appear to have intermediate characteristics between huckleberry oak and canyon live oak. White fir, Jeffrey pine, sugar pine, incense cedar, and black oak are scattered throughout these stands. The tree species are often stunted, with canopies no taller than those of the shrub layer. Mountain misery, Bolander's bedstraw, Newberry's penstemon, gay penstemon, naked stemmed buckwheat, Wright's buckwheat, western needlegrass, Ross' sedge, multistemmed sedge, Brewer's fleabane, Howell's rock cress, Quick's phacelia, dog bane, bristly-leaved rock cress, and rattail form a sparse herb layer in openings among shrubs. Bracken fern, broad petaled strawberry, false Solomon's seal, dogbane, and mountain spiraea often grow at shrub fringes.

Huckleberry oak has highly variable cover that varies conversely with the dominant granitic bedrock cover that dominates much of the landscape in the Desolation Wilderness Area. Greenleaf manzanita, pine mat manzanita, cream bush, bitter cherry, mountain whitethorn, and Sierra gooseberry are locally abundant. Scouler's willow, serviceberry and bracken fern have sparse distribution. White fir, Jeffrey pine, western juniper, red fir and lodgepole pine are widely scattered or in small, isolated clumps.

### Mountain Alder Alliance

This alliance occurs in small pockets along the margins of some wet meadows in the Project, with associated species being American dogwood, mountain fly honeysuckle, mountain spiraea, California corn lily, bracken fern, and lodgepole pine. Herb-layer species include creeping

bentgrass, ticklegrass, tall mannagrass, single-stemmed butterweed, bishop's cap, Solomon's seal, swamp onion, northern willow herb, pearly everlasting, lady fern, common rush, smooth yellow violet, and meadow rue. Quaking aspen closely borders the alliance in some areas.

#### Wet Areas: Seeps, Shoreline, Riverside, and Riparian

The areas described here are wet areas with sparse or patchy vegetation that precludes a more formal designation using the CalVeg classification scheme because there is no dominant tree, shrub, or herb layer (all layers less than 10 percent cover). These areas may also have dense, continuous vegetation with unclear species dominance that precludes assigning a name to the vegetation under conventional classification schemes.

Dense scrub riparian vegetation includes slender willow, arroyo willow, red willow, Fremont's cottonwood scattered among large patches of Himalayan blackberry, and several chaparral shrub species. Seeps are characterized often by small clumps of willows (red willow, arroyo willow, slender willow) and may include sedges, chain fern, scarlet monkey flower, twisted stalk, large-leaved lupine, bleeding hearts, mugwort, Himalayan blackberry, cutleaf blackberry, Pacific yew (ENF watch-list species), and Fremont's cottonwood. Streamside taxa often include a few tall white alder, redbud, hazelnut, California silene, California wild grape, Himalayan blackberry, miner's dogwood, and a dense moss and fern layer. Shoreline species include some species mentioned above, along with occurrences of Jerusalem oak, slender rush, self heal, curly dock, yellow wintercress, tinkers penny, ox-eye daisy, mugwort, St John's wort, rabbitsfoot grass, and plantain. Reservoir margins may also have a number of hydrophilic species with the most common species being common monkey flower, Baltic rush, common rush, toad rush, iris-leaved rush, sedges, Bolander's sedge, narrow-leaved lotus, sticky cinquefoil, small-fruited bulrush, and mugwort.

#### Wet Meadow: Grass/Sedge/Rush Alliance

Small, wet meadows occur above within the Project area. Arroyo willow, mountain spiraea, and cream bush often occur on meadow fringes or as individual shrubs within meadows. The herb layer is fairly low and has wet, rocky gravelly openings. Common herb layer species include scouring rush, iris-leaved rush, green-headed rush, Baltic rush, slender rush, woods strawberry, American speedwell, narrow-leaved lotus, self heal, and sheep's sorrel.

Other meadows may be dominated by graminoid species with tall emergent forbs. Meadow edges may also have lodgepole pine, single flowered clintonia, smooth yellow violet, columbine, small tiger lily, sweet scented bedstraw, leather grape fern, and western azalea. Taller forbs of interior meadow sites often include Bolander's tarweed, death camas, western bistort, Oregon saxifrage, white-flowered bog orchid, cow bane, sparse-flowered bog orchid, and bigleaf avens. Low forb and graminoid species include Parish's spike rush, three-stamened rush, green-headed rush, common rush, and creeping checker.

At higher elevations of the Project, wet meadows are often associated with shallow-sloped reservoir margins. Sedges, including beaked sedge and two other unidentified sedges, dominate these species-poor meadows. Additional species in these reservoir margin meadows are tufted hair grass, small-fruited bulrush, primrose monkey flower, tinker's penny, trifid bedstraw, Nevada rush, slender rush, common rush, creeping buttercup, ticklegrass, self heal, sticky

cinquefoil, and one-flowered oat grass. Other meadows occur along streambanks; and these typically have higher species diversity than the shoreline meadows and are more similar to lower elevation mountain meadows.

#### Annual Grass/Forbs Alliance

This alliance is the dominant vegetation over much of the lower elevation Sierra Nevada foothills. Annual grasses, including *Bromus* sp., *Vulpia* sp., *Avena* sp., dogtail, and *Lolium* sp., dominate this alliance. At higher elevations, this alliance occurs only as small pure patches but often constitutes the herb layer in a number of shrub and tree dominated vegetation alliances. Other species associated with this alliance include bluegrass, Purpus' phacelia, hemizonella, many-flowered dichelostemma, wild oats, elegant brodiaea, heterocodon, Spanish clover, gay penstemon, and calycadenia.

#### Barren / Rocky Areas

Barren areas range in character from rocky fill material nearly devoid of vegetation to areas with extensive bedrock slabs and outcrops common in larger river canyons and at higher elevations. More rocky, barren areas may support small numbers of weedy herb and grass species including *Bromus* sp., *Trifolium* sp., *Vicia* sp., *Geranium* sp., *Madia* sp., *Carduus* sp., *Lactuca* sp., *Rubus* sp., and *Aira* sp.

Barren areas widespread in chaparral and openings in the mixed conifer/pine forest support bluegrass, mountain streptanthus, imbricate swordfern, lace fern, hemizonella, Torrey's mimulus, mountain monardella, fringe pod, rock daisy, Gray's lupine, Indian's dream, Bridge's cliff brake, *Lomatium* sp, Stebbin's phacelia (ENF sensitive species), Mariposa phacelia (ENF watch-list species), hens and chickens, rhomboid clarkia, Pleasant Valley mariposa lily (ENF sensitive species), naked buckwheat, Sierra sedum, awned slender wheatgrass, cheat grass, rattail, Nuttall's vulpia, California skullcap, soap plant, Sierra morning glory, and gay penstemon.

#### Agricultural

This land use occurs in lower elevation foothills of the Sierra Nevada.

#### 4.2.3 Special Status Plant Species

Information obtained through the USFWS website, CNDDDB (CDFG 2001), CNPS (CNPS 1994), ENF sensitive- and watch-list species occurrence records (USDA 2000b) and results from SMUD's 2000 botanical inventory were reviewed for the following discussion of special status plant species.

Special-status plant species are those plant taxa designated by federal and state resource agencies and the CNPS for protection and conservation. Target special-status plant species for this Project include: 1) taxa listed or proposed for listing as endangered, or threatened, pursuant to the ESA or CESA; 2) candidates for federal or state listing under the ESA or CESA; 3) species listed by the USFS as sensitive (FSS) or watch (WL); 4) taxa listed as rare pursuant to the CNPPA; 5) taxa which meet the criteria for listing, even if not currently listed, as described in Section 15380 of

the CEQA guidelines; and 6) taxa listed in the CNPS Inventory of Rare and Endangered Vascular Plants of California (CNPS 1994).

There are 48 special-status plant species/subspecies (see Appendix E4-1) determined to have the potential to occur within the Project area. Of these, there are 33 populations of nine special status plant species currently known and confirmed to occur within the Project boundary: Stebbins' phacelia, Pacific yew, Pleasant Valley Mariposa lily, Red Hills soap root, California bolandra, Mariposa phacelia, Sierra sweet bay, woolly violet, and round leaf honeydew. Four additional populations of four species, including saw-tooth lewisia, are documented by the ENF as occurring within the Project boundary, but were not located during a 2000 botanical inventory, despite a thorough survey of the area. In 2001, four additional special-status plant populations, including one yellow bur navarretia population, were documented by the ENF to be in or very near the Project area but have not yet been confirmed within the Project boundary (Table E4.2-1).

<b>Table E4.2-1. Known occurrences of special-status plant species within the UARP area.</b>			
<b>T-Line/River Reach/Species/</b>	<b>Status<sup>1</sup></b>	<b>ENF Population Number</b>	<b>Inventory Population Number</b>
<b>Transmission Line – East</b>			
Yellow bur navarretia	FSC, FSS, CNPS 4	FS-03-77	Unconfirmed @ Slab Creek Res.
Pleasant Valley mariposa lily	FSC, FSS, CNPS 1B	New	CALCLAA-CR-02 @ Camino Res.
Woolly violet	WL, CNPS 1B	No ENF #	Unconfirmed @ Union Valley Res.
<b>Silver Creek</b>			
Pleasant Valley mariposa lily	FSC, FSS, CNPS 1B	FS-03-121	CALCLAA-CR-01 <sup>1</sup>
		New	CALCLAA-CR-03
		FS-03-33	CALCLAA-JR-01
		New	CALCLAA-JR-02
Mariposa phacelia	WL	No ENF #.	PHAVAL-CR-01
California bolandra	WL, CNPS 4	New	BOLCAL-CR-01
Red Hills soaproot	FSC, WL CNPS 1B	New	CHLGRA-CR-01
Pacific yew	WL	New	TAXBRE-CR-01 – Jaybird adit
Stebbin's phacelia	FSC, FSS, CNPS 1B	FS-03-02	PHASTE-JR-01
		FS-03-24	PHASTE-JR-02
		New	PHASTE-JR-03
		FS-03-19	PHASTE-JR-04
		New	PHASTE-JR-05
		FS-03-03	PHASTE-JR-06
		New	PHASTE-JR-07
		New	PHASTE-JR-08
		New	PHASTE-CR-02
		New	PHASTE-CR-03
		New	PHASTE-CR-04
		New	PHASTE-CR-05
		FS-03-06	PHASTE-CR-06
		New	PHASTE-CR-07
Sierra sweet bay	WL	No ENF #.	MYRHAR-JR-01
		New	MYRHAR-JR-02
Saw-toothed lewisia	FSC, FSS, CNPS 1B	FS-03-02	LEWSER-JR-01 <sup>1</sup>
Woolly violet	WL, CNPS 1B	No ENF #	VIOTOM-UV-01

<b>Table E4.2-1 (Continued)</b>			
<b>T-Line/River Reach/Species/</b>	<b>Status<sup>1</sup></b>	<b>ENF Population Number</b>	<b>Inventory Population Number</b>
		New	VIOTOM-UV-02
		New	VIOTOM-UV-03
		No ENF #	VIOTOM-UV-04
		New	VIOTOM-UV-05
		New	VIOTOM-UV-06
<b>South Fork Silver Creek</b>			
Stebbin's phacelia	FSC, FSS, CNPS 1B	FS-03-24	Unconfirmed South Fork Silver Creek
		FS-03-25	Unconfirmed South Fork Silver Creek
Round leaf honeydew	WL	New	DROROT-IH-01
Woolly violet	WL, CNPS 1B	No ENF #	VIOTOM-IH-01 <sup>1</sup>
<b>Gerle Creek</b>			
Woolly violet	WL, CNPS 1B	No ENF #	VIOTOM-GR-01
Stebbin's phacelia	FSC, FSS, CNPS 1B	New	PHASTE-LL-01
Mariposa phacelia	WL	No ENF #	PHAVAL-LL-01 <sup>2</sup>
<b>Brush Creek</b>			
Pacific yew	WL	New	TAXBRE-BCR-01
<sup>1</sup> Notes: FSC = Federal Species of Special Concern FSS = United States Forest Service Sensitive Species CNPS 1B = Species considered by the California Native Plant Society as rare or endangered in California or elsewhere. CNPS 4 = Species considered by the California Native Plant Society as plants of limited distribution. WL = Watch List <sup>2</sup> These occurrences are documented by the ENF as occurring within the FERC Project Boundary, but were not located during the 2000 botanical inventory			

The CNDDDB and CNPS databases indicate that five federal and state-listed species (Layne's ragwort (listed as Threatened under the ESA and as Rare under the CESA), Pine Hill flannel bush, El Dorado bedstraw, Pine Hill ceanothus, and Stebbin's morning glory (all listed as Endangered under the ESA and Rare under the CESA) occur on the Pine Hill gabbro formation in western El Dorado County. These five special-status species are considered to have a very high potential of occurring within the Project area where the SMUD transmission line crosses the formation. At this time, none of these listed species have been confirmed to occur within the Project area. Two additional listed species, Orcutt's grass (listed as Endangered under both the ESA and CESA) and Tahoe yellow cress (listed as Endangered under the CESA), occur in the Project area but are considered to have a low potential to occur within the Project area due to a lack of suitable habitat.

4.2.4 Noxious Weeds

The noxious weed species list targeted for the 2000 botanical inventory was provided by the ENF. In 2001, the list was expanded to include input from the EDC Department of Agriculture and it now includes the following:

- Goat grass (*Aegilops triuncialis*)
- Lens-podded whitetop (*Cardaria chalepensis*)
- Italian thistle (*Carduus pycnocephalus*)
- (*Centaurea* spp.) (All species including spotted knapweed (*C. maculosa*) and yellow star thistle (*Centaurea solstitialis*), especially at elevations above 3,000 feet.)
- Skeleton weed (*Chondrilla juncea*)
- Canada thistle (*Cirsium arvense*)
- Scotch broom (*Cytisus* sp.) including *Cytisus scoparius*
- Oblong spurge (*Euphorbia oblongata*)
- Fennel (*Foeniculum vulgare*)
- French broom (*Genista monspeliensis*)
- Tall whitetop (*Lepidium latifolium*)
- Dalmation toadflax (*Linaria genistifolia*)
- Purple loosestrife (*Lythrum salicaria*)
- Spanish broom (*Spartium junceum*)
- Medusahead (*Taeniatherum caput-medusae*)

Nine populations of four noxious weed species (Table E4.2-2) were found and documented during the 2000 botanical inventory. Italian thistle is abundant around the White Rock Powerhouse, Slab Creek Reservoir, Brush Creek Reservoir, and Camino Reservoir, but was not documented or mapped because of its recent addition to the noxious weed list for the Project. No additional known populations were found to occur within the Project area during a review of known existing information in 2001.

<b>Table E4.2-2. Noxious weed populations at SMUD facilities.</b>		
<b>Facility</b>	<b>Species</b>	<b>SMUD population number</b>
White Rock Powerhouse and Adit	Yellow star thistle	CENSTO-WR-01
	Scotch broom	CYTSCO-WR-01
Slab Creek Reservoir	Yellow star thistle	CENSOL-SCR-01a & 01b
	Scotch broom	CYTSCO-SCR-01
	Goat grass	AEGCYL-SCR-01
Camino Reservoir, Camino Powerhouse and Transmission Line	Yellow star thistle	CENSOL-CR-01
	Goat grass	AEGCYL-CR-01a
	Skeleton weed	CHOJUN-CR-01a
Union Valley Reservoir Dam	Yellow star thistle	CENSOL-JR-01

#### 4.2.5 Sensitive Communities

A search for sensitive communities was made using the CNDDDB (CDFG 2001). The CNDDDB indicated the presence of sphagnum bog, northern volcanic mud flow vernal pools, northern hardpan vernal pools, and valley needlegrass grassland in the vicinity of the Project. At this time, none of the above sensitive communities are known to occur within the Project area.

The ENF (USDA 2001c) identified the ENF sensitive lava cap community in the vicinity of Peavine Ridge. The ENF sensitive bog and fen communities are not known to occur in the project boundary. Other types of sensitive communities that may occur within the Project area are protected under various plans and statutes and include seeps, springs, wet meadows, riparian vegetation, open ponderosa pine stands, old growth forests, perennial grasslands, oak woodlands, and late successional forests. Sensitive areas and communities observed within the Project area during the 2000 botanical inventory are described below for each facility.

### 4.3 **Botanical Resources in the Project Area**

#### 4.3.1 Rubicon Reservoir

The landscape around Rubicon Reservoir is dominated by barren/rocky areas interspersed with shrub- and tree-dominated vegetation. The dominant vegetation type is Huckleberry Oak Alliance, followed by Lodgepole Pine Alliance and Wet Meadows: Sedge/Rush/Grass Alliance along reservoir margins. Mixed Conifer/Fir Alliance is poorly represented, with small patches of large conifers overtopping huckleberry oak. The Rockbound Tunnel outlet channel between Rubicon Reservoir and wetlands south of Rockbound Lake is bordered, in succession, by Wet Meadows: Sedge/Rush/Grass Alliance, Lodgepole Pine Alliance, and Huckleberry Oak Alliance interspersed with barren / rocky areas. Ponded water along the outlet channel contains pond lily and floating leaved pondweed. No special-status plants and no noxious weeds were found during the 2000 botanical inventory. Special-status species with potential to occur at Rubicon Reservoir can be found in Table E4-2 in the Appendix to Exhibit E, Section 4 located at the end of this section.

#### 4.3.2 Rubicon Dam Reach

The Rubicon River reach several hundred feet below the dam is dominated by Mountain Alder Alliance with small patches of Wet Meadow: Sedge/Rush/Grass Alliance along the stream margins. A bedrock-dominated mosaic, with huckleberry oak and dense stands of Lodgepole Pine Alliance and Mixed Conifer/Fir Alliance occurs adjacent to the Rubicon River. Quaking aspen is a common tree-layer species in some parts of the Mixed Conifer/Fir Alliance stands and dominates a stand just outside the Project area.

Based on the CalVeg map, the vegetation along the river reach downstream to Miller Creek, is dominated by barren areas of granitic rock types and sparse huckleberry oak, White Fir Alliance, and Mixed Conifer/Fir Alliance. A minor alliance is Montane Mixed Chaparral. The presence and character of riparian vegetation and other wet areas along the remainder of this reach could not be ascertained from existing information. However, in Section 31 (T14N, R16E, SE1/4

Section 31), a relatively large polygon of Wet Meadows: Sedge/Rush/Grass Alliance occurs just south of Rubicon Springs. Again, in Section 30 (T14N, R16E, SW1/4 Section 30), a small polygon of Wet Meadows: Sedge/Rush/Grass Alliance occurs just southeast of the confluence with Miller Creek. The precise location of these two wet meadow areas relative to the Project area is not known.

No special-status plants and no noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory nor were any identified during a search of existing information.

#### 4.3.3 Rockbound Lake (non-Project facility)

The landscape around Rockbound Lake has a strong component of granitic bedrock and has a relatively higher vegetation cover than nearby Rubicon Reservoir. The dominant or important vegetation types are Huckleberry Oak Alliance, Lodgepole Pine Alliance, Wet Meadow: Sedge/Rush/Grass Alliance, and Mixed Conifer/Fir Alliance. The wet meadow at the south end of Rockbound Lake is particularly lush and very wet. This vegetation summary is based on casual observations made during the 2000 botanical inventory as well as the CalVeg vegetation maps for the ENF. No special-status plants and no noxious weeds were discovered within the Project area during a search of existing information.

#### 4.3.4 Rockbound Dam Reach

The CalVeg vegetation map for the ENF shows the vegetation types along this reach to be Mixed Conifer/Fir Alliance, Red Fir Alliance, White Fir Alliance, and Montane Mixed Chaparral. The mouth of this reach at Buck Island Lake had no obvious riparian vegetation and was dry in October 1999 and in July 2000. The remaining river reach was not observed during the 2000 botanical survey. The presence and character of riparian vegetation and other wet areas along this reach could not be ascertained from existing information. No special-status plants and no noxious weeds were discovered within the Project area during a search of existing information.

#### 4.3.5 Buck Island Reservoir

The landscape around Buck Island Reservoir is dominated by barren/rocky areas of granitic bedrock interspersed with shrub- and tree-dominated vegetation. The dominant vegetation type is Huckleberry Oak Alliance followed by Lodgepole Pine Alliance and Wet Meadows: Sedge/Rush/Grass Alliance along reservoir margins. Mixed Conifer/Fir Alliance is well represented with patches of large conifers overtopping huckleberry oak. No special-status plants and no noxious weeds were found within the Project area during a 2000 botanical inventory.

#### 4.3.6 Buck Island Dam Reach

The CalVeg vegetation map for the ENF shows the vegetation types along this reach to be Mixed Conifer/Fir Alliance, Red Fir Alliance, White Fir Alliance, and Montane Mixed Chaparral. However, barren/rock is the dominant landscape feature around the river reach. The portion of this reach was surveyed in detail during the 2000 botanical inventory is just below the dam. Wet

Meadow: Sedge/Grass/Rush Alliance occurs in small substrate accumulation areas along the streamside below Buck Island Dam. The streamside meadows are small and interspersed with lodgepole pine and mountain alder. The remainder of the reach to Rubicon River was not observed during the 2000 botanical inventory. The presence and character of riparian vegetation and other wet areas along this reach could not be ascertained from existing information. No special-status plants and no noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory, nor were any identified during a search of existing information.

#### 4.3.7 Loon Lake Reservoir

The dominant vegetation at Loon Lake Reservoir is Mixed Conifer/Fir Alliance. These stands occur along the south and west shore, the north end of Pleasant Lake, and within the Loon Lake campground at the southwest corner of the reservoir. Huckleberry Oak Alliance is abundant and occurs intermittently along the south shoreline, most of the east shoreline, at the north end of Pleasant Lake, and around the west dam. Lodgepole Pine Alliance, with nearly pure stands of lodgepole pine, occurs along the reservoir margin, adjacent meadow margins, and among the undeveloped campsites along the north shore west of the dam. Wet Meadow: Sedge/Rush/Grass Alliance vegetation occurs along the shoreline and inlets submerged at higher water levels.

Two large, granitic barren areas occur adjacent to Loon Lake Reservoir just south of the west dam and adjacent to the Pleasant Lake arm of Loon Lake Reservoir. The barren/rocky area just south of the west dam is, in part, a quarry or old staging area for District activities. The northern portion of this area is undisturbed, sloping bedrock with a surprising diversity of species, including a prostrate form of wedge-leaf ceanothus, greenleaf manzanita, huckleberry oak, western needlegrass, Bridge's cliff brake, cream bush, slender muhly, mountain phlox, Wright's buckwheat, hoary buckwheat, naked stemmed buckwheat, leafy dwarf knotweed, Kellogg's knotweed, short grass sedge, rosy everlasting, Parry's rush, Newberry's penstemon, Douglas' silene, and western juniper. The barren/rocky area adjacent to the Pleasant Lake arm supports a very sparse version of the Huckleberry Oak Alliance.

No special-status plants and no noxious weeds were found within the Project area during the 2000 botanical inventory.

#### 4.3.8 Loon Lake North Dam Reach (Gerle Creek)

Based on the CalVeg vegetation maps, the dominant vegetation adjacent to Gerle Creek is Mixed Conifer/Fir, Montane Mixed Chaparral, and the barren/rock area. Three large meadows, Gerle Meadows, Neck Meadows, and Upper Gerle Creek Meadows were not surveyed during the 2000 botanical inventory, but were identified using ENF meadow inventory data. These meadows are both wet and dry, and in some cases include extensive mountain alder riparian vegetation. The Loon Lake Dam reach below the north dam was observed to have intermittent streamside tree, shrub, and herb cover. Gerle Creek, in this upper portion of the reach, is overtopped on one side by Mixed Conifer/Fir Alliance, and barren/rocky area on the other. The lower portion of Gerle Creek reach has a relatively high level of riparian cover, with American dogwood, bitter cherry, mountain alder, willow, and black cottonwood. No special-status plants and no noxious weeds

were found within the Project area that was surveyed during the 2000 botanical inventory, nor were any identified during a search of existing information.

#### 4.3.9 Loon Lake West Dam Reach (Rocky Basin Creek)

Based on the CalVeg vegetation maps, the dominant vegetation adjacent to Rocky Basin Creek is Mixed Conifer/Fir. Montane Mixed Chaparral and the barren/rock area are common, especially at the upper portions of the reach. Small inclusions of Mixed Conifer/Pine occur within the Mixed Conifer/Fir type. The Rocky Basin river reach below the Loon Lake's western dam was observed to have highly intermittent streamside tree, shrub, and herb cover. A small streamside meadow and a small patch of black cottonwood just below the west dam were observed during the 2000 botanical survey. The surrounding upland vegetation was observed to be Huckleberry Oak Alliance rather than Montane Mixed Chaparral, at least in the upper stream reach as depicted on the CalVeg vegetation maps.

One population of Stebbin's phacelia was found on the rocky slopes below the western dam. No noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory. For the remainder of Rocky Basin Creek, no special-status plants and no noxious weeds were discovered within the Project area during a search of existing information.

#### 4.3.10 Gerle Reservoir and Canal

The dominant vegetation all around Gerle Creek Reservoir and the access road (FS13N23) is Mixed Conifer/Fir Alliance. Huckleberry Oak Alliance occurs as relatively small patches on steep and rocky slopes east and just south of the dam, and just north of Angle Creek picnic area. Lush Wet Meadow: Sedge/Grass/Rush Alliance and very small stands of lodgepole pine occur at the northwest portion of the reservoir. Rushes and sedges dominate the undisturbed meadow west of the handicapped boardwalk at the north end of the Reservoir. A small pond lies within this meadow, with beaked sedge as the only significant component. The fringes of this meadow support lodgepole pine, self heal, white brodiaea, mountain alder, and bracken fern. The interior portions of the meadow support small fruited bulrush, tickle grass, primrose monkey flower, marsh speedwell, glaucous willow herb, trifid bedstraw, tall mannagrass, and white-flowered bog orchid. Angel Creek has sparse riparian vegetation, restricted to the narrow stream margins under a canopy of encroaching Mixed Conifer/Fir Alliance conifers. The developed area related to the operation and maintenance of Gerle Canal is mostly barren/rocky fill material. Several small valley elderberry grow on the steep, shaded western bank of the canal.

One population of woolly violet was found in the Gerle Creek campground at the north end of Gerle Creek Reservoir. No noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory.

#### 4.3.11 Gerle Creek Dam Reach

Based on the CalVeg vegetation map, Gerle Creek is abutted primarily by Mixed Conifer/Fir and Mixed Conifer/Pine. Gerle Creek, below the Gerle Dam, has a deep, wide scoured bedrock bed and shrub riparian species high up on the banks. The riparian shrub layer was observed to be a

continuous, narrow, band overtopped by Mixed Conifer/Fir Alliance stands. The presence and character of riparian vegetation and other wet areas along the reach to the confluence with South Fork Rubicon River could not be ascertained from existing information. No special-status plants and no noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory nor were any identified during a search of existing information.

#### 4.3.12 Robbs Peak Reservoir

Robb's Peak Reservoir is surrounded by Mixed Conifer/Fir Alliance with open rocky areas to the east and cleared, graded areas south of the dam maintained for continued project operations. No special-status plants and no noxious weeds were found within the Project area during the 2000 botanical inventory.

#### 4.3.13 Robbs Peak Dam Reach

The South Fork Rubicon River below the dam is well armored with many large granitic boulders and woody debris. The vegetation consists of herb and shrub-layer species growing where suitable substrate persists in protected areas along the stream course. The presence and character of riparian vegetation and other wet areas along the reach to the confluence with South Fork Rubicon River (SFRR) could not be ascertained from existing information. No special-status plants and no noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory, nor were any identified during a search of existing information.

#### 4.3.14 Ice House Reservoir

The dominant vegetation at Ice House Reservoir is Mixed Conifer/Fir Alliance. This alliance is the dominant vegetation around the reservoir except along the south shoreline where Montane Mixed Shrub Alliance is nearly as abundant. Wet Meadows: Sedge/Rush/Grass Alliance vegetation occur as two small polygons: one along the north shore and one associated with a small stream in Section 8 (T11N, R15E) along the southeast shoreline. Riparian vegetation at the east-end inlet streams, including South Fork Silver Creek (SFSC), is intermittent with shrub and herb-layer species growing among large granitic boulders in sites protected from scouring flows. Several barren/rocky areas associated with campground and other project facilities are also present. With the exception of one ENF population of woolly violet near the summer camp on the north side of the reservoir, no special-status plants and no noxious weeds were found within the Project area during the 2000 botanical inventory. This population is mentioned in the literature, however, could not be relocated during the 2000 botanical survey.

#### 4.3.15 Ice House Dam Reach

Based on the CalVeg vegetation maps, the dominant vegetation adjacent to SFSC is Mixed Conifer/Fir Alliance. Long sections of the SFSC reach are located within the 1992 Cleveland fire. In most instances, the designation Mixed Conifer/Fir Alliance is a potential natural vegetation type. Much of the burned-over area has been replanted or naturally seeded with a variety of conifer species, most notably ponderosa pine. In general, this reach is well armored with many large granitic boulders and bedrock from the dam to the confluence with Junction

Reservoir. Small patches of riparian vegetation with *Salix* sp. and mountain alder occur below the dam in association with streamside meadows and seeps. Based on more general observations made during the 2000 botanical inventory, there are large riparian shrubs and lush patches of herbaceous vegetation re-establishing over large sections of the reach exposed following the fire. Wet Meadows: Sedge/Rush/Grass Alliance vegetation abuts the reach below the dam and downstream (T11N, R14E) in sections 12 and 15 and in Section 5 at the junction with Big Hill Canyon Creek tributary. Undoubtedly, the presence and character of riparian vegetation and other wet areas along this long reach to the confluence with SFRR could not be completely ascertained from existing information.

Annual Grass/Forb Alliance, Mixed Conifer/Pine Alliance, Montane Mixed Chaparral Alliance, and barren/rocky areas are also present below the dam and, according to the CalVeg vegetation map, in various locations abutting the SFSC.

One population of special status round leaf honeydew was found in a seep-fed meadow below the dam. The 2000 review of existing information revealed two ENF populations of Stebbin's phacelia very near, if not within, the Project area along the reach just upstream of Junction Reservoir. No noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory or the remainder of the SFSC reach during a search of existing information.

#### 4.3.16 Union Valley Reservoir

Mixed Conifer/Fir Alliance is the dominant vegetation everywhere at Union Valley Reservoir. Inclusions of White Fir Alliance and Mixed Conifer/Pine Alliance are common, but small and highly localized. Barren/rocky areas are scattered along many parts of the reservoir margins. Some barren areas result from project and campground development, while most of the remaining sites are xeric sites with shallow, coarse, granitic sand substrates with sparse vegetation cover. One large, non-granitic, rocky barren/rocky area occurs on the large peninsula east of the dam.

Wet Meadows: Sedge/Rush/Grass Alliance vegetation with small inclusions of Mountain Alder Alliance occur predominantly along the northwestern and western inlets, but also at the SMUD employee campground (near Robb's Peak Powerhouse), and along three small tributaries between Fashoda campground and Big Silver Creek. The latter three tributaries are small meadows (bordered by mountain alder on the easternmost tributary) and/or meadow species overtopped by a mixed conifer canopy. Portions of the easternmost two tributaries were not observed during the 2000 botanical inventory due to a bald eagle nesting closure. Riparian vegetation at the east-end stream mouths, including Big Silver Creek, Wench Creek, and Tells Creek is intermittent with shrub and herb-layer species growing among large granitic boulders in sites protected from scouring flows. Wolf Creek and Yellowjacket Creek on the north side of Union Valley Reservoir were not visited during the 2000 botanical survey, and no additional information about the presence and character of streamside vegetation resulted from our search for existing information. Existing information will be supplemented by additional surveys which will be conducted in the 2002-2003 study seasons.

Seven populations of special status species (six woolly violet and one Stebbin's phacelia) were found during 2000 botanical inventory. The noxious weed, yellow star thistle, is located at the north end of Union Valley Dam.

#### 4.3.17 Union Valley Dam Reach

This very short reach is dominated by bedrock with sparse shrub and herb cover. No special-status species or noxious weeds were found during the 2000 botanical inventory.

#### 4.3.18 Junction Reservoir

Mixed Conifer/Pine Alliance is the dominant vegetation at Junction Reservoir, with white fir and Jeffrey pine being dominant in the tree layer. On warmer aspects, Jeffrey pine and ponderosa pine are most common. The shrub layer includes conifer regeneration, tan oak, hazelnut, Sierra laurel, mountain dogwood, serviceberry, western azalea, mountain maple, and Sierra Nevada currant. The herb layer includes thimbleberry, prince's pine, and bleeding hearts.

Northern Mixed Chaparral is abundant and intergrades with open mixed-conifer stands. The chaparral vegetation has many small to large openings of barren/rocky areas. Wet Meadow: Sedge/Rush/Grass Alliance vegetation is represented by three small meadows above the access road to the substation. A perennial creek on the steep slope south of the dam supports riparian vegetation overtopped by mixed conifer forest. The seepage from this perennial creek fans out over the slope and bedrock bluffs above the road to the dam. Several other small seeps above the reservoir arms of Little Silver Creek and SFSC are overtopped by Mixed Conifer/Fir forest and supports hydrophilic species. A small tributary below the mouth of SFSC has dense, shrub-dominated riparian vegetation. The mouth of Little Silver Creek has intermittent riparian plants along margins and is dominated by nearly unvegetated sandbars. The shoreline vegetation is dense in places but is also intermittent with many rocky or sandy sections.

Eleven populations of three special-status species (seven Stebbin's phacelia, two Sierra sweet bay, and two Pleasant Valley mariposa lily) were found during the 2000 botanical inventory. An ENF population of sawtooth lewisia thought to be within the Project area was searched for but not found. No noxious weeds were found at Junction Reservoir.

#### 4.3.19 Junction Dam Reach

This reach of Silver Creek was observed at three locations during the 2000 botanical inventory: below Junction Reservoir Dam, below the adit access point to the Jaybird Tunnel, and at Camino Reservoir. The river is deeply entrenched and dominated by scoured bedrock below steep-sided, mostly forested slopes. Riparian vegetation is sparse with scattered individual plants and patches of shrubs. The presence and character of riparian vegetation and other wet areas along the reach to the confluence with Camino Reservoir could not be ascertained from existing information. The CalVeg vegetation map indicates the predominance of Douglas fir/Pine Alliance and Mixed Conifer/Pine Alliance abutting all portions of the reach. The lower half of this reach is also represented by abundant Canyon Live Oak Alliance, Ponderosa Pine Alliance, Black Oak Alliance, Annual Grass/Forb Alliance, and Montane Mixed Chaparral Alliance. No special-

status plants and no noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory.

#### 4.3.20 Jaybird Tunnel Adit

The access road and adit is located on steep, north aspect slopes above Silver Creek and is surrounded by Mixed Conifer/Pine Alliance. West of the adit, a late-successional stand of large conifers dominated by Douglas fir and white fir and with a dense understory of tan oak shrubs is a unique stand in the Project area and has little evidence of past disturbance. This stand is multi-layered, with scattered conifer regeneration in all layers. The understory is dense with shrubby tan oak, mountain dogwood, serviceberry, and hazelnut. Less abundant shrub-layer species include bracken fern, thimbleberry, wood rose, *Vaccinium* sp., and deerbrush. The herb layer is dense in places with single-flowered clintonia, trail plant, creeping snowberry, white-veined wintergreen, elegant piperia, Hooker's fairy bells, and rattlesnake plantain. The remaining stands are in various stages of re-growth following timber harvest or thinning in the past. A steep, intermittent stream borders the east side of the Project area. The stream has a nearly continuous, shrub-dominated, riparian vegetation. Two small seeps occur along the access road to the adit. A small watercourse flows from penstock leakage through the rock and gravel spoils associated with the adit. The special-status species Pacific yew was found during the 2000 botanical inventory. No noxious weeds were found at the adit and surrounding Project area.

#### 4.3.21 Camino Reservoir

Canyon Live Oak Alliance and Douglas fir/Pine Alliance are the dominant vegetation types around the reservoir and along Jaybird Penstock and Jaybird Springs access road. At the reservoir, the Canyon Live Oak Alliance occurs generally on steep canyon slopes with many rock outcrops. The tree, shrub, and herb layers are similar to stands down river. At this location, the Douglas fir/Pine Alliance is closely allied to the Mixed Conifer/Pine Alliance with sugar pine, white fir, and incense cedar present at low abundance. The shrub and herb layer of the Douglas fir/Pine Alliance at Camino Reservoir includes deerbrush, bigleaf maple, mountain dogwood, Hartweg's iris, many-stemmed sedge, and glaucous blackberry.

Black Oak Alliance is abundant along the access road to the penstock. Northern Mixed Chaparral, White Leaf Manzanita Chaparral, and Annual Grass/Forb Alliances commonly occur along access roads and penstocks, and in undisturbed open slopes around the reservoir. The sensitive Lava Cap community is an ENF-sensitive community that commonly occurs within these latter three communities on nearby Peavine Ridge. The distinctive, low, herbaceous flora of this community grows in open areas with high cover of typically low-profile volcanic rock. One small site along the access road to the upper portion of the penstock has the distinctive flora and physical characteristics of the Lava Cap community, but also has a high cover of introduced annual grasses not observed in higher quality sites outside the Project area. The site is also unusual in that it has a seep and green strip of wetland plants in it.

A series of seeps occurs along the road between Jaybird Powerhouse and the dam, creating little oases of wetland plants along steep bluffs below the canyon live oak woodlands. A seep at the last hairpin turn along the Jaybird Springs access road to the powerhouse supports hydrophilic

plants along roadside slopes and ditches. The lower portion of Jaybird Creek is dominated by bedrock but has characteristic riparian shrubs and herbs growing in wet cracks and various substrate accumulation areas.

Eleven populations of five special-status species (six Stebbin's phacelia, two Pleasant Valley mariposa lily, one Mariposa phacelia, one California bolandra, and one Red Hills soaproot) and three populations of three noxious weed species (one yellow star thistle, one goat grass, and one skeleton weed) were found at Camino Reservoir during 2000 botanical surveys.

#### 4.3.22 Camino Tunnel Adit

The Camino Tunnel adit access road leaves Forebay Road just north of the Camino Penstock and accesses the adit approximately 3 miles east. The CalVeg vegetation map indicates that Canyon Live Oak Alliance, Interior Live Oak Alliance, Foothill Mixed Chaparral Alliance, Ponderosa Pine Alliance, and Douglas fir/Pine Alliance are the dominant vegetation types along the Camino Tunnel adit access road. No special-status plants and no noxious weeds were discovered within the Project area during a search of existing information.

#### 4.3.23 Camino Dam Reach

Based on the CalVeg vegetation map, the dominant vegetation abutting Silver Creek and SFAR is represented by Canyon Live Oak Alliance, Interior Live Oak Alliance, Ponderosa Pine Alliance, and Douglas fir/Pine Alliance. Foothill Mixed Chaparral Alliance, Annual Grass/Forb Alliance, and Black Oak Alliance are common and in some locations, abundant. The presence and character of riparian vegetation and other wet areas along the reach to the confluence with Slab Creek Reservoir could not be ascertained from existing information. No special-status plants and no noxious weeds were discovered within the Project area during a search of existing information.

#### 4.3.24 Brush Creek Reservoir

Canyon Live Oak Alliance, Douglas fir/Pine Alliance and Douglas fir Alliance represent the dominant vegetation at Brush Creek Reservoir. Douglas fir is often the most abundant conifer at Brush Creek reservoir, occurring on the east and south sides of the reservoir where it is the dominant conifer in the tallest tree layer. At the inlet of Slab Creek, White Alder Alliance vegetation is discontinuous and overtopped by upland forest. The inflow and outflow of Brush Creek have a sparse riparian zone of the White Alder Alliance. White alder is the dominant tree species along the creek margins. Additional tree-layer species include bigleaf maple and Fremont's cottonwood. Other common species include miner's dogwood, Pacific yew, western azalea, and Bridge's rose, Himalaya blackberry, California blackberry, Solomon's seal, elk clover, chain fern, lady fern, and rhubarb. A small seep at the end of the road to the dam supports a patch of hydrophilic vegetation. The special-status species, Pacific yew, was found during the 2000 botanical inventory. No noxious weeds were found.

#### 4.3.25 Brush Creek Dam Reach

The portions of Brush Creek below the dam and at the confluence with Slab Creek Reservoir were observed during the 2000 botanical inventory. White Alder Alliance vegetation is discontinuous and overtopped by Canyon Live Oak Alliance and Douglas fir/Pine Alliance. The ENF vegetation maps indicate that Ponderosa Pine Alliance and Interior Live Oak Alliance are also dominant vegetation types abutting or overtopping Brush Creek. The presence and character of riparian vegetation and other wet areas along the reach to the confluence with Slab Creek Reservoir could not be ascertained from existing information. No special-status plants and no noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory.

#### 4.3.26 Slab Creek Reservoir

The dominant vegetation at Slab Creek Reservoir is Douglas fir/Pine Alliance and Canyon Live Oak Alliance. Black Oak Alliance and Ponderosa Pine Alliance occur as single stands at the northwest end of the reservoir. Interior Live Oak Alliance occurs as scattered, small stands above the north shoreline.

White Alder Alliance is present at the inlets of Slab Creek and Brush Creek. Steep, intermittent and perennial drainages descend the slopes above the reservoir including Long Canyon Creek. These drainages are often mesic and cool, with sparse to lush vegetation near the shoreline. A seep just outside the gate to the Camino Powerhouse has dense and exposed, weedy vegetation that is, in part, composed of a subset of the typical White Alder Alliance species. Wet areas along small roadside bluffs to the Slab Creek Reservoir boat ramp support hydrophilic vegetation. The shoreline is very steep, with much woody debris, and loose rock with patchy and sparse vegetation. No special-status plants and two populations of two noxious weed species (one Scotch broom and one yellow star thistle) were found during the 2000 botanical inventory. Skeleton weed is also known to occur along the powerhouse access and tunnel adit roads.

#### 4.3.27 Slab Creek Dam Reach

The SFAR has little riparian vegetation below the Slab Creek Reservoir Dam because of the scouring effect of naturally occurring, seasonal high flows, and a preponderance of bedrock and boulders or lack of suitable substrate. This observation is consistent with the CalVeg map that shows barren/rock to be well represented along the reach. Immediately upstream of White Rock Powerhouse, a gravel/sand bar supports dense riparian scrub vegetation with clumps of willow, blackberry, and individual, small cottonwood trees. The presence and character of riparian vegetation and other wet areas along the remainder of the reach could not be ascertained from existing information. The dominant vegetation types abutting the reach are Ponderosa Pine, Douglas fir/Pine, and Canyon Live Oak Alliances. Foothill Mixed Chaparral Alliance, Black Oak Alliance, and Interior Live Oak Alliance are less abundant but common. No special-status plants and two populations of two noxious weed species (one goat grass and one yellow star thistle) were found during the 2000 botanical inventory. No special-status plants and no noxious weeds were discovered within the Project area during a search of existing information.

#### 4.3.28 White Rock Powerhouse, Penstock and Adit

The dominant vegetation is Northern Mixed Chaparral Alliance around the powerhouse. A small seep next to the powerhouse along the road supports hydrophilic vegetation. A seep or spring upslope to the south of the powerhouse supports a small clump of willow. The area cleared around the exposed portion of the White Rock Penstock is barren/rocky, wet from penstock seepage, and has sparse, mowed mix of hydrophilic and upland species.

Canyon Live Oak and Interior Live Oak Alliances are the dominant vegetation adjacent to adit number 2. A large barren/rocky area consisting of leveled spoils from construction of the White Rock Tunnel dominates the adit. The lush, mesic vegetation over White Rock Creek above the adit, consists of a sparse cover of tall White Alder Alliance vegetation overtopped by Canyon Live Oak Alliance. Seepage from the White Rock Tunnel supports riparian trees and other hydrophilic species. No special-status plants and two populations of two noxious weed species (Scotch broom and yellow star thistle) were found during the 2000 botanical inventory.

#### 4.3.29 White Rock Powerhouse Reach

This section of SFAR immediately below White Rock Powerhouse is a narrower, steeper river than portions of the SFAR observed upstream during the 2000 botanical inventory. The adjacent vegetation is Northern Mixed Chaparral Alliance (borderline Foothill Mixed Chaparral Alliance) and a barren/rocky area resulting from Project development and maintenance. The remainder of this reach downstream to the confluence with Chili Bar Reservoir is quite short. Based on the CalVeg vegetation map, the dominant vegetation abutting the reach further downstream is Canyon Live Oak Alliance, Ponderosa Pine Alliance, and Douglas fir/Pine Alliance. The presence and character of riparian vegetation and other wet areas along the remainder of the reach could not be ascertained from existing information. No special-status plants and no noxious weeds were found within the Project area that was surveyed during the 2000 botanical inventory.

#### 4.3.30 UARP Transmission Lines

The transmission lines for the UARP provide the link between the powerhouses of the UARP and the SMUD electrical grid that serves the SMUD service area. The lines are generally located to provide an interconnection to each of the powerhouses, following the shortest practicable route, and then terminating at a connection point near Sacramento County. The transmission line originates at Loon Lake powerhouse, which is the furthest point away from its destination, Folsom Junction. Folsom Junction is located just west of the El Dorado Sacramento County line, north of US Highway 50 within the Folsom City limits. The transmission lines, which consist of 69 kV and 230 kV lines, also provide backup for each of the powerhouses in the event of any of the lines are taken out of service or fail. For convenience of discussion, the transmission lines can be designated as having an upper section (above Camino Reservoir) and a lower section (below Camino Reservoir). A more complete discussion of the transmission lines is found in the Project Description, Exhibit A.

**Upper section transmission line.** The transmission line from Loon Lake powerhouse generally parallels the Loon Lake and Ice House Roads south, connecting with the Robbs Peak Powerhouse at a point on the northeast shore of the Union Valley Reservoir. This transmission line also connects with the Jones Fork Powerhouse located on the southeast shore of Union Valley Reservoir, with the transmission line generally circumscribing the western half of the reservoir. From the Union Valley Powerhouse, the transmission line extends west to the Jaybird Powerhouse, located just above the Camino Reservoir. The transmission line crosses the river canyons at the powerhouses but generally follows a route on upper slopes and ridge tops.

The taller, tree-dominated vegetation types along the portions of the transmission line in this area have been cut back or cleared to provide maintenance access, and more importantly, to protect the transmission lines from potential damage from natural disaster including severe weather or wild-land fire. This clearing is done in conjunction with the USFS, which oversees the clearing operations. As a result, many of the CalVeg types mapped as tree dominated vegetation types probably more closely resemble shrub or herb dominated vegetation common in the area. Shrub and herb dominated vegetation is generally not cut back unless it prevents access to the transmission line, or poses a safety issue.

The vegetation in the area along the western slope of the Sierra Nevada typically has conifer trees as the dominant, tallest layer of vegetation. However, as mentioned previously, the taller tree species along the transmission line are removed where they present potential safety hazard to the transmission line or the land surrounding it.

Based on the CalVeg vegetation map for the ENF and observation made during the 2000 botanical inventory, the dominant vegetation types along the transmission line are as follows: Douglas-Fir/Pine, Mixed Conifer/Pine, Mixed Conifer/Fir, Huckleberry Oak Chaparral, and Montane Mixed Chaparral. Black Oak Alliance and Canyon Live Oak Alliance are common in the steeper canyons, especially on slopes with south aspect.

The transmission line above Jaybird Powerhouse and Penstock lies, in part, within Montane Mixed Chaparral Alliance with many patches of the ENF sensitive lava cap community in the vicinity the transmission line route across Peavine Ridge. The transmission line route remains on the south side of Silver Creek, crossing three small drainages, including the reach below Bryant Springs, before crossing Junction Reservoir and dropping down to Union Valley Powerhouse and substation.

One population of special status species, Pleasant Valley mariposa lily, and two populations of two noxious weed species (one goat grass and one skeleton weed) were found above Jaybird Powerhouse/Penstock during the 2000 botanical surveys. The 2001 review of existing information revealed two additional ENF populations of two special-status species (one yellow bur navarettia and one woolly violet) to occur on or very near the transmission line route.

**Lower section transmission line.** The lower section of the UARP transmission line from below Camino Reservoir to Folsom Junction is generally located near the midsection of Camino Reservoir and located in a northeast to southwest orientation to Camino Powerhouse. From this location, it again follows a northeast to southwest orientation and an east to west orientation to

White Rock Powerhouse. From this point, the line continues east through the Sierra Foothills, generally paralleling US Highway 50 until its termination at Folsom Junction.

The most abundant vegetation polygons on the CalVeg maps are Agricultural, Annual Grass/Forb, Blue Oak, Foothill Pine, Chamise, Foothill Mixed Chaparral, Northern Mixed Chaparral, Interior Live Oak, Ponderosa Pine, and Douglas-Fir/Pine Alliances. Many intermittent or perennial streams are crossed by the transmission line, including the Folsom Aquaduct and Natomas Ditch at Blue Ravine, New York Creek, Allegheny Creek, Green Spring Creek, a tributary to Sweetwater Creek, White Oak Creek and at least two tributaries, Dry Creek, Indian Creek, Weber Creek, Hangtown Creek, two tributaries to Cold Springs Creek, Big Canyon, and several unnamed intermittent streams above Chili Bar Reservoir. White Alder Alliance is mapped on or very near the transmission line right-of-way at Blue Ravine and at Weber Creek. This alliance as well as other hydrophilic vegetation types may occur at any of these drainages. The transmission lines will cross most drainages overhead thereby avoiding potential impacts. However, the results of transmission line surveys detailing the location of access roads and towers relative to these drainages and botanical resources was not found in our search for existing information.

From Poho Ridge, the transmission line crosses a large wetland complex (T11N, R12E, Sections 11, 12, 13 & 14) on more gentle terrain above the canyon rim and southeast of Brush Creek Reservoir. The ENF meadow inventory indicates this area as Wet Meadow: Sedge/Grass/Rush Alliance. The transmission line then crosses a number of intermittent and perennial streams including the SFAR Canyon, Long Canyon, Iowa Canyon, North Canyon, South Canyon and White Rock Creek near Mosquito Road.

The transmission line crosses an ecologically sensitive Pine Hill formation. The formation is roughly 3 to 4 miles wide and trends northwest to southeast approximately from the SFAR at Folsom Lake to south of U.S. Highway 50 just west of Shingle Springs. The transmission line crosses the southern flank of Pine Hill, a peak 2,059 feet tall, jutting well above the surrounding foothills. The transmission line crosses a portion of the USBLM's Pine Hill Preserve, Penny Lake Unit (T10N, R9E, Section 14). There are five federally-listed species known to occur in very close proximity to SMUD's transmission line: Layne's ragwort, Pine Hill flannelbush, El Dorado bedstraw, Pine Hill ceanothus, and Stebbin's morning glory. Valley elderberry, the host plant for the endangered valley elderberry longhorn beetle, is known to occur in areas like those crossed by the transmission line.

The presence and character of riparian vegetation and other wet areas at most of the drainages crossed by the transmission line could not be ascertained from existing information. Presumably, most of these drainages are crossed overhead by the transmission line. In addition, access roads crossing stream reaches are long-established roads maintained for continued access to the transmission line.

#### **4.4 Literature Cited**

Abrams, L. 1940. Illustrated flora of the Pacific states. Vol. I. Stanford University Press, Stanford, CA.

- Abrams, L. 1944. Illustrated flora of the Pacific states. Vol. II. Stanford University Press, Stanford, CA.
- Abrams, L. 1951. Illustrated flora of the Pacific states. Vol. III. Stanford University Press, Stanford, CA.
- Abrams, L. and R. S. Ferris. 1960. Illustrated flora of the Pacific states. Vol. IV. Stanford University Press, Stanford, CA.
- CDFG (California Department of Fish and Game). 2001. California natural diversity database special plants list. CDFG, Natural Heritage Division, Sacramento, CA.
- CNPS (California Native Plant Society). 1994. Inventory of rare and endangered vascular plants of California. 5<sup>th</sup> ed.. CNPS, Sacramento, CA.
- Hickman, J. C., editor. 1993. The Jepson manual: higher plants of California. Berkeley: University of California Press, Berkeley, CA.
- KEA Environmental, Inc. 2000. Botanical inventory for the Upper American River Project. Prepared for SMUD, Sacramento, CA.
- National Invasive Species Council. 2001. Management plan: Meeting the invasive species challenge.
- University of California. 1996. Sierra Nevada ecosystem project, final report to Congress, Volumes I-IV. Wildland Resources Center Report No. 37, Centers for Water and Wildland Resources, University of California, Davis. July 1996.
- USDA (United States Department of Agriculture, Forest Service). 1998. Eldorado National Forest Land and Lake Tahoe Basin Management Unit. Wilderness management guidelines for the Desolation Wilderness, final environmental impact statement and record of decision, December 1998. USDA Forest Service, Pacific Southwest Region, San Francisco, CA.
- USDA. 2000a. Remote sensing lab CalVeg geobook: Existing vegetation, Version 1. Pacific Southwest Experiment Station, Sacramento, CA. CD-ROM volume 2.
- USDA. 2000b. Eldorado National Forest species list. USDA Forest Service, Pacific Southwest Region, San Francisco, CA. Updated February 24, 2000).
- USDA. 2001c. Special Status Plants and Sensitive Communities Lists for the ENF
- Weedan, N. F. 1996. A Sierra Nevada flora. 4<sup>th</sup> ed. Wilderness Press, Berkeley, CA.
- Wilcove, D. S., D. Rothstein, J. Dubow, A. Phillips, and E. Losos. 1998. Quantifying threats to imperiled species in the United States. *BioScience* 48:607-615.