

# **Pine Hill Preserve Management Plan**



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## I. INTRODUCTION

The Pine Hill Preserve (Preserve) was established in April 2001 to ensure that habitat for eight rare plant species growing on gabbro soils at western El Dorado County (EDC) would be protected from factors threatening their survival and recovery.

The gabbro is a unique soil formation in western EDC that supports chaparral, woodland, and grassland habitat types. The soil, rolling topography, and Mediterranean climate in the area combine to sustain about 10% of the total California plant diversity.

In addition to plant species richness, several rare and endemic plant species exist in the habitat types of the gabbro soil formation. Five of the eight rare plant species protected at the Preserve are listed under the Federal Endangered Species Act and/or the California Endangered Species Act. Four of the eight rare plants are also endemic to gabbro soils in western EDC.

Habitat destruction and fragmentation due to housing and commercial development, and the alteration of favorable fire regimes in western EDC, are the two main threats to the rare plants and their habitats. Currently, the Preserve provides protection and management for 4,042 acres of rare plant habitat, 3,154 of which lie within a US Fish and Wildlife Service (FWS) 5,001-acre area designated for the recovery of the federally listed rare plants.

A Cooperative Management Agreement (Agreement) among nine local, State, and federal agencies, and one private organization, enables the Preserve to work in coordination with these partners to increase protection of rare plant habitat and to provide the best management alternatives to maintain the rare plant populations' viability.

Although this Management Plan (Plan) focuses on publicly owned lands within the Pine Hill Preserve boundaries, it may also serve as a guide for management of adjacent public and privately owned lands within the gabbro soil formation that can be set aside and/or

managed for rare plant conservation purposes. This Plan was reviewed by the parties of the Agreement, and a draft Environmental Assessment document was presented for public review in the winter of 2007. After comments are received and addressed, the final Plan will be approved by all the parties of the Agreement, who will then become signatory parties of this Plan.

***Mission of the Pine Hill Preserve***

The mission of the Preserve is to conserve in perpetuity the rare plant species and plant communities of the western EDC gabbro soil formation.

***Purpose of this Management Plan***

This Plan will coordinate management activities at the Preserve with actions undertaken by federal, State, and local agencies, conservation organizations, and private land owners to fulfill the mission of the Preserve. The Plan will also guide management activities at the Preserve and will serve as the basis for future consultation with State and federal wildlife agencies to evaluate impacts of management on the rare plants.

This Plan describes physical and biological characteristics of the Preserve. It also identifies management challenges and funding needs, outlines implementation of management activities, and proposes strategies designed to conserve the rare plants and their habitats. This Plan will be updated a minimum of every five years or more frequently, as needed, to allow for changes in management strategies as identified through monitoring and research projects and evaluation of implemented management activities.

***Preserve Goals***

- 1) Protect and manage gabbro soil rare plant habitat areas in western EDC to ensure their conservation and recovery.
  
- 2) Promote and conduct research to find the best management techniques to aid in the conservation and recovery of the gabbro soil rare plants.

3) Manage vegetation to maintain adequate fuel loads, provide functional habitat for the rare gabbro soil plant species, and reduce the risks of wildfire damage to human life and property in areas adjacent to the Preserve.

4) Provide the local community and public in general with recreational, educational, and outreach opportunities related to rare plants and their habitats.

5) Establish a consistent long-term mechanism for funding management activities at the Preserve.

***Management Objectives***

A) Promote the protection of areas that will add to the Preserve system, with emphasis on areas where the rare plants are present, areas adjacent to the Preserve lands, and areas that will facilitate habitat connectivity and management.

B) Conduct plant surveys to determine rare plant distribution and estimated population numbers to evaluate the degree of protection afforded to five federally listed plant species in relation to the *Recovery Plan for Gabbro Soil Plants of the Central Sierra Nevada Foothills* recovery targets (USFWS 2002).

C) Conduct research and monitoring of the rare plants and their associated habitat to determine the habitat conditions and management needs that will best achieve the Preserve mission.

D) Institute a fire/fuels and vegetation management program to promote the viability of the rare plant species at the Preserve, reduce the threat of wildfire, and increase the protection of properties and structures adjacent to the Preserve.

E) Communicate to the public the benefits and risks of fuels management and prescribed fire.

F) Accommodate and facilitate recreational, educational, and outreach activities among public users, including guided and non-guided tours, teaching, interpretation, research implementation, volunteer coordination, and other activities compatible with the Preserve mission.

G) Identify and quantify funding needs, including management tasks, schedule of activities, responsible parties, and sources of funding.

## II. PROTECTED RARE PLANTS

The eight rare plant species targeted for protection at the Preserve are Stebbins' morning-glory (*Calystegia stebbinsii*) (Figure 1), Pine Hill ceanothus (*Ceanothus roderickii*) (Figure 2), El Dorado bedstraw (*Galium californicum* ssp. *sierrae*) (Figure 3), Pine Hill flannelbush (*Fremontodendron californicum* ssp. *decumbens*, previously *F. decumbens*) (Figure 4), Layne's butterweed (*Packera layneae*, previously *Senecio layneae*) (Figure 5), Red Hills soaproot (*Chlorogalum grandiflorum*) (Figure 6), Bisbee Peak rush-rose (*Helianthemum suffrutescens*) (Figure 7), and El Dorado mule-ears (*Wyethia reticulata*) (Figure 8). Naming conventions follow Jepson Flora Project: Index to California Plant Names (Rosatti 2006).



**Figure 1. Stebbins' morning glory.**

**Photos by Graciela Hinshaw.**



**Figure 2. Pine Hill ceanothus.**



**Figure 3. Pine Hill flannelbush.**

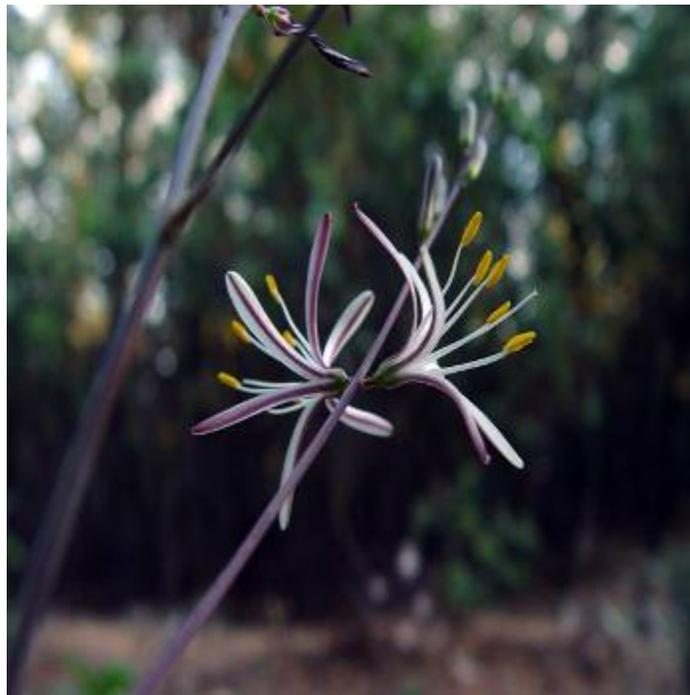


**Figure 4. El Dorado bedstraw.**

**Photos by Al Franklin.**



**Figure 5. Layne's butterweed. Photo by Al Franklin.**



**Figure 6. Red Hill soaproot. Photo by George W. Hartwell.**



**Fig. 7. Bisbee Peak rush-rose. Photo by George W. Hartwell.**



**Figure 8. El Dorado mule-ears. Photo by Graciela Hinshaw.**

### ***Rare Plant Status and Endemism***

Five of the eight rare plants, Stebbins' morning-glory, Pine Hill ceanothus, El Dorado bedstraw, Pine Hill flannelbush and Layne's butterweed, are protected by federal and/or State laws (Table 1). Red Hills soaproot and Bisbee Peak rush-rose are listed as rare by the California Native Plant Society (CNPS), and El Dorado mule-ears is considered by the BLM as a species of concern (Table 1).

Pine Hill ceanothus, El Dorado bedstraw, Pine Hill flannelbush, and El Dorado mule-ears are endemic to the Pine Hill area, and are not known to exist under natural conditions anywhere else.

**Table I. Rare plant species at the Pine Hill Preserve and their status.**

<b>Species</b>	<b>Federal and State Status</b>	<b>CNPS Status</b>
Stebbins' morning-glory	Endangered (federal and State)	1B.1 Rare, threatened or endangered in California and elsewhere. Seriously endangered in California (CNPS 2007).
Pine Hill ceanothus	Endangered (federal) and rare (State)	1B.2 (Rare, threatened or endangered in California and elsewhere. Fairly endangered in California.)
El Dorado bedstraw	Endangered (federal) and rare (State)	1B.2
Pine Hill flannelbush	Endangered (federal) and rare (State)	1B.2
Layne's butterweed	Threatened (federal) and rare (State)	1B.2
Red Hills soaproot	Species of Concern (Bureau of Land Management)	1B.2
Bisbee Peak rush-rose	None	3.2 Plants about which we need more information- Review list. Fairly endangered in California.
El Dorado mule-ears	Species of Concern (Bureau of Land Management)	1B.2

***Existing Laws and Conservation Programs***

Protection for the eight rare plant species at the Preserve is aided by the status provided by federal and State laws and regulations, by the CNPS listing, and by policies adopted by the EDC General Plan.

Protection of plants listed under the California Endangered Species Act (CESA) (Fish and Game Code Sections 2050 to 2097) is provided through habitat acquisition, review of local land use planning for projects that may impact the species, multi-species conservation planning, stewardship, recovery, research, and education (CNPS 2001). Protection of plants that are State listed as “rare” is provided under the California Native Plant Protection Act of 1977 (NPPA) (Fish and Game Code Sections 1900-1913), which directs DFG to “preserve, protect and enhance rare and endangered plants in this State.”

Protection of plants listed under the federal Endangered Species Act (ESA) (USFWS 1976) is provided by land acquisition, recovery plans, agreements with State agencies, consultation with federal agencies, prohibitions against damage of such species on federal lands, and by Habitat Conservation Planning processes (CNPS 2001).

The Bureau of Land Management (BLM) protects special status plants by providing inventories, designating Areas of Critical Environmental Concern (ACEC), monitoring, research, public education, land acquisition, and volunteer assistance (CNPS 2001).

Plants that are listed as rare by the California Native Plant Society (CNPS) are fully considered during preparation of environmental documents relating to the California Environmental Quality Act (CNPS 2001).

The EDC’s 2004 General Plan includes a Conservation and Open Space Element to address the conservation of biological resources. Goal 7.4: Wildlife and Vegetation Resources of the General Plan is to identify, conserve, and manage wildlife, wildlife habitat, fisheries, and vegetation resources of significant biological, ecological, and recreational value. Policy 7.4.1.1 of EDC’s 2004 General Plan establishes that “The County shall continue to provide for the permanent protection of the eight sensitive plant species known as the Pine Hill endemics and their habitat through the establishment and management of ecological preserves consistent with County Code Chapter 17.71 and the USFWS’s *Gabbro Soil Plants for the Central Sierra Nevada Foothills Recovery Plan*.”

In addition, policies 7.4.1.2 through 7.4.1.6 of the General Plan directly address conservation issues regarding the rare plants, including purchasing lands for preserve sites, limiting land uses within established preserve areas, designating an Ecological Preserve, preparing preservation/conservation strategies when discretionary development is proposed, and avoiding disturbance or fragmentation of important habitats when possible (EDC 2004).



### III. PRESERVE BACKGROUND

Historically, gold rush activities in the Pine Hill area and, more recently, commercial and residential development, have reduced and fragmented habitat for the rare plants growing on gabbro soils in western EDC (Barnes 2001 and USFWS 2002). Beginning in late fall of 1979, the California Native Plant Society (CNPS) coordinated with other groups to encourage the State of California to preserve significant natural areas and, in 1979, the 240-acre Pine Hill Ecological Preserve was established (USFWS 2002). This State-owned Ecological Preserve is currently part of the Pine Hill Preserve system.

Between 1979 and 1982, five of the eight species targeted for conservation at the Preserve were listed as rare or endangered by the State under the Native Plant Protection Act of 1977. In 1987, CNPS raised concerns to the California Department of Fish and Game (CDFG) about the lack of botanical surveys being performed prior to development of areas in western El Dorado County. In 1989, the County and the development community became aware of the CDFG's strong concern regarding this issue, and there was an agreement among all parties to seek a regional solution to accommodate development projects and off-site mitigation for the rare plants (BLM 2002)

In 1991, a study of potential rare plant preserve locations was conducted and published by EIP Associates with financing from development interests and EDC. The report addressed the lack of botanical surveys being performed prior to development in western EDC (EDC 2007). This document set the basis for future land acquisitions directed towards the establishment of a rare plant preserve system (EIP 1991).

In 1992, a Memorandum of Understanding among CDFG, the BLM, and the Bureau of Reclamation (BOR) recognized the importance of preserving habitat for the gabbro soil species. The EDC Board of Supervisors formed the Rare Plant Advisory Committee (RPAC) with business, non-profit, and State and federal agency participation to advise the County on rare plant policy. Because of the increasing demand for housing, commercial, and industrial development in western EDC, and the associated loss of

populations of rare plant species and the habitats with which they are associated, the RPAC was assigned to identify feasible rare plant preserve sites, as well as funding mechanisms and management strategies for these sites. The RPAC determined that the establishment of an approximately 3,450-acre preserve system was necessary for the recovery and ongoing protection of the rare plants, particularly in the Salmon Falls, Pine Hill, and Cameron Park/Shingle Springs areas as core preserve sites, and Martel Creek and Penny Lane areas as satellite preserve sites. Mechanisms identified to acquire lands at the core preserve sites included density transfers, easement sales or donations by willing partners, and land purchases (USFWS 2002).

In February 1993, the recommendations of the RPTAC were presented to the EDC Board of Supervisors (BOS) (EDC 2007). In March of 1993 the BOS approved, in concept, four of the preserve sites (units), and directed that the Salmon Falls, Martell Creek, Pine Hill and Penny Lane units be included in the General Plan update. The Board did not approve the Cameron Park unit at that time because of cost (BLM 2002). The Board of Supervisors deferred to an unspecified date consideration of local financing options for funding the acquisition or maintenance of the four preserve units they did conceptually approve (EDC 2007).

On February 27, 1995, a USFWS biological opinion with the Bureau of Reclamation (BOR) on the interim renewal of water contracts, including El Dorado County, identified the implementation of a preserve system for the five federally listed plants and the endowment of the preserve sites with sufficient funding to maintain and operate the preserve system as “critical needs” (USFWS, 1995).

On January 23, 1996, the EDC BOS approved RPAC recommendations, except for the preserve site at Cameron Park, and adopted Resolution No. 10-96 thereby approving the El Dorado County General Plan, including Policy 7.4.1.1 recognizing four ecological preserve units of the Pine Hill Ecological Preserve and establishing implementation strategies in accordance with the El Dorado County General Plan (Volume II, Background Information, Appendix I, Rare Plant Preserve Program). The rare plant

preserve sites are designated by the EP overlay shown on the land use map and defined by Policy 2.2.2 4.

In 1997, letters from the FWS and CDFG were sent to EDC to support the establishment, financing, and management in perpetuity of the five preserve sites (including the Cameron Park unit) and covering 3,450 acres in western EDC. On March 24, 1998, the BOS approved a General Plan amendment to include the Cameron Park unit, and adopted Ordinance 4500 and In-Lieu Fee resolution (EDC 2007).

In 2001, a Cooperative Management Agreement was approved by three federal and two State agencies, one county government, one county agency, and a local non-profit conservation group to pool their resources to conserve the eight rare plant species and the systems they inhabit (see Cooperative Management Agreement section below).

In 2002, the FWS published a recovery plan recommending the protection of 5,000 acres of habitat for the rare plants growing on gabbro soil. The FWS recovery plan recommendation guides the recovery and conservation goals for the rare plants and compiles the best scientific knowledge to halt their extinction. An ultimate goal of the FWS recovery plans is to remove species from the endangered and threatened species list once recovery goals are accomplished.

The 2004 EDC General Plan provides for the conservation and protection of soils, minerals, water, wildlife and fisheries, vegetation, cultural resources, and open space, and includes protection for the eight sensitive rare plants of western EDC. On July 19, 2004, the EDC BOS adopted Resolution No. 235-2004, thereby approving the 2004 General Plan including the five-unit ecological preserve and Policy 7.4.1.1 which states:

The County shall continue to provide for the permanent protection of eight sensitive plant species known as the Pine Hill endemics and their habitat through the establishment and management of ecological preserves consistent with County

Code Chapter 17.71 and the USFWS's *Gabbro Soils Plants for the Central Sierra Nevada Foothills Recovery Plan* (USFWS 2002).

### ***Cooperative Management Agreement***

Cooperation among agencies and organizations concerned with protection of the rare plants was formalized on March 1, 2001, with the signing of a Cooperative Management Agreement (Agreement) (Appendix 1). Eight local, State, and federal agencies, including BLM, BOR, FWS, CDFG, California Department of Forestry (CAL FIRE), EDC, El Dorado Irrigation District (EDID), and the private non-profit American River Conservancy (ARC), were participants in the 2001 Agreement. El Dorado County Water Agency (EDCWA) also participated in rare plant conservation issues and supported land acquisitions with funding and, in 2005, the Agreement was amended to include EDCWA as the ninth official party. On July 18, 2006, after reaching its 5-year term, the Agreement was ratified by the Cooperative Management parties. This new Agreement will be in effect until July 2011.

The Cooperative Management group is a committee formed by representatives of all the Agreement parties. This group meets quarterly (or more often if needed) to coordinate management activities and address issues such as rare plant habitat protection, land acquisitions, and funding mechanisms for the Preserve. The development of this Plan is among the common responsibilities of the Agreement parties. Other responsibilities of the parties are listed in the Agreement document and summarized in Table II.

This Plan will further assist the Preserve Manager and the Cooperative Management group by providing guidance for rare plant and habitat conservation activities at the Preserve. The Plan is written to allow for flexibility in response to the accumulation of new information, reviews, and updates of the Plan. Once approved by the parties to the Agreement, the Plan will be formally reviewed and updated every five years.

**Table II. Pine Hill Preserve Cooperative Management Agreement.**

Agency/organization	Responsibilities
ARC	Acquires land and provides fundraising expertise, volunteer support, and educational activities.
BLM	Conducts management planning, fuels management, and research; grants special management designation to BLM lands in the Preserve; and aids in recovery of federally listed plant species.
BOR	Contributes to land acquisition, management, and research.
CAL FIRE	Conducts management planning, and fuels management.
CDFG	Oversees and manages activities on CDFG lands; provides consultation guidance regarding compliance with the California Endangered Species Act.
EDC	Maintains an Ecological Preserve designation to enforce development standards for areas with the rare plants. Participates in funding land acquisition and management of the Preserve. Provides technical support.
EDCWA	Offers support in the protection, care, and management of the Preserve.
EDID	Provides access to the Preserve through easements adjacent to Preserve lands. Participates in funding land acquisition and management of the Preserve. Provides technical support.
FWS	Provides technical advice. Provides funding for land acquisition, research, and management.

***History of Land Acquisitions***

In 1979, under recommendation from the CNPS, CAL FIRE transferred 320 acres of not needed land at Pine Hill to the CDFG for ecosystem management (Howard 1979).

During the 1990s and into the current decade, funds from the County, State, and federal agencies have been dedicated to the common goal of acquiring properties (fee simple) for

the Preserve system. Often, one or more agencies provide the funding, the ARC acquires the land and transfers the title to an agency, and the Pine Hill Preserve accepts primary management responsibility.

Between 1990 and 1996, the State acquired 305 acres that helped establish the Salmon Falls unit. In 1991, the BLM dedicated 1,305 acres of public lands to this unit and, between 2002 and 2003, the BLM purchased 1,029 additional acres for the unit. In 2003, the EDC also purchased and added 20 acres to the Salmon Falls unit. In 2006, another 40 acres were added to the Salmon Falls unit. This unit currently totals 2,699 acres.

In 1991, the BLM dedicated 320 and 166 acres of public lands to the Preserve system, and created the Martel Creek and Penny Lane units, respectively.

In 1991, the BLM also added 40 acres of public lands to the 320 acres owned by the State at Pine Hill to create the Pine Hill unit. Two later acquisitions by EDC and the BLM in 2002 and 2004 added 43 more acres to the now 403-acre Pine Hill unit.

Between 1997 and 2002, several acquisitions were conducted by ARC in the Cameron Park area, using County, State, and federal funds. These acquisitions, totaling 392 acres, created the Cameron Park unit of the Preserve.

During 2005 and 2007, two different efforts to acquire 120 acres and expand the Preserve system were initiated by ARC. One of the acquisitions, consisting of two 20-acre parcels adjacent to the Salmon Falls unit, was funded by State and federal funds. The second acquisition process, using State and federal funding, is almost complete and includes two 40-acre parcels adjacent to the Martel Creek unit. In addition, the Preserve is in the process of obtaining 5.9 acres adjacent to the Cameron Park unit as part of the mitigation requirements assigned to a development project.

The land acquisition process has become more difficult due to the few remaining large parcels with suitable habitat and the elevated cost of land in the area, especially near the

Cameron Park unit, where some of the best habitat for the rare plants still exists. The acreage by owner in each of the Preserve units is summarized in Table II. A complete list of the different Preserve parcels, including EDC Assessor's parcel numbers, total acreage, acquisition history, ownership and current management agency is provided in Appendix 5. Proposed management designations for each parcel will be specified on basis of rare plant surveys being conducted at the Preserve, and expected to conclude during the winter of 2008.

**Table III. Pine Hill Preserve total acreage by ownership and unit.**

<b>Owner</b>	<b>Unit</b>	<b>Acreage</b>
BLM	Cameron Park	392
	Martel Creek	320
	Penny Lane	166
	Pine Hill	60
	Salmon Falls	2,346
BOR	Salmon Falls	29
State of California	Pine Hills	320
	Salmon Falls	305
EDC	Cameron Park	63
	Pine Hill	22
	Salmon Falls	19
	<b>Total</b>	<b>4,042</b>



## IV. SITE DESCRIPTION

### *Preserve Location and Physical Characteristics*

The 4,042-acre Preserve is located in the central Sierra foothills in western EDC, north of Highway 50 and southeast of Folsom Lake (Figure 9), approximately 30 miles east of Sacramento. Elevations at the Preserve range from 480 to 2,059 feet above sea level.

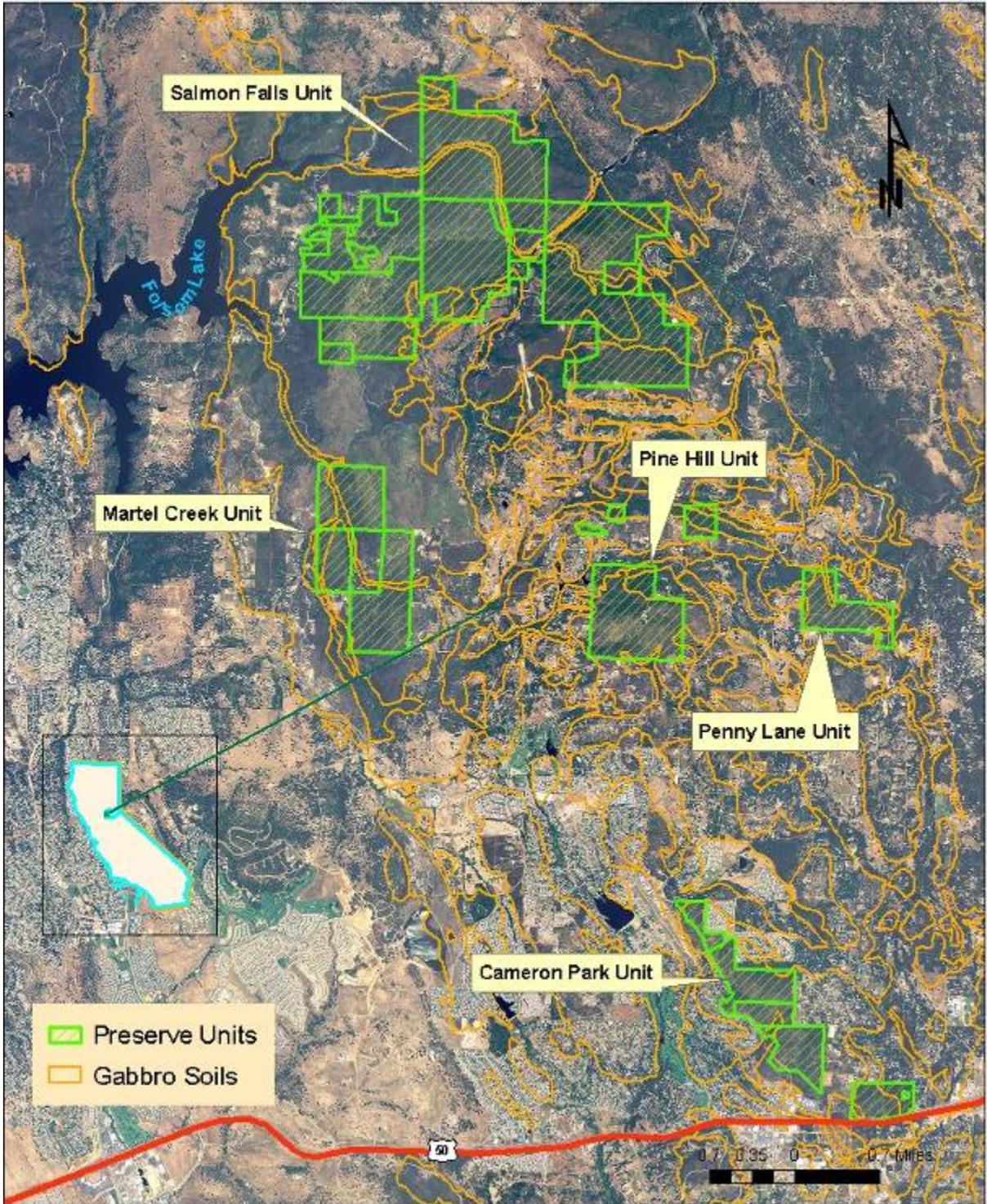
The Preserve is formed by five non-contiguous units that stretch over a 30,000-acre area of the gabbro soil formation (Figure 9). The gabbro soil formation dates from 175 million years ago during the late Jurassic Period (CDFG 1999). The dominant soils at the Preserve are classified as sandy loams of the Rescue Soil Series. These soils are well drained, with a high iron and magnesium content and a characteristic red color.

The climate is characterized as Mediterranean with cool wet winters and hot dry summers. Average precipitation and temperature during the last five years are 31 inches per year and 63° F, respectively (Weather Station History 2007); the average minimum and maximum temperatures during the past five years are 29° F and 113° F.

A portion of the South Fork American River runs through the Preserve, into which flow several intermittent and perennial creeks in the Preserve (Sweetwater, Martel, and Weber Creeks).

### *Preserve Units*

**1) Cameron Park** - This 454-acre unit comprises a 364-acre parcel and a 90-acre parcel in the Cameron Park and Shingle Springs areas, respectively. The largest parcel at Cameron Park is bisected in its northern portion by Meder Road. Both parcels are mostly surrounded by housing and commercial development, although a few privately owned parcels with natural habitat and significant rare plant populations remain undeveloped and help to naturally connect both unit parcels. Proposed development projects on



**Figure 9. Pine Hill Preserve location map and Preserve**

privately owned lands may impact the remaining habitat between the Cameron Park and Shingle Springs parcels, and may also continue to impact habitat all around the Preserve parcels. There is a utility right-of-way (ROW) easement associated with this unit.

**2) Martel Creek** - This is a 320-acre unit located in the Sweetwater Creek and Martel Creek areas. The unit comprises two 160-acre parcels that surround 80 acres of private land. The 80 acres of privately owned undeveloped land provide connectivity in the unit. Additional habitat and low density housing surround this unit. The Martel Creek unit is about to be expanded towards the east by the ongoing acquisition of 80 acres of adjacent natural habitat.

**3) Penny Lane** - This is a contiguous 166-acre area north of the town of Rescue and near Penny Lane road. This unit is surrounded by low-density development (houses with several-acre parcels). Some natural habitat remains in the privately owned parcels, either as a result of parcels not being developed or because landowners have maintained some of the original landscape and vegetation on developed parcels. There is a utility ROW associated with this unit.

**4) Pine Hill** - This 403-acre unit comprises a 360-acre parcel at Pine Hill and smaller disjunct parcels nearby. This unit is surrounded by housing developments. House parcels in this area tend to be larger (5-10 acres), allowing for some of the natural habitat and the rare plant species to survive on privately owned parcels. Several undeveloped parcels with habitat remain in the Pine Hill area, but development continues to be a main source of habitat destruction and fragmentation in this area. There are utility and communication ROWs in this unit and associated facilities at the top of Pine Hill. CAL FIRE also maintains a watch tower and associated infrastructure at the top of the Hill.

**5) Salmon Falls** - This is a mostly contiguous 2,699-acre unit located in the Salmon Falls/Webber Creek area. The area surrounding this unit is mostly undeveloped, with areas of privately owned natural habitat that currently connect the Salmon Falls unit to the Martel Creek unit. Two mining claims are associated with this unit.

### *Vegetation Types*

Vegetation at the Pine Hill area is represented by three distinct types: grassland, woodland, and chaparral (Figure 10) (FWS 2002). The majority of the Preserve is covered with chaparral species. More than 700 plant species (approximately 10 percent of the native species in California) are represented in the gabbro soils formation and adjacent areas (Horenstein and Ehrgott 1977). Wilson (1986) described the Pine Hill area as having the highest concentration of rare and endangered plants in EDC. This high concentration is represented in areas set aside for conservation purposes at the Preserve and the surrounding remaining pockets of natural habitat.



**Figure 10. View of Pine Hill, showing grassland, oak woodland, and chaparral habitat types. Photo by Al Franklin.**

**1) Northern Mixed Chaparral.** The main vegetation type at the Preserve was described by Holland (1986) as gabbroic northern mixed chaparral. Primary species included in this vegetation type are chamise (*Adenostoma fasciculatum*), white leaf Manzanita (*Arctostaphylos viscida*), toyon (*Heteromeles arbutifolia*), California redbud (*Cercis occidentalis*), poison oak (*Toxicodendron diversiloba*), different species of ceanothus (*Ceanothus* spp), and California buckthorn (*Rhamnus californica*). All eight rare plant species targeted for protection at the Preserve are associated with gabbro- and serpentine-derived soils (USFWS 2002) and are present on the chaparral habitat type (Table IV).

**2) Woodland.** The woodland vegetation type is represented by grey pine (*Pinus sabiniana*), ponderosa pine (*P. ponderosa*), interior live oak (*Quercus wislizenii*), blue oak (*Q. douglasii*), and California black oak (*Q. kelloggii*) in combination with the chaparral species. Although El Dorado bedstraw is found in chaparral areas, it is mostly present in woodland areas. Other rare plant species, such as Pine Hill flannelbush, Layne's butterweed, El Dorado mule-ears, Red Hills soaproot, and Bisbee Peak rush-rose are also found in woodland areas (Table IV).

**3) Grassland.** Grassland areas are mostly represented by non-native grasses such as brome (*Bromus* spp.) and little quaking grass (*Briza minor*), although some native species, such as purple needlegrass (*Nasella pulchra*), bluegrass (*Poa bulbosa*), and blue wild rye (*Elymus glaucus*), are also present. Grassland patches occur in openings within the chaparral and woodland vegetation types, and as understory and interstices within the chaparral species. The rare plants are not common in the grasslands, but Layne's butterweed, El Dorado mule-ears, Red Hills soap root, and Pine Hill ceanothus have been observed in the chaparral/grassland transition areas or growing within patches of grassland (Table IV).

#### ***Rare Plants Description and Distribution***

**1) Stebbins' morning-glory** is a perennial herb, about 40 cm tall, producing white flowers from May through July. This species requires pollination by bees and other insect

**Table III. Distribution of rare plants at the Pine Hill Preserve by habitat type.**

<b>Species</b>	<b>Habitat types</b>	<b>Preserve Unit</b>
Stebbins' morning-glory	Chaparral	Cameron Park and Salmon Falls
Pine Hill ceanothus	Chaparral, chaparral/grassland transition	Cameron Park, Pine Hill and Salmon Falls
Pine Hill flannelbush	Chaparral, chaparral/woodland transition	Pine Hill
El Dorado bedstraw	Woodland, chaparral	Cameron Park, Pine Hill and Penny Lane
Layne's butterweed	Chaparral, woodland and grassland patches	Cameron Park, Martel Creek, Penny Lane, Pine Hill and Salmon Falls
El Dorado mule-ears	Chaparral, woodland and grassland patches	Cameron Park, Martel Creek, Penny Lane, Pine Hill and Salmon Falls
Red Hills soaproot	Chaparral, woodland and grassland patches	Cameron Park, Martel Creek, Penny Lane, Pine Hill and Salmon Falls
Bisbee Peak rush-rose	Chaparral, woodland and grassland patches	Cameron Park, Martel Creek, Pine Hill and Salmon Falls

species to successfully establish seed (Baad and Hanna 1987). The fruit is a capsule and seeds can frequently be observed once the capsule opens. The leaves have 7 to 9 deep, narrow lobes, and the trailing or climbing branches can grow up to 1 m in length (FWS 2002). Stebbins' morning glory has a rootstock that sends out herbaceous rhizomes that help with propagation (Nosal 1977). This species seems to be shade intolerant and does not occur beneath closed canopy (Baad and Hanna 1987). At the Preserve, this species is present in chaparral areas of the Cameron Park and Salmon Falls units (Table IV). It also occurs in areas of Nevada County, with very restricted distribution.

**2) Pine Hill ceanothus** is a perennial evergreen shrub that grows up to 3 m in diameter (Wilson 1996). The branches generally lie on the ground, and they can root if in contact with the soil. It has small white flowers that grow in clusters from April through June.

This species requires pollination, mostly by flies, gnats, bees, and wasps, for reproductive success (James 1996). The fruits are reddish-brown and, when mature, they open in an explosive way that helps to spread the seeds. After a fire, Pine Hill ceanothus does not resprout, but depends on re-establishment from seeds. Canopy shading of this species affects its flower and fruit reproduction (James 1996). This endemic species to the Pine Hill area is found in the Preserve chaparral areas at the Cameron Park, Pine Hill, and Salmon Falls units. It is also found at some chaparral/grassland transition areas (Table IV).

**3) Pine Hill flannelbush** is a perennial shrub that grows up to 1.5 m tall. The leaves are covered with hairs and have 5 to 7 deep lobes. The flowers are orange and the blooming period is from April to July. Native solitary bees pollinate the flowers (Boyd 1994). The fruit is a capsule containing an average of 3 to 4 seeds (Boyd 1985). Seventy percent of the developing fruit is destroyed by insects prior to maturing. The seeds can be eaten by rodents and dispersed by harvest ants (Boyd 1996). This endemic species is usually present on rocky ridges in chaparral and woodland communities (Hickman 1993), with a very restricted distribution within the Preserve. It is only represented in the chaparral and woodland/chaparral transition habitats at the Pine Hill unit (Table IV).

**4) El Dorado bedstraw** is a small perennial herb, with hairy aboveground stems up to 30 cm in length that are sometimes connected underground (Hinshaw pers. obs. 2007). The small leaves are also hairy and arranged in groups of four at each node. Flowers are pale yellow and the species blooms between May and July. The small fruit is covered with hairs (Hickman 1993). Very little is known about the biology or ecology of this endemic species (CDFG 1992). It grows in the understory of live oak or black oak woodlands, often on north facing slopes (EIP 1991), although in the Preserve it is also found in the chaparral understory. This species is present at the Cameron Park, Pine Hill, and Penny Lane units (Table IV).

**5) Layne's butterweed** is a perennial herb up to 60 cm tall that grows from a rootstock. The larger leaves grow at the base of the plant, and smaller leaves along the stem. The

flower heads are yellow and bloom from April to July (CNPS 2001). The predominant breeding system for this species is outcrossing pollination, with the resulting dandelion-like seeds likely dispersed by wind (Marsh 2000). This species is mostly found in open, rocky areas in chaparral and woodland habitats (EIP 1991) and in some grassland patches. Observations suggest that Layne's butterweed is an early successional species that occupies temporary openings on gabbro or serpentine soils and is eliminated as vegetation grows up around it (Baad and Hanna 1987). It is distributed over all units at the Preserve (Table IV). It also occurs in the Red Hills in Tuolumne County and near Brownsville in Yuba County.

**6) Red Hills soaproot** is a perennial herb that grows from a long underground bulb with several thin, reddish-brown outer coats. The plant has a rosette of long, narrow basal leaves with wavy margins, a thin, branching stem up to 30 cm tall, and scattered whitish flowers. The flowers, which bloom in June, open in the evening and close by morning. The fruit is a rounded capsule divided into three chambers (FWS 2004). This species is present at all units of the Preserve and is typically found on rocky soils in open areas in chaparral (EIP 1991), although it is also present in woodlands and grasslands in the Preserve (Table IV). It also occurs in the Red Hills area in Tuolumne County.

**7) Bisbee Peak rush-rose** is a broom-like perennial shrub up to 75 cm tall with many straight, slender stems. The leaves are flat and approximately 2.5 cm long. The green leaves and stems are very densely covered with soft, white, short hairs. The yellow flowers have five broad petals and appear from April to August. This species is distributed on rocky areas over all the Preserve units. It is also distributed beyond the gabbro soil formation into the Ione soil formation (EIP 1991) (Table IV) and in Amador and Calaveras counties.

**8) El Dorado mule-ears** is a perennial plant up to 1 m tall that spreads through underground rhizomes (Ayres 1997). It has large (20 cm long), ovate leaves with a broad base, and one to four yellow flower heads with the appearance of a typical sunflower inflorescence (EIP 1991). This species is pollinated by native bees with the seeds

dispersed by water and wind, although recruitment by seeds is very poor (Ayres and Ryan 1977). El Dorado mule-ears is restricted to the Pine Hill area where it grows mostly in open areas on the gabbro soil formation. This endemic species of western EDC is present at all units of the Preserve, in chaparral, woodland, and grassland areas (Table IV).

### ***Other Wildlife Species in the Preserve Area***

The Preserve's vegetation is not only rich in plant diversity (see Appendix 2 for a list of plant species of the Pine Hill unit and surrounding areas), but also helps to support a diversity of wildlife in the area. Over 240 species of wildlife are known to occur within and near the Preserve (Appendix 3).

Wildlife observed at the Preserve area include coyote (*Canis latrans*), black-tailed jackrabbit (*Lepus californicus*), black-tailed deer (*Odocoileus hemionus*), mountain lion (*Puma concolor*), California ground squirrel (*Spermophilus beecheyi*), black bear (*Ursus americanus*), red-winged blackbird (*Agelaius phoeniceus*), Mallard duck (*Anas platyrhynchos*), western scrub-jay (*Aphelocoma californica*), great egret (*Ardea alba*), red-tailed hawk (*Buteo jamaicensis*), valley quail (*Callipepla californica*), western rattlesnake (*Crotalus viridis*), California whipsnake (*Masticophis lateralis*), and California horned lizard (*Phrynosoma coronatum*).

In addition, the Preserve supports numerous insects including the various pollinators required for rare plant reproduction. An undetermined number of fungi, soil bacteria, and algae also exist in protected areas within the Preserve. Because the mechanisms for the conservation of the rare plants depend upon the existence and functionality of the entire ecosystem, conservation and management efforts should also focus on preserving the soil, hydrology, and adequate fire regimes to sustain all wildlife species.



**Figure 11. California whipsnake, Salmon Falls unit. Photo by Graciela Hinshaw.**

### ***Cultural Resources***

There is no clear pattern of historical land use in the gabbro soils area, although in general more settlement and ranching/farming activities were established in the relatively flat oak woodlands than the chaparral-covered hills. A cursory review of land records on file at the BLM Folsom Field Office indicates that Preserve lands (which are mostly located on brushy hillsides) generally were transferred to private ownership later than the more open low-lying oak woodlands.

The documentary record suggests decades of intensive mining in the area beginning during the Gold Rush. For decades, towns like Salmon Falls, Shingle Springs, and Rescue were significant service centers for local miners. As a consequence, placer and hardrock mining sites occur in the Preserve and adjacent areas. An example of a mining site is the hardrock Boulder Mine, located near Weber Creek. Other mining sites and features in the Preserve include the Niles Reinhold Placer Mine, a 1930s mining settlement near Weber Creek; an 1800s house site near Peacock Ravine; and the

Diamond Ditch/Park Canal, a mining and irrigation ditch that runs through the Cameron Park unit (Barnes 2001).



## V. MANAGEMENT ISSUES AND STRATEGIES

This section identifies main issues affecting the survival, conservation, and recovery of the rare plants. It also describes management strategies to address these concerns. The strategies focus on ameliorating or eliminating threats to the survival, conservation, and recovery of the rare plants.

### *Land Protection*

The most common threat to all the species protected at the Preserve is the loss and/or fragmentation of their remaining natural habitat (FWS 2002). Most of the 30,000 acres of gabbro soil plant habitat has been lost to commercial, urban, and suburban development. The establishment of the Pine Hill Preserve has helped to ensure protection for 4,402 acres of gabbro soil plant habitat, 3,154 of which lie within the FWS 5,000-acre area designated for the recovery of the federally listed rare plants.

Because habitat destruction and fragmentation in western EDC continues at a rapid rate, the Preserve's main strategy focuses on identifying and setting priorities to protect rare plant habitat. Habitat and plant protection can be accomplished through acquisition and dedication of land for conservation purposes and/or implementation of other land protection mechanisms, such as the establishment of conservation easements.

The Preserve collaborates with the various partners to locate funds for land acquisition through applications for grants, appropriation of federal funds, and local, State, and federal mitigation funds set aside to offset the effects of rare plant habitat destruction and alteration. The Preserve also works with private landowners willing to provide protection for the rare plants and their habitats by allowing surveys and monitoring projects to be conducted on their properties, and by providing areas for habitat connectivity (corridors and "stepping stones") that support the dispersal of plants among habitat areas and facilitate genetic exchange among occurrences.

The proper identification of units is an important aspect of land protection at the Preserve. Strategic placement of posts, signs, and fences will help identify Preserve boundaries, provide guidance to the public about appropriate uses, and consequently help to maintain the Preserve's ecological integrity.

Another important aspect of land protection at the Preserve is the prevention and remediation of incidents such as trespass, trash dumping, and off-road driving that may damage the rare plants directly or degrade their habitat. Regular patrolling visits to establish presence at the Preserve and communication with neighbors have proven to be effective strategies for habitat protection at the Preserve. Neighbors regularly report incidents to the Preserve manager, thus helping to prevent trespass and habitat degradation incidents. The Preserve also works with the BLM and local law enforcement to prevent, remediate, and prosecute the most severe illegal trespass incidents.

### ***Inappropriate Fire Regime***

The second most important threat to rare plants at the Preserve is habitat degradation due to altered fire regime. Some of the rare plants at the Preserve have evolved with fire and require an appropriate fire regime to germinate, successfully establish, and/or reproduce (Ayres 1977, Boyd 1985). The historical fire regime, which was favorable to the rare plants, has been altered by fire suppression and subsequent fuel buildup or, conversely, by frequent fires that do not allow for recovery of the native vegetation. Most of the rare plants at the Preserve benefit from some kind of disturbance, such as removal of shrubs that compete with the rare plants for space, sunlight, and soil nutrients. For some species, fire also plays a role in periodically removing shrubs and promoting seed germination. Without fire or other disturbance mechanisms that eliminate shrub competition, the rare plant populations tend to decline in number and distribution over time.

The excessive accumulation of fuel (from a combination of dense trees, shrubs, and/or grasses, dead and alive) at some of the Preserve areas not only reduces rare plant habitat quality, but also increases the chances of catastrophic fire events that may be detrimental (due to excessive heat in the soil and vegetation layers) to rare plants, human life, and

property. Prescribed burning at the Preserve can restore appropriate fire regimes for the rare plants, aiding in their conservation and recovery. However, because Preserve boundaries interface with urban and suburban development, safety to human life and property are major considerations and constitute a tremendous challenge for effective management of fire-related activities at the Preserve.

The Preserve strategies to restore fire, or use other mechanisms to reduce fuel loads, include an evaluation of risks to habitat, human lives, and property, and the development of a Fire Plan. The risk evaluation focuses especially on the Cameron Park unit where most of the wildland-urban interface occurs (Hood, 2004). A draft Wildfire Community Protection Plan (WCPP) was prepared by Murphy (2007) for the Cameron Park unit of the Pine Hill Preserve. These documents provide information that can be used for a more general approach at the Preserve once specific needs of each Preserve unit are considered.

An important strategy is to continue to implement fuels reduction projects, including the creation of fuel breaks to reduce the risk of catastrophic wildfire that may affect human lives, property, and rare plant habitat. In the event of wildfire, completed fuels reduction projects will facilitate safe, effective fire suppression, and may provide a geographic approach for fire containment while taking into consideration the biological values in the area.

In 2002, the Preserve started creating a fuel break around a large portion of the perimeter of the Cameron Park unit (next to the most densely populated area). Chaparral, cut with chainsaws, was hand-piled and burned under controlled conditions. Trees and herbs were left undisturbed, rare plants were marked, and crews were trained to recognize the rare plants and avoid them. When burning operations had to stop due to health concerns for one neighbor, the removal of the shrub layer along the fuel break continued using a shrub masticator. A vegetation chipper was also used on larger pieces of debris accumulated in the brush piles. This shrub removal seems to be beneficial for most of the rare plants, which have established in areas formerly occupied by the shrubs. Furthermore, recruitment of new individuals is evident in areas where the shrub piles were burned.

Effects of brush removal on the rare plants are being evaluated by the BLM through monitoring programs for Stebbin's morning glory, Pine Hill ceanothus, El Dorado bedstraw, and El Dorado mule ears.

Because positive responses to burning at long intervals does not imply that the species can survive repeated burning at short intervals, another strategy to restore adequate fire regimes for the rare plants at the Preserve is to conduct further research on the response of the rare plants to fire, to evaluate the regeneration of these species (e.g., the rate at which the seed bank is replenished), and to learn about the range of fire frequencies the species tolerate and the range that optimizes regeneration.

Other strategies include continued cooperation between the BLM, CAL FIRE, FWS, and CDFG in obtaining funding for planning and implementation of prescribed burns and other fuel reduction activities. In 2006, FWS and BOR's Central Valley Project Conservation Project (CVPCP) and Habitat Restoration Project (HRP) identified fuels management at the Preserve as a priority. The Preserve successfully applied for funds to develop a fire management plan that includes management alternatives to reduce fuel loads, initiate the implementation of the plan, and monitor and evaluate its effectiveness in enhancing rare plant habitat. During 2007, a series of small fuels reduction projects was implemented at the Cameron Park and Pine Hill units.

During In 2006, the Preserve initiated participation with EDC Fire Safety Council to coordinate wildfire prevention activities and has worked in coordination with the Cameron Park Fire Safety Council to participate in the development of the WCPP and seek advice for the implementation of fuels reduction projects at the Preserve.

Community education and outreach, and cooperation with the local Fire Safe Councils, is a valuable strategy to successfully implement fuels load reduction at the Preserve. The Preserve will continue to evaluate opportunities and implement practices to reduce the risk of wildfires that could result in catastrophic events for the rare plants and human communities. The Preserve will also continue to expand outreach and educate

homeowners and communities about prevention of fires that may affect the Preserve.

### *Access*

One of the main management concerns at the Preserve is the limited direct access to the Preserve units for management purposes or for public use. Vehicle access is either extremely restricted or nonexistent. Foot access is possible, although somewhat limited, and there are several points where private property (with permission) has to be crossed before reaching Preserve lands.

On one hand, limited access to the Preserve units helps maintain habitat integrity by preventing trespass issues. The Ponderosa 50 parcel of the Cameron Park unit is the only parcel of the Preserve that has open and regular access by vehicles, which favors illegal trash dumping. On the other hand, restricted access prevents low impact, responsible public use and hinders patrolling and monitoring. In accessible areas, the Preserve receives considerable use by hikers, wildlife observers, and other visitors year-round. Furthermore, management activities in areas at the Preserve with available access are more easily scheduled and implemented.

At the Cameron Park unit there is no good access point at this time to provide parking and public access. Development of such an access point for education and interpretation is a priority because this unit 1) is located near to densely populated areas, 2) has a high diversity of native plant species, including seven of the eight rare plants, and 3) is a favorite place for guided plant tours and general public use, including hiking and wildlife watching activities.

The Salmon Falls unit is the largest unit of the Preserve. Because of its extension and the contiguity of habitat surrounding this parcel, this unit has the most potential for hiking, wildlife observation, and other low-impact recreation. For this reason the development of a vehicle access point south of the South Fork American River is a priority. This access point will provide parking and access to designated trails and routes in this area. It should be designed to prevent impacts to rare plants and take into account adjacent land

ownership boundaries. Public road access to the Salmon Falls unit from Kanaka Valley Road may be possible, but would require either further land acquisitions or an access easement and parking area to allow the public to visit.

The State-owned land in the Pine Hill unit has a long history of use for interpretation, especially spring field trips guided by CNPS, CDFG, and the Preserve. Most public use is confined to the access road and the summit of the hill. Access for the public involves walking up the paved road from the electronic gate at the base of the hill.

There is no public road access to the lands in the Martel Creek or Penny Lane units. Because these units lack a full complement of the rare species, their interpretive value is limited and they are not well suited for the development of trails for recreation.

Strategies to improve access to all Preserve units include identification and mapping of existing and potential access points, opening and maintaining trails, and designating parking areas. The Preserve will also continue to coordinate with private landowners to gain increased/improved access across private lands to the Preserve, and target for acquisition parcels that would improve access to the Preserve units.

**Roads and Trails.** Some roads will remain available for various special purposes, such as easement and right-of-way access. Some roads may be retained for administrative or fire suppression purposes, but will not be open for public use. Public use of vehicles on Preserve lands will be limited to roads leading to designated parking areas. Generally, the public will have vehicular access to the edge of the Preserve and to designated parking areas, but travel on the Preserve will be non-motorized. The 1872 General Mining Law provides for access over public lands to mining claims, but neither this Law nor the BLM guarantee access to claims over private property.

Existing trails providing access within the various Preserve units will continue to be maintained and/or restored. Trails not required for management or public non-impacting recreation will be restored to natural habitat by 1) closing the trails, 2) controlling erosion

and weeds if needed, and 3) planting native plant species. Creation of new trails will be considered only if absolutely needed for management or public use, and if the associated effects on the rare plants can be minimized or avoided.

Building new roads on Preserve lands that interfere with the Preserve's mission and with local, State, and federal conservation goals for rare plant habitat protection will not be allowed. Therefore, and according to long term management goals consistent with the BLM's 1983 Sierra Management Framework Plan and the 2008 Sierra Resource Management Plan (RMP) and Record of Decision, new roads on Preserve lands is unlikely.

Road and trail use, development, maintenance, and associated activities on federal lands are subject to the provisions of the ESA and, therefore, protection of the rare plants will be favored over activities that may be detrimental to these species or their habitat.

**Parking Areas.** There are no developed parking facilities in the Preserve; the few designated parking spots are on private property or along public roads, requiring a walk of up to a half mile or more to reach Preserve lands. As a consequence, visitors are encouraged to carpool and park as few vehicles as possible at designated parking areas near the Cameron Park, Pine Hill, and Salmon Falls units. In the Cameron Park area, one of the most visited units at the Preserve, parking along public roads and then crossing Meder Road to reach a trail is a safety concern.

Designation and development of parking areas in the Cameron Park and Salmon Falls units are discussed in the Management Tasks section of this Plan. Funding for development of these parking areas is addressed in the economical analysis section.

### ***Preserve Public Uses***

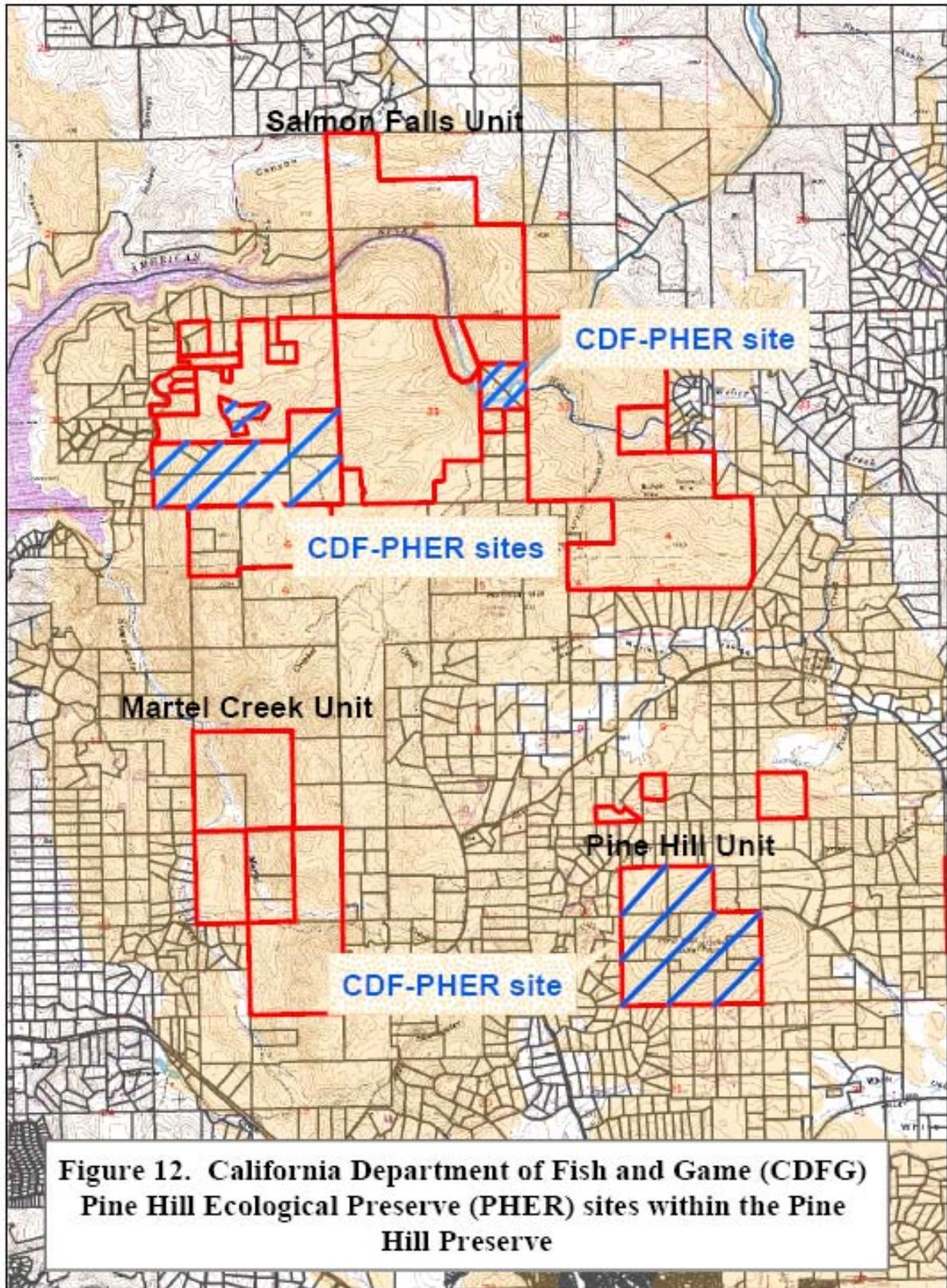
One of the Preserve goals is to provide the community with recreational and educational opportunities to promote the protection of rare plants and their habitat. Some of the main concerns and approaches regarding the use of Preserve lands by the public relate to:

**Special Designation Areas.** Section 1580 of the Fish and Game Code provides for the acquisition, designation, and management of property to protect threatened and endangered plants, animals, and specialized habitat types as Ecological Reserves. Because CDFG has designated the State lands on portions of the Pine Hill and Salmon Falls units as the Pine Hill Ecological Reserve (PHER), and because access to these areas is through privately owned parcels and roads, public access to these areas is restricted. In general, guided field trips and hiking are allowed with previous notification of CDFG and/or the Preserve Manager. The CDFG PHER sites within the Preserve are shown in Figure 12.

The BLM 2008 RMP has designated the Preserve as an Area of Critical Environmental Concern (ACEC). This designation requires the BLM to protect its important natural resources (BLM, 2007), and certain public restrictions apply. Only the BLM Preserve lands are included under this ACEC designation. Activities that have the potential to cause significant disturbance (i.e., large-scale mining, construction of roads, high-voltage transmission lines, telecommunication towers, etc.) may not be permitted or would require careful planning to avoid or to minimize resource impacts. If there are conflicts between plant protection and public access, plant protection will have priority.

To provide consistency with the RMP and the recent designation of the Preserve ACEC, the following restrictions apply:

- Prohibit target shooting and camping
- Allow commercial uses through special recreation use permits
- Limit hiking, equestrian and mountain bike use to existing designated trails
- Close trails that are causing adverse impact to ACEC values or other resources
- Approve new trails (hiking, equestrian, or mountain bike) only if they do not adversely affect the ACEC's relevant and important values
- Prohibit Right of Ways (ROWs) that adversely impact rare plant populations or fragment their habitat



**Off-road Vehicles.** One road in the Salmon Falls unit, used primarily for recreation, has a long history of off-road vehicle (ORV) use. This road may remain open to the public, and moderate vehicle use may be allowed, as long as this use does not conflict with protection of the rare plants. Recent development on private property has blocked historical vehicle access to this part of the Salmon Falls unit for both public and management uses, although land owners allow access by foot through their properties for management purposes. A desirable strategy to solve the access restriction in this part of the Preserve would be the acquisition of lands or easements to allow for direct access. No other roads in the Preserve have a similar history and use pattern or will remain open for vehicular recreation.

**Equestrian and Mountain Bike Use.** Little equestrian or mountain bike use occurs in the Preserve. Horses and mountain bikes cause more disturbance than human foot traffic to the surface of trails, especially when soils are wet. Horses also bring weed seed in their digestive tracts, hooves, and coats. However, occasional use of trails may be authorized if impacts to sensitive resources can be minimized. Proposals for use of trails for equestrian or mountain bike use by organized groups will be considered in areas where impacts to listed plant populations can be avoided. Such proposals would need to include strategies and demonstrate the ability of users to address potential problems resulting from trail use, such as trail maintenance and weed control. The proposals would only be accepted on a provisional adaptive management basis, and would be regularly evaluated for impacts. Specific measurable thresholds of change detrimental to the rare plants and associated with the potential equestrian and bike use would be established. If those thresholds were reached or exceeded it would trigger either modification or cancellation of use.

**Day Use and Camping.** Currently, there is little recreational camping on Preserve lands. The confluence of Weber Creek and the South Fork American River is the only area that receives regular recreational camping use. Boaters that camp along the river rarely camp within Preserve lands.

Holders of recreational dredging permits along the South Fork American River at the Salmon Falls unit are currently allowed to cold camp, or camp on sand or gravel bars where there is no continuity of fuels to the canyon slope. The BLM has the discretion to authorize these permits or not, and suction dredging on mining claims may only occur under approved Plans of Operations.

Only the Salmon Falls unit is large enough to be suitable for camping, such as at the confluence of the South Fork and Weber Creek where ORV users camp. There is a history of conflict between the recreationists who drive their (mostly) four-wheel-drive vehicles to the river from Jurgens Road and local residents. Many of the difficulties result from activities that occur at night. Residents have reported drunkenness, shooting, bonfires, driving of vehicles across private property, and damage to private property. Residents are particularly concerned about the possibility of an escaped campfire or bonfire running from the bottom of the canyon up to their homes above. Limiting the area to day use with appropriate enforcement will help alleviate these problems. Enforcement will occur in cooperation with BLM rangers and the EDC Sheriff's Department.

If allowed, overnight camping may impact the natural resources and increase the cost of monitoring and managing for such use. For example, fire hazard due to campfires would increase as would law enforcement needs. Potential problematic behavior by campers using alcohol and lighting unsafe campfires would require night patrols.

Environmental degradation like crushing and cutting vegetation, petroleum spills into the river, driving in riparian zones, poor sanitation, etc., have also occurred in association with camping and ORV use. Campfires are generally used in the evening or morning in the context of camping. No destructive wildfires have occurred as the result of camping at the confluence, but the potential exists. There are no toilet facilities along this stretch of the river which causes sanitation problems, magnified in importance by the proximity to the river. Although these kinds of activities can happen during the day as well as at night, drug/alcohol use, insufficient law enforcement, the impetus for fires, and longer

visitor stays all tend to increase the likelihood of environmental damage when people stay overnight.

From 2005 through 2007, the Preserve has taken care of illegal camp sites, and the associated cleaning of trash sites, at the Cameron Park unit. This year, cleaning of three sites at the Cameron Park unit was especially critical because of the use of camping stoves and fire pits by trespassers. Remediation of reported illegal camping incidents, and periodic patrolling and protection of the Preserve units to prevent such incidents, continues to be strategic to address this management issue.

**Boating Access.** The South Fork American River is the only available boating water in the Preserve. It is a major whitewater rafting stream with high levels of both commercial and private use. Folsom Lake extends up the South Fork American River into the Preserve, especially when the lake is at high water. Boaters, when they leave the water, tend to stay close to the water, mostly in the riparian zone. None of the plant species or communities to which the Preserve is dedicated are riparian. Further, most terrestrial activity of rafters occurs at designated stopping points, none of which are in the Preserve.

#### ***Extension of Existing Public Roads/Highway Projects***

The Preserve contributes to the wealth and health of the western EDC inhabitants, and the public in general, by protecting natural resources and providing opportunities for recreation and education. Most of the adjacent landowners are pleased to have preserved lands next to their property, enjoying the natural views and recognizing that their property value and life quality increase as a result of the Preserve's open space, cleaner environment, and development restrictions that help reduce overcrowding and ease traffic concerns.

Because the demand for housing, commercial development, and associated services (roads, utilities, water, etc.) in western EDC continues at an accelerated rate, development of natural habitat also continues. To accommodate ongoing development of western EDC, there could be efforts to widen and pave roads that pass through the

Preserve. Some individuals have expressed interest in exploring this. An example would be the construction of a paved road on Preserve lands that parallels the existing Highway 50. This road would extend along a half mile of currently protected habitat, impacting (destroying) rare plants and their habitat, further fragmenting and reducing the habitat for the rare plants, and potentially contributing to the dispersal of non-native plants, colonization by noxious weeds, and making the habitat more susceptible to trash dumping.

The 2002 FWS recovery plan establishes that the Pine Hill Preserve is the main player in the protection, management, and recovery of the rare plant species. The funds to acquire many of the Preserve parcels come from contributions by the FWS, BOR, National Fish and Wildlife Foundation, the Wildlife Conservation Board, and EDC. All the federal agencies provided the funds with the express understanding that the land purchased would be used for the conservation of five federally and State listed species and the habitat on which they depend. Funds provided by EDC target the protection of all eight rare plant species. To use the land for another purpose that would involve significant rare plant or habitat destruction would violate the intent under which the funds were donated and/or assigned.

### ***Research and Monitoring***

Research and monitoring at the Preserve includes the need to learn more about the biology, ecology, and demography of the species, as well as species and habitat response to management activities. The main strategy will be to continue to implement research and monitoring projects to fill data gaps and uncertainties related to species distribution, habitat associations, factors affecting reproduction (including the presence of pollinators), population numbers, and changes over time. If we answer these questions we can identify (and remediate) factors that threaten the rare plants and provide for the best management alternatives to protect the rare plants and their habitats.

Research and monitoring needs for the rare plants at the Preserve will also be conducted to fill the gaps in knowledge within and among species. For instance, we know that

Stebbins' morning-glory grows from a rootstock and that it responds well to disturbance, such as a prescribed fire conducted at the Salmon Falls unit during 1991. We also know that this species seems to be shade intolerant and does not occur beneath a closed canopy of vegetation (FWS 2002), and pollination studies show that animal vectors are needed for successful seed set (Nosal 1997). However, because the numbers of this species in the Salmon Falls area where the prescribed fire was implemented have decreased from several hundred to a few due to the overgrowth of chaparral, we need to determine the optimum disturbance regime (fire, shrub clearance, etc.) and the intensity/periodicity of the regime implementation to maintain and promote the populations of Stebbins' morning glory.

We know that Pine Hill ceanothus does not resprout from its crown after a fire as do many chaparral shrub species, depending instead on re-establishment from seeds that proliferate before the chaparral overgrows (FWS 2002). We also know that the branches of this species develop roots when in contact with soil, which helps the species extend its distribution. One study demonstrated that canopy shading affects flower and fruit production and that non-specific pollinators are required for reproductive success of this species (James 1996). We need to determine the optimum disturbance regime (fire, shrub clearance, etc.) and the intensity/periodicity of the regime to best benefit the populations of Pine Hill ceanothus, while maintaining an adequate composition of associated species to provide for the survival of its pollinators.

Studies of the Pine Hill flannelbush show that insects, including native solitary bees, are required for pollination. One study found that seventy percent of the developing fruit is destroyed by insects prior to maturing (Boyd 1996). The remaining fruit opens during summer and releases seeds onto the soil, which are eaten by rodents and dispersed by harvester ants (*Messor andrei*) (Boyd 2003). This species needs fire for the establishment of seedlings, although small Pine Hill flannelbush shrubs also seem to be associated with recent human disturbance, such as vegetation removal (FWS 2002). Studies to determine the optimum reproduction and propagation conditions for this

species may help to prevent flower and fruit predation, and also contribute to maintaining and/or expanding its distribution.

Very little is known about El Dorado bedstraw; information about its biology or ecology are not available (CDFG 1999). Studies of this species are concentrated in the Pine Hill area, although recently the BLM has conducted monitoring in the Cameron Park area. Preliminary results at the Cameron park unit indicate that this species may slightly benefit from shrub removal. At the end of 2007, transplants of this species from a private parcel onto Preserve lands took place. The transplanted individuals will be monitored to determine if successful establishment and survival of this species can be accomplished. The practice of transplanting rare plants into functional habitat should not be supported over protection of species *in situ*. However, because the El Dorado bedstraw habitat on the private lot will be destroyed by development, and because an area of the Preserve is in need of restoration due to a recent wildfire, there is an opportunity to relocate and protect the rare plants while contributing to the knowledge and conservation of this species.

Layne's butterweed occupies openings on gabbro soils and is eliminated as vegetation grows around it (Baad and Hanna 1987). Marsh (2000) determined that the predominant breeding system for the species is outcrossing; flower heads pollinated by insects produce more viable seeds than flower heads where pollinators were excluded. Marsh (2000) also found that persistent, heat-resistant seed exists in the soil beneath chaparral, and that seeds germinate in the first year with no special treatment necessary to break dormancy. Ongoing research on Preserve lands by Gogul-Prokurat (2007) includes seed collection and evaluation of microhabitat sites for Laynee's butterweed. Results from this research will be extremely valuable in providing species-specific information and identifying additional plant occurrences as well as potentially suitable unoccupied habitat areas.

Bisbee Peak rush rose responds well after fire or slight disturbance, such as the removal of the shrub layer. Lack of disturbance and fire suppression in chaparral may decrease opportunities for this species to establish (R. Woodward, pers. comm. 2005). Research

priorities for this species include a more precise classification from authoritative professional botanists in order to determine if it is indeed a unique rare taxon, or is in fact a member of a more widespread common taxon (*H. scoparium*).

Seed dispersal mechanisms for the Red Hills soaproot are not known and pollinators have not been identified, although moths are likely pollinators considering that the flowers open at night. Reproduction in this species is primarily by seeds, unlike *C. pomeridianum*, a relative that reproduces vegetatively from division of the bulbs (FWS 2004). Basic studies regarding the ecology of this species would provide guidance for its management needs and help to ensure its long-term conservation.

El Dorado mule-ears can reproduce vegetatively by producing new above-ground stems from its spreading root system. The clonal plants can cover a large area, and portions of individual plants can be several hundred years old (Ayres 1997). This species is pollinated by native bees, is self-incompatible, and the recruitment from seed is very poor (FWS 2002). Gogul Prokurat (2007) research includes species-specific habitat information for use in predictive habitat modeling that will help identify additional plant occurrences as well as potentially suitable unoccupied habitat areas.

Identified research needs are listed in the Management Tasks section. Those needs include projects currently being implemented, such as rare plant surveys and monitoring populations of rare plants and their habitats, and projects that will be implemented once funding and other resources are obtained. Future research and monitoring needs will be addressed once those needs are identified through adaptive management.

The Preserve will also continue to cooperate with students, researchers, agencies, and institutions interested in conducting studies at the Preserve. Coordination with people, agencies, and organizations will also continue to obtain funds to implement research projects at the Preserve.

### ***Habitat Maintenance and Restoration***

Shrub reduction in rare plant habitat is the most important habitat restoration issue at the Preserve. Erosion control, especially along trails, is another issue that requires yearly attention. Noxious weed control, although currently not a major problem at the Preserve, requires careful monitoring and rapid remediation before eradication becomes a problem. Trash removal and habitat destruction prevention, such as off-road driving or cutting of plants, are among the management challenges to restore habitat at the Preserve, especially in areas that interface with urban development.

The Preserve strategies to continue habitat restoration include control of shrubs, erosion, weeds, and remediation of trash/trespass incidents at specific areas. All these activities will likely continue at the Preserve with the help of volunteers. Preserve neighbors also provide invaluable help by reporting and preventing incidents such as illegal trespass, trash dumping, and habitat destruction in the Preserve.

### ***Education and Outreach***

Community education and outreach are not only main issues at the Preserve, but are also management goals. The Preserve focuses on increasing public awareness of the rare plant species, promoting understanding of the ecological, economic, and social implications of preserved lands, and the Preserve's responsibilities to help achieve conservation of the rare plants. Efforts also focus on providing recreational and educational opportunities for the community, and including the community in management decisions that will affect conservation of the rare plants.

Support from surrounding communities will be vital to protecting land and conducting management activities that may involve community participation. The Preserve has greatly benefited from the volunteer work of a Volunteer Coordinator, who helps with most of the outreach activities conducted at the Preserve. In the future, creation of a funded Volunteer Coordinator position will be requested.

### ***Visual Resources***

The Preserve will adopt BLM's visual resources management (VRM) system for BLM-owned lands and as a general approach for all lands at the Preserve (BLM 2006).

Generally, federal and State lands that abut or are near BLM lands utilize the VRM system for classifying their holdings. Private lands that are next to or near BLM lands are not subject to VRM guidelines when being developed or utilized for agricultural, industrial, or commercial uses (BLM 2007), but private lands with natural habitat may also adopt the VRM system.

The VRM system is based on the premise that different levels of scenic values require different levels of management, and that desired values can be accomplished by using the basic design elements of form, line, color, and texture of surrounding natural landscapes. Determining how an area should be visually managed requires an assessment of the area's scenic values and adjustment of project designs so that visual impacts can be minimized.

Strategies to identify and evaluate scenic values at the Preserve to determine the appropriate levels of management will be achieved by conducting a Visual Resource Inventory, and by conducting a Visual Resource Contrast Rating analysis. Outcomes of these strategies will help to incorporate visual design techniques to ensure that management activities at the Preserve are in harmony with the visual natural surroundings.

### ***Cultural Resources***

No prehistoric village/camp sites have been found in the Preserve, and few have been reported for lands adjacent to the Preserve with similar terrain and vegetation. The chaparral-covered hills in the Preserve were probably not an advantageous place for prehistoric people to live, although they may have been productive hunting and plant-gathering grounds after wildfire had burned off the brush. Native Americans may have also ignited fires with the intention of making the chaparral a more productive habitat for game.

Evidence of prehistoric human uses (i.e., isolated artifacts, sparse flaked-stone scatters, projectile points, hunting blinds, etc.) in the Preserve may be extremely difficult to find in the chaparral areas. Habitat protection and restoration projects at the Preserve, such as fencing, fuels reduction, erosion control, and plant relocations are subject to archaeological surveys.



## VI. MANAGEMENT TASKS

This section describes the techniques used to address the various management issues at the Preserve. The tasks focus on solutions to management concerns as described in the Management Issues and Strategies section of this Plan.

### *Land Protection*

The Preserve will continue its efforts to protect rare plants habitat in western EDC with the help of its partners. The Preserve will also continue to work with private landowners to protect habitat and contribute to habitat connectivity of protected lands. Specific tasks to accomplish land protection include:

- 1) Identification and evaluation of suitable lands that can be added to the Preserve system. Lands with the potential for protection of the rare plants will be ranked, and priorities for protection of such lands will be assigned, based on the following criteria, listed in order of importance:
  - a) habitat where most of the species are present, or with a high possibility of being present once habitat is properly managed.
  - b) habitat with Stebbins' morning glory, El Dorado bedstraw, or Pine Hill flannelbush, three of the rare plant species at the Preserve with extremely restricted distribution.
  - c) habitat that is adjacent to Preserve areas or that will contribute towards connectivity of already protected land.
  - d) habitat that will add to management feasibility, for instance providing direct access to Preserve lands or contributing to buffer areas that would allow implementation of prescribed burns.
- 2) Protection of gabbro soil rare plant habitat. Land protection will be accomplished through:
  - a) acquisition of habitat from owners willing to sell their lands for conservation purposes.

- b) special designation of publicly owned lands for conservation of the rare plants.
  - c) promotion of cooperative agreements with land owners interested in conservation and recovery of the rare plants and their habitats.
  - d) acquisition of large parcels and adjacent to preserved lands, preferred over acquisition of smaller, non-connected parcels.
  - e) acquisition of parcels at the lowest cost possible.
  - f) evaluation of existing agreements, such as conservation easements, to provide for the protection of rare plants and their habitats on privately owned lands.
- 3) Identify and obtain sources of funding for land protection activities, including land acquisition, establishing and/or acquiring conservation easements, conducting survey and monitoring projects, patrolling, posting, signing, fencing, and other activities directed towards the protection and enhancement of rare plant habitat. Main sources of funding to be pursued include:
- a) The BOR/USFWS Central Valley Program Improvement Act (CVPIA) Habitat Restoration Program.
  - b) USFWS Cooperative Endangered Species Conservation Fund (Section 6).
  - c) EDC and EDID development fees set aside for rare plant conservation purposes.
  - d) Federal and State processes (Sec. 7 and 2081(b), respectively) designed to mitigate impacts of development on listed species.
  - e) BLM-based and cost share funds.
  - f) Other sources of funding that may be identified over the term of the Plan.
- 4) Implement a regular program for patrolling activities at the Preserve. Patrolling activities will be conducted by the Preserve manager in coordination with BLM Law Enforcement staff. Volunteers will also contribute to patrolling activities by reporting incidents, such as trespass, trash dumping, etc., to the BLM office. The patrolling program will include:

- a) visit each unit no less than once every two weeks. At units like Cameron Park, where trespass, trash, restoration, and other issues require more frequent visits, patrol at least once per week.
  - b) communicate with neighbors to prevent and remediate trespass, trash, off-road driving, and other incidents and issues at problem areas.
  - c) coordinate patrolling activities with other management activities (surveys, monitoring, restoration projects). Frequency of visits will be increased or decreased as needed.
- 5) Develop infrastructure to aid in the protection of Preserve lands. Infrastructure development activities will include:
- a) identification of Preserve boundaries by placing permanent posts and signs.
  - b) construction of fence lines in areas where Preserve boundaries are expected to be permanent and where fencing is feasible.
  - c) placement of temporary posts and signs in areas where the Preserve is more likely to expand its boundaries.

### ***Inappropriate Fire Regime***

Emphasis will be placed on the management of vegetation to reduce excessive fuels load at strategic areas, for instance along the interface of Preserve lands and densely populated areas. Because of the reasons discussed in the Management Issues and Strategies section, the use of fire at the Preserve for habitat restoration purposes will not always be possible. Techniques that will be implemented at the Preserve to manage vegetation to benefit the rare plants habitat include:

- 1) Implementation of prescribed burns when possible. The use of controlled fire is preferred over other techniques to help decrease the excessive fuels load and improve habitat for the rare plants. The following criteria will be followed when implementing prescribed burns:
  - a) safety for human lives and property will be top priority.
  - b) a fire plan will be developed for every prescribed burn.

- c) the Preserve will work in close coordination with CAL FIRE and the BLM fire crews when implementing prescribed burning activities.
  - d) the Preserve will obtain the appropriate permits/authorizations to conduct prescribed burning activities.
  - e) the Preserve will implement an intensive outreach program to inform neighbors about planned prescribed burning activities and give the community an opportunity to express their support, concerns, etc.
  - f) the Preserve will work in coordination with the EDC Fire Safety Council to conduct education and outreach activities in the community regarding fire safety issues.
  - g) the Preserve will carefully monitor prescribed burning effects on the rare plants and their habitat.
- 2) Implement other fuels reduction activities when the use of prescribed burning may not be feasible. Techniques that provide an alternative to fire include:
- a) removal of vegetation by field crews using hand tools.
  - b) removal of vegetation using mechanical equipment such as masticators, chippers, weed eaters, and mowers.
- 3) Construct fuels break lines using fire and/or mechanical methods at areas with higher risks for non-controlled fires.
- 4) Continue to create and maintain an approximately 25-acre fuels break along portions of the perimeter of the Cameron Park unit and in areas adjacent to residential development where dense and decadent chaparral is present.
- 5) Conduct educational and outreach efforts to decrease the possibilities of a non-controlled fire in at-risk communities adjacent to the Preserve.
- 6) Monitor the rare plants to assess the response to shrub removal. Currently, the BLM is monitoring effects of shrub removal on El Dorado bedstraw, Pine Hill ceanothus,

Stebbins' morning glory, and El Dorado mule ears. This monitoring will continue, and monitoring of other rare plants will also be conducted, after implementation of shrub removal treatments.

7) Implement adaptive management based on responses to fire by the rare plants.

8) Continue to work in coordination with CAL FIRE, EDC Fire Safe Council, BLM, BOR, and other partners on:

- a) potential fuels reduction projects to be implemented at the Preserve.
- b) identification of funding sources for preparation of fire plans and implementation of fuels reduction activities.
- c) community and education outreach

### ***Access***

The Preserve continues to look for viable options to access Preserve lands, both to conduct management activities and to provide for education and outreach opportunities.

Improving the access conditions at the Preserve units will be accomplished by:

1) Identification and mapping of potential direct access points to the Preserve units.

2) Acquisition of parcels and/or access easements to facilitate direct access to the Preserve.

3) Development of agreements with neighboring land owners to provide access to the Preserve lands through existing facilities, roads, parking areas, etc.

4) Designation and development of parking areas in at least two Preserve units: Cameron Park and Salmon Falls.

5) Maintaining the current pedestrian approach to visitor management at Preserve areas where this approach is successful.

6) When necessary, closure of certain areas within the Preserve may be implemented as an interim measure to address issues such as extreme fire danger, road danger, or to protect a recently restored area. Closures will likely be temporary, signs will be posted at main entry points to this area, and maps of the closure area will be provided to the public.

**Roads and Trails.** Facilities for visitors, including construction and or maintenance of roads and trails, will be consistent with planned public uses outlined in the Management Issues/Strategies section of this Plan, i.e., educational activities and low impact recreation.

1) The basic access planned through roads and trails will be concentrated at access points to both the Cameron Park and Salmon Falls units.

2) Trails for public access will be designated in both the Cameron Park and Salmon Falls units.

3) Planned trail development and use at the Salmon Falls area will include the following considerations:

a) if the regional trail along the north side of the South Fork of the American River is developed, a portion of that trail will cross the Preserve. The actual route of such a trail will be chosen to avoid impacts to the rare plants.

b) a trail system on the south side of the river in the Salmon Falls unit will be for pedestrian use.

c) trail(s) will have a dual purpose, both recreational and interpretive.

d) potential biological impacts on the rare plants will be a major determinant of trail location. Trail routes will be chosen to minimize such impacts.

3) Planned trail development and use at the Cameron Park area will include the following considerations:

- a) the trail system will have the dual purpose of assisting with management activities and providing access to the public.
  - b) a self-guided interpretive trail will be created with a trailhead at the parking area.
  - c) walking trails for neighborhood use will be designated.
  - d) existing roads and trails will provide the basic framework for the trail system.
  - e) closure of unneeded roads and trails will be an important task in creating a designated trail system.
  - f) closing of roads not used for management, recreation, or access to the Preserve.
  - g) creation of new trails if absolutely needed for management or public use.
- 4) Maintaining the few trails that provide access within the different Preserve units on a yearly basis will include:
- a) control of erosion.
  - b) prevention of shrub overgrowth.
  - c) control of weeds.
- 5) Continued work with Preserve staff and volunteers to provide ongoing maintenance for some of the existing roads will include:
- a) restoration of existing roads.
  - b) eradication of weeds along existing roads.
- 6) Identify and implement appropriate measures to minimize impacts on rare plant habitat while providing road and trail maintenance, management, and public access.

### **Parking areas**

Development of at least two parking areas at the Preserve edges is contemplated in this Plan. Economic evaluation of the cost of these two sites is included in the Property Analysis Record (Appendix X). Tasks for the development of parking areas include:

- 1) Determine the best feasible areas for parking lots. Proposed areas include:
  - a) areas along Meder Road and Cameron Park Drive in the Cameron Park unit.
  - b) areas near Sabana Drive and Parker Drive in the Cameron Park unit.
  - c) an area along Kanaka Valley Road in the Salmon Falls unit.
  
- 2) Design and develop parking areas, one at the Cameron Park unit and one at the Salmon Falls. Both parking areas will be provided with:
  - a) a concrete pad.
  - b) a bathroom.
  - c) interpretive and visitation rules information for visitors.

### ***Preserve Public Uses***

Most activities usually allowed on public lands are also allowed in the Preserve as long as they do not conflict with the protection of the rare plants and their habitat. Public activities at the Preserve and the associated management tasks take into consideration the following:

**Special Designation Areas.** Although the CDFG PHER sites at the Preserve, which include parcels at the Pine Hill and Salmon Falls units, have special regulations, the public is not totally restricted and can visit the site with authorization by the CDFG and the Preserve Manager.

- 1) Uses of the PHER sites within the Preserve include:
  - a) Guided educational tours for classes and the general public.
  - b) Non-guided tours for people visiting the sites for authorized research purposes.
  - c) Non-guided tours for people hiking along established trails for minimum impact recreational purposes, such as wildlife viewing and photography.
  
- 2) Restriction of public uses at the PHER sites within the Preserve to prevent damaging or destroying rare plants include:
  - a) Uncontrolled access

- b) Use of off road vehicles
- c) Use of mountain bikes
- d) Walking around the site and outside of designated roads or trails.
- e) Horseback riding within the PHER boundaries.

3) General public uses at the Preserve units, at sites other than PHER sites, is permitted with protective measures incorporated to protect the rare plants. These protective measures include:

- a) Operation of motorized vehicles within the Preserve units is not allowed unless authorized by the Preserve under special circumstances.
- b) The use of internal combustion engines, camping, campfires, smoking, and fireworks is not allowed.
- c) From time to time there may be a need to temporarily close certain access roads and certain areas to all public uses that could result in igniting a wildfire and/or damaging or destroying federally listed threatened or endangered plant species.
- e) If temporary closure of certain areas at the Preserve is deemed necessary, signs will be posted at main entry points to these areas, and maps of the closure areas will be provided to the public.

4) In areas at the Preserve, other than the PHER sites, that became ACEC by designation under the BLM 2008 Sierra RMP, restrictions to the following activities may apply:

- a) large-scale mining.
- b) construction of high-voltage transmission lines.
- c) construction of roads.
- d) construction of telecommunication towers
- e) other activities that may deemed detrimental to the rare plants.

5) Temporary closure of specific areas may occur as an interim measure to address concerns such as extreme fire danger, areas with erosion problems, and areas recently restored. Closure signs will be posted at main entry points to this area. Maps of the closure areas will be available and provided to the public as needed.

**Off-road Vehicles.** Although in general off-road vehicle is not a compatible use for the Preserve, the following applies under the current status of the Preserve's BLM lands:

1) Miners with valid mining claims on BLM lands may retain vehicular access to those claims for mining activity through BLM roads. The BLM does not regulate access to mining claims on BLM lands through private lands.

2) Easement and right-of-way (ROW) holders will be able to access and use their easements and ROWs, as long as they limit their activities to the established easement and ROWs areas. The BLM does not regulate access to easements or ROWs on BLM lands through private lands.

3) Some roads may be retained for administrative or fire suppression purposes, but will not be open for public use.

4) Locked gates may be used, with keys issued to those who need access.

**Equestrian and Mountain Bike Use.** Occasional use of existing trails for equestrian and mountain bike use may be authorized if impacts to sensitive resources can be minimized. The following list identifies actions that will be undertaken to minimize impacts on the rare plants and their habitat:

1) Users should obtain the Preserve's authorization to conduct such activities.

2) Traffic in areas where the rare plants are present will be avoided.

3) Prevent the dispersal of non-native plants by users. This can be accomplished by BLM requests that bikes be cleaned prior to entrance to the Preserve, and that horses entering the Preserve be fed with weed-free hay.

4) Engage users in helping to conduct periodic trail maintenance, including erosion and weed control.

5) Suspend equestrian and bike use activities if there are conflicts with protection of the rare plants, and continue activities only after remediation of conflicts.

**Day Use Camping.** The following currently applies, or will apply, to camping within the non-special designation areas at the Pine Hill Preserve:

1) Accessible areas of the Preserve will be designated as day use areas, open from one half-hour before sunrise to one half-hour after sunset.

2) Overnight camping is not allowed (except as described below for miners and dredgers) because of potential impacts to resources and the cost of monitoring and managing such use.

3) Camping (“occupancy”) by miners with valid existing mining claims is currently permitted under the 1872 Mining Law if it is “reasonably incidental to mining.”

4) If BLM land in the Preserve is designated an ACEC, mining claimants will have to file a Plan of Operations for all activities beyond casual use, such as camping or occupancy.

**Boating Access.** Unlike terrestrial forms of travel, boating should have little effect on plant species and communities in the Preserve.

1) “No Camping” signs will be posted at areas that attract occasional campers.

2) Management will be consistent with river management in the BLM South Fork American River Management Plan.

***Extension of Existing Public Roads/Highway Projects***

In general, the creation of new roads, or extension of existing roads on Preserve lands, will be discouraged because of the associated destruction and/or further fragmentation of the already restricted habitat for the rare plants. To determine potential impacts of road extension projects on Preserve lands the following activities will be conducted:

- 1) Detailed surveys and mapping of rare plant occurrences should be required for areas with potential for extension of existing public roads/highway projects.
- 2) A careful analysis of potential impacts to population(s), including distribution of occurrences and significance in relation to the entire population.
- 3) A full mitigation plan, as required by the federal and State regulatory wildlife agencies, to offset detrimental effects of the project on the rare plants.

### ***Research and Monitoring***

Main research tasks at the Preserve will continue to focus on recovery of the federally listed rare plants, conservation of the non-listed species, and accomplishing the Preserve's mission to protect all rare plant species in perpetuity. Research and monitoring tasks at the Preserve will also help to answer more specific questions regarding the rare plants and habitat responses to different management practices, particularly to fuels reduction practices. For instance, although most of the rare plants seem to respond favorably to fires under certain conditions, the inadequacy of the fire regime may negatively impact the species. Therefore, research to identify the most appropriate fire regimes or other techniques used to eliminate shrub competition will be studied. Research needs include basic knowledge of the rare plant distribution, estimated numbers, habitat relationships, etc. Tasks to accomplish the research need to include:

- 1) Conduct plant surveys at the Preserve to evaluate the degree of protection afforded to the five federally listed plants in relation to recovery plan targets. Activities to accomplish this task include:
  - a) develop species and habitat survey protocols.

- b) acquire Geographical Information System (GIS) imagery for the Preserve.
  - c) develop a GPS/GIS application for data collection in the field.
  - d) complete plant/habitat surveys of at least 4,000 acres on the Preserve over a period of three years, beginning in 2006.
  - e) produce maps and information about distribution and estimated numbers of the rare plant populations by 2009.
  - f) identify current protection status of each species and sites and conduct updated assessments of threats to rare plants associated with lands adjacent to Preserve sites.
- 2) Evaluate relationships between rare plant population distribution and the characteristics of the habitat. Activities to accomplish this task include:
- a) establish baseline conditions for listed species and habitat using plots at the Preserve.
  - b) analyze newly acquired and existing data regarding species distribution.
  - c) create GIS baselines of species occurrences and environmental correlations.
  - d) create a predictability model to find areas of most suitable habitat for the rare plants (e.g., soil characteristics, plant associations, microtopography, fire history, etc.) to be used to refine and/or efficiently expand the protection to rare plants.
  - e) monitor species response to management treatments.
- 3) Evaluate effects of fire regimes on the distribution of the rare plants. Activities to accomplish this task include:
- a) review fire history at the Preserve.
  - b) review historical rare plant occurrences at the Preserve.
  - c) evaluate recent prescribed burns (within the last 6 years) on rare plant habitat.
  - d) evaluation of fuels reduction methods on rare plants at the Preserve.
- 4) Continue conservation planning for rare plant habitat including:
- a) identify pending conservation needs for the rare plants.

- b) design and protect linkages between populations, and identify the most critical links for genetic exchange between populations.
- 5) Evaluate and successfully implement adaptive management based on:
- a) identify the best management practices based on results and information from previous research and management actions, as found in monitoring reports, research papers, and documentation of management decisions and implementation processes at the Preserve.
  - b) periodically review management techniques used to obtain the best results for rare plant and habitat conservation.
  - c) establish a formal adaptive management decision-making process for changing plan management actions based on new information.
- 6) Conduct monitoring and research activities to help better understand and manage habitat for each of the rare species including:
- a) data collection and creation of maps to estimate current population densities and trends over time.
  - b) genetic studies to determine metapopulation relations/dynamics or variation within single large occurrences of a species.
  - c) identification of germination requirements and percentage of plants for each species growing from seed, rootstocks, bulbs or branches.
  - d) evaluation of shade effects of shrub species on rare plants.
  - e) identification and monitoring of seed and fruit gatherers.
  - f) evaluation and monitoring of rare plant responses to the removal of the shrub layer.
  - g) information gathering regarding pollinators for each species.
  - h) identification of seed dispersal mechanisms.
  - i) creation of GIS layers and maps to help with effective management of these species.

- 7) Establish a long-term, regularly implemented monitoring program for the rare plant populations at the Preserve. This program will include:
- a) identification of measurable characteristics that can be used to track significant changes in rare plant populations and their habitats.
  - b) the use of monitoring plots to collect, compare, and analyze rare plant demographic information.
  - b) identification of thresholds that will trigger changes on habitat or species management practices.
- 8) Conduct propagation and introduction of native species, including the rare plants, to:
- a) restore habitat in areas where fire suppression activities, soil erosion or other factors have contributed to the alteration and degradation of natural habitats.
  - b) enhance habitats suitable for the rare plants, but where rare plants are currently not present.
  - c) augment current rare plant populations to aid in the recovery and conservation of these species.

### ***Habitat Maintenance and Restoration***

Main habitat restoration techniques will continue to be implemented with the help of volunteers and Preserve staff, and collaboration with the Preserve partners.

- 1) Control of the shrub layer will continue to be implemented using controlled burns and mechanical removal methods.
- 2) Control of erosion at specific areas within the Preserve will continue to be implemented by constructing water bars along eroded trails and roads. Areas within the Preserve where soil erosion by water during the rainy season has become a problem will be restored by re-contouring the water flow and placement of materials to slow down and control the erosion, including straw wattles and sediment barriers.

3) Control of weeds using exclusively mechanical methods will continue to be implemented at specific areas within the Preserve. Mechanical methods have proven to be effective in controlling weeds at the Preserve. The use of chemical control within the Preserve boundaries is discouraged, but its use will be considered if absolutely necessary.

4) Trash removal at the Preserve units, especially those closer to densely population areas, will continue to be conducted on a regular basis with the help of volunteers.

### ***Education and Outreach***

The Pine Hill, Cameron Park, and Salmon Falls units within the Preserve are better suited for educational and outreach activities than the Martel Creek and Penny Lane units. The Pine Hill unit has been a traditional location of botanical and environmental resource interpretation, and the CNPS has led trips there for decades. Both the Pine Hill and Cameron Park units are well suited for interpretive activities, with extensive panoramic views and the rare plants clustered in a relatively small area. The Salmon Falls unit and surrounding areas provide thousands of acres of natural habitat where functional ecological systems can be observed, studied, and managed. Education and outreach activities at the Preserve include:

1) Continue to implement an interpretative program of guided walks to the different Preserve units.

a) at least 5 weekend tours will be conducted during springtime.

b) weekdays tours for students groups will be conducted as requested during the months of April through June.

c) the Preserve will accommodate special interest guided tours (geology, fire management, etc.) year round.

2) Continue to provide general public education about rare plant protection at the Preserve by:

a) providing opportunities to observe wildlife under natural conditions.

b) providing opportunities to conduct studies and research at Preserve lands.

- c) mentoring students interested in promoting the conservation and protection of the rare plants by developing study papers.
- 3) Continue to train volunteer naturalists who will conduct guided tours, school outreach, and participate in community activities to help promote the Preserve's mission.
- 4) Develop interpretive displays for school outreach, participation in botanical and scientific events, technical presentations, and community events. Displays will include:
- a) Powerpoint presentations
  - b) interpretative posters
  - c) brochures
  - d) mounted plant specimens
- 5) Increase public awareness of the rare plant species, and an understanding of the regulations and incentives for conservation and management needed to achieve species conservation/recovery. To achieve this task we will use:
- a) brochures
  - b) press releases
  - c) website
  - d) development of electronic newsletter
- 6) Cultivate the existing volunteer habitat restoration team to help:
- a) maintain trails
  - b) control erosion
  - c) conduct revegetation of disturbed areas
  - d) eradicate noxious weeds
  - e) build fences
  - f) place posts and signs
- 7) Continue to promote recruitment of volunteers, either as organized groups or as individuals including:

- a) scientific organizations such as UC Davis, UC Berkeley, Sac State University, and the Chicago Botanical Garden
- b) religious groups, such as the Temple of Rishon
- c) families
- d) boy/girl scouts groups
- e) schools
- f) anyone with enthusiasm about nature

8) Facilitate student community service activities of local colleges and high schools. Under this task an agreement between the Preserve and the educational institution should be in effect prior to student participation. Students participating in community service activities are provided with a certificate by the Preserve.

9) Coordinate with the surrounding counties to get information about the educational outreach opportunities of the Pine Hill Preserve into the hands of the schools and classrooms of the following districts under the EDC Office of Education:

- a) Rescue Union School District
- b) Buckeye Union School District
- c) Gold Trail Union School District
- d) Latrobe Union School District
- e) Mother Lode Union School District
- f) Gold Oak Union School District
- g) Placerville Union School District

10) Coordinate with universities, community colleges and schools to provide cost-effective research and monitoring opportunities while promoting regional partnership.

Ongoing projects at the Preserve include:

- a) University of California, Davis
- b) Sacramento State University
- c) Saint Francis High School
- d) Gold Trail School

e) O.W. Erlewine Elementary Eco-Club

11) When appropriate facilities such as parking areas, bathrooms, and kiosk(s) are built, a program for field trips to the Preserve will be offered to elementary schools to engage students and promote an overall awareness of the ecology of the Preserve and the significance of protecting this unique resource.

11) Interpretative stations at the strategic areas of Cameron Park, Pine Hill, and/or Salmon Falls units will be established as funding becomes available. These stations may include:

- a) displays and/or kiosks placed at each designated trailhead.
- b) creation of interpretive trails
- c) establishment of at least one self-guided interpretive trail at the Cameron Park unit.

12) The Preserve will attend and participate in as many community events as possible to acquaint the public with the Preserve and its ecological diversity. Such events include:

- a) El Dorado County Fair
- b) Harvest Festival
- c) American River Salmon Festival

13) Special outreach activities related to fuels management and fire ecology education and management at the Preserve will continue to be conducted. These activities will include:

- a) educational and community outreach about fire ecology and the need for fuels management at the Preserve.
- b) attempts to contact and consult surrounding property owners regarding any fuels reduction work on Pine Hill Preserve.
- c) door-to-door visits to landowners or occupants whenever possible. When occupants are not at home informational materials will be left for them to read.
- d) providing brochures and other materials to educate Preserve neighbors about fire ecology and the need for fuels management.

- f) conducting education about the importance of fire ecology and fuels management on guided walks and in community and educational outreach of the Preserve.
- g) developing interpretive materials, such as PowerPoint presentation and display boards, that include the importance of fire ecology and fuels management.

### ***Visual Resources***

To protect, maintain, and enhance the visual quality of the Preserve, the following tasks will be conducted:

1) Identify the visual resources at the Preserve and assign them to inventory classes using BLM's VRS inventory process. This process will include rating the visual appeal of the different units, evaluating the management needs for the rare plants, and evaluating public concern for scenic quality.

- a) management of an area with high scenic value might be focused on preserving the existing character of the landscape.
- b) management of an area with little scenic value might allow for major modifications to the landscape.

2) Assign a Class Level Objective to the various units at the Preserve in accordance with the BLM Handbook H-8410-1. Visual Resource Inventory to assess scenic values and determine visual impacts in an objective and consistent way by:

- a) using the basic design elements of form, line, color, and texture to describe and evaluate landscapes.
- b) adjusting project designs so the elements are repeated, visual impacts can be minimized. Projects that repeat these design elements are usually in harmony with their surroundings; those that are not create contrast.
- c) applying visual design techniques to ensure that surface-disturbing activities are in harmony with their surroundings.

3) Through management activities, retain the general existing character of the landscape. The level of changes to the characteristic landscape should be low to moderate, and should take into consideration natural regimes (such as changes caused by fires) in the area.

4) Conduct analysis of proposed management activities to meet management objectives or to incorporate required adjustments.

### ***Cultural Resources***

Although the potential for significant cultural resources, both historic and prehistoric, to occur in the Preserve appears to be low, the Preserve agencies will:

1) Comply with Section 106 of the National Historic Preservation Act and other cultural resource laws and executive orders in advance of any projects with potential adverse effects to cultural resources. Projects at the Preserve that may affect cultural resources include building trails, parking lots, and other facilities for public access.

2) Identify, preserve, and protect the Preserve's cultural resources, and fill in gaps to gain knowledge about representative cultural resources at the Preserve by:

- a) conducting cultural surveys of at least 30 percent of the Preserve lands.
- b) conducting inventory of cultural resources at the Preserve.
- d) revisiting areas of dense chaparral previously inventoried and where cultural resources may have been overlooked. This activity could be especially effective on recently burned areas.
- e) including in the inventory areas of dense chaparral that have received little attention, as long as surveys are not detrimental to the rare plants.

3) Avoid adverse effects on cultural resources while conducting and implementing habitat management activities at the Preserve, such as plant inventories, trash clean-up, noxious weed eradication, and native plant revegetation, to ensure that:

- a) significant historic-period artifacts are not cleaned up.
- b) significant subsurface archaeological deposits are not disturbed.

4) Develop detailed historical contexts for better understanding and evaluating the Preserve's cultural resources. These historical contexts can be generated through primary document and oral historical research, and will include:

- a) gold mining.
- b) fire history.
- c) homesteading.

## VII. FINANCIAL SECTION

Only management activities at the Preserve have been considered under this financial section. Costs for future land purchases, such as acquisition, closing, etc., have been excluded from the Preserve's management needs economic analysis. The evaluation of biological qualities of parcels targeted for acquisition is the only associated land acquisition cost that has been included in the economic analysis. The evaluation generally consists of a survey of a particular parcel to determine its ecological value in relation to the Preserve goals.

Already established management projects, such as patrolling and restoration activities, were considered in the economic analysis. Future feasible projects, such as fence lines along strategic sites at the Preserve, the purchase and installation of signs, and implementation of new restoration activities mentioned in the Management Tasks section of this Plan were also considered.

Some of the foreseeable research and monitoring needs, and activities needed to conduct biological surveys and to produce reports, are also included in the economic analysis. However, costs of particular future research needs at the Preserve are not part of this economic analysis. Future research needs will be identified through implementation, monitoring, and adaptive management activities at the Preserve. Future funding of research to provide solutions to management needs at the Preserve will be accomplished by applying for and obtaining grants, and through coordination with professionals, colleges, and universities to conduct studies that will result in benefits to the rare plants.

Costs for development of infrastructure (fencing, development of parking areas, visitor's stations, etc.) were considered in the economic analysis, although those needs may have to be modified in the future as the Preserve continues to change in size and shape.

### ***Property Analysis Record***

The economic analysis was prepared using the Property Analysis Record (PAR) (Appendix 5), a computer program developed by the Center for Natural Lands Management. The PAR is an effective tool to determine costs for different management tasks at the Initial and Capital level (up front cost of management projects) and the Ongoing level (recurrent costs with an established periodicity). The PAR also calculates the amount of endowment funds required for management of lands in perpetuity.

### ***Financial requirements***

Initial and Capital requirements for the different management tasks at the Preserve with a contingency fund of 10% and 22% of administrative costs is \$615,420.

The Ongoing financial requirements, equivalent to a yearly budget for the Preserve with 10% contingency, amounts to \$237,338.

The endowment required to provide income for the yearly budget, based on an estimated 4% of return interest rate, is \$6,548,870. Based on these calculations, the endowment per preserved acre equals \$1,468.

### ***Funding sources***

Currently, ongoing management and research activities at the Preserve have been funded by a combination of federal, State, and County funds, federal grants, and by in-kind contributions by private groups such as ARC, CNPS, and an effective network of volunteers established and managed by the Volunteer Coordinator. All of these agencies, organizations, and volunteers are expected to continue their contributions to the Preserve.

Specific funding mechanisms that will help to build the endowment of the Preserve for its management in perpetuity include mitigation fees set aside by EDC for the rare plants habitat management, contracts and agreements with different Preserve Agreement parties (EDID, EDC, CDF, ARC), Management Grants (BOR, FWS), and Contributed Funds (BLM).

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