

## San Joaquin Valley Upland Species

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
E	Blunt-nosed Leopard Lizard	<i>Gambelia sila</i>	F	1998	San Joaquin Valley Upland Species	2C	Very High	Loss and fragmentation of habitat by agricultural, residential, and commercial development was cause of decline. Current population demographics not well known. Located in an area highly impacted by CVP.	Determine habitat management and compatible land uses, conduct surveys for presence/absence, protect key habitat areas within range.	Key habitat in range: natural lands in western Madera County, natural lands in Panoche Valley of Silver Creek Ranch in San Benito County, agricultural and natural land between north end of Kettleman Hills and the Gujarral Hills and Anticline Ridge, natural lands west of Hwy 33 and east of the coast ranges between Pleasant Valley, Fresno County to the north and McKitterick Valley in Kern County to the south, natural lands of the linear, piedmont remnants of habitat west of I5 between Pleasant Valley and Panoche Creek in Fresno County, natural lands in upper Cuyama Valley. Protect additional lands in and around Pixley NWR, Elk Hills Naval Petroleum Reserves, Lokern natural area, Semitropic Ridge natural area.
E	Riparian Brush Rabbit	<i>Sylvilagus bachmani riparius</i>	F	1998	San Joaquin Valley Upland Species	6C	Very High	High potential for downlisting although now critically endangered. Habitat alteration and loss due to CVP.	Identify and obtain biological information needed to manage Riparian Brush Rabbit, establish 3 more wild populations within historical range on suitable habitat, and prepare a Recovery Plan specific to the Riparian Brush Rabbit.	Caswell Memorial State Park in San Joaquin and Stanislaus Counties has only extant population. Possible habitat restoration on Bureau of Land Management land along Kings River in Fresno County.

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E	Tipton Kangaroo Rat	<i>Dipodomys nitratoides nitratoides</i>	F	1998	San Joaquin Valley Upland Species	3C	Very High	Population size presently unknown. Habitat loss was due to CVP. Only 3.7 % historical acreage inhabited.	Major focus is on acquisitions and conservation easements. Also, expand, coordinate and continue habitat management studies; study competition with Heerman's Kangaroo Rat; design and implement population monitoring program; inventory and assess parcels near existing protected areas.	Kern, Kings and Tulare counties: Inventory and acquire land for suitable movement corridors between Pixley NWR and Allensworth Ecological Reserve, Kern NWR and Semitropic Ridge conservation lands, Kern Fan Element of the Kern Water Bank, and Cole's Levee Ecosystem Preserve.
E	San Joaquin Kit Fox	<i>Vulpes macrotis mutica</i>	F	1998	San Joaquin Valley Upland Species	3C	Very High	Kit Fox serves as an umbrella species for other species in this recovery plan. Located in an area highly impacted by the CVP. Loss of grassland and salt desert shrub habitat when changed to irrigated agricultural use.	Protect habitat and enhance population interchanges in listed areas. Determine habitat restoration and management prescriptions. Determine current distribution and population trends with emphasis on potential habitat in listed counties.	Core populations: Carrizo Plain natural area in San Luis Obispo County, Natural lands of western Kern County (Elk Hills, Buena Vista Hill, Buena Vista Valley, Lokern Natural Area), and Ciervo-Panoche Natural Area of western Fresno and eastern San Benito Counties. Other areas: LeMoore Naval Air Station, Pixley/Allensworth NWR, Semitropic Ridge Natural Area and around Bakersfield metro area. Acquire land for suitable movement corridors in these regions.
E	San Joaquin Woolly Threads	<i>Lembertia congdonii</i>	F	1998	San Joaquin Valley Upland Species	1	High	A monotypic genus with a high recovery potential located in an area highly impacted by CVP. Many populations on public land.	Protect existing habitat in the San Joaquin Valley, manage populations on public land. Monitor representative sites within each metapopulation.	Metapopulations: Carrizo Plain Natural Area, Lost Hills in Kern County, Kettleman Hills in Fresno and Kings Counties, Jacalitos Hills of Fresno County. Isolated occurrences in Panoche Hills in Fresno County, Bakersfield vicinity, and the Cuyama Valley.
E	California Jewelflower	<i>Caulanthus californicus</i>	F	1998	San Joaquin Valley Upland Species	2	High	Potential for downlisting or delisting. New surveys and continuous demographic monitoring	Protect the plants on private land in Santa Barbara Canyon. Continue protection and	Santa Barbara County: Santa Barbara Canyon. Fresno County: Kreyenhagen Hills.

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								are needed. Historical declines due to CVP activities.	management of occupied habitat on public lands. Establish plants on San Joaquin Valley floor.	San Luis Obispo County: Carrizo Plain.
E	Kern Mallow	<i>Eremalche kernensis</i>	F	1998	San Joaquin Valley Upland Species	2	High	CVP directly caused decline of species. 85% of suitable habitat on private land.	Protect 90 % of habitat in Lokern. Provide 150 meter buffer.	Kern County: Lokern, between Buttonwillow and McKittrick
T	Hoover's Woolly Star	<i>Eriastrum hooveri</i>	F	1998	San Joaquin Valley Upland Species	2	High	Species has high potential for recovery. Located in an area highly impacted by the CVP. Need 40 acre blocks of habitat to support population fluctuations.	Protect existing population on valley floor from conflicting development, acquire suitable habitat to allow for population fluctuations, monitor populations.	Four metapopulations: 1). Kettleman Hills in Fresno and Kings Counties, 2). Carrizo Plain and areas in Santa Barbara, San Luis Obispo, Kern Counties, 3). Lokern - Mariposa area in Kern County, and 4). Antelope Plain and Semitropic in Kern County.
E	Bakersfield Cactus	<i>Opuntia treleasei</i>	F	1998	San Joaquin Valley Upland Species	3C	High	Decline of this species is a result of loss of habitat to agriculture. Residential development threatens remaining populations on private land.	Protect existing habitat, prevent fragmentation of metapopulations and loss of unoccupied habitat. Survey and demographic research.	Within Kern County: North of Wheeler Ridge, Caliente Creek Drainage, Comanche Point, Cottonwood Creek, Kern Bluffs-Hart Park, Oildale-Kern River Oil Field-Round Mtn Rd, Poso Creek, Sand Ridge, Wheeler Ridge-Pleito Hills.
E	Giant Kangaroo Rat	<i>Dipodomys ingens</i>	F	1998	San Joaquin Valley Upland Species	2C	High	Increased effort to monitor may demonstrate species is stable or increasing and may have potential for downlisting.	Proper land use and management on public and conservation lands in Carrizo Plain natural area, Naval Petroleum Reserves in CA, Lokern Natural Area, and Ciervo-Panoche Natural Area. Supporting research on habitat management and restoration. Protection of additional land supporting key populations.	Protect public and conservation land: Carrizo Plain Natural Area, Naval Petroleum Reserves, Lockern Natural Area, and Ciervo-Panoche Natural Area (Kern, San Luis Obispo, Fresno Counties). Acquire and protect land: 90% natural land in Lokern Area, 90% natural land in California Resources Elk Hills, LLC, 80% of land in Naval Petroleum Reserves including Buena Vista /McKitterick Valley, all of Silver Creek Ranch, eastern bases of Monocline and Tumey Hills,

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										Cuyama Valley in NE Santa Barbara County, Kettleman Hills, San Juan Creek Valley in San Luis Obispo County. Acquire and restore periodically farmed land with no or Class-3 irrigation water rights east of occupied natural habitat and west of Hwy 5 along bases of Monocline Ridge and Tumey Hills.
E	Buena Vista Lake Shrew	<i>Sorex ornatus relictus</i>	F	1998	San Joaquin Valley Upland Species	3C	High	Partnership in place for Critical Habitat. Current population sizes and distribution is not well known. Known extant population restricted to 30 acres. Habitat loss due to CVP activities. Restricted to marshy wetland habitat that is on private land.	Preserve Kern Lake site. Locate and protect populations in Tulare Basin, enhance habitat in listed areas.	Kern County: Kern Lake site. Acquire land in Tulare Basin (Buena Vista [BV] Lake Aquatic Recreation Area, BV Golf Course, along BV Slough-Goose Lake Slough, and the Kern River west of Bakersfield), Pixley NWR, Goose Lake-bed, Jerry Slough east of Buttonwillow Ridge. Introductions possible at land of the Kern Water Bank Habitat Conservation Plan, and at Tule Elk Reserve near Tupman and Kern NWR.
E	Palmate-bracted Bird's Beak	<i>Cordylanthus palmatus</i>	F	1998	San Joaquin Valley Upland Species	2C	High	Working group established. Seven metapopulations on various refuges. Springtown population in trouble. Random or catastrophic event could eliminate entire population because of low genetic variation. Located in an area highly impacted by the CVP.	Protect Springtown Alkali Sink metapopulation from development and incompatible use. Protect and restore hydrology after Questa Eng. Corp. hydrologic study completed. Ascertain genetic composition of Woodland population.	Populations in: Sacramento NWR, Delevan NWR, Colusa NWR in Glenn and Colusa Counties. Springtown Alkali Sink near Livermoore in Kings County, Alkali Sink Ecological Reserve/Mendota Wildlife Management Area in Madera and Fresno Counties, Woodland in Yolo County, western Madera County,
T	Kern Primrose Sphinx Moth	<i>Euproserpines euterpe</i>	F	1984	Kern Primrose Sphinx Moth	2	High	This species will benefit from other actions preserving and managing grassland habitat in Carrizo. Walker Basin	Secure habitat through development and implementation of land protection plan. Survey known and possible	Walker Basin in Kern County and the Carrizo Plains National Monument in San Luis Obispo County

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								population is on private land. Species highly impacted by CVP activities.	habitats annually, analyze population trends. Implement agreements with land owners to reduce pesticide use near habitat. Patrol habitat during fly-over season and enforce regulations.	
E	Riparian Woodrat	<i>Neotoma fuscipes riparia</i>	F	1998	San Joaquin Valley Upland Species	6C	Medium	Benefits from emphasis on riparian brush rabbit. A subspecies with low recovery potential. Limited suitable habitat available.	Survey and map riparian areas of San Joaquin River, develop incentive plan to preserve cover and riparian vegetation, develop restoration plan for riparian corridors and reintroductions of riparian woodrat.	Only known population at Caswell Memorial State Park. Acquire private land to establish riparian corridor along Stanislaus River near extant population.
E	Fresno Kangaroo Rat	<i>Dipodomys nitratooides exilis</i>	F	1998	San Joaquin Valley Upland Species	3C	Low	Presumed extinct, however, will move to very high if any Kangaroo Rats found in surveys	Complete studies on relationships and taxonomy of San Joaquin Valley kangaroo rats. Locate populations within historical range. Increase habitat management studies. Restore habitat at Lemoore Naval Air Station. If possible captive breed and introduce into suitable habitat.	Acquire additional 80 -160 acres at LeMoore NAS. Protect natural land between Alkali Sink Ecological Reserve and San Joaquin River in Madera and Fresno County to the north. Acquire natural lands in western Madera and King's counties.
E	California Condor	<i>Gymnogyps californianus</i>	F	1996	California Condor	4C	Low	CVP may have affected food sources in San Joaquin Valley and Carrizo Plain. Will receive protection from actions to benefit other listed species such as by protecting lands and acquiring conservation easements.	Preserve key foraging areas near nests and roosts. Continue to monitor potential impacts of all surface-disturbing activities within historical condor range. Eliminate or reduce the effects of environmental contaminants.	Foothills of southwestern Kern County; the Carrizo and Elkhorn plains in San Luis Obispo and Kern counties; and lands in the vicinity of Pinnacles National Park, San Benito and Monterey counties.
T	San Benito Evening Primrose	<i>Camissonia benitensis</i>	D	1998	San Benito Evening Primrose	5	Low	Little impact from CVP. Populations heavily impacted by gravel mining	Prevent additional degradation and loss of habitat. Manage OHV use	Two occurrences in western Fresno County. 23 occurrences in southeastern

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								and off-highway vehicles (OHV).	to accommodate primrose. Protect populations on non-bureau lands.	San Benito County. Serpentine soil endemic.

## Serpentine Soil Species

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
T	Bay Checkerspot Butterfly	<i>Euphydryas editha bayensis</i>	F	1998	Bay Area Serpentine Species	3C	Very High	Populations fluctuate in size in both time and location. Heavy development pressure has reduced available suitable habitat in Santa Clara County. Species decline associated with urban growth in and around a CVP water district with past and current M&I water deliveries. Past funding of recovery actions is lacking from CVP related mitigation programs.	Protect existing habitat. Promote sustainable grazing practices on affected ranch land. Manage habitat in prioritized areas. Monitor populations for growth trends. Reintroduce into suitable habitats and non-serpentine experimental habitats.	Santa Clara County Core areas: Coyote Ridge (East of Santa Clara Valley and between San Jose and Morgan Hill and containing 4 core areas: Kirby, Metcalf, San Felipe, and Silver Creek Hills). San Mateo County at Edgewood County Park.
E	Tiburon Paintbrush	<i>Castilleja affinis</i> ssp. <i>neglecta</i>	F	1998	Bay Area Serpentine Species	9C	High	This is a small, disjunct and southern-most population of species. Located in Santa Clara County. Species decline associated with urban growth in and around a CVP water district with past and current M&I water deliveries. Past funding of recovery actions is lacking from CVP related mitigation programs.	Protection and management of populations on listed public lands including providing 500 foot buffer. Seed bank. Survey serpentine habitat.	Central Santa Clara County near Hwy 101.
E	Coyote Ceanothus	<i>Ceanothus ferrisae</i>	F	1998	Bay Area Serpentine Species	14	High	Limited distribution in Santa Clara County, over 60% of habitat is gone.	Protect and enhance existing four known populations and acquire	Santa Clara County: Anderson Dam, Kirby Canyon and Llagas Avenue north of

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								Heavy development pressure. Species decline associated with urban growth in and around a CVP water district with past and current M&I water deliveries. Past funding of recovery actions is lacking from CVP related mitigation programs.	proximal serpentine habitat for expansion. Eliminate threats of recreational activities, dumping and landfill. Survey for new populations at suitable habitats, consider introductions.	Morgan Hill. Perform survey of Croy Canyon near Morgan Hill.
E	Santa Clara Valley Dudleya	<i>Dudleya setchellii</i>	F	1998	Bay Area Serpentine Species	2C	High	Limited distribution in Santa Clara County, over 60% of habitat is gone. Heavy development pressure. Focus on acquisitions or easements. Species decline associated with urban growth in and around a CVP water district with past and current M&I water deliveries. Past funding of recovery actions is lacking from CVP related mitigation programs.	Protect and enhance existing known populations in Coyote Canyon and acquire proximal serpentine habitat for expansion. Eliminate threats of development, quarry expansion, recreational activities, dumping and landfill. Survey for new populations at suitable habitats, consider introductions. Seed banking.	Santa Clara County: Coyote Canyon, Tulare Hill, Metcalf Canyon, Kirby Landfill.
E	Metcalf Canyon Jewelflower	<i>Streptanthus albidus</i> ssp. <i>albidus</i>	F	1998	Bay Area Serpentine Species	3C	High	Limited distribution in Santa Clara County, over 60% of habitat is gone. Heavy development pressure. Focus on acquisitions or easements. Species decline associated with urban growth in and around a CVP water district with past and current M&I water deliveries.	Protect and manage existing populations on private and Santa Clara County park land. Acquire proximal serpentine habitat for expansion. Eliminate threats from road maintenance and construction, ORV's, dumping, and cattle grazing. Seed banking. Survey historical locales for suitability for introductions. Study effects of vegetation management techniques.	Santa Clara County: Extant population in Coyote Valley

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E	Presidio Clarkia	<i>Clarkia franciscana</i>	F	1998	Bay Area Serpentine Species	5	Medium	Isolated population, urbanization caused habitat loss and reduced size of a once large population in Oakland Hills.	Protect existing populations through land acquisition and conservation easements, provide 500 foot buffer zone, manage populations by eliminating invasive plants. Populations on public land have priority over those on private land.	In Alameda County at Redwoods Park and East Bay Regional Park in the Oakland Hills. Other population is on SF peninsula not in CVP impact area.
E	San Mateo Thornmint	<i>Acanthomintha obovata</i> ssp. <i>duttonii</i>	F	1998	Bay Area Serpentine Species	6C	Low	The only remaining large population is at Edgewood County Park, and an introduced population is at the Pulgas Ridge Open Space Preserve, both in San Mateo County. However, range is borderline to CVP impact area and declines were not primarily a result of CVP.	Protect and enhance two populations on San Mateo County and San Francisco Water District lands and set up monitoring program. Protect and enhance population at Edgewood Natural Preserve. Seed banking. Survey historic locales for suitability for re-introduction.	San Mateo County: Edgewood County Park and The Triangle, Pulgas Ridge Open Space Preserve introduced population.
E	Fountain Thistle	<i>Cirsium fontinale</i> var. <i>fontinale</i>	F	1998	Bay Area Serpentine Species	6	Low	Found in only four locations in San Mateo County. However, range is borderline to CVP impact area and declines were not primarily a result of CVP.	Protection and management of existing populations and existing habitat in The Triangle and Edgewood County Park natural preserves. Seed banking.	In San Mateo County along the eastern drainages of Crystal Spring Lake adjacent to Hwy 280
T	Marin Dwarf flax	<i>Hesperolinon congestum</i>	F	1998	Bay Area Serpentine Species	8C	Low	Found from Marin County south to San Mateo County. However, range is borderline to CVP impact area and declines were not primarily a result of CVP.	Protect existing habitat and populations. Develop management plans for existing populations. Removal of invasive plants.	In San Mateo County near Crystal Spring Lake, Edgewood County Park, and Woodside Glen.
E	San Mateo Woolly Sunflower	<i>Eriophyllum latilobum</i>	F	1998	Bay Area Serpentine Species	11	Low	Population is limited to Crystal Springs Road in San Mateo County. However, range is borderline to CVP impact area and declines were	Protect existing populations by combined effort with San Mateo County, Hillsborough, and the SF Water Department through land acquisition,	In San Mateo County, only 4 populations along Crystal Springs Road.

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								not primarily a result of CVP	conservation easements. Manage populations through monitoring, threat minimization, and removal of competitive species.	
E	White-rayed Pentachaeta	<i>Pentachaeta bellidiflora</i>	F	1998	Bay Area Serpentine Species	8	Low	The Triangle and Edgewood County Park in San Mateo County. However, range is borderline to CVP impact area and declines were not primarily a result of CVP.	Only one location known for this species. Protect and manage this population by working with SF water department and San Mateo County. Monitoring surveys, seed banking	In San Mateo County in The Triangle area, and adjacent to Edgewood County Park.

### Species of Chaparral and Scrub East of San Francisco Bay

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E	Large-flowered Fiddleneck	<i>Amsinckia grandiflora</i>	F	1997	Large-flowered fiddleneck	5	Very High	The species is currently presumed extant at only two locations, both in western San Joaquin County. These include the lone natural population at the Contra Costa Water District's Etchelet property and the reintroduced "Drop Tower" population at the Lawrence Livermore National Laboratory Site 300. Competition from introduced annual grasses and forbs is considered the primary threat to the species. Likely threatened by loss of habitat from urban and agricultural conversion, in part through the delivery of	Reintroduction into 10 suitable habitat sites near Carnegie, Hospital, and Draney Canyons in San Joaquin and Alameda Counties, and near historic re-introduction sites in Contra Costa County (Black Diamond Mines Regional Preserve), currently underway. Ongoing seed banking. Supplemental planting and obtaining conservation easements at successful reintroduction sites, and planting at new reintroduction sites as next steps.	Carnegie Canyon in San Joaquin County and Draney Canyon in Alameda County

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								CVP water, and livestock grazing; competition and/or interference from associated plants (mostly nonnative annual grasses).		
E	Callippe Silverspot Butterfly	Speyeria callippe callippe	D	N/A	Callippe Silverspot Butterfly	9C	Very High	Species decline associated with urban growth in and around a CVP water district with past and current M&I water deliveries. Urban development and expansion still remains primary threat.	Conduct surveys to determine distribution. Protect known and potential habitat. Conduct research on biology and ecology of Callippe silverspot butterfly, host plant and nectar plant. Develop management plans.	Hills near Pleasanton in Alameda County
T	Alameda Whipsnake	Masticophis lateralis euryxanthus	F	2006	Chaparral / Scrub East of SF Bay	9C	High	Species decline associated with urban growth in and around a CVP water district with past and current M&I water deliveries. Urban growth still a primary threat. Grazing practices and fire suppression are also threats.	Long term protection of large blocks of habitat. Protection in perpetuity of strategic areas (population centers and areas of population connectivity). Research management including effects of fire management, grazing regimes, control of non-native species.	Contra Costa and Alameda Counties: There are 7 recovery unit areas recognized: Tilden-Briones, Oakland-Las Trampas, Hayward-Pleasanton Ridge, Mt. Diablo-Black Hills, Sunol-Cedar Mountain, Caldecott Tunnel Corridor, and Niles Canyon-Sunol Corridor.
T	Pallid Manzanita	Arctostaphylos pallida	F	2006	Chaparral / Scrub East of SF Bay	11C	Medium	Urbanization, disruption of natural disturbance regime resulted in lack of recruitment. Species decline associated with urban growth in and around a CVP water district with past and current M&I water deliveries. Seeds are fire activated.	Secure and protect specified recovery areas from incompatible uses.	Contra Costa and Alameda Counties: Sobrante Ridge, Tilden, and Huckleberry Ridge recovery areas.

## Gabbro Soil Species

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E	Stebbin's Morning Glory	<i>Calystegia stebbinsii</i>	F	2002	Gabbro Soil Plants	5C	High	Limited distribution. Historical declines due to CVP supported agriculture, commercial and urban development causing loss and fragmentation of habitat and are still primary threats.	Protection of areas occupied by species. Secure additional suitable habitat. Maintain metapopulation dynamics. Perform demographic studies to determine limiting life stages. Conduct surveys for occurrence in suitable habitats in Nevada County. Fire adapted plant affected by fire suppression.	Pine Hill formation in western El Dorado County: Salmon Falls/Martel Creek and Cameron Park north and south of Hwy 50. Nevada County band 5.6 km across.
T	Layne's Butterweed	<i>Senecio layneae</i>	F	2002	Gabbro Soil Plants	5C	High	Limited distribution. Historical declines due to CVP supported agriculture, commercial and urban development causing loss and fragmentation of habitat and are still primary threats.	Protect existing populations through habitat management. Maintenance of metapopulation. Survey serpentine soil areas and Mildred soil areas. Conduct studies on fire simulation germination treatment, grazing effects, effect of disturbance and fire on seedling establishment, pollinator identifications, seed banking, and demographic studies to ID limiting life stages.	Pine Hill formation in western El Dorado County: Salmon Falls/Martel Creek, Cameron Park north and south of Hwy 50, and Penny Lane preserve. Survey and maintain occurrences in Tuolumne and Yuba Counties.
E	Pine Hill Ceanothus	<i>Ceanothus roderickii</i>	F	2002	Gabbro Soil Plants	5C	High	Limited distribution. Historical declines due to CVP supported agriculture, commercial and urban development causing loss and fragmentation of habitat and are still primary threats.	Protection of areas occupied by species. Acquisition of proximal suitable habitat. Maintain metapopulation dynamics. Perform demographic studies to determine limiting life stages. Fire adapted plant affected by fire suppression.	Pine Hill formation in western El Dorado County, specifically Salmon Falls/Martel Creek, Pine Hill, Cameron Park preserve north and south of Hwy 50.

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E	Pine Hill Flannelbush	<i>Fremontodendron californicum</i> ssp. <i>decumbens</i>	F	2002	Gabbro Soil Plants	6C	High	Limited distribution. Historical declines due to CVP supported agriculture, commercial and urban development causing loss and fragmentation of habitat and are still primary threats	Protection of area at Pine Hill occupied by species. Seed banking. Preserve pollinators (native solitary bees) and dispersal fauna (ants). Maintain metapopulation dynamics. Introduce into Salmon Falls/Martel Creek area. Fire adapted plant affected by fire suppression.	Pine Hills central location within 1.25 km of Pine Hill and Salmon Falls/Martel Creek within western El Dorado County. Nevada and Yuba County need to be surveyed.
E	El Dorado Bedstraw	<i>Galium californicum</i> ssp. <i>sierrae</i>	F	2002	Gabbro Soil Plants	6C	High	Limited distribution. Historical declines due to CVP supported agriculture, commercial and urban development causing loss and fragmentation of habitat are still primary threats.	Protect remaining occupied habitat on public and private land through sale of fee title, conservation easement, or voluntary conservation by landowners. Maintenance of metapopulation dynamics. Seed banking. Demographic studies to determine limiting life studies, reproductive biology research, and genetic studies.	Pine Hills formation in western El Dorado County: Cameron Park, NW of Salmon Falls/Martel Creek, and the Pine Hill preserve.
E	lone Buckwheat	<i>Eriogonum apricum</i>	N/A	N/A	lone Chaparral Plant	2C	Low	Mining, agriculture, urban development, loss of fire regime, erosion and fragmentation of habitat are primary threats. Is on CVP border, impact from CVP minor.	Although no recovery plan is drafted, listing implies that protection and management of existing populations are vital since existing regulatory measures do not adequately protect species. Acquisition of additional suitable habitat and seed banking are other probable priority actions.	Occurs in western Amador County near Sacramento County border 70 km SW of Sacramento in lone Soil formation. Foothills of Sierra Nevada. All nine occurrences are within a 10-acre area.
T	lone Manzanita	<i>Arctostaphylos myrtifolia</i>	N/A	N/A	lone Chaparral Plant	5C	Low	Mining, agriculture, urban development, loss of fire regime, erosion and fragmentation of habitat are primary threats. Is on	Although no recovery plan is drafted, listing implies that protection and management of existing populations is vital since existing regulatory	Occurs in western Amador County near Sacramento County border 70 km SW of Sacramento in lone Soil formation. Foothills of Sierra Nevada. Main population 90

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								CVP border, impact from CVP minor.	measures do not adequately protect species. Acquisition of additional suitable habitat and seed banking are other probable priority actions. Protect from disease.	km square area. Disjunct populations in Calaveras County.

## Species of the Southern Sierran Foothills

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T	Chinese Camp Brodiaea	<i>Brodiaea pallida</i>	D/NP	2005	Southern Sierran Foothill Plants	2C	Very High	Mostly on private land. Two populations remain, genetics not known. Excellent potential for conservation work with private landowners. In CVP area, present threat from residential development.	Protection of extant populations and habitat. Reintroduction into suitable habitat from which species was extirpated. Research habitat management.	Tuolumne River watershed, Tuolumne County (1.2 km stretch along stream). Stanislaus River watershed, Calaveras County (4.8 km section above Tullock Reservoir within channel of two converging streams).
E	Keck's Checkermallow	<i>Sidalcea keckii</i>	D/NP	2005	Southern Sierran Foothill Plants	8	Very High	Low population numbers and number of occurrences. Located in an area highly impacted by the CVP. Although loss of habitat due to agricultural development was primary reason for decline, present threat is from invasive plants and small population size. Is a poor competitor.	Protection of extant populations and habitat. Seed banking. Survey and reintroduction into suitable habitat from which species was extirpated. Research habitat management.	1) Tulare County: Element Occurrence #5, Mine Hill, Tulare County and Element Occurrence #2, White River, Tulare County (if rediscovered) or another site if found during surveys. 2) Element Occurrence #4+ adjacent colonies, Piedra area & Tivy Mountain Preserve, Fresno County.
E	Hartweg's Golden Sunburst	<i>Pseudobahia bahiifolia</i>	D/NP	2005	Southern Sierran Foothill Plants	2	Very High	Located in an area highly impacted by the CVP. 53% reduction in historical acreage inhabited by this species. Habitat loss due to development, both agricultural and	Protection of extant populations and habitat. Reintroduction into suitable habitat from which species was extirpated. Research habitat management.	1) Element Occurrence (EO) #26, quarry north of San Joaquin River, Madera County and EO #18, Barnett Ranch, Stanislaus County ; 2) EO #21, Friant area, Fresno County ; 3) EO #3

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								residential, remains the primary threat.		Warnerville, Stanislaus County and EO #15, Dry Creek, Stanislaus County; 4) EO #8, north of Snelling, Stanislaus County and EO #29, Kelsey Reservoir area, Merced County; and 5) EO #25, Friant area, Madera County.
T	San Joaquin Adobe Sunburst	<i>Pseudobahia peirsonii</i>	D/NP	2005	Southern Sierran Foothill Plants	2	Very High	Located in an area highly impacted by the CVP. Reduction in numbers due to habitat loss from agriculture development. Populations not extirpated have been reduced in size. Invasive plants and grazing disturbance also threats.	Protection of extant populations and habitat. Reintroduction into suitable habitat from which species was extirpated. Research habitat management: Effects of grazing and competition from aggressive plants.	Element Occurrence (EO) #1, Adobe Canyon, Kern County, EO #18, Pyramid Hill, Kern County, EO #23 & 24, Fountain Springs area, Tulare County, EO #32 & 33, Rocky Hill, Tulare County, EO #15, Academy Avenue, Fresno County, EO #42, Sand Creek, Tulare County, EO #44, Wutchumna Hill, Tulare County, EO #14, Highway 180, Fresno County, EO #16, Redbank Reservoir, Fresno County, EO #30, Round Mountain, Fresno County, EO #31, northwest of Fairview, Fresno County, EO #27, & 28, Lewis Hill, Tulare County, EO #10, 19, & 21, Success Lake, Tulare County, EO #2, Long Tom Gulch, Kern County.
T	California Red-legged Frog	<i>Rana aurora draytonii</i>	F	2002	California Red-legged Frog	6C	High	CVP impact was significant on populations in Alameda and Contra Costa Counties. Foothill populations have varying degree of historical impact from CVP. Red-legged frog numbers not stable, further threats from development and habitat fragmentation.	Develop and implement management plans in each watershed. Develop and implement conservation plans for each state/regional park and water/utility district. Develop and implement guidelines for improving water and air quality standards within range. Conduct and establish captive rearing and	Sierra Nevada foothill sites in Butte, El Dorado and Placer counties. Throughout Contra Costa and Alameda Counties, and Henry Coe Park in Santa Clara County.

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
									reintroduction programs. Include habitat connectivity and metapopulation structure in mitigation considerations.	
T	Red Hills Vervain	<i>Verbena californica</i>	D/NP	2005	Southern Sierran Foothill Plants	8	Medium	Occurs in most of its historic 24 sq. mile range, but in lower population numbers. Range is within CVP impact area. Threatened by development and trampling from cattle.	Protection of extant populations and habitat. Research habitat management, especially for Red Hills population. Demographic monitoring needed. Withdraw potential mining patents from Red Hill Area of Concern. Seed banking if private land not acquired.	Protect Big Creek population which is on private land with development threat. Red Hills population needs management.
T	Mariposa Pussypaw	<i>Calyptridium pulchellum</i>	D/NP	2005	Southern Sierran Foothill Plants	8	Medium	Occurs mostly on private land, but good candidate for fish and wildlife partnership program. Extant populations in CVP area. Threat from residential development and human activities. Low genetic variation threatens some populations.	Protection of extant populations and habitat. Reintroduction into suitable habitat from which species was extirpated. Research habitat management. Seed banking from Ahwahnee and Indian Lakes in Madera County.	Private land at Jack Kirk ranch in Mariposa County. Implement management at Ahwahnee in Mariposa County.
T	Springville Clarkia	<i>Clarkia springvillensis</i>	D/NP	2005	Southern Sierran Foothill Plants	8	Medium	Occurs mostly on private land, but good candidate for fish and wildlife partnership program. Populations on border of CVP impact area. Grazing and invasive plants are threats.	Research and develop habitat management, especially effects of grazing, competition with herbaceous plants, value of prescribed burning.	Large majority on public lands in Tulare County at North and Middle Fork of the Tule River and Rancheria Creek.

## Central Valley Vernal Pool Species

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
T	Crampton's Tuctoria (Solano Grass)	<i>Tuctoria mucronata</i>	F	2005	Vernal Pool	2	Very High	Two known extant occurrences. Strong CVP impact on vernal pools in central valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from each population. Expand population into vernal pools on appropriate soil types at gov't communication facility in Yolo County.	Former government communication facility in Yolo County near Davis.
E	Longhorn Fairy Shrimp	<i>Branchinecta longiantenna</i>	F	2005	Vernal Pool	8	Very High	Only 4 known occurrences that are widely separated. Would benefit greatly from additional surveys to find more occurrences. Strong CVP impact on vernal pools in central valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Protect existing habitat in Zone 1 and 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat.	North Carrizo Plain north of Soda Lake, South Carrizo Plain in San Luis Obispo County, Altamont Hills of Contra Costa and Alameda Counties, and the Grasslands Eco Area in Merced County.
T	Vernal Pool Fairy Shrimp	<i>Brancynecta lynchi</i>	F	2005	Vernal Pool	2C	Very High	Wide ranging species, will serve as umbrella species for other vernal pool species. Strong CVP impact on vernal pools in Central Valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat.	At various locations in 28 counties including: Shasta, Tehama, Glenn, Butte, Placer, Sacramento, San Joaquin, Yuba, Merced, Tulare, Kings, Stanislaus, Madera, Fresno, Alameda, Contra Costa, and San Luis Obispo Counties.
E	Vernal Pool Tadpole Shrimp	<i>Lepidurus packardii</i>	F	2005	Vernal Pool	2C	Very High	Wide ranging species, will serve as umbrella species for other vernal pool	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas.	Found in 17% of vernal pools in the following counties: Shasta, Tehama, Butte,

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
								species. Strong CVP impact on vernal pools in Central Valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat.	Sacramento, Yuba, Placer, Glenn, Merced, Tulare, Kings, Fresno Stanislaus, and Alameda Counties.
T	Hoover's Spurge	<i>Chamaesyce hooveri</i>	F	2005	Vernal Pool	2C	High	26 extant occurrences remain, 54% are at Vina Plains. Strong CVP impact on vernal pools in Central Valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from each vernal pool region.	The Vina Plains in Butte and Tehama Counties. Visalia - Yettam area of Tulare County. Hickman-LaGrange area of Stanislaus County. Sacramento NWR in Glenn County. Bert Crane Ranch in Merced County.
T	Colusa Grass	<i>Neostapfia colusana</i>	F	2005	Vernal Pool	2C	High	45 extant occurrences, at least one in each historical location, potential to preserve full genetic and geographic range. Strong CVP impact on vernal pools in Central Valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from each vernal pool region.	Former government communication facility in Yolo County; northeast of the city of Merced in Merced County; east of Hickman in Stanislaus County.
E	Conservancy Fairy Shrimp	<i>Branchinecta conservatio</i>	F	2005	Vernal Pool	8	High	Known locations protected at Sacramento NWR, Jepson Prairie, etc. Could benefit from additional habitat protection efforts (e.g., Vina Plains). Strong CVP impact on vernal pools in Central Valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat.	Vina Plains in Butte and Tehama Counties, Caswell, Grasslands Ecological Area, the Flying M and Ichord ranches, Virginia Smith Land Trust in Merced County, Sacramento NWR in Glenn County, one location in Stanislaus County west of Modesto.

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
E	Hairy Orcutt Grass	<i>Orcuttia pilosa</i>	F	2005	Vernal Pool	2C	High	26 of 37 original populations now extant, 10 of which are at Vina Plains. Strong CVP impact on vernal pools in Central Valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from at least one population per occurrence.	Oroville in Butte County, Vina Plains in Butte and Tehama Counties, Sacramento NWR in Glenn County. Madera County, Merced County, and Stanislaus Counties.
E	Sacramento Orcutt Grass	<i>Orcuttia viscida</i>	F	2005	Vernal Pool	5C	High	8 of 9 original populations now extant. 5 occurrences, comprising more than 70% of occupied habitat, are located in about 2.3 sq. miles. Strong CVP impact on vernal pools in Central Valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking.	Cosumnes/Rancho Seco, Mather, Phoenix Field and Park all in Sacramento County.
T	California Tiger Salamander	<i>Ambystoma californiense</i>	N/A	N/A	California Tiger Salamander	3	High	Excellent opportunities on private lands within CVP impacted areas. Threatened in CVP impacted area, Endangered in Sonoma and Santa Barbara. Strong CVP impact on vernal pools in central valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Recovery actions not published. However, recovery actions should mirror common actions of all vernal pool species: protect existing habitat, manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat.	Found throughout CVP impacted areas.

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
T	Succulent (Fleshy) Owl's Clover	<i>Castilleja campestris</i> ssp. <i>succulenta</i>	F	2005	Vernal Pool	9	Medium	92 of 93 of original populations are extant, will benefit from other vernal pool habitat protection efforts.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from each vernal pool region.	Eastern Merced, Madera, Fresno, Stanislaus, and San Joaquin County.
T	San Joaquin Valley Orcutt Grass	<i>Orcuttia inaequalis</i>	F	2005	Vernal Pool	8	Medium	30 of 50 populations extant, will benefit from other vernal pool habitat protection efforts	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from at least one population per core area.	Fresno, Madera, Merced, and Tulare Counties.
T	Slender Orcutt Grass	<i>Orcuttia tenuis</i>	F	2005	Vernal Pool	8	Medium	Of 82 known occurrences, 76 presumed extant. Wide geographic range in NE Sacramento Valley vernal pool region. CVP impacted this region. Focus on site-specific projects.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from each vernal pool region.	Shasta, Tehama, Butte, and Sacramento Counties. Dales in Tehama County is primary concentration of occurrences (27).
E	Greene's Tuctoria	<i>Tuctoria greenei</i>	F	2005	Vernal Pool	2C	High	Located historically in 12 counties. 17 occurrences have been extirpated. 28 extant occurrences are found in 7 counties. Habitat loss to agricultural development. Grazing is	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing	Vina Plains in Butte and Tehama Counties, Richvale area in Butte County, eastern Merced County, Stanislaus, Glenn, Modoc, and Shasta Counties.

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
								a continuing and primary threat.	suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from each vernal pool region.	
E	Contra Costa Goldfields	<i>Lasthenia conjugens</i>	F	2005	Vernal Pool	5C	Medium	Concentration of species is in Solano County vernal pool region. Development, land use practices, and invasive species are threats. Strong CVP impact on vernal pools in central valley floor: Habitat loss due to agricultural and urban conversion of land in and around CVP service area.	Protect existing habitat in Zone 1 and 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from each vernal pool region.	Near Rodeo in Contra Costa County, at the San Francisco Bay NWR, and near Fremont in Alameda County.
E	Butte County Meadowfoam	<i>Limnanthes floccosa</i> ssp. <i>californica</i>	F	2005	Vernal Pool	2C	Low	Species not directly impacted by CVP but it has been funded as a CVP nexus. Threatened extensively by continued habitat loss and fragmentation from Chico.	Protect existing habitat in Zone 1 and secondarily Zone 2 Core areas. Manage habitat by maintaining hydrology of vernal pools, controlling invasives, and providing suitable upland habitat. Restore former degraded vernal pool habitat. Seed banking from each population.	Protect 95% of habitat: Chico, Doe Mill, Oroville, Vina Plains in Butte County.

## Central Valley Riparian and Wetland Species

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
T	Giant Garter Snake	<i>Thamnophis gigas</i>	D	1999	Giant Garter Snake	2C	Very High	Habitat throughout Sacramento and San Joaquin Valley highly impacted by agriculture and urban development as result of CVP. CVP	Identify areas of high Giant Garter Snake concentration and corridors of movement. Emphasize protection and enhancement of habitat and connectivity between	Butte, Colusa, Sutter, Yolo, Sacramento, San Joaquin, Merced, and Fresno Counties.

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
								impact on SJV populations historically important.	concentration areas. Protect additional suitable habitat in each population where available. Surveys needed in Merced and Fresno Counties where populations may be critically endangered.	
E	Least Bell's Vireo	<i>Vireo belli pusillus</i>	D	1998	Least Bell's Vireo	3C	High	Loss of riparian habitat due to CVP related activities are primary cause of population declines. Species has high recovery potential in San Joaquin Valley now.	Protect and manage riparian and adjacent upland habitat within historical range. Continue cowbird removal to eliminate brood parasitism. Conduct research and surveys to support management and reintroductions.	Historical range (30 years ago+) included entire central valley where species was abundant. Species requires riparian habitat for breeding. Now populations in CVP area are in Salinas River Valley in Monterey and San Benito Counties. Recent nesting activity at San Joaquin River NWR.
T	Valley Elderberry Longhorn Beetle	<i>Desmocerus californicus dimorphus</i>	F	1984	Valley Elderberry Longhorn Beetle	9	Medium	5-year review may change status of species.	Field studies and collections of adult beetles. Determine nature of contact zone between subspecies. Conduct life history and demographic studies. Study ecological interaction between VELB and host plant. Study egg inoculation techniques. Conduct scent-dog surveys to detect VELB.	Alameda, Amador, Butte, Calaveras, Colusa, Contra Costa, El Dorado, Fresno, Glenn, Madera, Mariposa, Merced, Nevada, Placer, Sacramento, San Benito, San Joaquin, San Luis Obispo, Shasta, Stanislaus, Sutter, Tehama, Tuolumne, Yolo, and Yuba.
T	Yellow-billed cuckoo	<i>Coccyzus americanus</i>	N/A	N/A	N/A	3C	High	Loss of riparian habitat due to CVP related activities is the primary cause of population declines. Changes in stream flow dynamics, reduction of stream meander, invasive species (tamarisk, fig, and black walnut), and aging of habitat have combined to reduce the quality of	Protect, manage, and restore native riparian habitat and adjacent uplands within historical range. Conduct research and surveys to support land acquisition, restoration, and management to help recover the species.	Historical range included the entire Central Valley where the species was common. The species requires riparian habitat for foraging and breeding. Central Valley populations are greatly reduced from historic levels, with the most stable population located in the South Fork Kern River Valley. Priority program areas lay along the main

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
								remaining habitat. The species has a high recovery potential in the Central Valley.		stems of the Sacramento River, San Joaquin River, and south fork of the Kern River.
T	California Red-legged Frog	<i>Rana aurora draytonii</i>	F	2002	California Red-legged Frog	6C	High	CVP impact was significant on populations in Alameda and Contra Costa counties. Foothill populations have varying degree of historical impact from CVP. Red-legged Frog numbers not stable, further threats from development and habitat fragmentation.	Develop and implement management plans in each watershed. Develop and implement conservation plans for each state/regional park and water/utility district. Develop and implement guidelines for improving water and air quality standards within range. Conduct and establish captive rearing and reintroduction programs. Include habitat connectivity and metapopulation structure in mitigation considerations.	Sierra Nevada foothill sites in Butte, El Dorado and Placer Counties. Throughout Contra Costa and Alameda Counties, and Henry Coe Park in Santa Clara County.

## Species of the Antioch Dunes Ecosystem

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
E	Antioch Dunes Evening Primrose	<i>Oenothera deltoides</i> ssp. <i>howellii</i>	F	1984	Antioch Dunes	9	High	Distribution limited to dunes, invasive plants are primary threat. On border of CVP impacted area. Historical hydrological processes that allowed for essential sand deposition and dune formation highly impacted by CVP.	Maintain present habitat. Prevent further fuelbreak maintenance and spread of exotic plants. Eliminate established invasive plants. Reestablish dunes using available sand.	Antioch Dunes NWR, Contra Costa County
E	Contra Costa Wallflower	<i>Erysimum capitatum</i> var. <i>angustatum</i>	F	1984	Antioch Dunes	6	High	Distribution limited to dunes, invasive plants are primary threat. On border of CVP impacted area.	Maintain present habitat. Prevent further fuelbreak maintenance and spread of exotic plants. Eliminate	Antioch Dunes NWR, Contra Costa County

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
								Historical hydrological processes that allowed for essential sand deposition and dune formation highly impacted by CVP.	established invasive plants. Reestablish dunes using available sand.	
E	Lange's Metalmark Butterfly	<i>Apodemia mormo langei</i>	F	1984	Antioch Dunes	9	High	Distribution limited to dunes, invasive plants are primary threat. On border of CVP impacted area. Historical hydrological processes that allowed for essential sand deposition and dune formation highly impacted by CVP.	Maintain present habitat. Prevent further fuelbreak maintenance and spread of exotic plants. Eliminate established invasive plants. Reestablish dunes using available sand. Conduct captive propagation at Moorpark College (America's Teaching Zoo/The Butterfly Project), and reintroduction efforts at the Antioch Dunes NWR.	Antioch Dunes NWR, Contra Costa County

## Tidal Marsh Species

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
E	Salt Marsh Harvest Mouse	<i>Reithrodontomys raviventris</i>	D/NP	N/A	Tidal Marsh Ecosystem	2C	Low	On CVP area border. Historically, loss of habitat mostly took place before CVP. CVP had minor affect on tidal marsh in SF Bay.	Protect existing tidal marsh habitat to promote the recovery and long term conservation of the harvest mouse. Manage, restore, and monitor tidal marsh habitat to promote the recovery of the harvest mouse. Conduct range-wide species status surveys/monitoring and status reviews.	Possible populations in Contra Costa County on southern shore of Suisun Marsh
E	California Clapper Rail	<i>Rallus longirostris obsoletus</i>	D/NP	N/A	Tidal Marsh Ecosystem	3C	Low	On CVP area border. Historically, loss of habitat mostly took place before CVP. CVP had minor affect on tidal marsh in SF Bay.	Protect existing tidal marsh habitat to promote the recovery and long term conservation of the clapper rail. Manage, restore, and monitor tidal marsh habitat	The tidal salt marshes of south San Francisco Bay, Muzzi Marsh and adjacent Corte Madera Marsh, Near the headwaters of Suisun and Hill Sloughs.

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
									to promote the recovery of the clapper rail. Conduct range-wide species status surveys/monitoring and status reviews.	
E	Soft Bird's Beak	<i>Cordylanthus mollis ssp. mollis</i>	D/NP	N/A	Tidal Marsh Ecosystem	9C	Low	On CVP area border. Historically, loss of habitat mostly took place before CVP. CVP had minor affect on tidal marsh in SF Bay.	Protect existing tidal marsh habitat to promote the recovery and long term conservation of Soft Bird's Beak. Manage, restore, and monitor tidal marsh habitat to promote the recovery of Soft Bird's Beak. Conduct range-wide species status surveys/ monitoring and status reviews.	The Carquinez Straits and the Suisun Marsh area, in northern Contra Costa County. Only two substantial populations, each comprising multiple colonies, are confirmed to occur outside of Suisun Marsh today, one at Fagan Slough (eastern Napa River, non-CVP area) and one at Southampton Marsh, Benicia.

## Pacific Coastal Species

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
T	Monterey Spineflower	<i>Chorizanthe pungens var. pungens</i>	F	1998	Seven coastal plants and Myrtle's silverspot butterfly	15	Low	Most populations outside CVP impact area. Salinas Valley populations impacted by agriculture supported by CVP.	Establish working group with landowners. Devise and implement a management plan.	Santa Cruz and Monterey Counties including Salinas Valley and Manzanita Park in Prunedale.
T	Santa Cruz Tarweed	<i>Holocarpha macradenia</i>	N/A	N/A	N/A	8	Low	CVP may have assisted agricultural, ranch and urban development in coastal terraces in Santa Cruz. Populations close to CVP impact borderline.	No recovery plan. Recovery actions implied in critical habitat listing include protect remaining coastal terrace habitat from any development. Remove invasive plant species. Manage remaining populations. Seed banking.	Critical habitat established in 2001 to cover 2,902 acres in Contra Costa, Santa Cruz, and Monterey Counties. Coastal terrace prairie habitat. Reintroductions taking place in East Bay hills at Wildcat Park.
T	Western Snowy Plover	<i>Charadrius alexandrinus nivosus</i>	D	2001	Western snowy plover	3C	Low	CVP had minor effect on coastal areas, including Monterey Bay.	Manage and monitor breeding, wintering, and migration sites. Develop	Coastal and tidal marsh breeding sites along California

Status	Common Name	Scientific Name	Plan Stage	Year of Plan	Recovery Plan	Recovery Priority	CVPCP HRP Priority	Explanation	Highest Priority Actions	Highest Priority Areas
									long term management plan. Conduct recovery based scientific research.	coast. Significant population along Monterey Bay.
E	Santa Cruz Long-toed Salamander	<i>Ambystoma macrodactylum croceum</i>	D	1999	Santa Cruz Long-toed Salamander	6C	Low	CVP had minor impact on Santa Cruz coastal area.	Perpetuate self sustaining populations through protection and management. Conduct surveys for new populations and suitable habitat. Assess distribution from survey results. Conduct management based research.	3 metapopulations in coastal Santa Cruz and Monterey Counties from the city of Aptos south to the city of Castroville.
E	Robust Spineflower	<i>Chorizanthe robusta</i> var. <i>robusta</i>	F	2004	Robust Spineflower	9	Low	CVP had minor impact on Santa Cruz coastal area. Most populations out of CVP area.	Protect and manage existing populations. Conduct management oriented research. Establish new populations.	There are 10 populations in coastal Santa Cruz County from Santa Cruz to Sunset State Beach. Other 2 populations in Marin County, out of CVP area.