

HABITAT MANAGEMENT AND MONITORING PLAN

CRESTRIDGE ECOLOGICAL RESERVE



FINAL DRAFT

HABITAT MANAGEMENT AND MONITORING PLAN

for the

CRESTRIDGE ECOLOGICAL RESERVE

Prepared for

State of California
The Resources Agency
DEPARTMENT OF FISH AND GAME

and

BACK COUNTRY LAND TRUST

Prepared by

Conservation Biology Institute



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1.0 INTRODUCTION

1.1 PURPOSE OF MANAGEMENT AND MONITORING PLAN

The Crestridge Ecological Reserve is a nearly 2,400-acre Ecological Reserve as designated by the California Fish and Game Commission and a unit of the Multiple Species Conservation Program (MSCP) in San Diego County. The property is subject to a Conservation Bank Agreement with the California Department of Fish and Game (CDFG) and The Nature Conservancy (TNC). Designation as a reserve has protected Crestridge from the threat of development.

The goals of the MSCP are consistent with the goals of an Ecological Reserve. The MSCP provides special protection for the irreplaceable resources in San Diego County and guides development outside of biological resource core areas. Protection of these irreplaceable resources is vital to the general welfare of all residents. Central to the MSCP is the maintenance of ecosystems and vegetation communities that support sensitive species and fragile, irreplaceable resources. The MSCP's goal is to prevent future endangerment of the plants and animals that are dependent on these habitats.

The CDFG and MSCP both require the preparation of a habitat management and monitoring plan for the reserve that includes area-specific directives for the land and the species it supports, including species listed as "covered" under the take authorizations of the MSCP. Implementation protocols of the plan are intended to encourage the maintenance or improvement of the habitat quality of the reserve, while remaining adaptable to changing conditions on the reserve. The plan addresses the interface between adjacent developed lands and habitats in the reserve, appropriate land uses within the reserve, and enforcement standards for those uses that are compatible with the short- and long-term maintenance goals of the reserve.

The Back Country Land Trust (BCLT), under a management agreement with CDFG, will work with the CDFG to implement the Habitat Management and Monitoring Plan. In accordance with the plan, BCLT and CDFG will coordinate stewardship efforts for land management, monitoring, and maintenance. BCLT will also develop and implement volunteer and environmental education programs and encourage appropriate use of the land by the general public and the local community.

1.2 PROPERTY LOCATION, HISTORY OF USE, AND REGIONAL ECOLOGICAL SIGNIFICANCE

1.2.1 Location

The Crestridge Ecological Reserve is located in San Diego County, approximately 3 miles east of the City of El Cajon and due north of the community of Crest (Figure 1-1). The reserve is bounded on the north by Interstate 8, on the east by Harbison Canyon, on



the south by Mountain View and La Cresta roads, and on the southwest by La Cresta Road.

1.2.2 History of Use

The Crestridge property, also known locally as "Oakridge," was part of a Mexican land grant known as El Cajon de San Diego, or Rancho El Cajon. The name, "the box," referred to the pass between two hills. The original land grant consisted of 48,800 acres, the third largest land grant in San Diego County, and ultimately became the site of El Cajon, Lakeside, Santee, Bostonia, and Flinn Springs. The original boundaries of the rancho, roughly, were La Mesa on the west, Mt. Helix on the south, Camp Elliott on the north, and El Monte Park on the east (Moyer and Pourade 1969). The land was granted in September 1845 by Pio Pico to Maria Antonia Estudillo de Pedorena (Aviña 1976). Señora Pedorena and her family built houses and corrals for their stock and harvested large crops from the land (Pourade 1963). Miguel Pedorena died in 1850 and was buried in Old Town. His heirs began to dispose of their land during the Civil War (Moyer and Pourade 1969).

The Cornelius family owned much of the Rancho south of existing Interstate 8 in the early 20th century and raised beef and milk cows there, mostly on the area that is now an avocado grove and not part of the reserve. Mrs. Cornelius purchased the original water system for Crest from the army camp at Campo. The Cornelius's named the oak grove area "Mary Jane Park," in memory of their daughter who died as a child. Sometime before World War II, Colonel Ed Fletcher bought the "S" Tract of Rancho El Cajon from the Cornelius family. Fletcher used the property as a retreat for his family (Fletcher 1952). During World War II, the area was used by the Searchlight Battalion of soldiers. Officers' quarters and a recreation hall were built in the vicinity of the oak grove. Some of these structures remain today.

Mr. Buck Rickles worked for the Ed Fletcher Company, Inc. from 1963 to 1976 and raised his family on the property. Mr. Rickles supplied much of the information for this history of the property. He and Mr. Waller, who was the handyman for the Ed Fletcher Company, had cows, horses, and various other livestock, mostly in the area of the avocado grove, which is not now part of the reserve. Mr. Waller cleared the area that is now the annual grassland north of the oak grove on the reserve, erected fences, and used it to raise quarter horses. None of the rest of the property has been cleared.

During the late 1970s and 1980s, plans were approved for a residential development of more than 1,350 homes on the site. In 1989, the land was owned by Lawrence Malenfant, who planned an extensive community encompassing 2,000 homes, a golf course, lake, and sewer plant. He eventually went bankrupt. In the 1990s, Gatlin Development (Gatlin) planned to build 92 homes on about 450 acres and to designate about 1,500 acres as open space. This plan was approved by the County of San Diego.

In response to the development proposals, the citizens of Crest formed the Crest Open Space Supporters and the Back Country Land Trust to advocate conservation of the

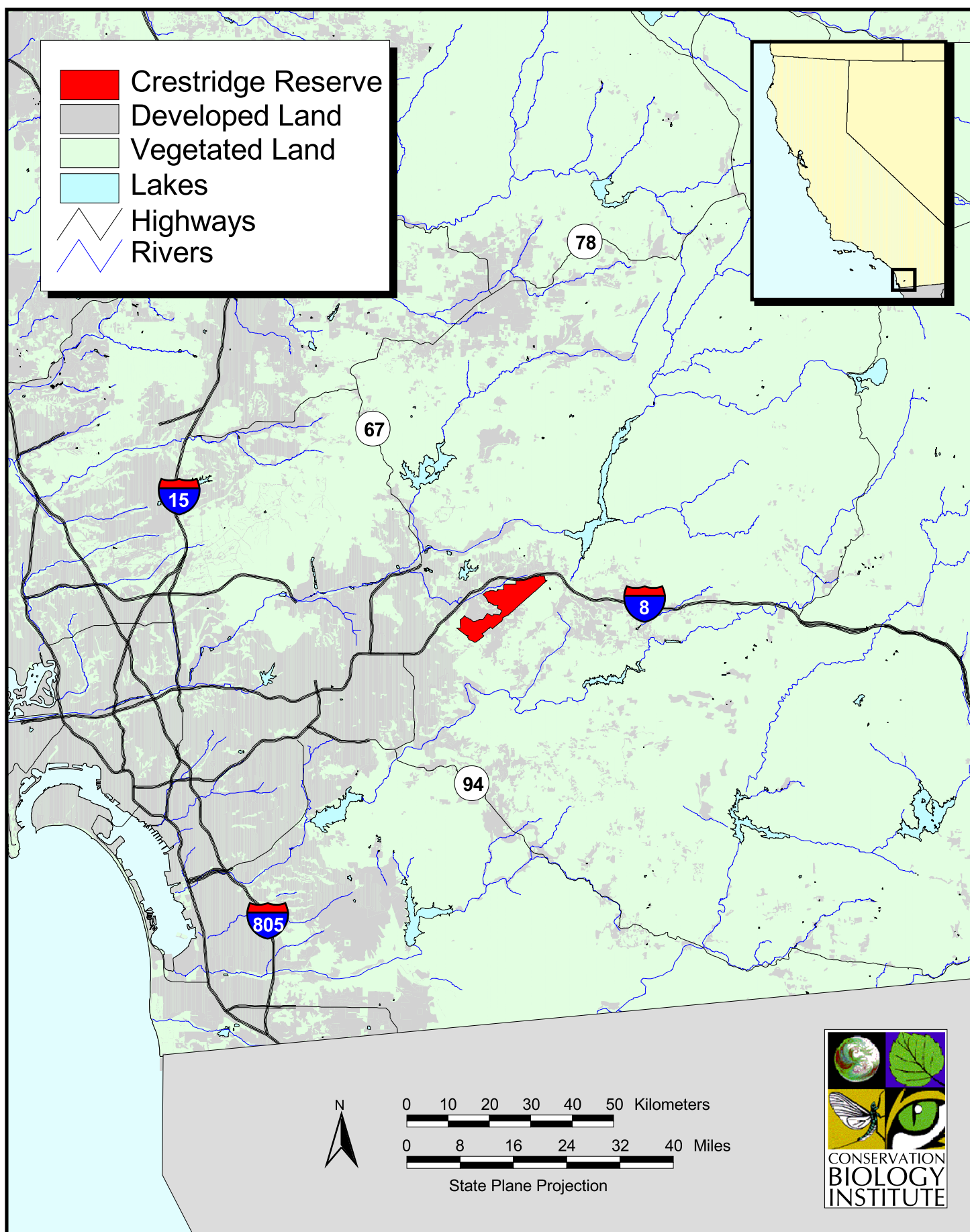


Figure 1-1. Location of Crestridge Ecological Reserve



property as open space and incorporation into the MSCP preserve system. The Endangered Habitats League also had a role in assuring conservation of the property.

In 1995, Gatlin established the Crestridge Conservation Bank on approximately 1,100 acres of the property, with the potential to add another approximately 1,400 acres to the bank. At the urging of the BCLT, other environmental groups, and the CDFG, TNC purchased the entire property, and in 1999 the Wildlife Conservation Board purchased the property from TNC. These properties now comprise the Crestridge Ecological Reserve, administered by the CDFG. TNC continues to sell mitigation credits, with the proceeds going toward additional acquisitions and an endowment for habitat management on the reserve.

1.2.3 Regional Ecological Significance

The Crestridge Ecological Reserve is a large island of habitat almost entirely surrounded by residential development. It is centrally located at the eastern edge of urban development between MSCP lands to the north of Interstate 8 and MSCP lands to the south of Interstate 8 and thus may function as a habitat linkage. Despite its proximity to urbanization, much of Crestridge shows relatively few signs of disturbance. Crestridge supports mature riparian woodlands and Engelmann oak woodlands, surrounded by coastal sage scrub and chaparral. These habitats provide nesting and foraging habitat for raptor species, including the black-shouldered kite (*Elanus leucurus*) and Cooper's hawk (*Accipiter cooperi*). The reserve supports a wide diversity of native butterflies and native plant species, including bunch grasses and sensitive herbaceous species. Crestridge supports the largest known populations of Lakeside ceanothus (*Ceanothus cyaneus*) and Hermes copper butterfly (*Lycaena hermes*). The coastal sage scrub habitat on the west end of the reserve may function as one of the "stepping stones" for coastal sage scrub birds, including the California gnatcatcher (*Polioptila californica californica*), in the Lakeside archipelago of coastal sage scrub.

The reserve is valued as open space by the surrounding community of Crest. Crestridge was also valued in prehistoric times, as evidenced by the existence of archeological sites on the reserve, including an ancient village.

1.3 MSCP RESPONSIBILITIES

Under the MSCP Plan, each conservation area must be managed to maintain and enhance habitat for covered species and other natural communities within the MSCP preserve system. The MSCP goal is to "manage" the reserve by allowing natural ecological processes to continue with minimal impact from humans. This responsibility bears with it the obligation to know the locations and condition of various resources on the reserve at all times, from season to season and year to year. Management entails careful observation and documentation to record how the natural communities respond to different levels and types of land uses, as much as it entails taking action. This plan and its implementation must evolve with our understanding of the resources and their responses to various environmental and man-induced conditions. For this reason, the



management and monitoring plan provides management options that may or may not be implemented, depending on the status of resources and the potential impacts of human management and adjacent land uses at any point in time.

This Habitat Management and Monitoring Plan for the Crestridge Ecological Reserve has been prepared to comply with the MSCP Guidelines for Preserve Management Activities (Section 6.3 of the Final MSCP Plan, Ogden 1998):

Area-specific management directives will be prepared by federal, state, and local agencies responsible for managing lands conserved as part of the preserve. Area-specific management directives will be developed using generally accepted practices and procedures for management of biological preserves. These directives will be developed and implemented to address species and habitat management needs in a phased manner for logical and discrete areas, once conserved as part of the preserve, including any species-specific management required as conditions of the take authorizations.

Both framework plans (generally) and area-specific management directives (specifically) will address the following management actions, as appropriate:

Preserve-level actions

- Fire management
- Public access control
- Fencing and gates
- Ranger patrol
- Trail maintenance
- Visitor/interpretive services
- Volunteer services
- Hydrological management
- Signage and lighting
- Trash and litter removal
- Access road maintenance
- Enforcement of property requirements

Species-level actions

- Removal of invasive species
- Nonnative predator control
- Species monitoring
- Habitat restoration
- Management for diverse age classes
- Use of herbicides and rodenticides
- Biological surveys
- Species management conditions



2.0 PROPERTY DESCRIPTION

2.1 GEOGRAPHICAL SETTING

The Crestridge Ecological Reserve is situated in southwestern San Diego County, approximately 3 miles east of the City of El Cajon and due north of the community of Crest. The reserve is bounded on the north by Interstate 8 (I-8), on the east by Harbison Canyon, on the south by Mountain View and La Cresta roads, and on the southwest by La Cresta Road.

Elevation ranges from 2,258 feet above mean sea level (msl) in the southeastern portion of the reserve to approximately 1,000 feet msl on lower slopes above Rios Canyon in the central portion of the property. Overall, rugged topography and steep slopes characterize the majority of the site. Relatively level terrain occurs primarily along the southern property boundary, just northeast of the end of Horsemill Road.

A number of blueline streams occur on Crestridge (Figure 2-1). Rios Canyon Creek and two unnamed drainages on either side of Ceanothus Slope flow north to Los Coches Creek. Two smaller, unnamed blueline streams drain into Rios Canyon from the south. A small portion of a blueline stream in the southeast portion of the reserve is a tributary to the larger drainage in Harbison Canyon. In addition to blueline streams, a natural spring occurs at about 1,700 feet elevation in the eastern portion of the reserve. This spring was not visited during the 2000 surveys (due to topography and dense vegetation) but appears from aerial photographs to support an oak woodland community.

According to the nearest weather station in El Cajon, administered by the Western Regional Climate Center, monthly average temperatures range from 54 to 76 degrees Fahrenheit, with an average minimum temperature of 41 degrees Fahrenheit in December and an average maximum temperature of 89 degrees Fahrenheit in August (for the period 1971-2000). Average annual rainfall for the period 1979-2000 is 12.67 inches at the El Cajon station, with minimum annual rainfall of 1.51 inches and maximum annual rainfall of 23.15 inches during this period.

2.2 ADJACENT LAND USE

The Crestridge Ecological Reserve is largely an island of natural communities surrounded by urban and agricultural communities and demarcated by roads. The long southern boundary is mostly bordered by residential development. The easternmost end of the property adjoins a patch of vacant land between the reserve and Harbison Canyon. Except for a small ravine, which may function as a corridor between Crestridge and Harbison Canyon, most of this land is very steep and effectively isolates Crestridge from Harbison Canyon. Interstate 8, Olde Highway 80, Flinn Springs County Park, and a few houses border the northern boundary of the reserve. Avocado groves and residential development along Rios Canyon Road largely separate the western and eastern portions of the reserve.



Aside from being isolated by roads and development, the primary threats from adjacent development are use of the site by offroad vehicles, landscaping (as point sources for exotic species introductions), and irrigation runoff. Irrigation runoff may facilitate invasion by Argentine ants (*Iridomyrmex humilis*) as well as cause erosion and affect the composition of plant communities onsite.

2.3 GEOLOGY AND SOILS

Seven soil series or formations are present on Crestridge (Figure 2-2). These include the Bosanko, Cieneba (including Cieneba-Fallbrook soils), Fallbrook (including Fallbrook-Vista soils), Las Posas, Visalia, and Vista series, and acid igneous rock land. Soil series are described below with respect to general structure and qualities, parental material, and location onsite.

Bosanko Series (Btc)

This series consists of well-drained, moderately deep clays that formed in material derived from acid igneous rock. Bosanko soils onsite occur in moderately sloping areas (5-9% slopes) and are characterized by a stony surface layer. Bosanko stony clays are typically <1 m deep over decomposed rock. Soil fertility is medium to high, runoff is slow to medium, and the erosion potential is slight to moderate (USDA-SCS 1973). Bosanko soils occur at the southeastern corner of the site.

Cieneba Series (ClG2, CmrG, CnE2, CnG2)

Cieneba soils include excessively drained, shallow coarse sandy loams. These soils formed in material weathered in place from granitic rock and occur in gently sloping to steep upland areas. Onsite, Cieneba soils occur in areas of 30-75% slopes. These soils are characterized by low fertility, rapid permeability, medium to rapid runoff, and high to very high soil erosion. Sheet and gully erosion may be evident. Cieneba very rocky coarse sandy loams (CmrG) are further characterized by very thin soils, rock outcrops over about 20% of the soil surface, and very large granodioritic boulders on about 30% of the surface (USDA-SCS 1973). Cieneba very rocky coarse sandy loams (CmrG) are one of the dominant soil types in the eastern portion of the site, occurring primarily on steep, north-facing slopes south and east of Flinn Springs County Park. Smaller pockets of this soil type occur in the central and western portions of the site. Cieneba coarse sandy loams (ClG2) are more restricted in distribution and occur primarily along the southern property boundary, east of the oak grove at the end of Horsemill Road.

Cieneba-Fallbrook rocky sandy loams (CnE2, CnG2) are included in the Cieneba series, but contain about 55% Cieneba coarse sandy loams and 40% Fallbrook sandy loams. Rock outcrops account for 5-10% of the soil surface, and large boulders cover 10% of the soil surface. These soils occur on slopes ranging from 9-65%. The Cieneba soil component consists of a 25 cm soil layer over weathered granitic rock. These soils have low fertility, moderately rapid permeability, medium to very rapid runoff, and moderate to very high erosion potential. The Fallbrook soil component consists of a thin surface

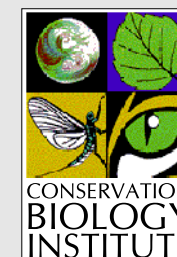
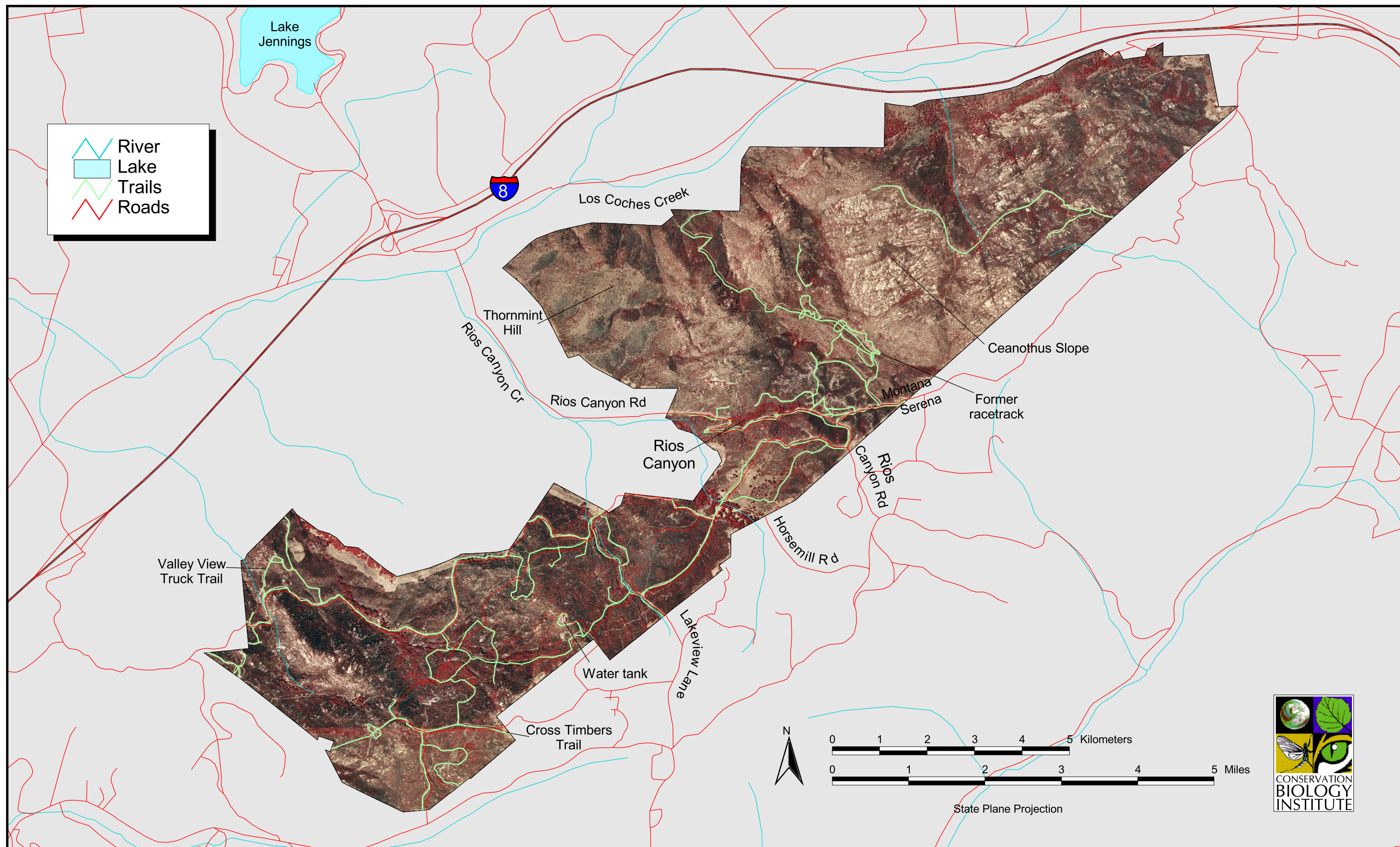


Figure 2-1. Aerial Photo Base Map of Crestridge Ecological Reserve

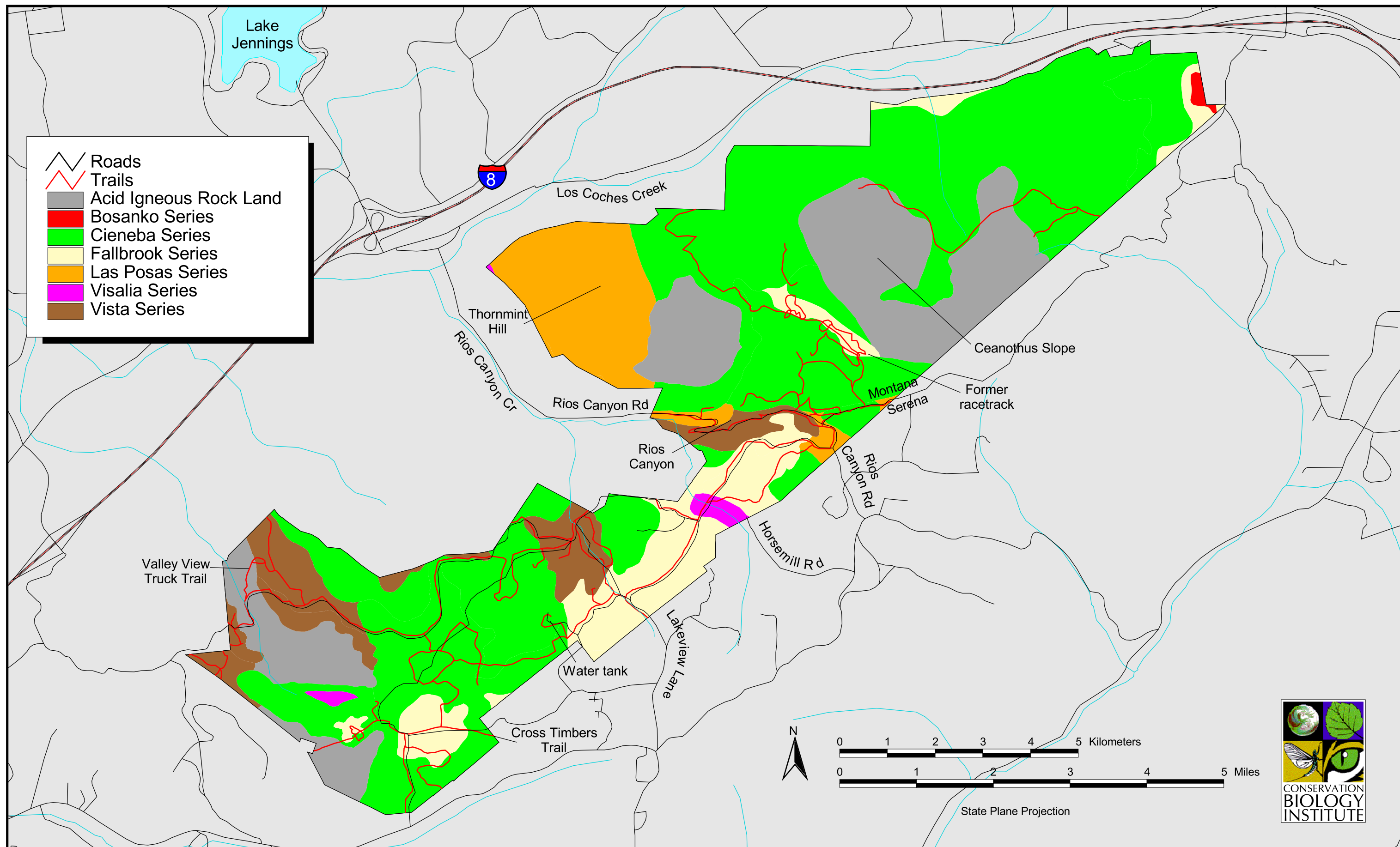


Figure 2-2. Soil Types of Crestridge Ecological Reserve



layer of sandy loam and a subsoil of sandy clay loam. These soils have medium fertility, slow to moderately slow permeability in the subsoil, medium to very rapid runoff, and moderate to very high erosion potential (USDA-SCS 1973). Cieneba-Fallbrook soils are important in the western part of the site. Cieneba-Fallbrook rocky sandy loams (CnE2) are also found in the east-central and eastern corners of the site, where they typically occur adjacent to and on lower slopes than Cieneba soils and acid igneous rock.

Fallbrook Series (FaC, FaC2, FaD2, FaE2, FeE, FeE2, FvE)

Fallbrook soils consist of well-drained, moderately deep, to deep sandy loams that formed in material weathered in place from granodiorite. These soils occur in upland areas onsite with slopes ranging from 5-30% and are typically 50-150 cm deep over rock. Fallbrook rocky sandy loams (FeE, FeE2) are further characterized by large boulders over 10-25% of the soil surface and rock outcrops over 10% of the soil surface. Soil fertility is low to medium, runoff is slow to rapid, and the erosion potential is slight to high. Fallbrook-Vista sandy loams (FvE) are about 50% Fallbrook sandy loams and 40% Vista sandy loams (USDA-SCS 1973). Fallbrook soils occur in localized patches in the western and west-central portions of the site. They are found in the grassland habitat just east of the oak grove at the end of Horsemill Road and on slopes north and northwest of this grove.

Las Posas Series (LrG, LpE2, LpD2)

The Las Posas series includes well-drained, moderately deep stony fine sandy loams with a clay subsoil. These soils occur in upland areas and form in material weathered from basic igneous rocks. The substratum of Las Posas soils is deeply weathered gabbro. Las Posas stony fine sandy loams (LrG) occur on steep slopes (30-65%) and are characterized by medium soil fertility, moderately slow subsoil permeability, rapid to very rapid runoff, and high to very high erosion potential. Las Posas fine sandy loams (LpE2) are not stony, occur on moderately steep slopes (15-30%), and are characterized by medium to rapid erosion and moderate to high erosion potential (USDA-SCS 1973). Las Posas soils are found only on south and west-facing slopes above Rios Canyon. In this location, Las Posas stony fine sandy loams (LrG) occur on upper slopes, while Las Posas fine sandy loams (LpE2) are restricted to lower slopes. This soil type is particularly significant as it is often associated with sensitive plant species.

Visalia Series (VaB, VaC)

The Visalia series includes moderately well-drained, very deep sandy loams derived from granitic alluvium. These soils occur on gently to moderately sloping portions of alluvial fans and floodplains. Visalia sandy loams onsite occur in areas of 2-9% slopes. Soil fertility is high, permeability is moderately rapid, runoff is slow to medium, and the erosion potential is slight to moderate, depending on the slope (USDA-SCS 1973). Visalia soils are restricted in distribution onsite, being found only in the oak grove at the end of Horsemill Road (VaB) and in a small patch in the western part of the site (VaC).



Vista Series (VsE, VvE, VvG)

The Vista series includes well-drained, moderately deep and deep coarse sandy loams derived from granodiorite or quartz diorite. These soils occur in upland areas with slopes ranging from 15-65%. Medium soil fertility, moderately rapid permeability, medium to rapid runoff, and a moderate to high erosion hazard potential characterize Vista coarse sandy loams (VsE). Vista rocky coarse sandy loams (VvG) are also characterized by medium soil fertility and moderately rapid permeability. In addition, these soils have rock outcrops over 10% of the soil surface and large boulders over 10-20% of the soil surface. These rocky coarse sandy loams, which occur on steeper slopes than the coarse sandy loams, are also characterized by rapid to very rapid runoff and high to very high erosion potential (USDA-SCS). Vista soils occur in relatively small patches in the western and west-central portions of the site.

Acid Igneous Rock Land (AcG)

Acid igneous rock land is a fast-draining formation that occurs on low hills and in areas of steep topography. Large boulders and rock outcrops cover 50-90% of the surface and are comprised of a variety of materials, including gabbro, basalt, or gabbro diorite. The soil layer is typically shallow and infertile and occurs over decomposed granite or basic igneous rock. Pockets of deeper soil can occur between the rocks. Runoff is rapid to very rapid, and the erosion potential is considered moderate to very high (USDA-SCS 1973). Acid igneous rock is prominent in the eastern part of the site, where it forms the steep, west-facing slopes above the former racetrack. In this location, the distribution of acid igneous rock correlates strongly with the distribution of the sensitive chaparral shrub species, Lakeside ceanothus (*Ceanothus cyaneus*). Another large outcropping of acid igneous rock occurs on south-facing slopes above Rios Canyon. Acid igneous rock also occurs on southwest-facing slopes above La Cresta Road, in the southwest portion of the site.

2.4 FIRE HISTORY

Crestridge has been subjected to repeated burning in recent times, and the frequency and interval between fires are likely reflected in the current vegetation onsite. Burn data for this site were obtained through the California Department of Forestry and Fire Protection (CDF) burn history database (CDF 2000) and cover the period from 1940 to 2000. It is possible that additional fires occurred on the reserve during this time period but were not recorded. The burn history data provide boundaries of individual fire events and the year of the event. These data do not provide information on fire intensity or season; both factors can influence post-fire vegetation recovery.

Ten fire events have been recorded at Crestridge (Figure 2-3). In general, fire frequency has been lowest in the east, highest in the west, and intermediate between the two in the central portion of the reserve. The most recent burns have occurred in the east-central portion of the reserve, followed by the northeast corner. The approximate acreages of these fires and their relative locations onsite are presented in Table 2-1.

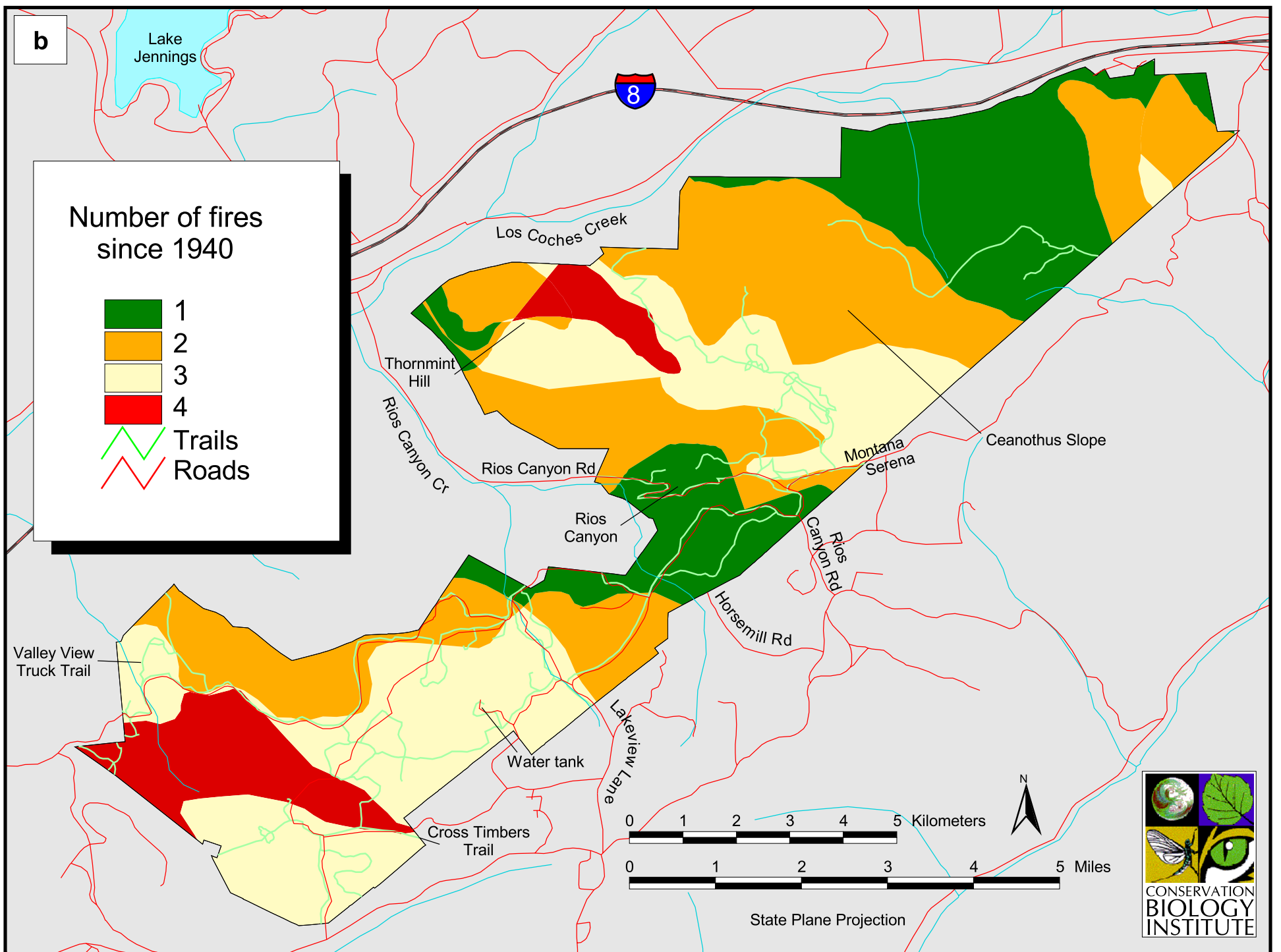
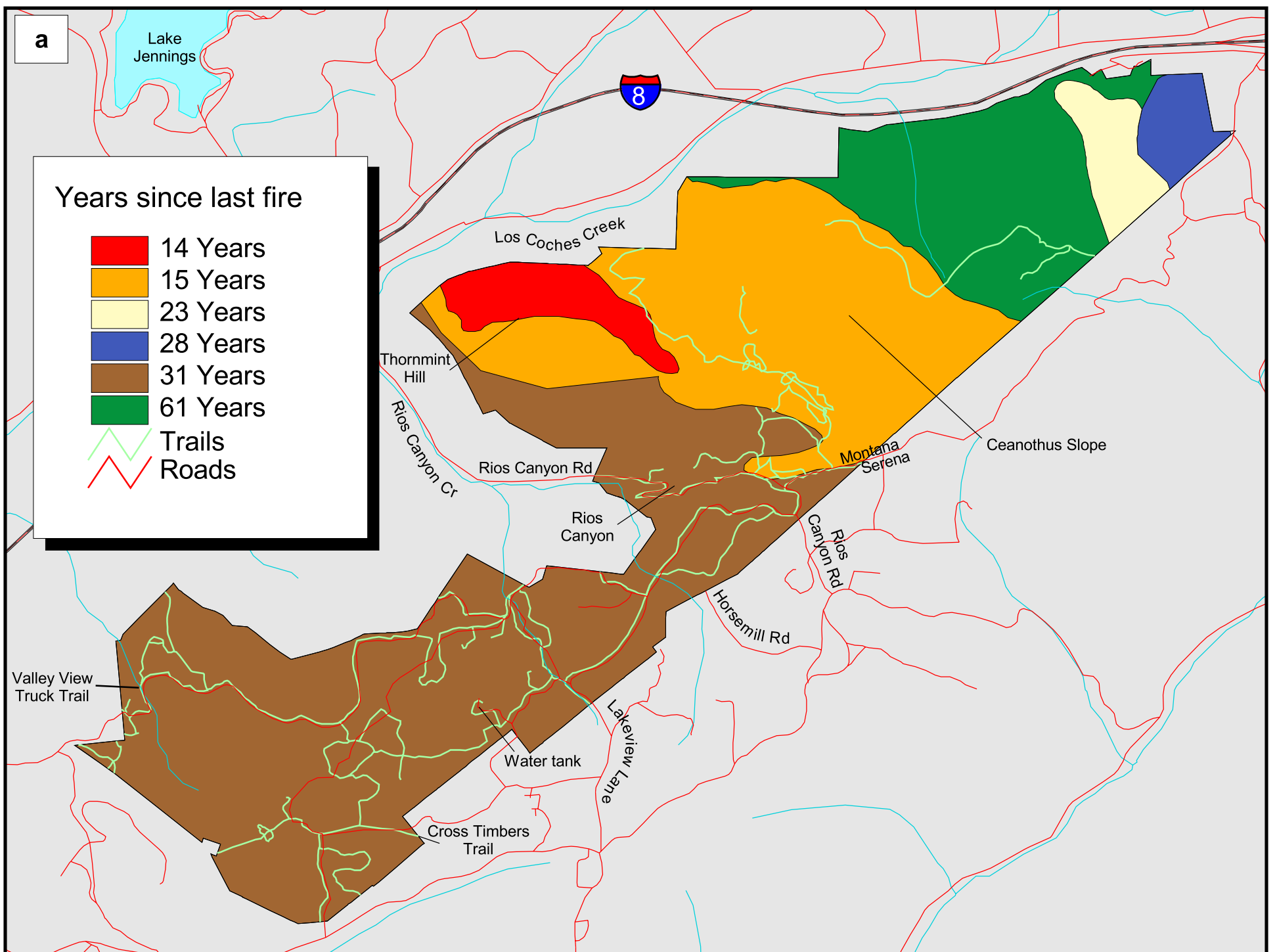


Figure 2-3a and b. Fire History of Crestridge Ecological Reserve



Table 2-1
Recorded Fire Events on Crestridge

Date of Fire	Approximate Acres Burned Onsite	General Area of Reserve
1940	1,300	Central and eastern
1950	950	Central and western
1953	650	Western
1958	350	Western corner
1965	650	Western, excluding north-facing slope along north boundary
1970	1,550	Central and western (Laguna fire)
1973	<50	Northeast corner
1978	50	Near northeast corner
1986	750	East-central
1987	80	North-central

Source: CDF fire history data (CDF 2000).

The following examples demonstrate some of the effects of fire on vegetation on Crestridge:

- The northeast portion of the reserve (e.g., north-facing slopes south of I-8) has only one recorded burn event (1940) and has experienced a fire-free interval of more than 60 years. Vegetation on these slopes consists of dense stands of southern mixed chaparral and well-developed oak woodlands.
- Steep, west-facing slopes in the east-central portion of the reserve last burned 15 years ago, whereas adjacent habitat to the east burned 61 years ago. Both areas support the sensitive plant, Lakeside ceanothus. Ceanothus on the west-facing slopes occurs in higher densities than areas to the east, but individual plants do not appear as large in this area.
- South and west-facing slopes above Rios Canyon have experienced two or three burns in the recorded time period, with the last burn occurring 14 years ago. In areas that burned twice, the interval between fires is 30 years (1940, 1970), with 31 years since the last fire. In areas that burned three times, the



fire intervals are 30 and 14 years (1940, 1970, 1986), respectively, with 15 years since the last fire. Areas on upper, west-facing slopes with the more frequent fires and fire intervals consist of coastal sage scrub with a high percentage of nonnative grasses. Conversely, lower slopes that have been subjected to less frequent fires and fire intervals consist of relatively intact sage scrub, except where they have been subjected to other disturbance factors (e.g., roads, trails, fuel breaks).

- The highest fire frequency occurs in the western portion of the reserve, where four fire events have been recorded, with 31 years since the last fire. The dominant vegetation association in these areas is chaparral. Timing and intensity of burns, in addition to fire frequency, have likely influenced the current shrub composition in this area. This area supports one of the highest concentrations onsite of the crown-sprouting species, scrub oak (*Quercus berberidifolia*).

Few areas of the Crestridge reserve show obvious evidence of recent burns. The exception is coastal sage scrub on south and west-facing slopes above Rios Canyon. In some portions of this area, shrub cover is noticeably sparser than elsewhere onsite, and the understory is dominated by nonnative weedy species. This effect appears to be magnified in areas that have experienced three (versus two) fire events.

2.5 CULTURAL FEATURES

Pursuant to the County of San Diego MSCP Framework Management Plan, all preserve lands will be inventoried for cultural resources, including historic structures, features, and landscaping, as well as historic and prehistoric archaeological sites, features, and artifacts. In addition, a management plan will be developed to provide for monitoring and protection of cultural resources. Protection and preservation of cultural resources must comply with County of San Diego ordinances (Title 4; Public Property, Division 1: Parks and Beaches, Article 2, Section 41.113) and applicable state and federal laws. The County's MSCP Framework Management Plan includes the following guidelines (County of San Diego 1997):

- A. Inventories shall include a record search at the South Coastal Information Center, San Diego State University, and an on-foot field survey, as well as pertinent archival and historical research.
- B. Specific management plans will be prepared to preserve and interpret cultural resources.
- C. All management activities within the preserve including, but not limited to, trail construction, placement of fencing and gates, and restoration of habitat will take into consideration potential impacts to cultural resources.
- D. No removal or modification of cultural resources shall occur without written approval by the Director of Parks and Recreation.



- E. Removal or disturbance of cultural resources shall not occur prior to completion of an approved mitigation program, such as data recovery or recordation. Preservation in place is the preferred mitigation measure.
- F. Condition and status of cultural resources shall be noted as part of routine monitoring activities, and remedial measures shall be taken if damage is noted.
- G. Site location information will be confidential and will be available only for qualified cultural resource staff and land managers. Site locations will not be shown on maps or divulged to the public.
- H. Interpretive programs for Native American heritage, local and regional history, and prehistory will be developed for the preserve. These may include lectures, walks, kiosks, signs, brochures, and displays, but will not include excavations, collecting of artifacts, or disclosure of confidential site locations unless an interpretive plan is developed and approved by the Director of Parks and Recreation. The plan will include supervision by a qualified archaeologist approved by the Director of Parks and Recreation.
- I. Any cultural materials collected from the preserves will be curated at a qualified curation facility.
- J. Native American tribal councils will be contacted and consulted for input.

A cultural resources management plan for Crestridge is being prepared pursuant to these guidelines. An outline for the plan is included as Appendix I.

Three prehistoric archaeological sites have been identified on the 1,173 acres of the reserve that have been surveyed for cultural resources (central and western parts of the reserve). This area was surveyed during the 1980s as part of a California Environmental Quality Act requirement when a portion of the reserve was originally proposed for development. One site (SDM-W-1121) is a village-like site consisting of extensive numbers of grinding features with interspersed midden and artifacts. The milling components include slicks, basins, and mortars, scattered over numerous large outcrops of bedrock. This site represents a rare association of bedrock milling and midden.

Site SDM-W-1122 consists of a series of milling areas with no definable midden or artifacts in association. Site SDM-W-1123 consists of a single bedrock outcrop with two milling components, including one mortar and one slick. The remainder of the property that has not been surveyed will be evaluated for archaeological resources. The BCLT has begun consultation with Native American groups to develop a fuller history of the site.

As discussed in Section 1.2.2, during World War II, the area was used by the Searchlight Battalion of soldiers. Officers' quarters and a recreation hall were built in the vicinity of the oak grove. Some of these structures remain today. The archaeological and historical land uses will be incorporated into a Cultural Resources Management Plan for the Crestridge Ecological Reserve. Examples of the types of management matrix and inventory of cultural resources that will be completed for the site are included in Appendix I.



3.0 HABITATS AND SENSITIVE SPECIES

3.1 VEGETATION COMMUNITIES

A generalized vegetation map of Crestridge was prepared in 1992 as part of the regional vegetation mapping for the MSCP. That map was generated from interpretation of 1990 aerial photographs (scale: 1" = 2000') and limited field verification. The purpose of the current vegetation mapping effort was to refine the earlier map, update vegetation changes due to fire or other disturbances, and provide a baseline for long-term monitoring comparisons.

Patricia Gordon-Reedy of the Conservation Biology Institute (CBI) and Fred Sproul, an independent biological consultant, mapped vegetation communities in spring 2000 using high resolution digital multispectral imagery captured by the Airborne Data Acquisition and Registration (ADAR) system (scale: approximately 1" = 328'). San Diego State University (SDSU) prepared the ADAR base maps used in vegetation mapping. Topography was overlain on these maps at a later date to assist in refining vegetation boundaries. Vegetation was mapped according to the modified Holland system of classification (Oberbauer 1996); using this system ensures compatibility with SANDAG's regional vegetation database. The California Natural Diversity Data Base (CNDDB) recently presented a refined list of California Terrestrial Natural Communities (CNDDB 1999) that is based on A Manual of California Vegetation (Sawyer and Keeler-Wolf 1995) and is consistent with the National Vegetation Classification System (FGDC 1997). The CNDDB encourages the use of this updated system; therefore, Holland vegetation categories have been preliminarily crosswalked to the CNDDB's updated vegetation classification, to the extent feasible.

Vegetation mapping was conducted primarily by direct observations and from vantage points using binoculars. A few areas in the eastern portion of the site were inaccessible and were mapped from the imagery alone. County of San Diego GIS staff digitized the vegetation boundaries, calculated acreages (Table 3-1), and produced a map of vegetation communities (Figure 3-1). These communities are described in Appendix A.1. A list of plant species was developed (Appendix A.2), and dominant species composition was recorded for nearly half of the vegetation polygons (Appendix A.4).

3.2 PLANT SPECIES

Patricia Gordon-Reedy of CBI and Fred Sproul, an independent biological consultant, conducted rare plant surveys in spring 2000 (see Table 3-2). Sensitive plant surveys also had been conducted on or near the Crestridge site as part of focused biological surveys for proposed development projects (e.g., RECON 1993, 1994; Sweetwater Environmental Biologists, Inc. 1994). Sensitive species surveys conducted in 2000 focused on establishing baseline conditions for management and monitoring of sensitive plant populations onsite. Toward this end, the current effort documented or verified locational information, estimated population size(s) for selected species, delineated population



boundaries, surveyed selected areas for sensitive species, and assessed threats to extant populations. Voucher specimens were not collected as part of this effort.

Table 3-1
Acreage by Vegetation Community

Vegetation Community	Acres
Coastal Sage Scrub	443.7
Southern Mixed Chaparral	1,757.8
Scrub Oak Chaparral	25.0
Nonnative (Annual) Grassland	14.8
Freshwater Seep	0.4
Coast Live Oak Riparian Woodland	7.9
Coast Live Oak Woodland	125.1
Eucalyptus Woodland	0.1
Disturbed Areas	11.8
Total	2,386.6

Sensitive plant surveys focused on locating, mapping, and estimating population size (where feasible) for MSCP covered species, i.e., those species for which special conservation and management measures are required by the MSCP take authorizations. Mapping was conducted on the ADAR imagery used for vegetation mapping. Population size was counted directly or estimated by visual observation. Other sensitive plant species were noted where observed but were not specifically surveyed for or mapped in this effort. Due to time limitations, focused sensitive plant surveys were conducted primarily in areas with a high potential to support endemic or otherwise restricted species (e.g., clay or gabbro soils; steep, rocky canyons).

Sensitive plant species detected on Crestridge are briefly described in Appendix A.3. Figure 3-2 presents locations of sensitive species mapped during this effort.

MSCP Covered Species

Two MSCP covered plant species were detected on Crestridge during the 2000 surveys: San Diego thornmint (*Acanthomintha ilicifolia*) and Lakeside ceanothus (*Ceanothus cyaneus*). Cleveland's goldenstar (*Muilla clevelandii*) was detected just offsite to the east.

Slender-pod jewelflower (*Caulanthus stenocarpus*) was also detected in one location on Crestridge. This species has undergone a taxonomic revision since originally being placed on the MSCP covered species list and is now considered a synonym of a more widespread, common taxon (*C. heterophyllus* var. *heterophyllus*). Therefore, this taxon was not mapped or recorded as a sensitive species.

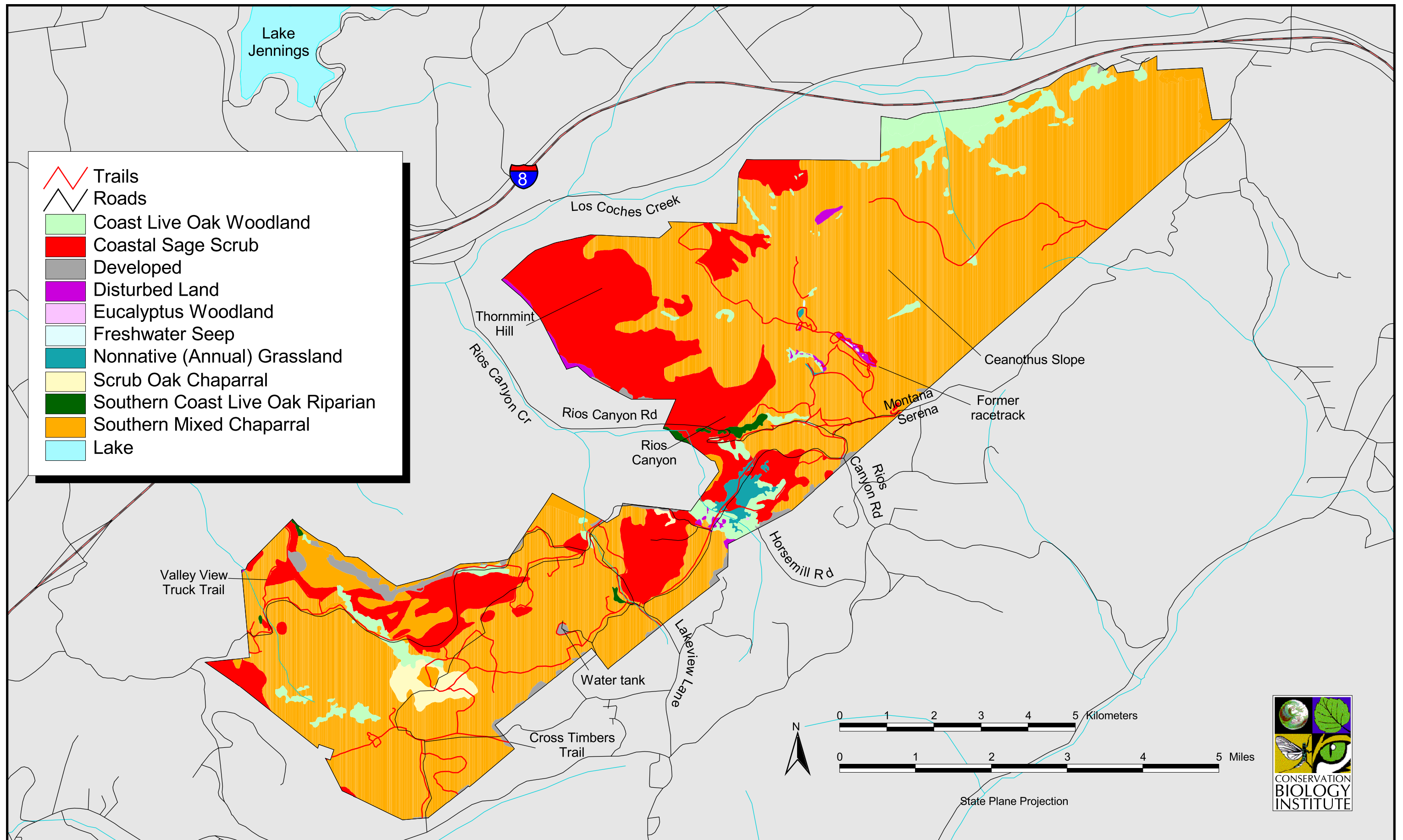


Figure 3-1. Vegetation Communities of Crestridge Ecological Reserve

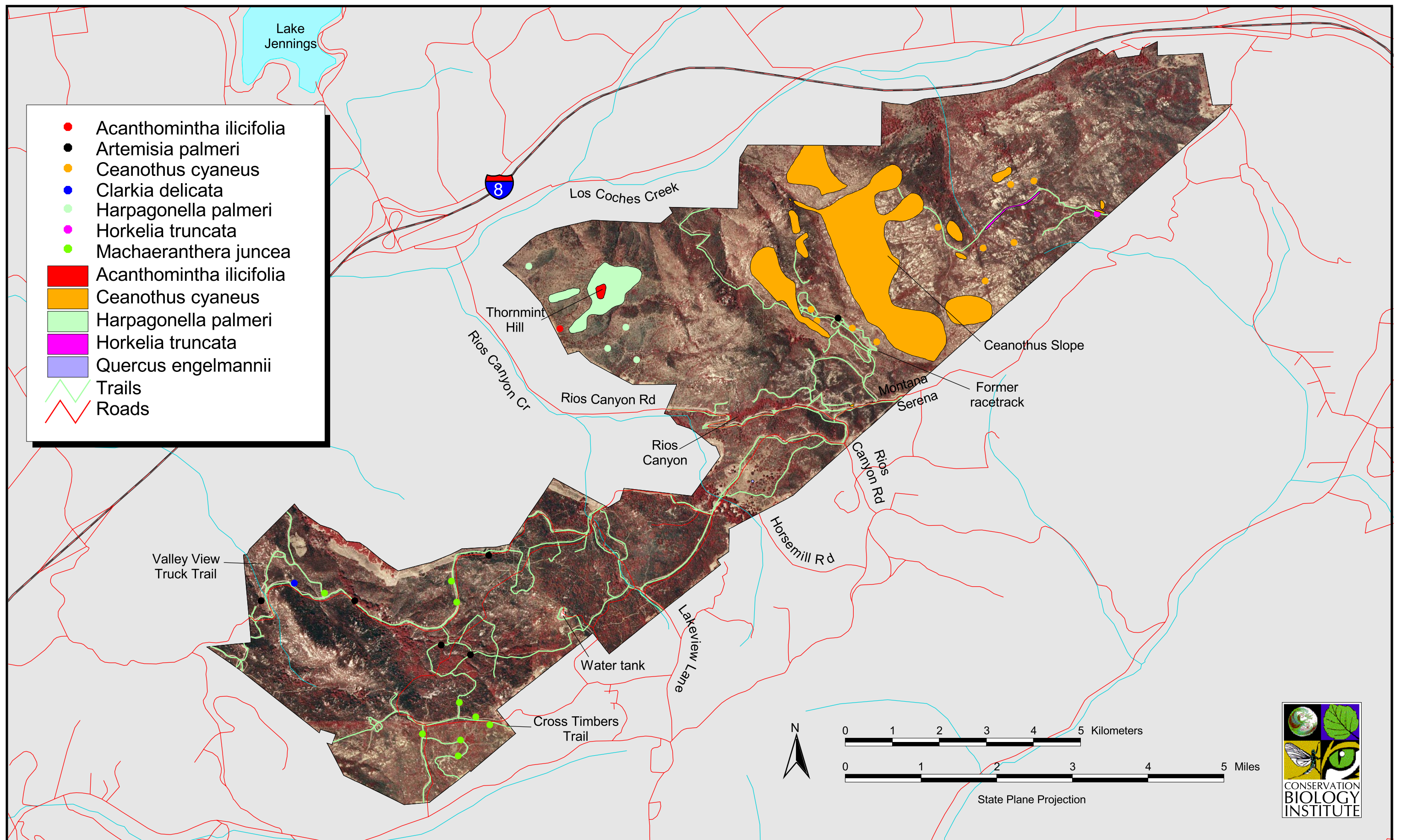


Figure 3-2. Sensitive Plants at Crestridge Ecological Reserve



Table 3-2
Vegetation Mapping and Sensitive Plant Survey Schedule

Survey Personnel	Survey Date	Survey Type	Survey Location
Patricia Gordon-Reedy Fred Sproul	4/17/00	Vegetation Mapping	Central (vicinity of Padre Dam water tower)
Patricia Gordon-Reedy Fred Sproul	4/19/00	Vegetation Mapping/ Sensitive Plants	Eastern (north-facing slopes south of I-8); central (vicinity of Horsemill Rd, slopes to east)
Patricia Gordon-Reedy Fred Sproul	4/25/00	Vegetation Mapping/ Sensitive Plants	Central and western (from water tower west to Wal-Mart overlook)
Patricia Gordon-Reedy Fred Sproul	4/26/00	Vegetation Mapping/ Sensitive Plants	Central and eastern (vicinity of Horsemill Rd and slopes to east, vicinity of 'racetrack'); western (slopes along La Cresta Drive, Las Coches Road, and east of Wal-Mart)
Patricia Gordon-Reedy Fred Sproul	4/28/00	Vegetation Mapping/ Sensitive Plants	Eastern (north-facing slopes south of I-8); central (slopes east of Rios Canyon Rd)
Fred Sproul	4/30/00	Vegetation Mapping/ Sensitive Plants	Eastern (from Dunbar Lane along southeast boundary to 'racetrack' overlook)
Patricia Gordon-Reedy Fred Sproul	5/8/00	Vegetation Mapping/ Sensitive Plants	Central (near oak grove); eastern (north of 'racetrack')
Patricia Gordon-Reedy Fred Sproul	5/9/00	Vegetation Mapping/ Sensitive Plants	Central (slopes east of Rios Canyon Rd)
Patricia Gordon-Reedy Fred Sproul	5/10/00	Vegetation Mapping/ Sensitive Plants	Central (slopes east of Rios Canyon Rd); western (rechecked selected areas west of the water tower)
Patricia Gordon-Reedy Fred Sproul	5/19/00	Sensitive Plants	Eastern (from Dunbar Lane to slopes overlooking I-8 to the north and 'racetrack' to the west)



3.3 ANIMAL SPECIES

Klein-Edwards Professional Services performed general and focused wildlife species surveys in and immediately adjacent to the Crestridge Ecological Reserve in 2000 and 2001. The purpose of these surveys was to identify invertebrate and vertebrate wildlife species that occur and utilize the reserve, whether as occasional visitors, as regular seasonal migrants, or as permanent residents. Observations and notes were taken on their activities onsite, including records of breeding or nesting success. These include federally and state listed wildlife species, as well as MSCP covered species, i.e., those species for which special conservation and management measures are required by the MSCP take authorizations. Repeated censuses of birds were initiated and performed along three specific routes within the reserve in an attempt to identify species diversity and determine relative abundance (Appendix F.5). The locations of certain sensitive and otherwise noteworthy wildlife species were mapped, and, in some cases, the species themselves were photographed. Wildlife species were identified in the field by sight, calls, tracks, scat, or other signs (Appendix B.1 and B.2).

Sensitive wildlife species observed and recorded within the boundaries of the Crestridge Ecological Reserve are briefly described in Appendix B.3. Figure 3-3 presents locations of sensitive species recorded onsite during these survey efforts. Field notes are included in Appendix B.4.

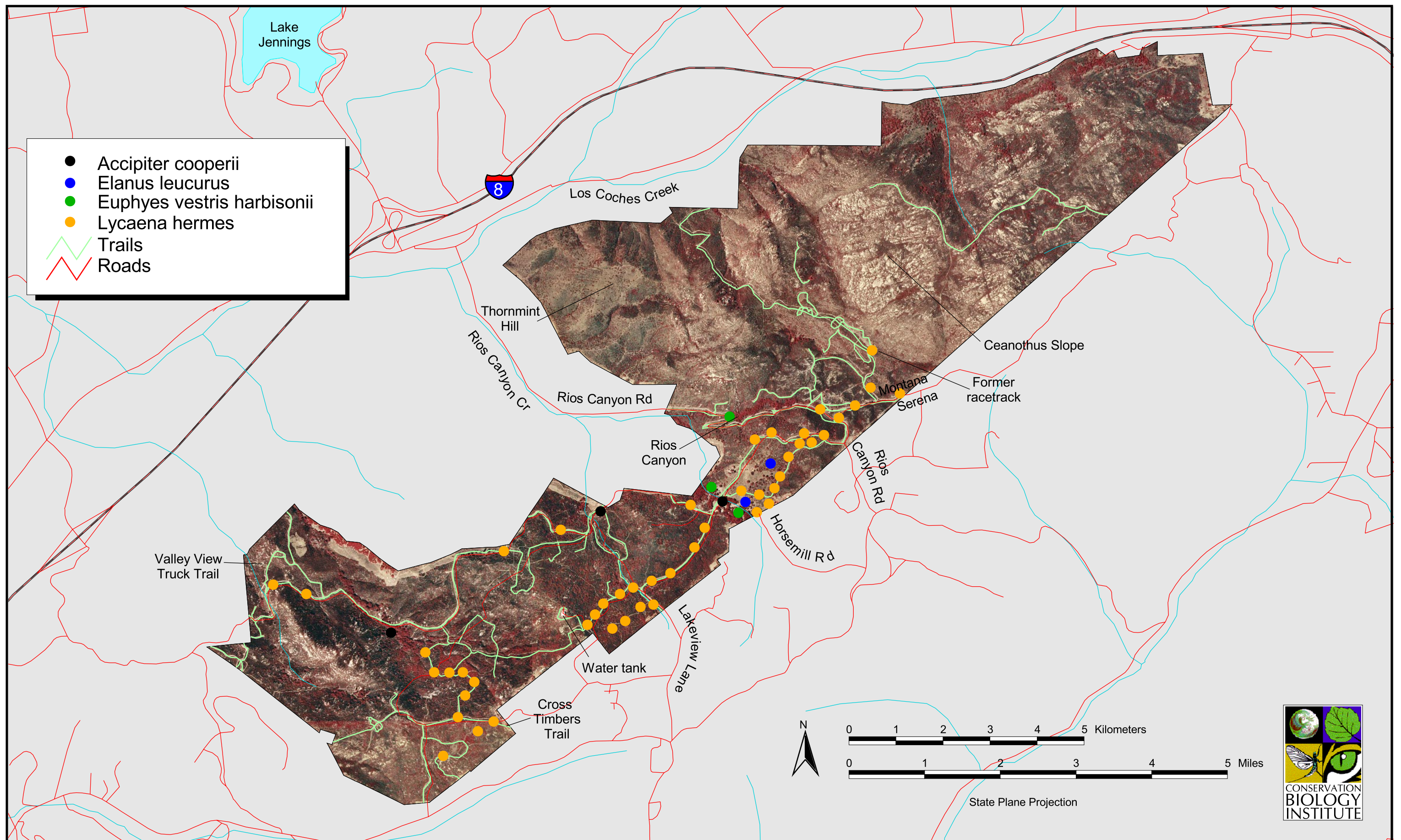


Figure 3-3. Sensitive Animals at Crestridge Ecological Reserve



4.0 CONSERVATION MANAGEMENT GOALS AND OBJECTIVES

4.1 THREATS AND POTENTIAL IMPACTS

The Crestridge Ecological Reserve is a large island of habitat almost entirely surrounded by residential development. It is located at the eastern edge of urban development between conserved MSCP lands to the north of Interstate 8 (I-8) and conserved MSCP lands to the south of I-8 and may function as a habitat linkage between these lands and conserved open space to the east. Thus, the primary challenge for management will be to maintain the current biodiversity of the reserve by containing edge effects from surrounding development and ensuring that the land remains as a viable habitat linkage.

Table 4-1 identifies the primary threats to habitats and sensitive species at Crestridge and the impacts that are expected to result from these threats. The most significant threats currently are caused by unauthorized offroad vehicles, resulting in trampling of habitat and soils, increased erosion, habitat loss, and roadkill. Over the long term, an altered fire regime, either through increased fire frequency or fire suppression, may reduce seral stages of vegetation communities, reduce species richness and biodiversity, and reduce the numbers and species of native pollinators. In addition, adjacent residences serve as point sources for exotic species introductions and are the source of irrigation runoff and altered hydrology. Roads and human activity in the area may ultimately result in displacement of corridors for wildlife.

This management plan is designed to address these threats and minimize potential impacts. Implementation of the management plan should maintain or enhance ecological "functions" of individual areas of the reserve and the reserve as a whole. While some of the biological goals are ecosystem or habitat-based, many of the objectives are specific to rare and endangered species to satisfy MSCP species-specific permit conditions. The MSCP covered species, as well as some other sensitive species onsite, are recommended for long-term monitoring to evaluate the effectiveness of management actions.

The following goals and objectives are intended to guide all management decisions on the Crestridge Ecological Reserve. They are derived from Table 3-5 of the MSCP Plan (Ogden 1998) as well as the Biological Goals, Standards, and Guidelines in the MSCP Resource Document (Ogden 1995). These goals and objectives are divided into Biological, Public Use, and Facility Maintenance Elements and form the basis for the management and monitoring actions described in Section 5. A biological goal is the statement of intended long-range results of management based on the feasibility of maintaining, enhancing, or restoring species populations and habitat. A public use goal is the statement of the desired type and level of public use compatible with the biological goals. Objectives are statements of the intended results of management actions that promote the biological, public use, or facility goals on the reserve. The management actions (Section 5) are intended to implement the objectives (CDFG 2001).



Table 4-1
Analysis of Threats

THREATS	IMPACTS
1. Public Use <ul style="list-style-type: none"> • Offroad vehicles* • Noise from offroad vehicles* • Equestrian use • Hiking 	<ul style="list-style-type: none"> • Habitat fragmentation (e.g., illegal trails)* • Habitat loss* • Trampling of habitat and soils* • Increased erosion* • Roadkill (e.g., lizards in trails)* • Reduction in disturbance-sensitive species • Exotic species dispersal • Littering and trash dumping • Reduction in native species richness and diversity • Reduction in numbers and species richness of native pollinators
2. Urban Edge <ul style="list-style-type: none"> • Fuelbreaks* • Landscaping* • Irrigation runoff • Noise • Lighting • Pets and children • Herbicides and pesticides 	<ul style="list-style-type: none"> • Altered soil moisture • Increased erosion • Point sources for exotic species introductions* • Reduction in disturbance-sensitive species • Increased exotic ant species and altered predator prey relationships • Littering and trash dumping* • Reduction in native species richness and biodiversity • Reduction in numbers and species richness of native pollinators
3. Habitat Fragmentation <ul style="list-style-type: none"> • Roads (onsite and offsite)* • Housing 	<ul style="list-style-type: none"> • Loss of habitat* • Displacement of wildlife corridors* • Reduction in area-dependent species • Altered predator prey relationships
4. Altered Fire Regime <ul style="list-style-type: none"> • Fire suppression* • Increased fire frequency 	<ul style="list-style-type: none"> • Reduced seral stage associates* • Reduction in native species richness and diversity, habitat conversion • Reduction in numbers and species richness of native pollinators

*Most significant threats and impacts (preliminary assessment).



4.2 BIOLOGICAL ELEMENTS

Goal 1: Maintain populations of MSCP covered species and other sensitive resources.

Objective 1 – Protect and maintain populations of MSCP covered plants and other sensitive plants (Lakeside ceanothus, San Diego thornmint, Cleveland's goldenstar, Engelmann oak). The primary threats to the conservation of sensitive plant species on Crestridge are invasive weed species and trampling and erosion caused by offroad vehicles. An altered fire regime, either through fire suppression or increased fire frequency, is a potential threat without appropriate fire management. For example, prescribed fire could be used to manage for a diverse age structure of Lakeside ceanothus to ensure reproduction and persistence of this species. In addition, under a regime of fire suppression, coastal sage scrub and chaparral habitats will become dense and closed and may reduce habitat for species such as thornmint.

Eliminating these threats will allow plant populations to complete their life cycles and will facilitate the persistence of these populations in the reserve. Monitoring the abundance of nonnative plants, followed by appropriate control methods, will be required, especially in areas where covered plant populations occur. In addition to eliminating threats, San Diego thornmint and Lakeside ceanothus populations should be augmented through seed collection and restoration to ensure that the genetic diversity of the onsite populations is not lost as a result of fire or other catastrophic events.

Objective 2 – Protect and maintain habitat (including host plants and nectar plants) for the Hermes copper, Harbison's dun skipper, and Quino checkerspot butterfly and pollinators of covered plant species. Many of the stressors that affect sensitive plants are also a threat to rare butterflies and other pollinators, particularly habitat loss (e.g., due to offroad vehicles) and fire suppression. It is unclear whether nonnative annual plant species may reduce habitat quality for the Quino checkerspot, e.g., by crowding out areas of *Plantago erecta*. Periodic fire may be desirable to reduce populations of nonnative species or to manage for a particular vegetation structure or composition. Prescribed burns should be phased to consider locations of the Hermes copper population onsite, i.e., to allow replacement habitat to regenerate without destroying the population.

Objective 3 – Protect and maintain coastal sage scrub breeding habitat for the California gnatcatcher and other sage scrub species (e.g., San Diego horned lizard, orange-throated whiptail, rufous-crowned sparrow). The coastal sage scrub habitat on Crestridge is mature, dense, and closed and currently does not appear to support California gnatcatchers, although gnatcatchers have been observed on the reserve in previous years and are known to occur west of the reserve (C. Edwards pers. comm.). Fire has been excluded from the central and western portions of the site, where coastal sage scrub occurs, for 14-31 years. Habitat quality for the gnatcatcher and other coastal sage scrub species would likely be enhanced through phased prescribed burns in these areas. Noise and habitat loss from offroad vehicles are an additional threat to these species. Offroad



vehicles and mountain bikes are a major hazard to lizards sunning in the dirt roads. The western patches of coastal sage scrub on the reserve are part of the Lakeside archipelago, a regional linkage comprised of patches of coastal sage scrub north and south of I-8. Maintenance of this coastal sage scrub and that in the interior of the reserve will help to facilitate multi-generational dispersal of gnatcatchers and rufous-crowned sparrows between the El Capitan coastal sage scrub north of Crestridge and scrub in the MSCP area south of Crestridge.

Objective 4 – Protect and maintain nesting and foraging habitat for MSCP-covered raptors and other raptor species. The oak woodlands on the northern and southern boundaries of the site and in Rios Canyon provide good nesting habitat for Cooper's hawks, red-shouldered hawks, black-shouldered kites, and other raptors. Nest disturbance during the breeding season is the primary threat to raptors at Crestridge. Seasonal closure of trails in areas with active raptor nests would enhance raptor nesting success in the area. Opening of the coastal sage scrub and chaparral communities through prescribed fire may enhance the habitat for raptor foraging.

Goal 2: Document the status of MSCP covered species and other sensitive resources in the reserve to help prioritize management actions and to assess the effectiveness of management actions.

Objective 1 – Monitor the populations of MSCP covered species and other sensitive species in the reserve and responses to management actions. Locations of covered species and other sensitive resources should be checked at least annually to document their continued conservation, track population status, identify potential threats, develop management recommendations, and gauge the effectiveness of management actions.

Goal 3: Monitor habitats and ecological processes to aid in identifying threats to ecosystem integrity or health and to guide adaptive management of the reserve.

Objective 1 – Monitor habitats to evaluate the physical condition of the habitat and any changes resulting from management measures and other factors. Reserve managers should be familiar with the structure and age classes of vegetation communities, and look for signs of senescence, disease, and pest infestations and lack of recruitment or reproduction. Managers should also evaluate recovery of the habitats after fire, fuel management, exotic plant control, and recreational uses.

Objective 2 – Monitor key ecological processes to provide an appropriate context for interpreting biological changes and responses to management measures. The extent, intensity, and periodicity of burns affects the structure and age classes of vegetation communities and can provide some insights into the need for fire management. A fire management plan should identify fire management units to facilitate maintenance of public safety and ecological function. Similarly, temperature and rainfall amounts and timing often have dramatic effects on species reproduction. The reserve manager should



use these data to interpret trends in species' population status. Stream hydrology data may also be used to evaluate the relationship between vegetation structure, species use, and flow patterns.

Objective 3 – Evaluate offsite areas as connection routes to Crestridge for large mammals, and ensure there are no constraints to animal movement within the reserve. The Crestridge Ecological Reserve is almost a habitat island that is nearly surrounded by roads and residential development. To maintain the integrity of the reserve, it is critical that it is connected to other habitat areas and that adjacent or new development does not interfere with wildlife movement in the area of the reserve. CBI is currently investigating potential wildlife movement corridors to Crestridge from adjacent areas as part of a separate CDFG grant.

Objective 4 – Monitor the indirect effects of adjacent land uses. Habitats on the edges of the reserve are susceptible to indirect impacts from nonnative landscaping that may invade the reserve, nonnative species such as house rats, house mice, and Argentine ants, and domestic pets that may prey on or compete with native species. The reserve edge also may be impacted by lights directed into the reserve or by persistent loud noises. The boundary of the reserve should be checked periodically for intrusive impacts and to identify and implement potential remedial actions. Fuel breaks may also serve as a substrate for invasive plants and should be monitored for new invasions.

Objective 5 – Monitor urban runoff within the reserve. Irrigation runoff from residential areas bordering the reserve may result in increased erosion and deposition of new substrates for colonization by weedy species (Hobbs and Atkins 1988; Saunders et al. 1991). Increased surface flows may also facilitate the invasion of exotic species, such as Argentine ants (Holway 1998). Increased surface moisture or underground seepage that results in increased soil moisture may also promote exotic plant establishment, facilitate invasion by Argentine ants, alter seed bank characteristics, and modify habitat for ground-dwelling fauna (Alberts et al. 1993; McIntyre and Lavorel 1994; Amor and Stevens 1976; Suarez et al. 1998; Saunders et al. 1991). Depending on the timing of any increased water supply, urban runoff may result in conditions that promote nonnative, exotic plant species (e.g., tamarisk) at the expense of native riparian tree species and may promote downcutting of streambeds. Runoff may also include pesticides that may be harmful to riparian resources.

Goal 4: Enhance and restore degraded habitats in the reserve.

Objective 1 – Implement habitat enhancement and restoration projects. Habitat degradation as a result of human activity and invasion by exotic species is a threat to habitat value for a variety of plant and animal species. Various habitat enhancement and restoration projects could be conducted on the reserve. As appropriate, develop specific enhancement or restoration plans for review and approval by the wildlife agencies. The wet meadow near the former racetrack area is a good candidate for enhancement once the offroad vehicle use is eliminated. There may also be opportunity to enhance habitat for



San Diego thornmint by reseeding areas where exotic plants have been removed. Recently burned areas could be reseeded with host and nectar plants for Quino checkerspot, if Crestridge is selected as a potential reintroduction site for the species.

Objective 2 – Abandon unnecessary trails and roads through the reserve to allow rehabilitation. Trails and other areas disturbed by offroad vehicle activity may promote increased runoff and soil erosion and may provide substrate for establishment of exotic species. These areas also provide access to otherwise undisturbed areas. Closing these areas to further human disturbance, along with actions to facilitate restoration, would improve the quality of the habitat for wildlife.

Objective 3 – Investigate the use of fire to enhance the quality of degraded vegetation communities, maintain a diverse age structure, and maintain and restore biotic and abiotic processes. Fire suppression for extended periods can lead to inappropriate age structure of the vegetation community. The fire management strategy at Crestridge should include reducing unplanned fire events through the use of maintained fire breaks and strategic prescribed burns, and experimenting with fire as part of a restoration process in currently degraded sage scrub and grassland habitats.

Objective 4 – Monitor the presence and extent of exotic species in the reserve and responses to management actions. Locations of exotic plants and animals should be checked at least annually to evaluate population size and potential threats to nearby resources and to gauge the effectiveness of management actions. Populations should be prioritized for management actions to maximize cost-effectiveness.

Goal 5: Implement research projects to address management issues.

Objective 1 – Facilitate the implementation of focused research projects. Effective management will ultimately be hindered by a lack of understanding of the basic biology of the resources and their responses to stressors and potential management actions. Implement focused monitoring and research projects that provide management-related information. Encourage and facilitate university-level research to address fundamental biological questions and unknowns.

Goal 6: Develop and coordinate a centralized data management system.

Objective 1 – Develop a centralized data management system for use in reserve management efforts. Effective management of the reserve will require a data management system that allows managers to store and query information collected over time. The data management system must support both spatial data and numerical data collected as part of management and monitoring efforts. This data management system should be used to track the responses of resources to management actions, provide summary reports to the wildlife agencies, and evaluate trends in population status of various species.



Objective 2 – Coordinate land management and resource allocations with other conserved areas. Effective management of the Crestridge Ecological Reserve will require an understanding of resource status and management needs in all parts of the MSCP preserve system. The centralized data management system must allow comparison of resource status and management activities among various portions of the MSCP preserve.

4.3 PUBLIC USE ELEMENTS

Goal 1: Enhance public appreciation of the value of the Crestridge reserve and conservation issues in general, consistent with biological objectives of the ecological reserve.

Objective 1 – Provide clearly marked public access points to the reserve and prohibit access at other locations. Public access should be controlled such that biological functions can be maintained throughout the reserve and public use impacts can be contained and monitored.

Objective 2 – Provide clearly identified trails for public use and safety. Restricting the locations of public use will assist in maintaining quality habitat for wildlife. Hikers and horses inadvertently disperse weed seeds, and areas of bare dirt provide substrate for establishment of exotic species.

Objective 3 – Identify cultural resources in the reserve and incorporate these resources into management objectives for biological resources. This management plan currently does not address cultural resources. Future work will be dedicated to researching and protecting the cultural history of the reserve.

Objective 4 – Identify appropriate passive uses of the reserve, and prohibit inappropriate recreational uses. Encourage uses that take advantage of the natural and scenic beauty of the reserve and that facilitate enjoyment of a wilderness experience. The California Fish and Game Commission identifies appropriate uses and restrictions for Ecological Reserves (Title 14, Chapter 11, Section 630). These include the following:

1. Protection of resources.
2. No commercial fishing, except by permit; limited to angling from shore.
3. No collecting, except by permit.
4. No motor vehicles, except on designated access roads and parking areas.
5. No swimming or wading, except by permit.
6. No boating, except by permit.
7. Hiking and riding on designated trails only.
8. No firearms, except by law enforcement personnel.
9. Ejection for violation of regulations.
10. Public entry can be restricted at the discretion of the CDFG.
11. No release or introduction of species, unless authorized by the commission.
12. No feeding of wildlife.



13. No pesticides, unless authorized by the commission.
14. No littering.
15. No grazing.
16. No falconry.
17. No aircraft, except by permit.
18. No pets, unless retained on a leash of less than 10 feet (3 m).
19. No fireworks or fires, except for management purposes.
20. No camping.
21. No vandalism.

Goal 2: Develop a public outreach and education program.

Objective 1 – Strengthen partnerships with other environmental and educational organizations to develop a public relations plan and public outreach and education program. Identify public agencies, nonprofit organizations, and educational groups that could work together to develop regional and local programs for public education.

Objective 2 – Encourage community involvement. Educating and involving the local residents surrounding the reserve will enhance the public's appreciation of conservation goals while facilitating appropriate public uses.

Objective 3 – Develop an education curriculum and stewardship program for high school students. Developing a sense of stewardship in young people through natural history education is critical to the success and persistence of the Crestridge Ecological Reserve and other MSCP preserves.

4.4 FACILITY MAINTENANCE ELEMENTS

Goal 1: Maintain facilities on the reserve to ensure that biological resource values are maintained and management activities are facilitated.

Objective 1 – Maintain facilities and infrastructure on the reserve. The existing infrastructure of gates and roads serves to restrict public access and allow fire suppression response. Maintenance of gates, fences, and roads will allow these functions to continue. Removal of derelict structures on the reserve will discourage use by trespassers and enhance the aesthetic values of the reserve.

Goal 2: Establish facilities to enhance the appreciation of and to encourage research on the natural resources of the reserve.

Objective 1 – Develop a nature interpretive center to relate the biological and educational goals of the reserve to the community and the public in general.

Objective 2 – Develop an educational laboratory to provide hands-on learning opportunities and a forum for community stewardship.



Goal 3: Remove litter and trash that may attract nonnative animals and reduce the aesthetic values of the reserve.

Objective 1 – Establish responsibilities for removing trash from the site and for regular garbage collection at specific locations.



5.0 MANAGEMENT AND MONITORING IMPLEMENTATION

The CDFG and BCLT are developing a Management Agreement that outlines roles and responsibilities for management and monitoring at Crestridge. They are also preparing a lease agreement that will provide the locations and specifications for future facilities on the reserve. The CDFG will continue to be responsible for enforcing uses and issuing citations at the reserve.

Recommended management and monitoring actions to achieve the goals and objectives in Section 4.0 are listed below. These are summarized in Appendix H. Management and monitoring actions considered a priority for implementation during 2002-2003 are listed in Section 6.0.

5.1 MANAGEMENT

5.1.1 Exotic Plant Control

The following exotic plant species are of primary concern for control or eradication. Some locations were mapped during the year 2000 surveys (Figure 5-1). Other exotic plant species observed onsite, but not mapped, are included in Appendix C.1. The primary objective in exotic plant control at Crestridge should be to monitor and control the abundance of invasive plant species, particularly around populations of sensitive plants and in riparian areas, using mechanical or chemical methods or prescribed burns. Appendix C provides details of the biology, threats, and management options for selected exotic plant species. Continued monitoring of exotic species populations, abundance, and locations will assist in determining which management options are most appropriate. CDFG will develop detailed measures for physical, biological, and chemical control; such measures are described further in *Invasive Plants of California's Wildlands* (Bossard et al. 2000).

1. **Eradicate tamarisk (*Tamarix* sp.) from Rios Canyon and other drainages.** The current infestation on the reserve is small and occurs within primarily native habitat. For these reasons, either digging or pulling plants or cutting the stem(s) and applying herbicide will best accomplish tamarisk control on Crestridge. Re-treat any resprouts within 4 to 12 months of the initial treatment (Carpenter 1998). Large mechanized equipment that may disturb native habitat should not be used.
2. **Eradicate pampas grass (*Cortaderia selloana*) from the reserve.** During the 2000 surveys, pampas grass was noted in only one location in the eastern portion of the Crestridge reserve, adjacent to a trail. This small infestation consisted of only a few plants. This species also occurs offsite, where it has been planted as a landscaping ornamental in adjacent residential developments. Although the small stand of pampas grass at Crestridge does not currently pose a major threat to



- native vegetation or sensitive plant species, it has the potential to expand its distribution due to its seed dispersal mechanism, presence of a seed propagule source in the vicinity, and the network of roads, trails, and other bare soil areas on the reserve. Pampas grass has been effectively controlled through both physical and chemical methods (see Appendix C). Flowering stalks should be bagged prior to removal to prevent seed dispersal.
3. **Remove young eucalyptus (*Eucalyptus* sp.) trees from the drainages.** Large, mature eucalyptus trees are not recommended for removal at this time because they appear to provide perches for red-shouldered hawks and other raptors. However, evidence of recruitment from these trees should be monitored, and the young saplings or suckers should be removed. Eucalyptus trees can be removed through either physical or chemical methods or a combination of both (Appendix C).
 4. **Eradicate African fountaingrass (*Pennisetum setaceum*) on the slopes above Rios Canyon and along roads within the reserve.** Small stands of African fountaingrass may be a threat to populations of sensitive plant species (e.g., San Diego thornmint, small-flowered morning-glory, Palmer's grappling hook). African fountaingrass also occurs offsite, with extensive stands observed on southwest-facing slopes above La Cresta Road and along La Cresta Boulevard. Hand removal would be an appropriate management tool for most stands of fountaingrass on Crestridge and would likely need to be used in conjunction with native plant revegetation to reduce subsequent colonization opportunities for the fountaingrass. Because of the potential for seed longevity in the soil and the offsite propagule sources in proximity to the reserve, long-term monitoring of the Crestridge reserve will be required to ensure that new infestations are controlled at an early stage. See Appendix C for a discussion of the large stand of fountaingrass above Flinn Springs County Park.
 5. **Manage tocalote (*Centaurea melitensis*) at levels that do not threaten sensitive species and their habitat, especially on the south and west-facing slopes above Rios Canyon (Thornmint Hill) and along the fuelbreak at the bottom of the slope.** Tocalote is best controlled through monitoring and spot eradication of plants in critical areas prior to widespread infestations. The use of herbicides (e.g., RoundUp Pro) has been highly effective in these cases, especially along trails. A 1.5-2% solution of RoundUp Pro is recommended for the weeds on Thornmint Hill (M. Kelly pers. comm.). Chemical control would be more efficient than mechanical control in this area, and there will usually be less resprouting using herbicide than with mechanical cutting. Where chemical control is not possible (e.g., using volunteers who are not trained in the safe use of herbicides), weed whips, brush cutters, loppers, hoes, etc. can be used to cut the weed as close to the ground as possible. As some plants will resprout from the below-ground root and many of these plants have seeds that germinate over a long period of time, control efforts should be done on a weekly to every other week

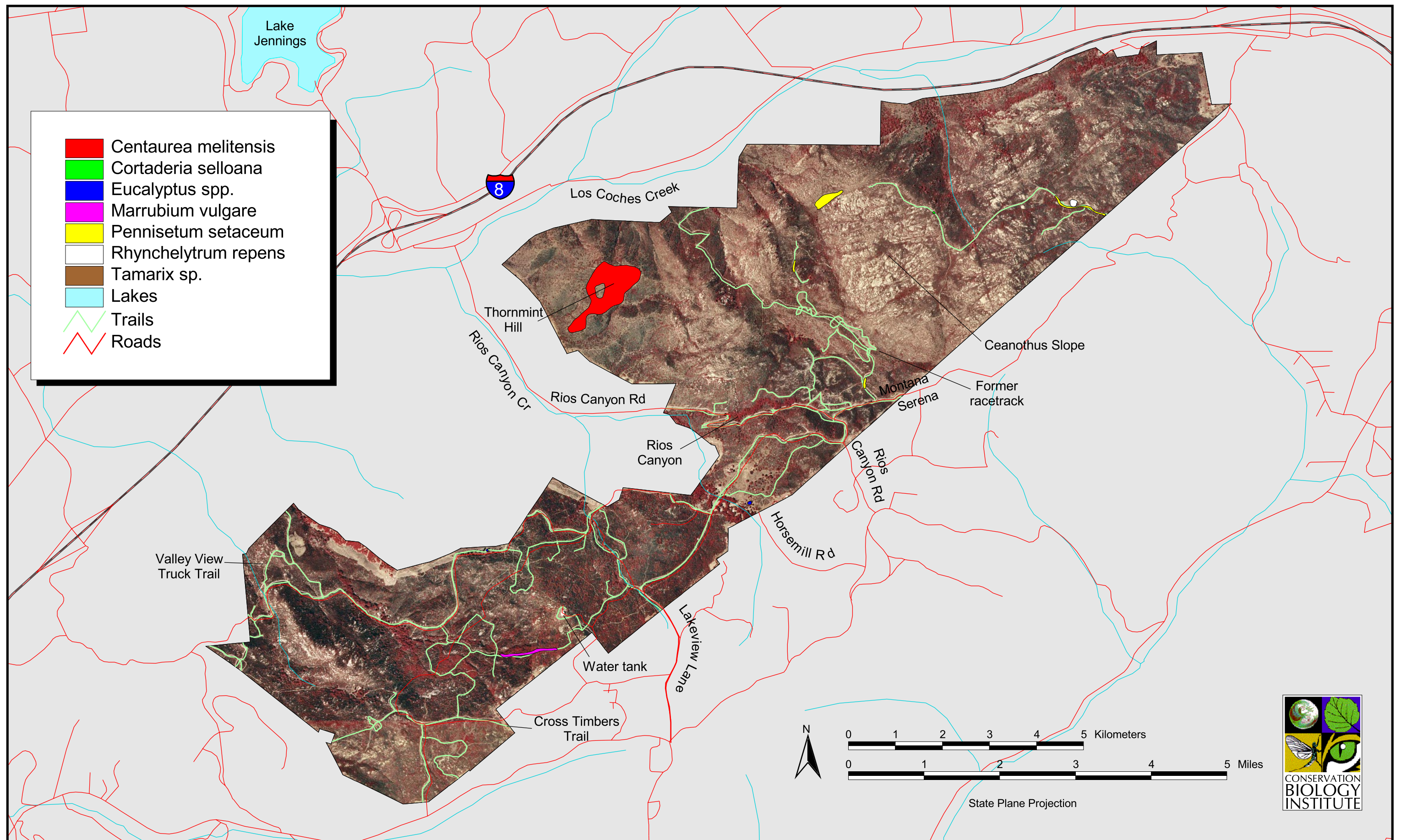


Figure 5-1. Exotic Plants at Crestridge Ecological Reserve



basis until they show signs of forming buds. During the blooming season, weekly visits are important to prevent any plants from setting seed.

Mowing is probably more appropriate along the base of the west-facing slope adjacent to Rios Elementary School. Plants should be cut below the lowest branches, and cutting should occur when the population has just started to bloom. If plants are mowed too early, regrowth, flowering, and seed production may occur.

6. **Manage purple falsebrome (*Brachypodium distachyon*) on the upper west and southwest-facing slopes above Rios Canyon at levels that do not threaten San Diego thornmint.** At this time, mowing along the base of the slope adjacent to Rios Elementary School and spot-treating with herbicide along the trail leading up to the thornmint population should be management priorities. Little information is available on control of purple falsebrome in wildland areas. Use of Fusillade, a grass-selective herbicide, should be tried (T. Smith pers. comm.), although this species has shown some resistance to herbicides in Mediterranean regions (Heap 2000). A fire management plan that reduces fire frequency in this area and allows for shrub regeneration may also be effective for controlling purple falsebrome.
7. **Remove individual horehound (*Marrubium vulgare*) plants and restore and manage habitat conditions to minimize the potential for new infestations.** Horehound was noted in only one location during the 2000 surveys: along an east-west oriented trail leading from the Padre Dam water tower to the western portion of the site. Equestrian use is common along this trail, and horehound has likely been spread through this area by horses. Its presence is indicative of localized, degraded conditions. Horehound can be controlled through both mechanical and chemical methods (Appendix C).
8. **Remove individual plants of Natal grass (*Rhynchelytrum repens*) along the southeast property boundary to prevent the spread of this species further into the reserve.** Natal grass occurs on a flat rock outcrop adjacent to a northwest-oriented trail. Vegetative material and flowering stalks should be removed from the reserve. If plants are in bloom during the removal process, flowering stalks should be bagged prior to removal, as described for pampas grass.
9. **Remove star thistle (*Centaurea solstitialis*) and small or immature exotic tree species in the vicinity of the proposed nature center.** These include palm trees, pepper trees, and eucalyptus trees. Mature specimens of these species are not a high priority for removal, but keep them from spreading.
10. **Control the exotic species in the annual grassland in the center of the reserve through a fire management and restoration program** (see Sections 5.1.3 and 5.1.6).



11. **Remove *Emex* plants from along the north side of Cross Timbers Truck Trail (near La Cresta Heights Road) and the cleared area bordering homes southeast of Rios Elementary School.**
12. **On an annual basis, map stands of exotic species and prioritize them for treatment.** See Appendix C.1 for a list of exotic species observed at Crestridge. Many of these are included on the California Exotic Pest Plant Council list as exotic pest plants of greatest ecological concern in California (CalEPPC 1999).

5.1.2 Exotic Animal Control

13. **Manage borer beetles infesting Engelmann oaks.** Tag Engelmann oaks that are infested with borer beetles, and monitor the beetles and health of trees. Serious infestation can damage or kill the trees. Work with the state Food and Agriculture Department and the U.S. Department of Agriculture to determine possible methods of biological control for the beetles.
14. **Note locations of Argentine ants and fire ants with respect to position in the reserve and adjacent land uses.** The Argentine ant and fire ant are exotic pests in southern California and have been shown to have detrimental effects on terrestrial communities. The exotic ants tend to follow drainages or areas of moist soils. Fire ants have been observed on Crestridge near the Rios Elementary School and in the oak grove near the center of the reserve. The ants have the potential to invade the reserve from adjacent urban areas. By mapping locations of Argentine ants and fire ants, evaluate whether runoff into the preserve from adjacent lands or other adjacent land uses may be contributing to exotic ant invasions. See monitoring recommendations (Section 5.2).
15. **Evaluate the need to remove boxed beehives from the reserve.** Beehives within the reserve are currently located near hiking trails and may pose liability issues from recreational users of the reserve. However, the domesticated bees may fill a niche that might otherwise be occupied by Africanized bees, if they occur in the area. Alternatively, the beehives may attract Africanized bees, which could compete with native pollinators. Note the presence and locations of domesticated and Africanized bees in the reserve. Determine which species inhabit the beehives. See monitoring recommendations (Section 5.2).
16. **Control pets in the reserve.** Dogs and cats and other domesticated animals living adjacent to the reserve are a potential predation threat to native species. Educate homeowners about keeping pets indoors at night and keeping pet food indoors or in a secured location that does not attract animals from the reserve. When walking dogs in the reserve, owners should keep their dogs on a leash, stay on the trails, and pick up after them (CDFG Title 14, Ch.11.630).



17. **Restrict the use of pesticides in the reserve.** Pesticides may be useful in controlling fire ants and exotic rodents, if they are found in the reserve. Use of pesticides requires a license and permits from CDFG.

5.1.3 Fire Management

A Framework Fire Management Plan is included as Appendix D. This document establishes the framework for working with the California Department of Forestry and Fire Protection (CDF) to develop a specific plan for wildland fire suppression, pre-fire treatment and vegetation management, post-fire rehabilitation, and prescribed burns at Crestridge.

The goals of the fire management plan at Crestridge are to (1) ensure the safety of the surrounding residential community, (2) maintain a "natural" fire cycle, and (3) control invasive weed species. The CDF strives to suppress all fires that threaten public safety. Pre-fire treatment of the land, in the form of fire breaks and fuel management, as well as enforcement of allowable land uses will help to prevent catastrophic wildland fires at Crestridge. Although fire is an integral part of the ecosystem processes on Crestridge, overly frequent fires may result in shifts in native species composition, a loss of certain native species, or habitat type conversions that favor nonnative species. Maintaining an appropriate fire cycle will assist in achieving a diverse age structure of vegetation communities and will prevent the habitat from becoming too mature and dense. This, in turn, will reduce the fuel load and thus reduce the chances of large uncontrollable fire events.

This habitat management plan for Crestridge recommends the following tasks for the BCLT and CDFG:

18. **Work with the CDF to prepare a fire management plan that identifies:**
 - Fire management objectives and general guidelines
 - Road maintenance requirements
 - Fire management units
 - Staging areas for trucks and equipment
 - Fuelbreaks
 - Pre-fire treatment
 - Prevention and suppression tactics, by fire management unit
 - Post-fire rehabilitation activities
 - Schedule for prescribed burns, by fire management unit
 - Sensitive resource areas to be avoided (both biological and cultural resources)
19. **Inform landowners about maintaining their own defensible space.** Landowners adjacent to the reserve are responsible for having an appropriate defensible space around their homes and other structures and a noncombustible roof, per the Bates Bill (Assembly Bill No. 337), which was approved in



September 1992. The East County Fire Prevention/Protection District is the responsible agency for communicating this information to landowners.

5.1.4 Erosion Control

Offroad vehicle traffic and, to a lesser extent, equestrian activities, have resulted in excessive erosion and formation of gullies along trails and in habitat associated with and below eroded trails. Runoff from offsite land uses can contribute to erosion problems, and badly eroded trails can be a public safety issue. Erosion may also expose or deposit new substrates for weed colonization (Hobbs and Atkins 1988).

- 20. Restrict or prohibit equestrian and mountain bike activity in areas where erosion is a problem.** Restrict equestrian and mountain bike activity to roads that are maintained by CDF (see Section 5.1.7). Close roads to equestrians and mountain bikes for 3 days following rainfall events greater than 1 inch.
- 21. Correct erosion problems adjacent to sensitive plant populations.** In the eastern part of the site, erosion may be impacting Ramona horkelia. Also, Las Posas (gabbro-derived) soils, which support San Diego thornmint and Palmer's grapplinghook on Thornmint Hill, are characterized by high to very high erosion potential. Identify erosion problems that have the potential to impact these populations, and install reinforcements to slow erosion.
- 22. Install checkdams in eroded drainages to catch debris and slow erosion.** Identify locations. In some areas, a CDFG permit may be required for this action.
- 23. Install water bars across dirt roads to control erosion.** Work with the CDF to identify locations where erosion problems can be minimized by maintaining roads and installing water bars.
- 24. Control water sources and urban runoff within the reserve.** The only feasible means of controlling residential runoff may be an educational program that informs residents of the detrimental effects of certain types of landscaping plants and watering regimes on adjacent biological resources and offers literature on alternatives such as xerophytic plantings and drip irrigation. Additional recommendations may be appropriate for new developments, such as requiring the use of French drains to minimize seepage on slopes, diverting runoff away from the reserve, and restricting irrigation and certain types of plantings adjacent to the reserve. Meet with residents to explain the impacts of urban runoff in the reserve. Especially investigate horse manure runoff into the drainage along Horsemill Road. Monitor sources of water adjacent to the reserve (see Section 5.2).



25. Ensure that water flow is not impeded upstream from San Diego sedge (*Carex spissa*) locations. San Diego sedge is the host plant for the Harbison's dun skipper.

5.1.5 Seed Collection and Storage

26. **Develop a seed collection program for Lakeside ceanothus and San Diego thornmint to ensure that the genetic diversity of the onsite populations is not lost as a result of fire, habitat degradation, or other catastrophic events.** Collect seed in conjunction with other management measures to maintain or improve habitat quality and in a manner that does not impact existing populations. Collected seed should represent the entire Crestridge population of the species. For Lakeside ceanothus, focus initially on seed collection within the area that has burned most recently (14 years) and that is most susceptible to adverse impacts from fire. Seed collection for Ramona horkelia is currently a lower priority than for Lakeside ceanothus and San Diego thornmint. A take authorization will be necessary for the collection of seeds of San Diego thornmint. See Appendix E for protocols for seed collection, storage, and propagation (from McMillan and CBI 2002).
27. **Store collected seed in a recognized seed collection facility.** For Lakeside ceanothus, seed from recently burned areas should be stored separately from seed from areas with the longer fire-free interval (61 years). Seed should be available for post-burn seeding, enhancement, or reintroduction efforts, as determined necessary. Seed should not be stored for longer than 3 years. See Appendix E.
28. **Collect soil samples that may harbor seeds of San Diego thornmint.** Take a number of soil samples from the core thornmint area, and identify the seed bank present, if possible, especially for thornmint and Palmer's grappling-hook seed. (Dr. Ellen Bauder at San Diego State University is probably one of the few people who can identify thornmint seed.) These soil samples could be planted, watered, and grown to see what germinates. This approach, recommended by Mike Kelly of Kelly & Associates, could help determine whether thornmint seed is still present in the seed bank. Growing up the samples could show what plants predominate and contribute to understanding competitive interactions. A take authorization will be necessary for the collection of soil samples.

5.1.6 Habitat Enhancement and Restoration

29. **Restore the wet meadow near the former racetrack.** The former racetrack area currently supports wetland species but has been degraded by offroad vehicle use that has altered the topography and likely promoted invasion of the wetland habitat by nonnative species. Recontour this area to remove offroad vehicle ruts and 'jumps,' and ensure that water drains to the north. Native wetland species are already present in this area, so revegetation (i.e., introduction of native plant



materials) may not be necessary. However, some weed control is necessary to reduce the cover of nonnative wetland species. Avoid genetic contamination by prohibiting the introduction of cultivars or native species from different geographic regions. Erect temporary signs to indicate habitat restoration.

30. Enhance the oak grove at the Crestridge entrance (between Horsemill Road and Lakeview Lane). The oak grove could be enhanced by taking the following steps:

- Remove the concrete slab in the open area of the grove to provide an opportunity for oak recruitment and regeneration as well as understory development.
- Rip the soil in the area of the old foundation to address soil compaction and removal of nonnative plants.
- Remove the rock planters to provide an opportunity for oak recruitment and regeneration as well as understory development, unless the rock walls are determined to be of historic significance.
- Remove nonnative species in the oak grove area, including Vinca, Indian fig cactus, and Mexican bird-of-paradise. Also remove St. Augustine grass along the creek, downslope and north of the oak grove.
- Close off roads underneath the oaks to prevent soil compaction and damage to tree roots. Allow the duff to remain in the oak grove, and prevent recreational users from raking away the duff.
- Replant bare areas where horses have crossed the creek. Replant these areas with native species, such as meadow rue (*Thalictrum polycarpum*), California fuchsia (*Epilobium canum*), and sticky monkeyflower (*Mimulus aurantiacus*).
- If an active oak regeneration program is deemed necessary, this would include acorn collection and seedling production for outplanting, soil preparation (e.g., augering planting holes, adding fertilizer), predator control (including protective devices for both vegetative growth and roots of seedlings), weed control, and reestablishment of a native understory (McCreary 1990; Pavlik et al. 1991).

31. Restore the annual grassland in the center of the reserve to native vegetation. This would likely entail a series of prescribed burns at the appropriate time of year, followed by active seeding and plantings.



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32. **If deemed appropriate, reseed host plants and nectar plants in suitable habitat areas to expand potential Quino checkerspot habitat areas (e.g., Thornmint Hill).**

5.1.7 Public Use

33. **Control public access points.** Provide public access to the reserve exclusively at two locations: Lakeview Lane and Horsemill Road. The Management Agreement between BCLT and CDFG will address responsibility for controlling public access and enforcement authority. The following entities will have keys to the gates at Lakeview Lane and Horsemill Road: CDFG, BCLT, CDF, East County Fire Prevention/Protection District, San Diego County Sheriff, Padre Dam Municipal Water District (MWD), San Diego Gas and Electric (SDG&E), and selected researchers as authorized by CDFG and BCLT.
34. **Identify, map, and close off (at least) 15 other points of possible vehicular access by the public, using appropriate fencing and signs.**
35. **Map foot trails, and close off trails that are redundant and trails along the reserve boundary.** Do not allow any new trails to be created. Allow trails that CDF considers useful as fuel breaks to remain (see Fire Management Plan).
36. **Close or re-route trails that are near sensitive biological areas.** Trails that are not necessary for fire access or that may serve as fuel breaks should be closed or re-routed away from sensitive biological areas. Trails for fire access or fuel breaks should be allowed to remain, once these are identified in the Fire Management Plan. Trails near sensitive biological resources may result in soil disturbance and promote habitat invasion by nonnative species. These may include the following:
- Close the trail to the San Diego thornmint area, except for monitoring and docent-led tours. Restricting access to this area will also help protect potential habitat for the Quino checkerspot butterfly.
 - Minimize access in areas known to support the Hermes copper butterfly.
 - Minimize access within 30 m of Harbison's dun skipper locations (*Carex spissa* plants in the riparian areas).
 - Restrict public access to areas with active raptor nests during the breeding season.
37. **Close off trails that should be restored.** The roads cut for soil percolation testing (as part of the original proposed development project in the western portion of the reserve) should be closed off to allow for natural revegetation. The



progress of revegetation should be monitored to determine if soil ripping or active restoration efforts are needed to facilitate recovery.

38. **Restrict mountain bikes and equestrians to existing roads and truck trails through the reserve.** Do not allow mountain bikes and equestrians on narrow foot trails. Only pedestrians are allowed on the narrow foot trails.
39. **Establish a trailhead with kiosk and signs, and develop a trails map.**
40. **Identify public safety issues.** The Crestridge reserve manager is responsible for ensuring the safety of visitors by maintaining trails and strictly enforcing access and land use. Patrol and enforcement by the CDFG warden on a routine schedule will help ensure public safety and protection of the reserve.
41. **Establish a volunteer training program.** The BCLT should work with technical specialists to coordinate a regular series of volunteer training workshops. This will ensure a qualified work force to address management and monitoring issues. Following is a list of suggested training workshops and recommendations for technical specialists to lead each workshop or series of workshops:

<u>Workshop</u>	<u>Specialist</u>
• Nonnative invasive plant identification and removal, including restricted use of herbicides	Mike Kelly, John Ekhoﬀ
• Wildlife tracking	San Diego Tracking Team
• Water quality and streamflow monitoring	San Diego Stream Team
• Bird identification and monitoring	Claude Edwards
• Invertebrate identification and monitoring	Michael Klein
• Docent training	Various specialists

42. **Schedule volunteer work days.** BCLT will schedule volunteer days and recruit members of the community to assist with maintenance of the reserve. BCLT will coordinate day or weekend projects that require little or no training with volunteers to achieve reserve management objectives, such as debris and trash removal and trail maintenance. BCLT will also develop objectives for educating the local community about the reserve and will recruit and train volunteers for this purpose.
43. **Establish docent-led programs and nature walks.**
44. **Identify property owners along the reserve boundaries.** Using Wildlife Conservation Board and County of San Diego parcel records, develop a list of property owners and addresses, and contact property owners about Crestridge security issues and ecological goals of the reserve. Provide phone numbers for fire, sheriff, BCLT, and CDFG to all property owners on the reserve boundary.



45. **Publish a regular newsletter and website about reserve stewardship activities and issues.** BCLT currently publishes an organization-wide newsletter that includes activities at Crestridge. BCLT also has a web site for the Earth Discovery Institute (EDI) project at www.earthdiscovery.org, where there will be a page for biological and cultural resource management issues. Photos documenting Crestridge's natural resources will be posted on the website. The website and newsletter will also provide educational materials for neighbors of the reserve that contain information about how to avoid or control impacts of children, irrigation runoff, noise, landscaping, and use of herbicides and pesticides adjacent to the reserve. Request that street lights adjacent to the reserve use low pressure sodium illumination sources. Residences adjacent to the reserve should avoid use of spotlights into the reserve and shield light sources so that the lighting is focused downward. Encourage neighbors to keep pets and pet food indoors at night.
46. **Prepare a cultural resources management plan for Crestridge.** Dr. Susan Hector is preparing a cultural resources management plan for Crestridge that addresses use of the site by the Kumeyaay Indians and the relationship of San Diego's historic families to the land. An outline for the management plan is included in Appendix I.
47. **Partner with other San Diego County environmental/wildlife organizations** (e.g., San Diego Natural History Museum, resources agencies, San Diego State University Field Station, other land trusts) for cross promotion, education, interpretation, and docent training.
48. **Develop a habitat-based curriculum project.** Granite Hills High School (GHHS) is partnering with the Crestridge Ecological Reserve to develop a habitat-based, cross-disciplinary experiential curriculum and service learning program that will meet state content standards, comply with district service learning requirements, and support regional conservation goals. The program will foster civic responsibility through student involvement in the community. Students will learn first-hand about the natural and cultural resources of Crestridge and the relationship of these resources to their own community and quality of life. See Appendix J.
49. **Prohibit unauthorized motor vehicles (Title 14, Ch.11. 630).**
50. **Prohibit feeding of wildlife (Title 14, Ch.11. 630).**
51. **Prohibit unauthorized collection and introduction of plants and wildlife (Title 14, Ch.11. 630).**
52. **Prohibit dumping of dirt, trash, and garden refuse (Title 14, Ch.11. 630).**



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53. **Prohibit firearms, pesticides, fireworks, and fire, except where authorized (Title 14, Ch.11. 630).**
 54. **Prohibit camping and vandalism (Title 14, Ch.11. 630).**
 55. **Pets must be retained on a leash of less than 10 feet (Title 14, Ch.11. 630).**
 56. **Prohibit horses and bikes in riparian areas.**
 57. **Promote use of weed-free hay for feeding horses in the community by creating a demand for suppliers of weed-free hay.** There are currently two sources of horse feed in the community. They should be encouraged to find and use a source of weed-free hay for users of Crestridge.
 58. **Assist the CDFG in patrolling for illegal uses in the reserve.** The CDFG is responsible for enforcement of reserve boundaries and public use and can issue citations for abusers of the regulations. BCLT should establish volunteer foot, equestrian, and bike patrols to assist, under CDFG direction.
 59. **Research future buildout plans for parcels east of Crestridge.** Work with the County of San Diego to determine the status of planning efforts with the goal of maintaining a habitat linkage between Crestridge and Harbison Canyon.

5.1.8 Facilities Maintenance

Fencing and Boundary Enforcement

60. **Contract with a land surveyor to officially map the reserve boundary.** Mark the boundary and inform neighbors of the legal boundary line of the reserve.
61. **Identify portions of the reserve boundary where fencing is needed.** Fencing should probably be installed or reinforced in areas adjacent to residential lots, roads, and other level areas. Fencing along steep, rocky areas (e.g., along the southeastern boundary) is probably not necessary. Fencing should be maintained as needed and should be checked at least annually.
62. **Establish property signs along the reserve boundary (3 signs every linear mile) and at each access point, identifying the area as an ecological reserve and providing directions for access and contact information.**
63. **Maintain all existing fences and locked gates, and establish a list of persons with keys to the reserve** (CDFG staff and warden, BCLT, CDF, East County Fire Prevention/Protection District, SDG&E, Padre Dam MWD, Sheriff, selected researchers).



Debris Removal and Building Restoration

64. **Remove unused ranching equipment and facilities.** For example, remove the fence in the annual grassland, fence west of the oak grove, the backstop west of the oak grove, fences along and across the drainages, pipes and metal debris adjacent to Horsemill Road, and old axle, outhouse, irrigation tubing, foundation, and sign posts in the proposed nature center area, etc. Evaluate the need to retain the old farm equipment and barn storage areas east of the warden's house. Remove the pens east of the warden's house.
65. **Evaluate the need to remove the white house just east of the oak grove, based on cultural history and potential future use.**
66. **Repair the warden's residence, as needed.**
67. **Remove litter at periodic intervals, and arrange for regular garbage pickup.** Place closed garbage cans and recycle bins at public entry points (Horsemill Road and Lakeview Lane). Remove trash from drainages, especially Rios Canyon.

Road and Trail Maintenance

68. **Work with the CDF to maintain roads to prevent erosion.**
Examples:
 - Lakeview Lane between the end of La Cresta Road and the oak grove
 - Along the bottom of the drainage south and west of Lakeview Lane
 - Along Rios Canyon Truck Trail
 - Along Cross Timbers Trail some distance west of the houses at the end of La Cresta Heights Road
69. **Maintain trails to prevent erosion.** Mulch trail surfaces to minimize erosion. Do not use materials for trail mulch that are a source of seed of invasive exotic species. Use native brush that has been cleared along dirt roads and chipped onsite. Install water bars where necessary to divert water off the trail. Water bars can be made from native rock obtained onsite, native logs, or 4x6 redwood timber. Set the water bar at a 60-degree angle across the trail, and extend it such that water is carried completely off the trail. Provide rock at the downslope end of the water bar to dissipate the flowing water.

Normal trail use will result in a berm along the edge (outslope) of the trail. This berm will prevent water from flowing off the trail and cause gullying down the center of the trail. Maintain the outslope (the berm at the edge of the trail) by pulling the berm back into the trail tread.

Do not allow trails to widen more than 4 ft. If trails continue to widen as a result of inappropriate use, they should be closed for restoration.



70. **Establish and maintain interpretive signs and trails signs.**
71. **Establish a site and develop plans for a trailhead and staging area for visitor parking.** The primary parking location for the public should be the cul-de-sac at Horsemill Road. Additional public parking (for scheduled events) could include the area west of the oak grove, near the old backstop. Minimal parking for staff and researchers could be allowed at the EDI field station. Handicap parking should be allowed at the EDI Bridge to Nature (nature center).
72. **Evaluate the need for powerline remediation.** Based on recommendations from the Wildlife Research Institute, the existing powerline across Crestridge may need remediation to mitigate for potential bird strikes.
73. **Purchase equipment for management, maintenance, and monitoring.** See the Property Analysis Record (PAR) in Appendix G.

Earth Discovery Institute

74. **Set up a lease arrangement with CDFG for the EDI Bridge to Nature and EDI field station.**
75. **Establish the EDI field station as a facility for hands-on environmental and cultural education and community service opportunities.** See Appendix J.
76. **Establish the EDI Bridge to Nature.** This structure will serve as an inspirational meeting place. It will be built through community volunteers and provide an outlet for their artistic expression. See Appendix J.

5.2 MONITORING

5.2.1 Sensitive Species Monitoring

The MSCP Plan (Ogden 1998) and Biological Monitoring Plan (Ogden 1996) require monitoring of the habitats and species conserved in the MSCP. Table 5-1 summarizes the biological monitoring requirements for the Crestridge Ecological Reserve. Monitoring will include presence/absence surveys, estimates of relative abundance, assessments of habitat quality and habitat use, and mapping of species distributions to determine population trends and identify threats, using the data forms in Appendix F. Monitoring should focus initially on those biological and ecological factors that appear to be most important to species persistence and that may be influenced by management measures. Demographic monitoring of some species may be warranted if populations indicate a decline. Monitoring results should be evaluated in conjunction with climate and fire history data, as appropriate. Monitoring of federally and state listed species will require the appropriate permits and memoranda of understanding.



Table 5-1
Priority Species and Resources Recommended for
Long-term Monitoring and Management

Scientific Name	Common Name	Annual Monitoring
Plants		
<i>Artemisia palmeri</i>	San Diego sagewort	Presence/absence
<i>Harpagonella palmeri</i>	Palmer's grappling hook	Presence/absence, pollinators
<i>Quercus engelmannii</i>	Engelmann oak	Recruitment, insect host and infestations (borer beetles, gall wasps)
<i>Acanthomintha ilicifolia</i>	San Diego thornmint	Population trends, seed collection, weed control, pollinators
<i>Ceanothus cyaneus</i>	Lakeside ceanothus	Population trends, age structure, seed collection, pollinators
<i>Horkelia truncata</i>	Ramona horkelia	Presence/absence, seed collection, pollinators
<i>Muilla clevelandii</i>	Cleveland's golden star	Population trends, reproductive strategies, pollinators
Animals		
<i>Lycaena hermes</i>	Hermes copper butterfly	Host and nectar plants, patch use, and population trends
<i>Euphyes vestris harbisoni</i>	Harbison's dun skipper	Host and nectar plants, patch use, and population trends
<i>Euphydryas editha quino</i>	Quino checkerspot butterfly	Habitat potential
<i>Elanus leucurus</i>	Black-shouldered kite	Presence/absence relative to habitat structure and area of reserve
<i>Accipiter cooperi</i>	Cooper's hawk	Nesting location relative to habitat structure and area of reserve



Table 5-1
Priority Species and Resources Recommended for
Long-Term Monitoring and Management
(continued)

Scientific Name	Common Name	Annual Monitoring
<i>Aquila chrysaetos</i>	Golden eagle	Foraging locations relative to habitat structure and area of reserve
<i>Polioptila californica californica</i>	California gnatcatcher	Banding and dispersal studies, population trends and location relative to habitat structure and area of reserve
<i>Aimophila ruficeps</i>	Rufous-crowned sparrow	Presence/absence and location relative to habitat structure/area of reserve
<i>Amphispiza belli belli</i>	Bell's sage sparrow	Presence/absence, location relative to habitat structure/area of reserve
<i>Phrynosoma coronatum blainvillei</i>	San Diego horned lizard	Presence/absence, location relative to habitat structure and area of reserve
<i>Cnemidophorus hyperythrus beldingi</i>	Orange-throated whiptail	Presence/absence, location relative to habitat structure and area of reserve
<i>Thamnophis couchi hammondi</i>	Two-striped garter snake	Presence/absence, location relative to habitat structure and area of reserve
<i>Crotalus ruber ruber</i>	Red diamond rattlesnake	Presence/absence, location relative to habitat structure and area of reserve
	Large and medium-sized mammals	Tracking -- access to the reserve
Vegetation Communities		
Native grassland		Location, extent, and weed control
Coastal sage scrub and chaparral		Age structure and density for fuel modification or prescribed burning
Oak woodlands		Recruitment
Wet meadow		Restoration, weed control



77. **Annually conduct presence/absence surveys for San Diego sagewort along drainages, and map locations (July - September).**
78. **Annually conduct presence/absence surveys for Palmer's grappling hook at Thornmint Hill (March - April).** Note insect pollinators when monitoring. Note the abundance of Palmer's grappling hook relative to the San Diego thornmint population on Thornmint Hill, as the grappling hook may be outcompeting the thornmint in this area.
79. **Annually survey Engelmann oaks for insect pest infestations and evidence of oak seedling recruitment.** Map locations of individual Engelmann oaks.
80. **Annually monitor the San Diego thornmint population at Thornmint Hill (April - June).** Estimate population density or relative abundance. Note insect pollinators when monitoring. Review and map the population boundaries relative to previous years. Note the site conditions, and identify potential threats or stressors (see Appendix F.2).
81. **Annually monitor the Lakeside ceanothus population on Ceanothus Slope (April - June).** Review population boundaries relative to previous years, and note age structure. Note insect pollinators when monitoring. Note the site conditions, and identify potential threats.
82. **Annually conduct presence/absence surveys for Ramona horkelia in the eastern part of the reserve (May - June).** Note insect pollinators when monitoring. Map site locations, note the site conditions, and identify potential threats.
83. **Re-survey selected areas for San Diego goldenstar (May).** San Diego goldenstar occurs in clay soils just beyond the easternmost Crestridge property boundary, where it was observed in relatively low numbers during the 2000 survey period. This species is an herbaceous perennial from a corm. In below-average rainfall years, many corms fail to produce vegetative and/or flowering material. Re-survey areas of appropriate soils in the eastern part of the property during years of average or above-average rainfall to determine whether San Diego goldenstar occurs on the Crestridge reserve. Note the site conditions, and identify potential threats.
84. **Annually census dwarf plantain (*Plantago erecta*), the host plant for the Quino checkerspot butterfly, for the butterfly in the northern section of the reserve near Rios Canyon Road and Rios Elementary School (Thornmint Hill).** The plantago population exceeds 1,000 plants situated within a flat open ridgetop, appropriate conditions for Quino adults and larvae. Monitor patches for post-diapause larvae of Quino checkerspot once per week from about the last week of January to the end of February. Monitor adjacent hilltops or ridgetops once per week for adults from March through mid-May.



85. **Annually monitor and census eggs and larvae of Hermes copper in May.** Monitor and census adults in June. Note inter-colony movement and relative abundance. Note and map host and nectar plants. See data form in Appendix F.3.
86. **Annually monitor San Diego sedge for evidence of overwintering larvae of Harbison's dun skipper.** Monitor adult Harbison's dun skippers in June for potential nectary plants in the current known locations. Note inter-colony movement and relative abundance. See data form in Appendix F.3.
87. **Annually note nesting and foraging areas for black-shouldered kites, Cooper's hawks, and golden eagles on the reserve, and record nest trees and locations on a map.** Record the period of time the birds are in the nest, and restrict access (within 100 m) during this period.
88. **Annually conduct presence/absence surveys for California gnatcatchers in coastal sage scrub (January-March).** Determine nesting and monitor productivity (April-July). Cooperate with the County of San Diego in banding and dispersal studies.
89. **Annually conduct bird point count surveys, using the forms and methods in Appendix F.5.**
90. **Monitor raptor populations at Crestridge, pending recommendations on protocols from the Wildlife Research Institute,**
91. **Continue monitoring herpetofauna, pending recommendations from U.S. Geological Survey (USGS) biologists.** Monitor status and trends in the populations every 5 years, based on USGS efforts on the west slope of Thornmint Hill (see Appendix F.4).
92. **Note the locations, relative to habitat structure and area of the reserve, of other sensitive species.** As part of field efforts, map locations and note habitat use by rufous-crowned sparrow, Bell's sage sparrow, San Diego horned lizard, orange-throated whiptail, coastal rosy boa, two-striped garter snake, and red diamond rattlesnake.
93. **Annually map presence and extent of exotic plant species, and evaluate responses to management actions.** Monitoring will address trends in species presence and abundance and evaluate the effectiveness of management actions to control invasions and removal.
94. **Monitor Argentine ants, fire ants, and Africanized bees.** Monitoring will address whether and where these species are in the reserve and whether their presence correlates with identifiable edge effects and declines in covered species presence or relative abundance. Monitoring will track the distribution of exotic



species over time and the effectiveness of specific management actions in controlling invasions.

95. **Monitor population levels and distribution of mule deer on the reserve.** Assess ratios of does, bucks, and fawns.

5.2.2 Habitats and Ecological Processes Monitoring

96. **Prepare an update of the vegetation map every 5 years, using current color-infrared aerial photography (i.e., 2005, 2010, etc.).** Use fire history maps to help in the update. Note the condition and dominant species of vegetation communities by vegetation polygon, as described in Appendix F.1. (See also Appendix A.4 for an example of how this technique was used on Crestridge.) Identify potential threats by vegetation polygon. For each polygon, note the general level of disturbance (e.g., percent composition of invasive species, percent of bare ground caused by trails or offroad vehicles, etc.), and responses to management actions. Incorporate these attribute data into the GIS for each vegetation polygon. Establish permanent photo points, and use photos to help document and record changes in communities. Potential photo vantage point locations include the water tower, warden's house, slope above the former racetrack, Rios Elementary School parking lot, Thornmint Hill, and locations along roads and trails in the reserve. Automated change detection analyses using digital imagery may be helpful in updating vegetation maps and monitoring habitat changes. The Geography Department at San Diego State University has developed a change detection data set by integrating multitemporal (2000 and 2001) IKONOS image data obtained through a NASA grant and vegetation mapping data developed by CBI.
97. **Monitor the structure and age classes of vegetation communities to assess recovery following fire.**
98. **Monitor habitats for signs of senescence, lack of recruitment or reproduction, disease, and pest infestations.**
99. **Annually monitor the indirect effects of adjacent land uses.** Note the presence of harmful lighting directed into the reserve, house mice and rats, and domestic pets off-leash. Check the boundary periodically for intrusive impacts.
100. **Identify sources of urban runoff adjacent to the reserve, and propose containment options to landowners.** Check the reserve boundary periodically for inappropriate runoff. Especially check runoff of horse manure into the drainage along Horsemill Road.
101. **Monitor wildlife movement to and from the reserve.** Identify most frequently used movement corridors for large mammals, and remove any impediments.



Install fences to direct movement and revegetate areas, if needed, to encourage use. As part of a separate CDFG grant, CBI will identify long-term monitoring locations based on investigations of potential movement corridors. These locations should be incorporated into the Crestridge monitoring efforts.

- 102. Track fires (extent, intensity, and periodicity of burns) on the reserve using CDF fire history data.**
- 103. Install a meteorological station on the reserve to monitor temperature, humidity, wind speed and direction, and rainfall.**
- 104. Monitor stream flow and water quality in Rios Canyon Creek.** Install staff gages in Rios Canyon Creek, and work with the San Diego Stream Team to monitor water quality. Note presence/absence of water in other drainages on site relative to time of year and rainfall amount.

5.2.3 Public Use Enforcement

- 105. Patrol public use of the reserve to ensure compliance with the rules and biological goals of the reserve and to assess level of use by area of the reserve.** Track trail use, and determine which trails are used more frequently than others. On an annual basis, inspect all of the trails to monitor and mitigate for impacts. This may include restoring the outslope of the trail, installing waterbars, and pruning along the edge of the trail.
- 106. Monitor presence and location of domestic animals in the reserve.**
- 107. Issue tickets to persons that violate reserve regulations (CDFG warden).**

5.2.4 Research Needs

Scientific research is an important component of adaptive management. The Crestridge Ecological Reserve provides many opportunities for research projects that would inform management decisions. The CDFG and BCLT should encourage partnerships with academic institutions to conduct applied research at Crestridge. Research projects could include but are not limited to the following.

- Response of vegetation communities to changes in fire regimes.
- Recovery of vegetation communities after fire.
- Response of vegetation communities to restoration efforts.
- Response of target species populations to changes in fire regimes.
- MSCP covered species population dynamics.
- Effectiveness of measures to control nonnative plant species.
- Fire management techniques and strategies.



- Population genetics studies of species present on the reserve (e.g., rare plants, butterflies).
- Effectiveness of measures to control exotic grasses through use of prescribed fire.
- Recovery of native species after prescribed fire.
- Why is the Hermes copper butterfly restricted to selected areas in San Diego County? What are the conditions at Crestridge that favor such a large population? For example, what are the soil conditions (chemical composition and mineral components) where the populations occur?
- Ecology of various pollinators important to endemic plant species.
- Oak regeneration studies.
- Use of Crestridge for California gnatcatcher dispersal, using marked birds.
- Large mammal (deer, mountain lion, bobcat, coyote, fox) use of Crestridge for dispersal, foraging, and reproduction.
- Use of Crestridge by bats -- where do they roost/forage?

5.3 DATA MANAGEMENT AND REPORTING

5.3.1 Data Management

- 108. Develop a data management system to incorporate baseline data collected for the preparation of this management and monitoring plan.** The data management system should be compatible with the subregional database structure being developed by the wildlife agencies and should include the baseline GIS data for annual updating. The base map used for this management plan can serve as the base map for updating spatial biological data.
- 109. Incorporate monitoring data collected to track the responses of resources to initial management actions.**
- 110. Evaluate the suitability of the data management system for management purposes, and refine the system as necessary.**
- 111. Maintain a record of habitat management and monitoring activities.** This record will assist in evaluating changes in resource status and responses to management actions. The record will also assist in updating the habitat management and monitoring plan, as needed. See Appendix F.6.

5.3.2 Reporting

- 112. Annually review resource status for the next year's reserve management activities.** Review the management needs for each year, and provide a list of proposed management actions, prioritized by resource, to the CDFG and BCLT for approval. Prioritize funding for next year's reserve management activities, and



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- prepare a budget for the prioritized list of proposed management and monitoring actions for each year, for submittal to the CDFG and BCLT.
- 113. Coordinate with managers in other parts of the MSCP preserve to compare monitoring and management results.** Review the resource status and management and monitoring results at other preserves in the MSCP for perspective in evaluating management and monitoring needs at Crestridge.
- 114. Provide an annual summary of management and monitoring activities at Crestridge.** Prepare a summary of management and monitoring activities to provide to the County of San Diego Department of Planning and Land Use for inclusion in their annual MSCP report, which is submitted to CDFG and U.S. Fish and Wildlife Service (see Appendix F.6). Also post this summary on the Crestridge Ecological Reserve website.
- 115. Submit a report to the wildlife agencies every 3 years.** Summarize management activities, management priorities, restoration activities, and the ability to meet resource management goals, based on current funding status, every 3 years for submittal to the wildlife agencies. The report should also describe necessary updates to the habitat management and monitoring plan.

5.4 STAFFING

- 116. Hire a reserve manager to live onsite.** The reserve manager should be a qualified biologist who can identify and prioritize management and monitoring tasks and direct biologists and volunteers in implementing these tasks.
- 117. Establish an infrastructure of goals and responsibilities for Crestridge partners, including the following:**

Back Country Land Trust -- Incorporated in 1991 to preserve the rural nature of East San Diego County, BCLT has been involved in the preservation of more than 4,000 acres of scenic, cultural, and biologically significant lands. Until 2001, BCLT was entirely volunteer-operated. BCLT is a membership organization with more than 300 members. BCLT will work with the CDFG to oversee management of the 2,400-acre Crestridge Ecological Reserve and coordinate the construction and education programs of the Earth Discovery Institute.

California Department of Forestry -- CDF protects the people of California from fires, responds to emergencies, and protects and enhances forest, range, and watershed value, thus providing social, economic, and environmental benefits to rural and urban citizens. CDF is working with the CDFG to develop a fire management plan for the reserve.



California Department of Fish and Game -- CDFG holds fee title to the Crestridge Ecological Reserve. CDFG has an agreement with BCLT to manage the reserve and supports the construction of the Earth Discovery Institute and educational programs at the reserve.

County of San Diego -- The County of San Diego is committed to implementing its MSCP subarea plan, of which the Crestridge Ecological Reserve is a part.

Earth Discovery Institute -- EDI is the name applied to the two structures to be built at the reserve, as well as the name for the educational and interpretive programs that will be conducted at the reserve. EDI will consist of the Field Station and the Bridge to Nature, designed by world-famous artist James Hubbell and architect Drew Hubbell. The buildings will be green-designed by Jim Bell, to be self-sustaining with renewable energy and water-efficient designs. The Field Station will be the station for monitoring the species on the reserve, according to the Habitat Management and Monitoring Plan, and will be staffed by a Lands Manager. Environmental education programs will be conducted in conjunction with the Environmental Science Academy at Granite Hills High School. Interpretive programs will be developed in collaboration with the local band of Kumeyaay Indians.

Hubbell & Hubbell -- Working as the artist/architects in the design and construction of the two facilities that will comprise the Earth Discovery Institute, the Hubbells have a long and successful history of using their projects as hands-on learning opportunities for volunteers. They plan to build the structures with sustainable technologies such as straw bale and photo voltaics.

5.5 BUDGET

- 118. Review the Property Analysis Report (PAR) in Appendix G to establish and prioritize a budget for Crestridge.**
- 119. Assess and prioritize the currently available funding for Crestridge.**
- 120. Identify potential funding sources.**
- 121. Prepare grant applications.**



6.0 MANAGEMENT AND MONITORING PRIORITIES FOR 2002-2003

Section 5 identified management and monitoring tasks for Crestridge. All of these tasks are summarized in Appendix H. The table below identifies management and monitoring priorities over the next 2-year period, the primary responsible party, and timeframe for implementation (1st quarter = January-March, 2d quarter = April-June, 3d quarter = July-September, 4th quarter = October-December). To facilitate reference, tasks are organized and numbered to correspond to tasks in Section 5.

TASK	RESPONSIBLE	TIME
Exotic Plant Control		
1. Remove tamarisk from Rios Canyon (few individuals).	CDFG, with volunteers	4th quarter 2002
2. Remove Pampas grass from the reserve (1 location).	CDFG, with volunteers	3d quarter 2002
4. Begin hand removal of African fountaingrass on the slopes above Rios Canyon.	CDFG, with volunteers	2002-2003
5. Begin chemical treatment of totalote on Thornmint Hill and along the fuelbreak at the bottom of the slope.	CDFG, with volunteers	2d quarter 2002 2d quarter 2003 (when thornmint is in bloom)
6. Begin chemical treatment of purple falsebrome on Thornmint Hill.	CDFG, with volunteers	2d quarter 2002 (when thornmint is in bloom)
12. Continue mapping stands of exotic species and prioritizing for treatment.	BCLT	2d quarter 2002
Fire Management		
18. Work with the CDF to prepare a fire management plan.	CDFG	2002-2003
19. Inform landowners about maintaining their own defensible space.	CDF and BCLT	1st quarter 2002
Public Use		
34. Identify, map, and control illegal vehicular access points.	BCLT and CDFG	1st quarter 2002



TASK	RESPONSIBLE	TIME
35-39. Map all trails within the reserve and identify trails that should be closed or have restricted access (redundant trails, trails near sensitive resources, trails needing restoration)	BCLT	2d quarter 2002
41. Establish a volunteer training program, with initial emphasis on exotic plant identification and control.	BCLT and CDFG	2d quarter 2002 2d quarter 2003
44. Identify property owners along the reserve boundaries, and contact each one about stewardship responsibilities and assistance in patrolling for illegal uses.	BCLT and CDFG	1st quarter 2002
46. Prepare cultural resources management plan.	BCLT	4th quarter 2003
49-56. Post regulations and enforce illegal uses in the reserve (prohibit motor bikes, feeding of wildlife, dumping of dirt, trash, and garden refuse, horses in riparian areas).	CDFG	1st quarter 2002
Facilities Maintenance		
60. Contract with a land surveyor to officially map the reserve boundary.	CDFG	2d quarter 2002
61. Identify portions of the reserve boundary where fencing is needed.	CDFG and BCLT	3d quarter 2002
62. Establish property signs along the reserve boundary (3 signs every linear mile) identifying the area as an ecological reserve, providing directions for access, and posting illegal uses and contact information.	CDFG	3d quarter 2002
63. Maintain fences and gates, and establish a list of persons with gate keys (CDFG staff and warden, BCLT, CDF, SDG&E, Padre Dam MWD, East County Fire District, Sheriff, selected researchers).	CDFG	1st quarter 2002
67. Arrange for regular garbage pickup.	BCLT	1st quarter 2002
71. Establish a site for visitor parking.	CDFG and BCLT	4th quarter 2002



TASK	RESPONSIBLE	TIME
Species Monitoring		
80. Survey for the San Diego thornmint population at Thornmint Hill.	CDFG	2d quarter 2002 2d quarter 2003
83. Re-survey selected areas for San Diego goldenstar.	CDFG	2d quarter 2002 2d quarter 2003
84. Re-survey dwarf plantain (<i>Plantago erecta</i>), the host plant for the Quino checkerspot butterfly, in the northern section of the reserve near Rios Canyon Road and Rios Elementary School (Thornmint Hill).	CDFG	1st quarter 2002 1st quarter 2003
85. Monitor and census eggs and larvae of Hermes copper in May.	CDFG	2d quarter 2002 2d quarter 2003
86. Monitor San Diego sedge for evidence of Harbison's dun skipper larvae.	CDFG	1st quarter 2002 1st quarter 2003
87. Map raptor nest sites.	BCLT and CDFG	1st quarter 2002 2d quarter 2002
Habitats and Ecological Processes Monitoring		
100. Identify sources of urban runoff adjacent to the reserve, and propose containment options to landowners.	BCLT	3d quarter 2002 3d quarter 2003
Public Use Enforcement		
105. Patrol public use of the reserve to ensure compliance with the rules and biological goals of the reserve and to assess level of use by area of the reserve.	BCLT and CDFG	2002-2003
107. Issue citations to persons that violate reserve regulations.	CDFG	2002-2003
Data Management		
108. Use the base map (digital or hard copy) created for this management plan to update trails, adjacent land owners, and biological information.	BCLT	4th quarter 2002
Staffing		
116. Hire a reserve manager to live onsite.	BCLT and CDFG	4th quarter 2002



TASK	RESPONSIBLE	TIME
117. Appoint a volunteer coordinator.	BCLT	2d quarter 2002
Budget		
118. Review the PAR to establish and prioritize a budget.	BCLT and CDFG	1st quarter 2002 1st quarter 2003
119. Assess and prioritize the currently available funding.	BCLT and CDFG	2d quarter 2002 2d quarter 2003



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