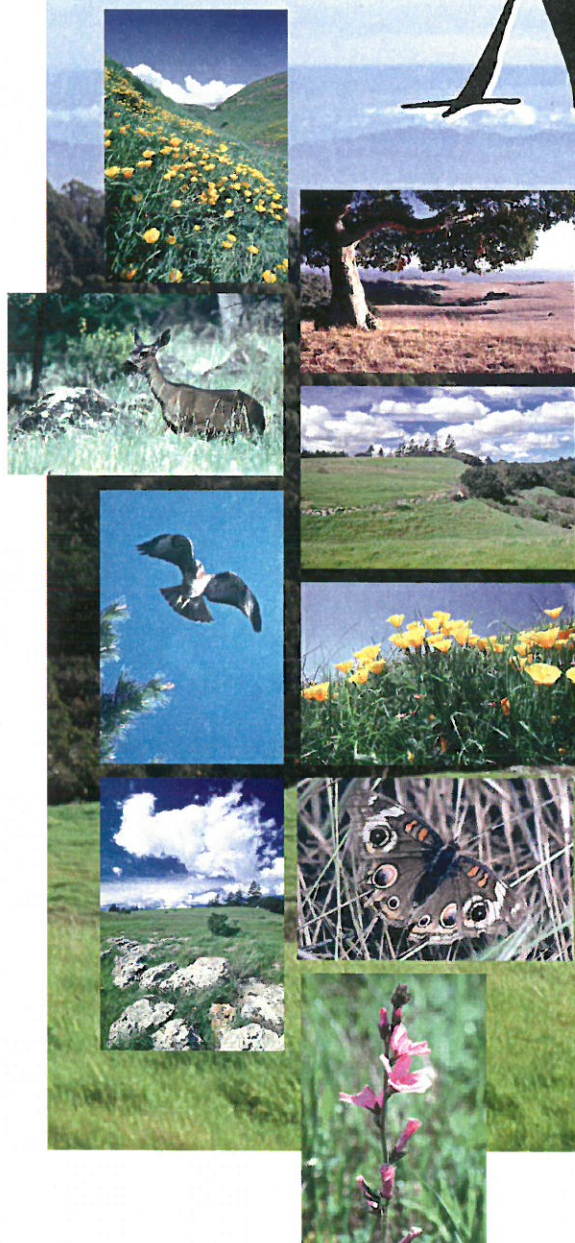


Moore Creek

PRESERVE



PREPARED BY THE
City of Santa Cruz
Parks and Recreation Department
APRIL 2002

INTERIM MANAGEMENT PLAN

Moore Creek

PRESERVE

PREPARED BY THE
CITY OF SANTA CRUZ
PARKS AND RECREATION DEPARTMENT

APRIL 2002

INTERIM MANAGEMENT PLAN



ACKNOWLEDGEMENTS

The Moore Creek Interim Management Plan was prepared by the Parks and Recreation Department of the City of Santa Cruz. The primary author is Susan Harris, Greenbelt Planner. Key contributors include Kirk Lenington, Resource Ecologist for the City of Santa Cruz and Laura Perry, Executive Director of the Land Trust of Santa Cruz County. Reviewers throughout the preparation of this document include Jim Lang, Parks and Recreation Director, and Steve Hammack, Superintendent of Parks.

Special thanks to Don Nielsen for his stunning photographs. A longtime central coast resident, he conveys environmental awareness through his passion for outdoor photography.

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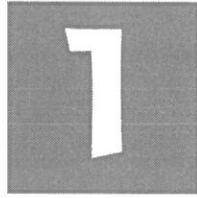
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INTRODUCTION

1.1 INTERIM MANAGEMENT PLAN PURPOSE

Moore Creek Preserve is a 246-acre natural area located on the western edge of the City of Santa Cruz. The property lies within the Moore Creek watershed, the most pristine riparian habitat in Santa Cruz. Numerous threatened and endangered plant and wildlife species have been documented on the Preserve. The purpose of the Moore Creek Preserve Interim Plan is to provide a policy framework for management of Moore Creek Preserve and protection of these sensitive resources until a long-term Management/Master Plan is completed for the property.

The State of California Wildlife Conservation Board holds two conservation easements over the property. One of the easements encompasses the canyon and oak woodlands along the Moore Creek corridor; the second easement includes the uplands, which features primarily coastal prairie. The Land Trust of Santa Cruz County has responsibility for management of the easement along the Moore Creek corridor. Because of these City, State, and Land Trust responsibilities, preparation of this Interim Plan has required coordination among the three entities. The conservation easements are discussed further in Section 1.4.

This Interim Plan was prepared by the City of Santa Cruz Parks and Recreation Department, in cooperation with the Land Trust of Santa Cruz County and the California Department of Fish and Game. The City of Santa Cruz Parks and Recreation

Commission is the lead advisory body to the Santa Cruz City Council for review and approval of this Interim Plan.

This Interim Plan establishes management policies, not land use policy, and will not restrict future uses to be determined when a long-term Management/Master Plan is completed for Moore Creek Preserve. Similar to this interim plan, the long-term plan will be a cooperative effort involving the City of Santa Cruz, the State of California, and the Land Trust of Santa Cruz County.

1.2 SETTING

Most of the Preserve lies within the western portion of the Moore Creek watershed, the most pristine watershed within the City of Santa Cruz. The west branch of Moore Creek flows southward from the University campus lands through the Preserve, into Antonelli Pond and Natural Bridges State Park, emptying into the Monterey Bay National Marine Sanctuary.

Uplifted marine terraces rising from south to north, incised by deep, steep-walled canyons along Moore Creek characterize the Preserve's topography. Coastal prairie and grasslands dominated by non-native species cover much of the upland area of the property. The lower southern terraces currently feature less diverse grasslands, while high diversity coastal prairie and wildflower fields are found on the upper terraces. Coast



live oak forest, rock outcrop vernal pools and mimas are also found in the upland areas. Many of the special status plant species at the Preserve are associated with the coastal prairie habitat.

Canyon slopes are dominated by dense mixed evergreen forest and oak woodland. Coastal scrub also occurs on slopes in the lower reach of Moore Creek. Riparian forest and scrub thrive along Moore Creek at the bottom of the canyons.

Moore Creek Preserve supports a diverse array of wildlife, including several special status species. Chlone tiger beetle, monarch butterfly, and American kestrel habitat occurs on the Preserve. The Preserve also serves as an important wildlife corridor, allowing access between adjacent undeveloped lands.

The City acquired Moore Creek Preserve, designated as one of the City of Santa Cruz greenbelt lands, in 1998. Prior to the City's acquisition, the land was referred to as the "Bombay" property. "Bombay" was in reference to the prior private owner. Over the past decades, the "Bombay" property has been the subject of intense development pressures and litigation. The successful protection of this significant open space area is a tribute to the dedication of committed citizens in Santa Cruz.

During the 1970s, community interest grew to create a greenbelt to preserve the open space surrounding the City. In 1979, Measure O passed which identified specific greenbelt properties. These lands included the 246-acre Moore Creek

1.3 PLANNING PROCESS

tion of the property east-west.

1.4 CONSERVATION EASEMENTS

Since that time, the adjoining 49-acre "Westside Kinzli" property was purchased by private individuals at a price far exceeding the City's ability to acquire the land. The City-owned greenbelt land on the western boundary of the City is thus currently limited to the 246-acre Moore Creek Preserve.

Over the years, various development scenarios were proposed. In 1998, a development proposal and Environmental Impact Report were submitted to the City for a residential development of up to 25 units. This proposal led to a heightened community interest in protecting the entire greenbelt property. To prevent any residential development and ensure the greenbelt land's protection as a natural area, the City of Santa Cruz would need to purchase the property.

As a starting point for fundraising, the Santa Cruz City Council committed \$1 million to the \$3.9 million purchase price. In November 1998, over 75% of City voters endorsed the Community Investment Measure, which authorized a bond to contribute an additional \$1.65 million toward the purchase. The City also received \$1 million from the California Wildlife Conservation Board and \$250,000 from the California Environmental Enhancement and Mitigation Program. With the funding in place, the City purchased the property in December 1998.

Conservation easements, held by the State of California, ensure protection of Moore Creek Preserve's sensitive resources. The purpose of the easements is to ensure that Moore Creek Preserve will be retained forever in a natural condition and to prevent any uses that will significantly impair or inter-



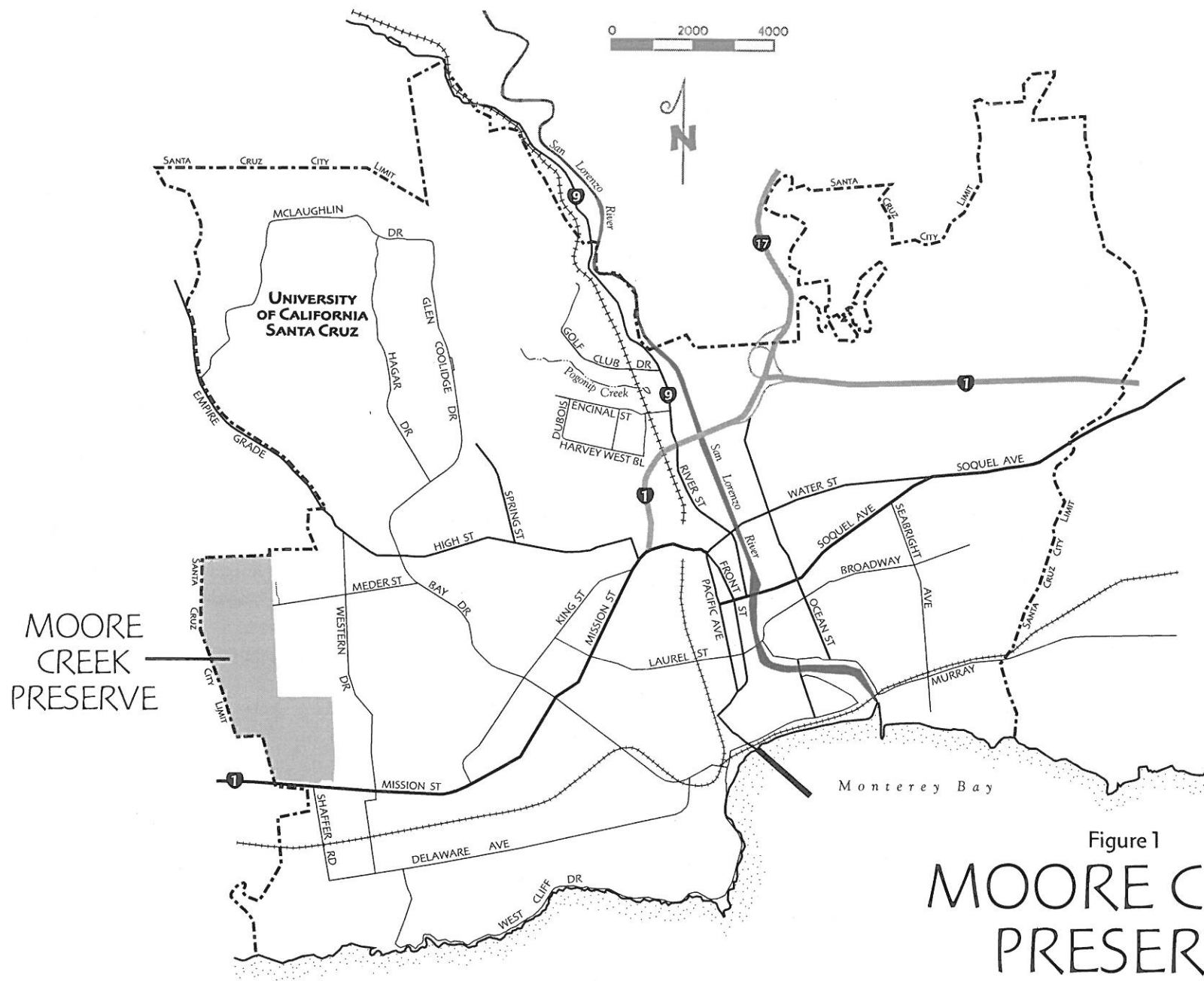


Figure 1
**MOORE CREEK
 PRESERVE
 SITE LOCATION**

1.5 SUMMARY OF INTERIM PLAN USES AND MANAGEMENT ACTIONS

Development of this Preliminary Draft Interim Management Plan was guided primarily by conservation and resource protection objectives, in accordance with the easements held by the State of California. While public access is an important component for the City of Santa Cruz, the access must be consistent with easement requirements and restrictions. Moore Creek Preserve is unique among the City's greenbelt lands in that the public uses that could be considered during the planning process were limited from the outset.

The *Greenbelt Master Plan, A Planning Feasibility Study* (1994) and the *Moore Creek Corridor Access and Management Plan* (1987) were also reviewed to identify appropriate interim uses. Both of these documents, however, were completed prior to the conservation easements. The Greenbelt Master Plan identifies the following possible uses and infrastructure for earlier phases, or interim development: hiking trails, a small parking area and an access road to the parking area. The Moore Creek Corridor Plan also includes policies to provide public access, however, specific recommendations address the east branch of Moore Creek rather than the Moore Creek Preserve area.

The uses and infrastructure improvements permitted under this Interim Plan include:

- ◆ Hiking trails (dogs prohibited)
- ◆ Cattle grazing
- ◆ Study, preservation, enhancement and protection of native species and their habitat
- ◆ Installing interpretive, regulatory, and directional signs
- ◆ Fencing for grazing and property boundaries
- ◆ Erosion control measures

These proposed uses and improvements under this Interim Plan are intended to provide for public access while minimizing environmental impacts and facility improvements. A parking area, public access road, and permanent restroom facilities are not recommended for this initial phase. The need for and loca-

ture with the conservation values of the property. The California Wildlife Conservation Board holds the easements, however, the easements are administered by the California Department of Fish and Game.

The first conservation easement, totaling 85 acres, includes the canyons along the Moore Creek corridor and the monarch butterfly habitat in the southeastern portion of the Preserve. The Land Trust of Santa Cruz County manages this easement for the California Department of Fish and Game; however, the City of Santa Cruz is the property owner. This agreement was entered into prior to the City's purchase of the property.

The remaining approximately 160 acres is subject to another conservation easement. This conservation easement was required by the California Wildlife Conservation Board as a condition of the City receiving \$1 million in State funding toward the purchase of the property. The Land Trust is not responsible for management of this second easement.

Both conservation easements include the same language regarding appropriate uses and restrictions (see Appendix A). The easements allow for "study, preservation, enhancement and protection of native species and their habitat," trails or roads, parking and public restrooms. Signs, fencing, and erosion control measures are also permissible. Any new facilities must be consistent with the conservation purposes of the easements.

The conservation easements also include restrictions on various activities to ensure that no actions or uses within Moore Creek Preserve will be detrimental to native vegetation and wildlife habitat. For example, no removal or cutting of trees and other vegetation is allowed except where necessary for fire hazard reduction, construction and maintenance of trails and roads, erosion control, grazing, and control of non-native species.

The restrictions under the conservation easements are for perpetuity, thus ensuring Moore Creek Preserve will remain a natural area. These easements limit the types of uses that can be considered in this Interim Plan and any future long-term Master/Management Plan.

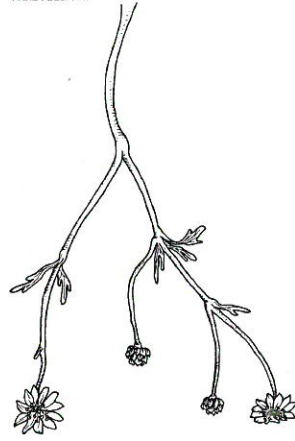


ILLUSTRATION:
SARA BRAY
CALIFORNIA BUTTERCUP
RANUNCULUS CALIFORNICUS

Figure 2

MOORE CREEK PRESERVE

INTERIM PLAN

RESOURCE PROTECTION

PRESERVATION AND ENHANCEMENT
OF NATIVE SPECIES AND THEIR HABITAT

GRAZING

CATTLE GRAZING TO REDUCE FIRE HAZARD
AND ENHANCE COASTAL TERRACE PRAIRIE

HIKING TRAILS

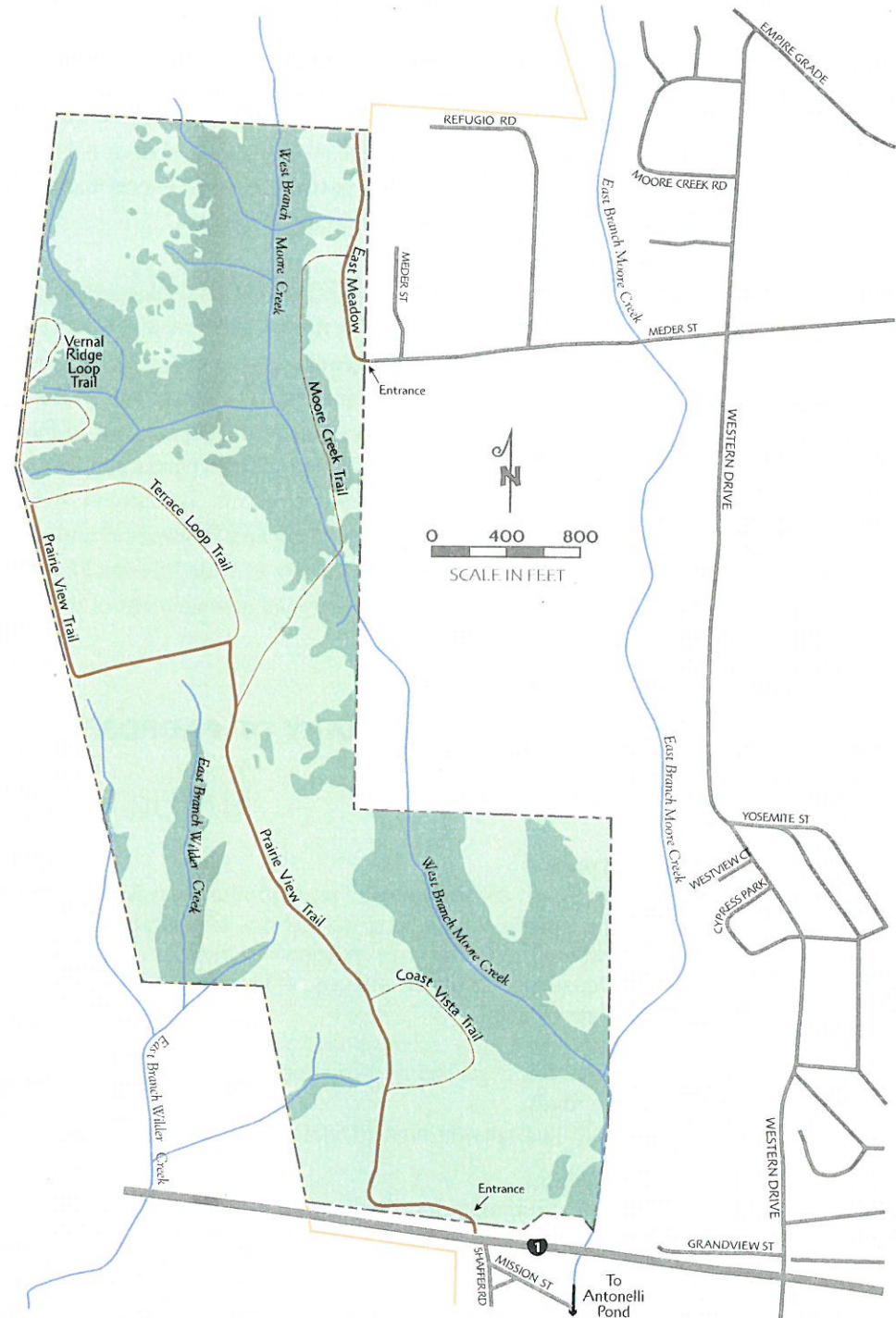
HIKING ONLY ON ALL TRAILS.
DOGS, EQUESTRIAN AND BICYCLE USE
NOT ALLOWED WITHIN THE PRESERVE

CONSERVATION EASEMENTS

EASEMENTS HELD BY THE STATE OF CALIFORNIA
ENSURE THAT THE PRESERVE WILL BE RETAINED
IN A NATURAL CONDITION AND PREVENT USES
THAT WOULD IMPAIR OR INTERFERE WITH
CONSERVATION VALUES.

LEGEND

-  PEDESTRIAN TRAIL
-  SERVICE ROAD
-  PAVED ROADS
-  CITY LIMIT
-  MEADOW
-  FOREST/WOODLAND



tion of these infrastructure improvements and facilities should be based on long-term rather than short-term uses. Specific management actions included in this interim plan focus on enhancement of native species and their habitat, fire hazard reduction, erosion control measures, and maintenance of trails, service roads, fencing and signs.

1.6 INTERIM PLAN IMPLEMENTATION

The City of Santa Cruz, as the property owner, holds the overall responsibility for management of Moore Creek Preserve and implementation of this Interim Plan. The Land Trust of Santa Cruz has been designated by the California Department of Fish and Game to implement management actions pertaining specifically to the conservation easement within the canyon along Moore Creek. The City of Santa Parks and Recreation and the Land Trust have worked cooperatively on this Interim Plan to ensure there is effective and coordinated management of the re-

SUMMARY OF PROPOSED PRESERVE MANAGEMENT ACTIONS

NATURAL RESOURCES ELEMENT

- ◆ Install a pedestrian crossing at Moore Creek to minimize impacts to riparian habitat.
- ◆ Monitor the creek channel and seeps to ensure cattle grazing and visitors are not causing harmful impacts.
- ◆ Install fencing as needed to avoid damage to seep areas from cattle grazing.
- ◆ **Eucalyptus/Monterey Cypress Grove**
 - ◆ Monitor grove for over-wintering monarch butterfly.
 - ◆ Thin eucalyptus grove (young saplings) as needed to minimize fire hazard to adjacent residential areas and to maintain existing perimeter.

- ◆ **Coastal prairie**
 - ◆ Monitor high-diversity coastal prairie/wildflower fields.
 - ◆ Continue cattle grazing in all coastal prairie habitat areas. Conduct prescribed burns in coordination with the City of Santa Cruz Fire Department. Consult with a qualified botanist regarding appropriate timing.
 - ◆ Conduct mowing as recommended by a qualified botanist. Continue mowing of fuel break areas along property boundaries and service roads.
 - ◆ Remove invasive non-native vegetation from grassland areas.
- ◆ **Moore Creek**
 - ◆ Install and maintain fencing to keep cattle from impacting riparian vegetation.
 - ◆ Minimize visitor impacts to the riparian vegetation by monitoring any creek crossing and encouraging users to stay on trail.

NATURAL RESOURCES ELEMENT CONTD

Ohlone Tiger Beetle

- ◆ Conduct annual surveys and research (approximately mid-February through April). A qualified biologist shall conduct surveys.
- ◆ Prohibit use of pesticides in beetle habitat areas.
- ◆ Prohibit collection of Ohlone tiger beetles unless authorized by U. S. Fish and Wildlife Service for research purposes.
- ◆ Monitor trails and service road use to ensure habitat is not damaged. Ensure any erosion control measures along service roads or trails do not disrupt beetle habitat.
- ◆ Monitor vegetation cover in Ohlone tiger beetle habitat areas to ensure adequate bare ground exists.
- ◆ Conduct annual spring mowing along trails and roads where Ohlone tiger beetles have been observed.
- ◆ Conduct non-native vegetation removal (e.g. light scraping) in

habitat areas as needed. Consult with the U.S. Fish and Wildlife Service and a qualified biologist prior to implementing any action in beetle habitat.

San Francisco Popcornflower

- ◆ Conduct annual surveys (approximately March through May). A qualified botanist shall conduct surveys.
- ◆ Continue grazing in popcornflower habitat areas.

California Red-legged Frog

- ◆ Conduct annual surveys. A qualified biologist shall conduct surveys.
- ◆ Maintain fencing at access to stream corridors to prevent damage from cattle grazing.

HYDROLOGY & EROSION CONTROL ELEMENT

Moore Creek Erosion Control

- ◆ Restrict cattle from grazing within Moore Creek. Install and maintain fencing as needed.
- ◆ Minimize disturbances to steep slopes along Moore Creek corridor.
- ◆ Re-route the existing trail across Moore Creek (near water line) and construct a bridge to reduce erosion impacts. To the extent feasible, trail alignment should be designed so the gradient is less than 12 per cent.
- ◆ Existing informal and unauthorized trails on steep slopes should be obliterated to encourage pedestrian use of maintained trails.

Wilder Creek Erosion Control

- ◆ Restrict cattle grazing from the east branch of Wilder Creek.
- ◆ Minimize disturbances to steep slopes along Wilder Creek corridor.

Upland Erosion Control

- ◆ Restrict cattle grazing from eroded gullies at tributaries.
- ◆ Realign trail segments in low-lying, wet areas to minimize dam-

age and trampling during the wet season (refer to Chapter 4).

- ◆ Install erosion control features, such as drainage dips and water bars, on service roads as recommended by an erosion control specialist. Consult with a biotic specialist prior to disrupting the roadbed within Ohlone tiger beetle habitat areas.
- ◆ Restrict use of motorized vehicles during wet conditions. Vehicle access during wettest months should be limited to emergencies only.
- ◆ Minimize soil disturbances on steep slopes.
- ◆ Avoid bare, exposed soil in easily eroded areas during the wet season when conducting non-native species removal and other vegetation management actions.
- ◆ Monitor gully erosion. In cases of accelerated gullyerosion, contract with an erosion control specialist to implement appropriate measures. If gully is located within a sensitive habitat area, ensure proposed erosion control measures are reviewed by a qualified botanist/biologist and the appropriate agency (U.S. Fish and Wildlife Service or California Department of Fish and Game).

TRAILS ELEMENT

- ◆ Ensure a qualified biologist reviews maintenance actions in Orlone tiger beetle habitat areas prior to implementation (Prairie View and East Meadow Trails).
- ◆ Utilize various techniques to discourage use of non-designated paths. Techniques may include planting native vegetation, installing logs or other natural debris to cover pathway, posting signs indicating area is closed, or fencing to discourage use.

GRAZING ELEMENT

- ◆ The grazing contractor shall not conduct any activities on the Preserve that would be incompatible with habitat conservation objectives. Prohibited activities shall include, but are not limited to, the establishment of any road; dumping of any objects or materials; use of biocides or other agricultural chemicals; use of vehicles except for the purposes of performance of grazing service; placement of structures, whether temporary or permanent with the exception of water troughs; cutting or burning vegetation; hunting; trapping; bearing firearms; planting of vegetation; leaving animal carcasses or parts; starting or maintaining fires; and disposing of waste.
- ◆ Vehicles and trailers shall remain on established mowed service roads to the maximum extent possible. No off-road vehicles shall be used except strictly for range management purposes, and use of such vehicles off-road shall be kept to a minimum. Vehicle access shall be minimized during wet season.
- ◆ As necessary, the City shall provide and install appropriate signs stating "Do Not Disturb/Feed Livestock."
- ◆ Pedestrian entrance gates to the property shall be designed to ensure cattle cannot pass through the gates.
- ◆ Vehicle entrance gates to the property shall remain closed and locked when not in immediate use.

Trail

- ◆ Conduct annual maintenance, including trail mowing, brushing, and erosion control repairs.
- ◆ Conduct Park Ranger patrols to ensure appropriate trail use and enforce regulations.
- ◆ Monitor impacts of trails near sensitive species. Refer to special status species resource management actions, Section 2.3.

Grazing Management Guidelines

- ◆ Not more than approximately seventy cows should be grazed on the designated lands through approximately October. The number of cattle will be reduced during the rainy season. During the wettest months, the cattle may need to be removed from the Preserve entirely. The number of cattle shall be determined based on the recommendations of the City's consulting biologist.
- ◆ Fencing shall be maintained to control access of cattle to riparian corridors and other sensitive areas as determined by City. Fencing shall be designed to accommodate wildlife movement to and through riparian corridors. Within the west and east meadows, additional fencing may be installed as needed to encourage grazing in targeted areas.
- ◆ The grazing contractor will be responsible for inspection and repair of fencing needed to contain cattle. The City will periodically inspect the fencing.
- ◆ Water troughs will be provided in locations approved by the City. Salt and mineral blocks shall be placed by the grazing contractor near the water trough. Salt and mineral blocks should be placed in areas of tall fescue infestation wherever possible.
- ◆ The grazing contractor will provide supplemental feed at a location mutually agreed on by the contractor and the City.

2

NATURAL RESOURCES

2.1 NATURAL RESOURCES

At Moore Creek Preserve, the City's and Land Trust's primary responsibility is management of natural resources. Plant and wildlife species that are considered sensitive biotic resources require dedicated protection and enhancement efforts. This Natural Resources Element describes existing resource conditions and identifies management goals and specific management actions for these resources.

Sensitive biotic resources are defined as those species that are listed by the State and/or Federal government and the California Native Plant Society (CNPS) as having special status. Plant communities that are considered as High Inventory Priority Plant communities by the California Department of Fish and Game, and areas recognized as sensitive habitat by the City of Santa Cruz General Plan, are also considered sensitive resources.

Sites where sensitive habitat areas and plant communities occur at Moore Creek Preserve are designated as Natural Resource Management Areas (NRMAs). These areas are differentiated based upon the type of plant community or sensitive species present. In some instances a NRMA for a target species may be located within a larger NRMA. The NRMAs proposed under this Preliminary Draft Interim Management Plan include the following:

PLANT COMMUNITIES

- ◆ Coastal prairie
- ◆ Riparian and oak woodland
 - Moore Creek canyon
 - Wilder Creek canyon
- ◆ Mixed eucalyptus and Monterey cypress grove (monarch butterfly over-wintering habitat)

SPECIAL STATUS SPECIES

- ◆ Ohlone tiger beetle habitat
- ◆ San Francisco popcornflower habitat
- ◆ California red-legged frog habitat

An overview of plant communities and special status species is presented in Section 2.2. More detailed descriptions of the Natural Resource Management Areas and recommended management actions are included in Sections 2.3 and 2.4. Much of the information regarding observed species and plant communities is based on surveys conducted by Environmental Science Associates (ESA) from 1995 through 1997 for the environmental review of the previously proposed residential development. Since the City's acquisition of the property in December 1998, City staff and other qualified biologists and botanists have conducted additional surveys to update distribution and abundance information.



2.2 OVERVIEW OF PLANT COMMUNITIES AND SPECIAL STATUS SPECIES

Moore Creek Preserve features an abundance of plant communities, which include coastal prairie, vernal pools, freshwater seep, coyote brush scrub, central coast scrub, coast live oak forest (upland and riparian), central coast riparian scrub, mixed evergreen forest, and mixed eucalyptus and Monterey cypress woodland. For purposes of this Interim Plan, coastal prairie, riparian plant communities, and the mixed eucalyptus and Monterey cypress grove (monarch butterfly over-wintering habitat) are considered high priority Natural Resource Management Areas.

Coastal prairie is a grassland community occurring on the terraces. Coastal prairie featuring a higher diversity of native plant species is found on the upper, northernmost terraces, while non-native grasses dominate the lower southern terraces. Rock outcrop vernal pools and mima mounds are also found on the terraces. Rock outcrop vernal pools are seasonal wetlands formed when an area of exposed rock creates a topographic depression. Mima mounds are raised areas, two to three feet high, interspersed with seasonal wetlands and drainages.

Native scrub communities at Moore Creek Preserve are primarily located on the slopes along Moore Creek and Wilder Creek. Central coast scrub, found primarily along the lower reach of Moore Creek, is comprised of low woody shrubs, such as California sagebrush, sticky monkey flower, coyote brush, and poison oak. Central coast riparian scrub is found along the lower reach of Moore Creek along the stream channel. Arroyo willow is the dominant species in the riparian scrub. An isolated stand of French broom, an invasive non-native species, is located near the Meder Street entrance.

Woodland communities also occur primarily on the canyon slopes along Moore Creek. Coast live oak forest occurs, however, as both riparian and upland communities. Two stands of large upland coast live oaks are found in the northernmost portion of the Preserve. Some of the tree trunks in these stands range up to six feet in diameter. Mixed evergreen forest is comprised of dense stands of Douglas fir, coast live oak, California bay, and tan oak

along the northwestern tributaries to Moore Creek. An isolated stand of mixed eucalyptus and Monterey cypress occurs in the southeastern corner of the property near Grandview Street. This stand is considered potential monarch butterfly habitat.

Within some of these plant communities, special status plant and wildlife species have been documented. San Francisco popcornflower has been located in at least three different sites within coastal prairie. Ohlone tiger beetle has also been observed at several sites within prairie habitat. California red-legged frog has been observed in the Moore Creek stream channel. Monarch butterflies have been reported to use the mixed eucalyptus and Monterey cypress grove as over-wintering habitat.

Moore Creek Preserve also provides habitat for numerous bird species, including special status species such as great blue heron, red-tailed hawk, American kestrel, and Vaux's swift. The mixed eucalyptus and Monterey cypress grove is considered red-tailed hawk nesting habitat. The Preserve also functions as an important wildlife corridor, particularly for larger predators. Bobcat and mountain lions are expected to use the property as part of their hunting grounds. Several species of bats are also expected to occur within the Preserve. Recently, evidence of feral pigs has been observed in the uplands area.

2.3 PLANT COMMUNITY RESOURCE MANAGEMENT

COASTAL PRAIRIE

Coastal prairies are comprised of a diverse vegetation community, characterized by native bunch grasses as well as great array of annual forbs. At Moore Creek Preserve, the coastal prairie habitat includes high-diversity wildflower field areas, low diversity areas dominated by non-native grass species, and medium-diversity areas that are intermediate in species composition. San Francisco popcornflower (*Plagiobothrys reticulatus* var. *rossianorum*), a State endangered species, is also associated with coastal prairie habitat.

ILLUSTRATION: SARA BRAV
PURPLE NEEDLE GRASS
NASELLA PULCHRA

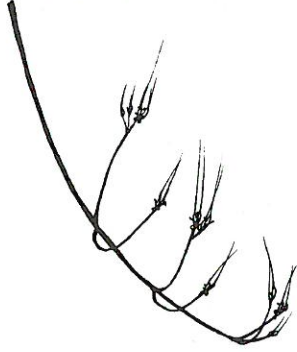
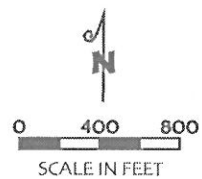


Figure 3
**MOORE
 CREEK
 PRESERVE**
EXISTING SETTING



species are often found in the low-lying areas between the mounds, however these species have not been identified at Moore Creek Preserve. In the past, it is likely the mimina mounds supported a greater diversity of native plant species.

Historically, highly diverse prairie, native bunchgrasses and wildflower fields were more widespread. The introduction of non-native grasses and forbs, overgrazing, and alteration of disturbance has led to the loss and degradation of coastal prairie habitat. Coastal prairie evolved with a number of different disturbances that influenced and shaped the ecology of these habitats. These disturbances include such factors as wildfire (pyric); grazing pressure and soil disturbance from mammals (biotic); and rainfall patterns, drought, and temperature (climatic). The frequency, intensity, and scale of pyric and biotic disturbances have been greatly altered by the intervention of humans. Concurrent with this alteration of natural disturbance events has been the introduction of invasive, non-native plants and other organisms.

The Management Actions listed below focus on diligent and dedicated management to ensure the long-term survival of high-diversity coastal terrace prairie and to improve low-diversity prairie. This requires cycles of disturbance to minimize the growth of invasive non-native species and reduce the build up of thatch (dead grass). Natural disturbance includes fire and grazing. Mechanized disturbance such as mowing can also be effective.

COASTAL PRAIRIE

MANAGEMENT ACTIONS

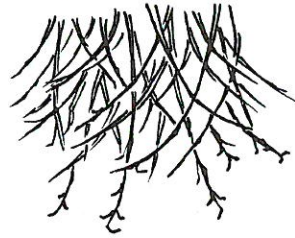
- ◆ Monitor high-diversity coastal prairie/wildflower fields.
- ◆ Continue cattle grazing in all coastal prairie habitat areas. Conduct prescribed burns in coordination with the City of Santa Cruz Fire Department. Consult with a qualified botanist regarding appropriate timing.
- ◆ Conduct mowing as recommended by a qualified botanist. Continue mowing of fuel break areas along property boundaries and service roads.
- ◆ Remove invasive non-native vegetation from grassland areas.

Areas of high-diversity wildflower fields are found in the upland area near Wilder Creek and in pockets throughout the property. Colorful displays of wildflower blooms characterize high diversity prairie during spring and early summer. Representative species include California goldfields (*Lasthenia californica*), Johnnybuck (*Triphysaria eriantha* ssp. *rosea*) and blue-eyed grass (*Sisyrinchium bellum*). Typically wildflower fields occur when rock layers are exposed or near the surface. Native grass species include California oatgrass (*Danthonia californica*), purple needlegrass (*Nassella pulchra*), and California brome (*Bromus carinatus*).

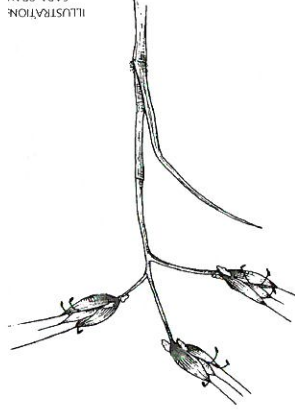
The southern terraces at Moore Creek Preserve are dominated by non-native grass species. Some of the annual non-native grasses include soft chess (*Bromus mollis*) perennial ryegrass (*Lolium perenne*), foxtail barley (*Hordeum jubatum*), and foxtail brome (*Bromus rubens*). These dense non-native grasses prevent germination of native species, including many wildflowers. Although the majority of the southern area is characterized by non-native grassland, small areas of high diversity coastal terrace prairie still occur.

Medium-diversity prairie occurs through most of the upper, northern terraces and along the Meder Street entrance. It features both native and non-native grasses and wildflowers. Non-native grasses typically include the annual species listed above. Typical native grass and wildflower species include purple needlegrass (*Nassella pulchra*), California poppy (*Eschscholzia californica*), blue dicks (*Dichelostemma pulchra*), and Johnny jump-ups (*Viola pedunculata*). The presence and abundance of native versus non-native species varies depending on past disturbances and soil depth.

Moore Creek Preserve also contains geologic features unique to the Central Coast region known as mimina mounds. Mima mounds are natural formations featuring relatively even-spaced earthen mounds, approximately one foot or higher, with low-lying, poorly drained areas in between the mounds. At the Preserve, mima mounds typically rise two to three feet high above the surrounding grassland and ground elevation. At other mimina mound locations in the region, uncommon to rare



CALIFORNIA OATGRASS (BUNCH)
DANTHONIA CALIFORNICA



CALIFORNIA OATGRASS
(FLOWER)
DANTHONIA CALIFORNICA

ILLUSTRATION
SARA BRAY

Figure 4

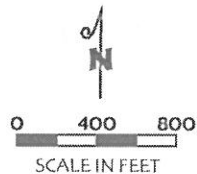
MOORE CREEK PRESERVE

PLANT COMMUNITIES

Source: Environmental Science Associates, 1998

LEGEND

-  **HIGH DIVERSITY/
COASTAL PRAIRIE**
-  **MEDIUM DIVERSITY PRAIRIE**
-  **LOW DIVERSITY
NONNATIVE GRASSLAND**
-  **VERNAL POOL**
-  **COYOTE BRUSH SCRUB**
-  **CENTRAL COASTAL SCRUB**
-  **COAST LIVE OAK WOODLAND**
-  **CENTRAL COAST RIPARIAN SCRUB**
-  **MIXED EVERGREEN FOREST**
-  **FRENCH BROOM SCRUB**



MOORE CREEK CANYON

The Moore Creek management area includes the stream corridor and the deep, steep-walled canyon. Plant communities within this management area include coast live oak forest, both riparian and upland forest, and Central Coast riparian scrub. Moore Creek is fairly typical of small coastal streams in the Santa Cruz region. The width of the channel generally ranges between five and seven feet. The creek itself is well shaded by dense, overhanging vegetation.

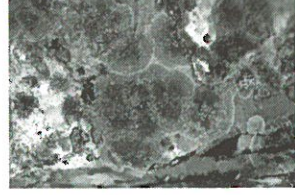
Coast live oak forest occurs as dense forest habitat within Moore Creek canyon and tributary ravines. Coast live oak (*Quercus agrifolia*) is the dominant species within the riparian and upland forests, intermixed with tan oak (*Lithocarpus densiflorus*), California bay (*Umbellularia californica*), California buckeye (*Aesculus californica*), and madrone (*Arbutus menziesii*). Mixed evergreen forest, characterized by Douglas fir (*Pseudotsuga menziesii*), California bay, coast live oak and tan oak also occurs along the northwestern tributaries to Moore Creek. At the lower southern reach of Moore Creek is Central Coast riparian scrub, which is predominantly a thicket of arroyo willow (*Salix lasiolepis*).

Moore Creek serves as an important wildlife corridor. It also provides potential nesting habitat for several sensitive bird species, including American kestrel (*Falco sparverius*) and Vaux's swift (*Chaetura vauxi*). Great blue heron (*Ardea herodias*) have been observed at Moore Creek Preserve, however, no nesting colonies have been identified.

MOORE CREEK

MANAGEMENT ACTIONS

- ◆ Install and maintain fencing to keep cattle from impacting riparian vegetation.
- ◆ Minimize visitor impacts to the riparian vegetation by monitoring any creek crossing and encouraging users to stay on trail.
- ◆ Install a pedestrian crossing at Moore Creek to minimize impacts to riparian habitat.



WILDER CREEK CANYON

Wilder Creek canyon is comprised of the eastern branch of Wilder Creek and coyote brush scrub plant communities. The east branch of Wilder Creek is a seasonal stream, confined to a relatively narrow channel. Coyote brush scrub occurs along the canyons. This plant community is dominated by coyote brush (*Baccharis pilularis*), California blackberry (*Rubus ursinus*), and poison oak (*Toxicodendron diversilobum*). Freshwater seeps are also found at the head of the creek. Within this relatively large seep area, water is at the surface or very near the surface during the rainy season. Rush (*Juncus phaeocephalus*) and sedge (*Carex stipitata*) are often found in seep areas.

WILDER CREEK

MANAGEMENT ACTIONS

- ◆ Monitor the creek channel and seeps to ensure cattle grazing and visitors are not causing harmful impacts.
- ◆ Install fencing as needed to avoid damage to seep areas from cattle grazing.

EUCALYPTUS/MONTEREY CYPRESS GROVE

A dense stand of blue gum (*Eucalyptus globulus*) and Monterey cypress (*Cupressus macrocarpa*) occurs in the southeast-ern corner of Moore Creek Preserve. Most likely this stand of trees was originally planted to serve as a windrow. Because of the allelopathic compounds within the eucalyptus litter, understory vegetation is sparse and is limited to non-native grasses. This stand of trees, however, provides over-wintering habitat for monarch butterflies and nesting habitat for red-tailed hawks.

EUCALYPTUS/MONTEREY CYPRESS GROVE

MANAGEMENT ACTIONS

- ◆ Monitor grove for over-wintering monarch butterfly.
- ◆ Thin eucalyptus grove (young saplings) as needed to minimize fire hazard to adjacent residential areas and to maintain existing perimeter.

2.4 SPECIAL STATUS SPECIES RESOURCE MANAGEMENT

OHLONE TIGER BEETLE HABITAT

Ohlone tiger beetle (*Cicindela ohlone*), found only in remnant stands of coastal prairie in the Santa Cruz region, has been identified at three locations within Moore Creek Preserve. The U. S. Fish and Wildlife Service has published the proposed rule to list the Ohlone tiger beetle as endangered, but as of May 2001 no final action had been taken regarding the listing.

The Moore Creek Preserve Ohlone tiger beetle population is one of five known populations within Santa Cruz County. Habitat consists of open native grassland with shallow, poorly drained clay or sandy clay soils. At Moore Creek Preserve the observed locations occur along unpaved roads which were historically used as part of cattle operations. This unique beetle has adapted to these open areas within and adjacent to coastal prairie for hunting and to thermo-regulate.

Ohlone tiger beetles are distinguished from other local beetles by their bright green coloring and metallic colors highlighted by stripes and spots. Adults are approximately one-half inch in length. Female tiger beetles excavate burrows in the soil to deposit their eggs. After the larva emerges from the egg, it enlarges the hole turning it into a burrow. Larvae lunge from these burrows to seize insect prey. When the larva transforms into an adult, it emerges from the burrow. Surveys to determine the presence of Ohlone tiger beetle are conducted during the spring when adults have emerged from the burrows and are active.

Threats to Ohlone tiger beetles include invasive non-native vegetation, over-collection, pesticides, and vulnerability to extinction from random natural events such as flood, drought, disease or fire. At Moore Creek Preserve, management actions are needed to ensure non-native vegetation does not overtake habitat areas. Recreational activities may also impact beetle habitat depending on the intensity, type, and seasonality of recreational uses. Recreational use in habitat areas must also be carefully monitored to ensure the habitat is not disturbed.

OHLONE TIGER BEETLE

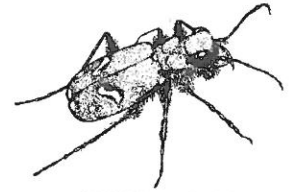
MANAGEMENT ACTIONS

- ◆ Conduct annual surveys and research (approximately mid-February through April). A qualified biologist shall conduct surveys.
- ◆ Prohibit use of pesticides in beetle habitat areas.
- ◆ Prohibit collection of Ohlone tiger beetles unless authorized by U. S. Fish and Wildlife Service for research purposes.
- ◆ Monitor trails and service road use to ensure habitat is not damaged. Ensure any erosion control measures along service roads or trails do not disrupt beetle habitat.
- ◆ Monitor vegetation cover in Ohlone tiger beetle habitat areas to ensure adequate bare ground exists.
- ◆ Conduct annual spring mowing along trails and roads where Ohlone tiger beetles have been observed.
- ◆ Conduct non-native vegetation removal (e.g. light scraping) in habitat areas as needed. Consult with the U.S. Fish and Wildlife Service and a qualified biologist prior to implementing any action in beetle habitat.

SAN FRANCISCO POPCORNFLOWER HABITAT

The San Francisco popcornflower (*Plagiobothrys diffuses*) is the only special status plant species documented on Moore Creek Preserve to date. It is listed as endangered by the State of California and as a species of special concern by the federal government. This short-stature, white-colored wildflower blooms from March through May. It is associated with poorly drained, coastal prairie habitat.

Thought to be extinct since 1965, the San Francisco popcornflower was identified in northern Santa Cruz County in 1977. A total of seven populations have been documented since that time. The Moore Creek Preserve population was first discovered in 1989. The 1989 survey documented approximately 1,000 individuals in the upper terrace meadow near the western boundary. Additional patches were discovered in 1997 in the meadow near the Meder Street entrance.



OHLONE TIGER BEETLE
CICINDELA OHLONE

Recent surveys conducted in spring 2000 identified approximately 1,900 plants in patches in the meadow near Meder Street. Two patches, with approximately 200 plants in each patch, were also identified in the upper terrace meadow area along the western boundary.

SAN FRANCISCO POPCORNFLOWER

MANAGEMENT ACTIONS

- ◆ Conduct annual surveys (approximately March through May). A qualified botanist shall conduct surveys.
- ◆ Continue grazing in popcornflower habitat areas.

CALIFORNIA RED-LEGGED FROG HABITAT

Moore Creek provides habitat for the California red-legged frog (*Rana aurora draytonii*), which is listed as threatened by the federal government and as a species of special concern by the State of California. Moore Creek Preserve is not designated as critical habitat by the U. S. Fish and Wildlife Service.

Red-legged frogs are principally an aquatic species, although they may also be found temporarily in upland areas during the rainy season. Typically red-legged frogs are found along streams and in wetland habitats. Breeding habitats generally include natural and artificial ponds and reservoirs, marshes and freshwater coastal lagoons (Bulger, 1999).

A survey for red-legged frogs was conducted along Moore Creek in 1999 (Bulger). Two juvenile red-legged frogs were identified. This survey finding, however, does not provide definitive information on the abundance of red-legged frogs. Red-legged frogs typically are well concealed under dense vegetation during the daylight hours when the survey was conducted. It is likely that Moore Creek provides summer habitat for a much greater number of individuals. No tadpoles were seen, though this is not unexpected since it is unlikely that red-legged frogs are breeding in the stream.

Based on the qualitative evaluation of the Moore Creek habitat for red-legged frogs conducted during the 1999 survey, juvenile red-legged frogs could occur at any location along Moore Creek. Adult frogs would more likely be found in deeper pools. Wilder Creek may also provide habitat; however, it was not in-

cluded in the 1999 survey.

In summary, Moore Creek Preserve provides the following habitat values for red-legged frogs: 1) rearing habitat for juveniles produced at nearby ponds (UCSC Arboretum and to the west of the Preserve); 2) dry season (summer) refuge for adults; and 3) facilitates local dispersal during drier periods of the year (Bulger, 1999). Continued protection of the stream corridor in a relatively natural state will ensure these habitat values are maintained.

CALIFORNIA RED-LEGGED FROG

MANAGEMENT ACTIONS

- ◆ Conduct annual surveys. A qualified biologist shall conduct surveys.
- ◆ Maintain fencing at access to stream corridors to prevent damage from cattle grazing.

2.5 GENERAL RESOURCE MANAGEMENT

These general Resource Management Actions are applicable throughout Moore Creek Preserve.

GENERAL RESOURCE

MANAGEMENT ACTIONS

- ◆ Remove trash and inorganic debris during periodic clean-ups and in response to reports of illegal camping or dumping.
- ◆ Retain dead and downed trees, snags and limbs in-situ for habitat. Remove only if the situation will result in a public safety hazard.
- ◆ Prevent the further spread of invasive non-native species and actively remove non-native vegetation.
- ◆ Close informal pathways as needed.
- ◆ Discourage use of chemical treatments for vegetation management whenever possible. Treatment shall be in accordance with the City's Integrated Pest Management (IPM) Policy.

3

HYDROLOGY AND EROSION CONTROL

Most of the Moore Creek Preserve property is located within the Moore Creek watershed, the least disturbed drainage basin within the City of Santa Cruz. The southwestern area of the Preserve lies within the Wilder Creek watershed, which is also largely undeveloped. The health of Moore Creek, Wilder Creek, and habitat along the creek corridors is dependent on management practices throughout these watersheds.

Moore Creek Canyon is protected under a conservation easement held by the State of California (refer to Section 1.4). The Land Trust of Santa Cruz County has management responsibility for this easement, in accordance with an agreement with the State. Wilder Creek canyon is protected under a separate conservation easement, which also includes the remainder of the upland area. The Land Trust does not have management responsibility for Wilder Canyon.

Watershed management is important to the City, the Land Trust, and the State. Careful management will ensure the creeks remain healthy, and have cool, clear water free of contaminants and stable stream banks with minimal erosion. In contrast, problems occur when there are excessive sediments, algae, and contamination from animal waste or other toxics.

Erosion problems can include collapsed and trampled banks that result in excessive sedimentation. This excess sediment can impede stream flow, fill pools, and cover the creek bottom with

sediment. Improperly constructed trails and roads and unvegetated slopes can also lead to accelerated erosion rates and sedimentation problems. Excessive sedimentation and other water quality problems can diminish fish, amphibian and insect populations within the creek, as well as harming downstream resources.

This element of the Interim Management Plan provides a brief overview of Moore Creek and Wilder Creek (eastern branch). This section focuses on hydrology and erosion issues. General erosion control measures and specific management actions are included in the final section of this chapter. A discussion of riparian habitats along the creek corridor is presented in the Natural Resources Element (Chapter 2).

3.1 MOORE CREEK

Moore Creek's headwaters are located on the University of California Santa Cruz campus lands to the north of Moore Creek Preserve. The creek is fed by both surface and subsurface drainage. Moore Creek has two main tributaries, the west and east branches. The west branch, which flows intermittently, is located within Moore Creek Preserve. Moore Creek's eastern branch is located beyond the Preserve's boundary to the east. The branches come together approximately 1,000 feet north of Highway 1. The main branch of Moore Creek continues along the eastern property line and crosses under Highway 1 through a box culvert.





To the south of the Preserve, Moore Creek flows through Antonelli Pond. Owned by the Land Trust of Santa Cruz County, Antonelli Pond is an artificial fresh water pond dating back to the early 1900s. It was constructed when Moore Creek was dammed to create a holding basin for logs. From Antonelli Pond, Moore Creek flows through Natural Bridges State Park and a coastal lagoon to Monterey Bay.

Within the Preserve, the west branch of Moore Creek flows relatively undisturbed through a steep-sided canyon. This canyon, ranging from 140 to 160 feet deep, was incised over time by creek flow across the coastal terraces. The canyon slopes are very steep, from 30 per cent gradient to nearly sheer vertical walls. These steep slopes are largely composed of highly erosive soils.

In the northwestern area of the Preserve, a tributary canyon feeds into this west branch canyon. Due to existing property boundaries, the tributary canyon and main canyon create an isolated upland mesa between them. There is no direct vehicle access from within the Preserve boundaries because of the steep canyons. Another isolated mesa exists along the eastern boundary of the Preserve; however, it is accessible from the Meder Street entrance.

Characteristic features of Moore Creek were identified during a survey conducted for red-legged frog habitat (Bulger 1999). Based on this survey, three reaches with varying characteristics were identified. In the northern reach of Moore Creek, the creek bottom is comprised of bedrock, small boulders, cobbles, and moderate to low levels of fine sediments in pools. Most of the pools are relatively small and shallow. This upper reach can be characterized as a pool-riffle type channel. The middle reach of Moore Creek is located within the adjacent privately owned property, previously known as the Kinzli greenbelt land. This section of the creek is characterized by relatively level stretches with intervening drops into plunge pools. At the southernmost reach of Moore Creek within the Preserve, the streambed is very level with a silt/sand/gravel bottom. Pools are relatively shallow.

MOORE CREEK EROSION CONTROL MANAGEMENT ACTIONS

- ◆ Restrict cattle from grazing within Moore Creek. Install and maintain fencing as needed.
- ◆ Minimize disturbances to steep slopes along Moore Creek corridor.
- ◆ Re-route the existing trail across Moore Creek (near water line) and construct a bridge to reduce erosion impacts. To the extent feasible, trail alignment should be designed so the gradient is less than 12 per cent.
- ◆ Existing informal and unauthorized trails on steep slopes should be obliterated to encourage pedestrian use of maintained trails.

Because Moore Creek corridor within the Preserve is undeveloped and relatively undisturbed, the creek health is relatively good. In the upper reaches, the stream banks are relatively stable and the corridor has been minimally impacted by human intrusion, although there are some informal trails across the steep slopes. At the downstream end of the upper reach, the streambed has been trampled from a cattle crossing. While cattle grazing can have a beneficial effect on coastal prairie habitat, grazing and trampling within creek corridors can be detrimental to habitat and result in accelerated erosion. Measures such as fencing are necessary to keep cattle out of these sensitive areas. In the southernmost reach, illegal camping and dumping have been reported.

Water quality data for the west branch of Moore Creek is not currently available. A sampling and water quality monitoring program has been established at Antonelli Pond. The Coastal Watershed Council, a local non-profit organization, is conducting monitoring for the Land Trust. In the future, the City and the Land Trust may cooperate with the Coastal Watershed Council to gather water quality data for Moore Creek Preserve. Although Moore Creek corridor has been minimally disturbed compared to most creek corridors with the City of Santa Cruz, management actions are needed to ensure the creek remains healthy and any existing erosion does not worsen.

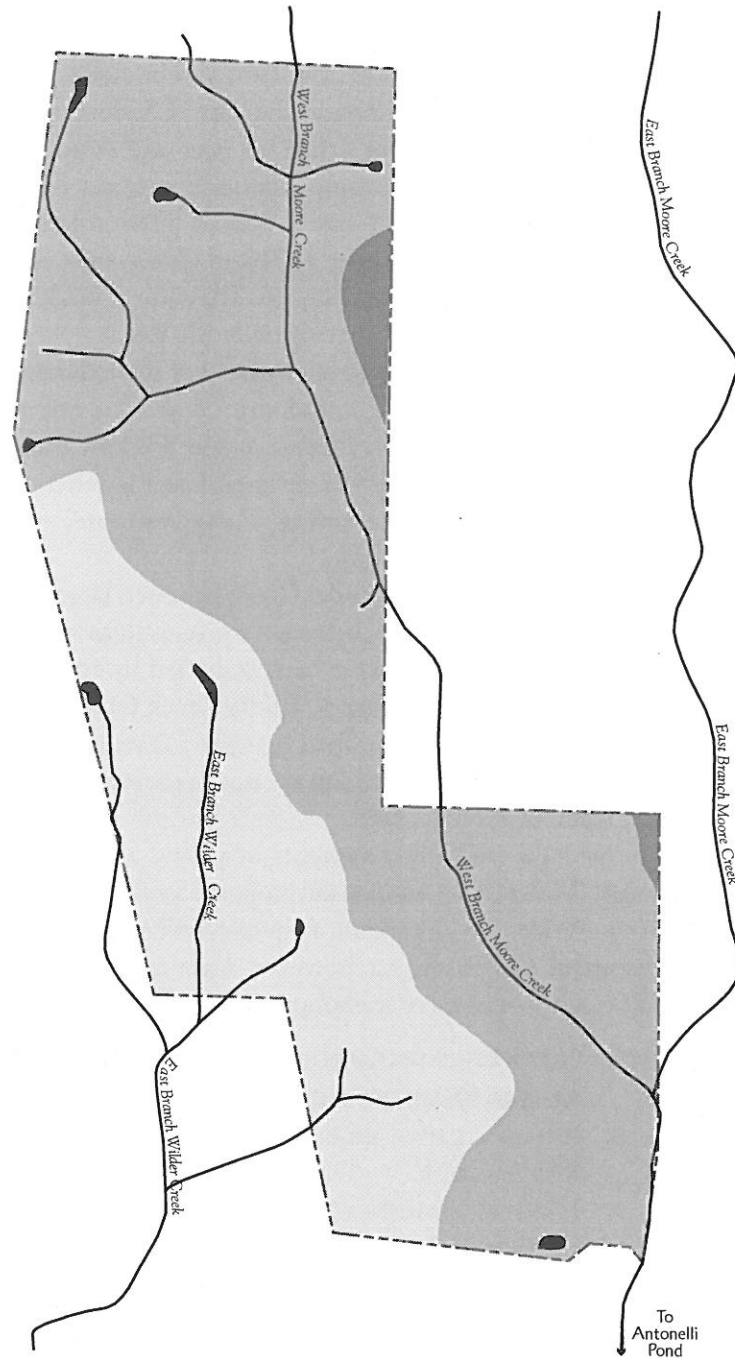
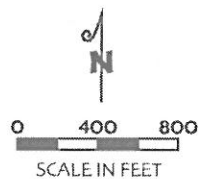
Figure 5

MOORE CREEK PRESERVE

HYDROLOGY

Source: Environmental Science Associates, 1998

- CREEK
- SEEPS
- WESTERLY WATERSHED
- WEST BRANCH MOORE CREEK WATERSHED
- EAST BRANCH MOORE CREEK WATERSHED



3.3 EROSION CONTROL IN UPLANDS

Upland areas, in addition to the canyons, require careful management and erosion control measures. While much of the grassland area in the Moore Creek uplands is stable, erosion problems in need of remediation do exist. Specific problems include: head-cutting and bank collapse at the head of some tributary canyons; accelerated erosion due to improperly designed roads and unauthorized trails; runoff from adjacent properties; and cattle trampling near seep areas.

Headcutting and accelerated erosion at the tributary canyon near the Meder Street entrance is particularly severe. The headcut is primarily a result of the existing unpaved service road, which collects and concentrates runoff to the gully area during high intensity rainfall. Under natural conditions, runoff would be dissipated in sheet flow across the vegetated swale. Runoff from adjacent properties has also contributed to gullying across the road-way. Erosion control specialists have recommended relocating a section of the roadway and restoring the roadbed to a more natural condition (Zembsch, 2001). Any relocation of the roadbed or grading must be carefully analyzed for potential impacts to sensitive species in the area (San Francisco popcornflower and Ohlone tiger beetle). A more detailed discussion of the service road relocation is included in Chapter 4.

Erosion problems have also occurred at some of the tributary canyons in the northwestern area of the Preserve and at the head of the east branch of Wilder Creek. Erosion in these areas is primarily a result of cattle trampling during the rainy season. Restricting cattle grazing in these areas during the wettest months and installing fencing as needed will decrease erosion and enable re-vegetation of bare soils.

Erosion can be minimized along the existing service roads by installing drainage dips and water bars as needed. In some locations along the existing service road, in the wettest months there is standing water due to the high groundwater levels. Restricting motor vehicle access on service roads during the wettest months minimizes gullying and rutting within the roadbed. In these low-lying wet areas, new trail segments are needed-

3.2 WILDER CREEK (EAST BRANCH)

Most of the Wilder Creek watershed is located to the west of Moore Creek Preserve, beyond the City of Santa Cruz limits. The main branch of Wilder Creek is a perennial stream, which ultimately empties into Younger Lagoon. The upper portion of the east branch of Wilder Creek is located in the southwestern corner of the Preserve. Similar to Moore Creek, over time the flow of water has incised deep canyons. The eastern Wilder Creek canyon reaches a depth of approximately 100 feet.

Freshwater seeps occur at the head of the tributary canyons to both Wilder Creek and Moore Creek. One of the largest seeps on the Preserve is located at the Wilder Creek (east branch) canyon. Within these seep areas, water is either present year-round or very near the surface. These freshwater seeps are considered potential wetlands.

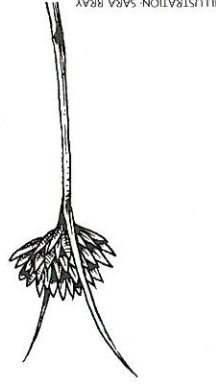
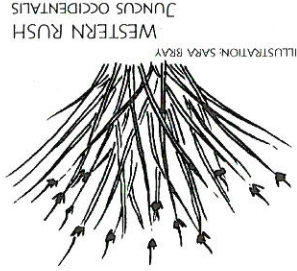
The east branch of Wilder Creek has been largely undisturbed by human intrusion, however, the seep areas at the head of the tributary canyons have been trampled by cattle in the past. Because this upper area of Wilder Creek (east branch) is not directly accessible from the Highway 1 corridor, problems of illegal camping and dumping are not as prevalent as on the lower reach of Moore Creek.

No new trail improvements or public access along or through Wilder Creek canyon are proposed for this Interim Plan process. Wilder Creek canyon, therefore, will remain minimally disturbed. Cattle grazing, however, if not carefully managed could result in excessive trampling and erosion problems.

WILDER CREEK EROSION CONTROL

MANAGEMENT ACTIONS

- ◆ Restrict cattle grazing from the east branch of Wilder Creek.
- ◆ Minimize disturbances to steep slopes along Wilder Creek corridor.



ed to allow for pedestrian trail access year-round. Trail realignments are presented in Chapter 4.

UPLAND EROSION CONTROL

MANAGEMENT ACTIONS

- ◆ Restrict cattle grazing from eroded gullies at tributaries.
- ◆ Realign trail segments in low-lying, wet areas to minimize damage and trampling during the wet season (refer to Chapter 4).
- ◆ Install erosion control features, such as drainage dips and water bars, on service roads as recommended by an erosion control specialist. Consult with a biotic specialist prior to disrupting the roadbed within Ohlone tiger beetle habitat areas.
- ◆ Restrict use of motorized vehicles during wet conditions. Vehicle access during wettest months should be limited to emergencies only.
- ◆ Minimize soil disturbances on steep slopes.
- ◆ Avoid bare, exposed soil in easily eroded areas during the wet season when conducting non-native species removal and other vegetation management actions.
- ◆ Monitor gully erosion. In cases of accelerated gully erosion, contract with an erosion control specialist to implement appropriate measures. If gully is located within a sensitive habitat area, ensure proposed erosion control measures are reviewed by a qualified botanist/biologist and the appropriate agency (U.S. Fish and Wildlife Service or California Department of Fish and Game).



4

TRAILS

Existing trails and service roads at Moore Creek Preserve are largely the result of cattle grazing operations that have occurred on the property over the past decades. This Interim Plan focuses on improving and enhancing the existing system to continue to serve cattle grazing and to provide public access to the Preserve. Under this Preliminary Draft Interim Plan, it is proposed that public access be limited to pedestrian use only (dogs prohibited) in order to minimize environmental impacts in this interim period. The future long-term Master Plan process is the appropriate time to explore an expansion of the trail network and consideration of other trail uses. Limiting of trail uses during this interim period does not preclude any future uses, nor should this Interim Plan be interpreted as a guide for future long-term uses or policies.

4.1 EXISTING ROADS AND TRAILS

Several unimproved roads presently exist within Moore Creek Preserve. Most of these roads appear to have been established as part of prior cattle grazing operations. With the exception of the lower segment of the access road near the Highway 1 entrance gate, these roads are unpaved.

The primary road provides access from the Highway 1 entrance. The paved segment parallels Highway 1 and then turns northward up the coastal terrace. The first section of this road is relatively steep and has no drainage control features. Continuing through the grasslands, the road ends at a gate along the western boundary.

Another roadbed, less utilized, continues northward from the gate along the western boundary until it ends at a tributary canyon. There is no vehicle access to the grasslands in the north central portion of the Preserve due to the tributary canyons.

In the southern and central grasslands, there is evidence of prior vehicle use on several short spur roads. These roadbeds are less developed. A loop road encircles the central grassland area and another access road leads down to Moore Creek in the vicinity of the City water lines, which cross the property east west.

From the Meder Street entrance, an unimproved road provides access to the north property line. At one time, this road was relatively well traveled, providing access to a horse corral. This road provides vehicle access to the meadow area along Meder Street only. There is no vehicle access from Meder Street to the west portion of the property. A segment of the road is resulting in accelerated erosion and headcutting at a tributary canyon (refer to Section 3.3). Realignment of this segment is recommended to reduce further headcutting.

Minimal use of these roads since the City's acquisition has resulted in denser vegetation cover on roadbeds and decreased rutting. While this is beneficial in terms of erosion control, an increase of dense non-native grasses along roadways within Ohlone tiger beetle habitat areas can result in a loss of suitable habitat. Section 2.4, Natural Resources Chapter, includes management actions that may need to be undertaken within roadway areas.



in the Preserve and problems of enforcing leash laws. There is currently limited enforcement available to enforce leash laws. Problems with leash law compliance in other natural areas and green-belt properties indicate that many dogs would be off-leash if dogs were permitted at Moore Creek Preserve.

Motorized vehicles would be authorized on service roads only. Vehicle use would be limited to resource management including grazing operations, park patrols and emergencies. Vehicle use would be restricted during the wet season to minimize erosion and rutting in roadbeds.

Long-term trail use within the Preserve will be explored as part of a future Master Plan process. This document does not establish or preclude any future trail uses.

4.3 ROAD AND TRAIL ALIGNMENTS AND IMPROVEMENTS

This section describes the service roads and trails that would comprise the Moore Creek Preserve trail system until a long-term Master Plan is completed. This system totals approximately two and one-half miles. Existing roads and pathways have been utilized to the maximum extent feasible. Realignment of some segments is recommended in cases where there are erosion problems or trail routes are negatively impacting sensitive habitat areas. Service roads are routes that serve as pedestrian trails but are also maintained for vehicle access. All of the service roads are located within grassland areas, therefore maintenance for vehicle access is limited to mowing to reduce grass cover and erosion control measures. Because the roads are unpaved and many areas are saturated during the wettest months, vehicle access on these roads is restricted during the rainy season to avoid rutting and accelerated erosion.

Pedestrian trails are maintained as narrow footpaths and do not provide for vehicle access. Trail maintenance includes clearing the trail bed, approximately 18 to 24 inches in width, and brushing along the trails. Erosion control measures, such as drainage dips, are also necessary to minimize erosion.

Similar to the service roads, existing trails appear to be primarily a result of cattle grazing operations. Most existing trails are informal and unimproved; many of them are cattle paths. One relatively well-established trail route crosses Moore Creek Canyon, connecting the Meder Street meadow area to the large central meadow to the west. The existing pathway across Moore Creek is steep in several sections and has no drainage control features. The creek crossing is in the vicinity of the City waterline.

Several unauthorized trails also exist in the southeastern area of the Preserve, near the terminus of Grandview Street. These trails are not the result of cattle grazing; instead, they appear to be used to access illegal camping and dumping sites.

4.2 TRAIL USE

Historically, most trails and service roads have been used as cattle paths. When a horse corral existed several years ago, there was also some equestrian use through the property. Since the City's acquisition of the property in 1998, the Preserve has been closed to general public access. Guided nature hikes, however, are sponsored by the City's Natural History Museum each spring.

The intent of this Interim Plan is primarily to address management and maintenance of existing facilities and resources rather than determining long-term uses for the property. During this interim period, it is recommended that trail use be limited to pedestrians only to minimize environmental impacts and the need for significant trail improvements at this time.

Horses and bicycles are not recommended at this interim phase. Establishing multi-use trails is not recommended as an interim policy due to the need for a higher level of trail improvement and a greater level of environmental impact from users overall. Also, because adjacent properties are in private ownership, there are currently no regional multi-use trail connections opportunities. Trails within the Preserve itself are relatively short in length. There are also no staging facilities on site or nearby for equestrians.

Dogs are also not recommended to be allowed in the interim period because of the many sensitive habitats and species with-



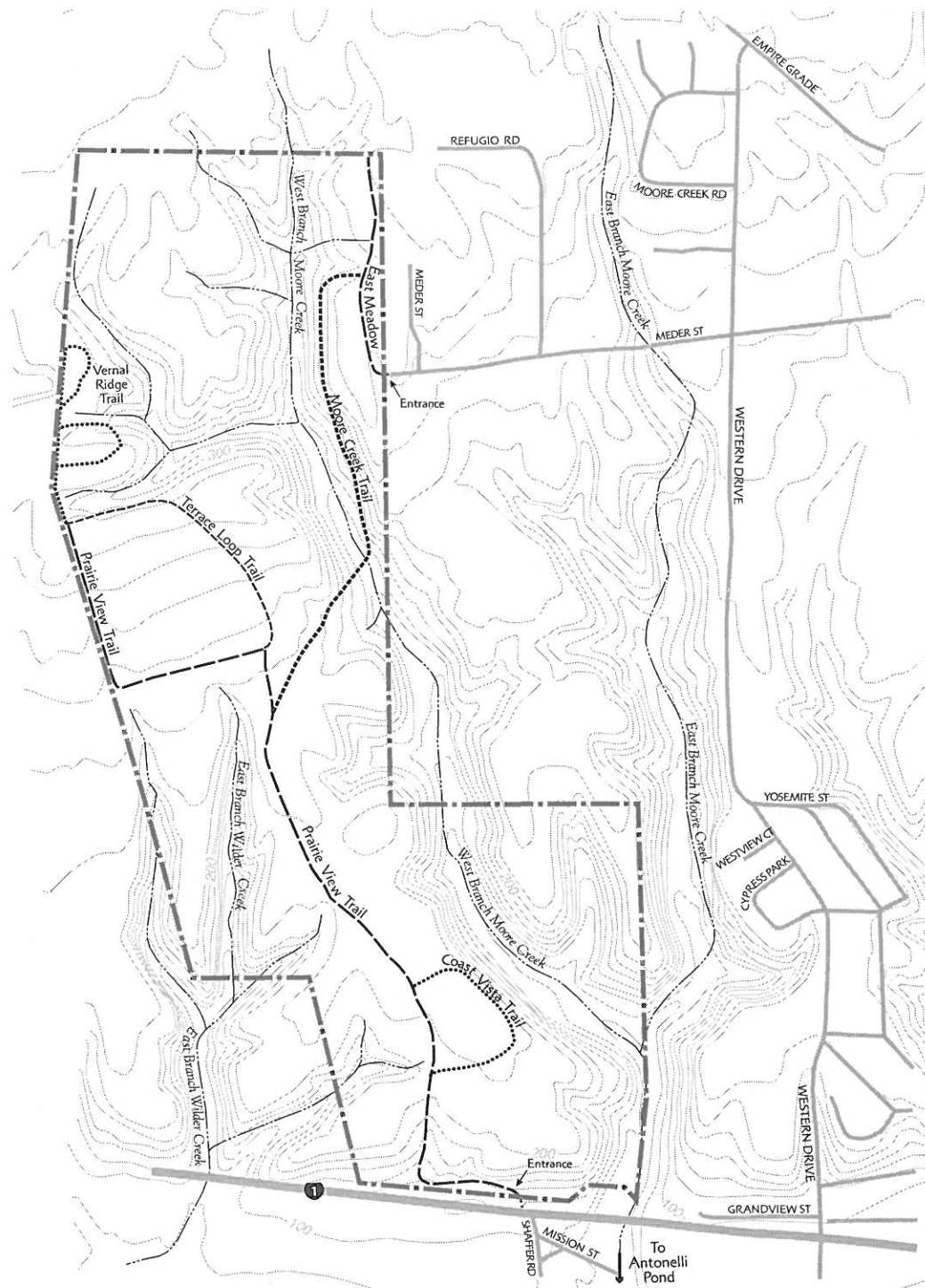
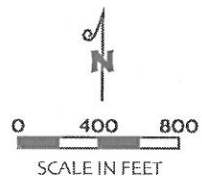
MOORE CREEK PRESERVE

EXISTING TRAILS & PROPOSED IMPROVEMENTS

HIKING ONLY ON ALL TRAILS.
DOGS, EQUESTRIAN AND BICYCLE USE
NOT ALLOWED WITHIN THE PRESERVE

LEGEND

- EXISTING TRAIL
- EXISTING SERVICE ROAD
- PROPOSED NEW TRAIL
- PROPOSED REALIGNMENT



SERVICE ROADS

PRAIRIE VIEW TRAIL (1.1 MILE)

Prairie View Trail begins at the Highway 1 entrance gate to the Preserve. A paved section of the road parallels Highway 1 for approximately 600 feet; this section may have once been a segment of the coast highway. The trail then climbs up the lower marine terrace and continues northward up the gently sloping rise through the central grassland. In the northern segment, the trail parallels the western property line.

Named for the expansive views of the Preserve's prairies, the entire trail is located within grasslands. Some segments of the trail pass through Ohlone tiger beetle habitat. Tiger beetle management actions apply to segments of the trail (refer to Section 2.4). Any trail maintenance must be closely coordinated with the City's Resource Ecologist or the City's designated biotic specialist. In the central grassland area, standing water is not uncommon in the roadbed during the wettest months. Restricting vehicle access during the rainy season will avoid rutting of the roadbed, however, it does not address pedestrian use. A new trail segment, a narrow footpath, should be established to the east paralleling the road route in this wet area. This new trail segment must be aligned to avoid impacts to the nearby mima mounds.

EAST MEADOW TRAIL (0.3 MILE)

The East Meadow Trail is an existing unpaved road beginning at the Meder Street entrance, on the east side of Preserve. This short road segment connects to the northern property line. There is no vehicle access to the western portion of the Preserve because of the steep terrain of Moore Creek canyon. The East Meadow Trail does connect to Moore Creek Trail, which provides pedestrian access to the western Preserve. Located within coastal terrace prairie habitat, the road passes through sensitive habitat areas for Ohlone tiger beetle and San Francisco popcornflower (refer to Section 2.4). Tiger beetle and popcornflower management actions apply to segments of the trail (refer to Section 2.4). Any trail maintenance or realignment must be closely coordinated with the City's Resource Ecologist or the City's designated biotic specialist.

TRAILS

MOORE CREEK TRAIL (0.5 MILE)

The existing road alignment is poorly designed and has resulted in accelerated erosion at a tributary canyon to Moore Creek. Head-cutting and bank failure has continued to worsen. Realignment of a segment of the road adjacent to the gully area would address this problem. The roadbed should be located further to the east, closer to the property line. The old roadbed should then be reconfigured to a more natural condition, a vegetated drainage swale. Because this road segment lies within potential Ohlone tiger beetle habitat, the road realignment must be designed to avoid impacts to the beetle.

Moore Creek Trail provides the only east-west connection within the Preserve. The steep slopes of Moore Creek Canyon limit trail opportunities to this corridor. Moore Creek Trail connects the East Meadow Trail to Prairie View Trail. The trail passes through grassland, coast live oak forest, and riparian habitat. The trail route generally follows an existing pathway. Some trail segments should be realigned because they are not properly designed and are excessively steep. Segments proposed for realignment include the connection from East Meadow Trail, sections along the upper canyon slope on the east side, and the segment in the vicinity of the creek crossing. On the west side of the creek, the trail is very steep and should be re-routed such that the gradient does not exceed approximately 12 per cent. A bridge crossing is also needed at Moore Creek.

COAST VISTA TRAIL (0.3 MILE)

Coast Vista Trail is a small loop trail that provides coastal views from the lower terrace. It provides an opportunity for trail users who do not wish to hike to the upper terrace to experience the views of open meadows and the Monterey Bay. Designating a formal trail in this area will also discourage the creation of numerous informal footpaths along the meadow. The trail is located within primarily non-native grassland, although there are small areas of high diversity coastal terrace prairie on the lower terrace. No sensitive species have been identified along the trail route.



TERRACE LOOP TRAIL (0.4 MILE)

Terrace Loop Trail allows trail users to encircle the upper terrace meadow area. This trail offers dramatic views of the Preserve's prairies, canyons, and the Monterey Bay Sanctuary.

The trail is located within coastal terrace prairie habitat. San Francisco popcornflower has been identified along the western segment of the trail. Popcornflower management actions apply to this trail corridor (refer to Section 2.4). Although vehicles have used this trail in the past, it is not recommended as a service road because of the sensitive plant species.

VERNAL RIDGE TRAIL (0.3 MILE)

Vernal Ridge Trail provides hiking access to a vernal pool and wildflower field, located to the north of Prairie View Trail. Existing cattle paths and vehicle use along the eastern fence line has created a series of parallel paths in this area. The proposed new trail would focus on improving one narrow footpath along the property line with a meandering trail extending into the meadow area.

The trail alignment would be designed to avoid impacts to the vernal pools and wildflower fields, while providing pedestrian access to this isolated area. Although there is evidence of prior vehicle use along the property line, this trail is not recommended as a service road because of the sensitive resources in the area.

4.4 TRAIL MANAGEMENT AND GUIDELINES

This section outlines trail design guidelines and management actions. Although much of the proposed trail system exists, trail design guidelines are needed to guide future maintenance and the proposed realignment of some trail segments.

TRAIL

DESIGN GUIDELINES

- ◆ Ensure that trails that also serve as service roads are maintained to a minimum of ten feet in width for patrol and emergency vehicle access. Maintenance primarily entails an annual mowing along the service road route and installation/maintenance of drainage dips or waterbars where needed.

- ◆ Construct pedestrian trails to be from two to four feet in width. Where the trail bed is less than four feet wide, conduct annual mowing and brushing along trail bed so there is a total clearance of four feet.
- ◆ Realign existing trail segments and construct new trails to avoid wet meadows and seeps (Prairie View Trail, Vernal Ridge Trail).
- ◆ Ensure any trail realignment in Ohlone tiger beetle habitat areas is reviewed by a qualified biologist prior to construction (Prairie View and East Meadow Trails).
- ◆ Install a bridge crossing at Moore Creek (Moore Creek Trail).
- ◆ Reroute existing trail segments that are excessively steep within Moore Creek Canyon (Moore Creek Trail). Where feasible, construct new trail with a gradient not exceeding twelve per cent.
- ◆ Provide drainage improvements on trail routes, to include drainage dips and water bars as recommended by technical specialists. The Parks and Recreation Department will coordinate with erosion control specialists to design site-specific solutions.
- ◆ Provide kiosks at the Highway 1 and Meder Street entrances. At kiosks, include trail system maps, regulations, safety information, and interpretive displays.
- ◆ Develop and implement a coordinated trail sign program to ensure signs are easy to read, consistent in design and message, and do not detract from the visual quality of Moore Creek Preserve. Post trail identification at intersections of all trails. Wooden posts will be six inches by



six inches with vandal resistant trail information. Trail signs will include the name of the trail, distance to intersecting trails, and trail use permitted.

TRAIL

MANAGEMENT ACTIONS

- ◆ Conduct annual maintenance, including trail mowing, brushing, and erosion control repairs.
- ◆ Conduct Park Ranger patrols to ensure appropriate trail use and enforce regulations.
- ◆ Monitor impacts of trails near sensitive species. Refer

- ◆ Ensure a qualified biologist reviews maintenance actions in Ochlone tiger beetle habitat areas prior to implementation (Prairie View and East Meadow Trails).
- ◆ Utilize various techniques to discourage use of non-designated paths. Techniques may include planting native vegetation, installing logs or other natural debris to cover pathway, posting signs indicating area is closed, or fencing to discourage use.

5

GRAZING

5.1 CATTLE GRAZING

Cattle grazing has occurred on the Moore Creek Preserve property for decades. Several years before the City's acquisition of the property, cattle grazing was discontinued by the prior owner. After the City's acquisition of the property, grazing was reinstituted once an agreement was completed with a grazing contractor. Under City ownership, the west meadow has been grazed since late summer 1999, while grazing was re-established on the east meadow in fall 2000.

Grazing has been very beneficial for coastal prairie habitat by reducing invasive, non-native weeds that degrade native habitat. Grazing is also effective in reducing fuel loads and wildfire hazard. Specifically, cattle grazing benefits native prairie habitat and minimizes fire risk by:

- ◆ Reducing the height of vegetation throughout meadow areas;
- ◆ Substantially reducing weed biomass;
- ◆ Substantially reducing seed production of non-native weeds; and
- ◆ Creating patchy areas of bare soil (Hayes, 1999).

Reduction of vegetation height and weed biomass is critical to reducing wildfire risk on the Preserve. Without grazing, dead grass (thatch) accumulates and creates a larger amount of biomass, which is fuel for any grassland fire. By keeping grass height lower, grazing also decreases the

chance of a grassland fire carrying up into taller adjacent plants and trees.

The patchy areas of bare soil created through grazing are particularly beneficial to two special status species found at the Preserve—Ohlone tiger beetle and San Francisco popcornflower. Both species require patchy bare soil conditions (refer to Natural Resources Chapter, Section 2.3). Their survival is threatened when non-native, dense grasses out-compete native plants and degrade prairie habitat.

Cattle grazing must be carefully managed so these benefits are maximized, while other potential negative effects such as erosion and loss of riparian habitat do not occur. The Natural Resources Chapter addresses sensitive areas that should be restricted from grazing, primarily Moore Creek and steep canyon walls. Tributary canyons are also not grazed.

5.2 GRAZING MANAGEMENT GUIDELINES

The grazing management guidelines address the number of cattle, timing of grazing, fencing, and placement of supplemental feed and water. These guidelines should be incorporated in a contract agreement with the grazing contractor.

- ◆ Not more than approximately seventy cows should be grazed on the designated lands through approximately October. The number of cattle will be reduced



- ◆ during the rainy season. During the wettest months, the cattle may need to be removed from the Preserve entirely. The number of cattle shall be determined based on the recommendations of the City's consulting biologist.
- ◆ Fencing shall be maintained to control access of cattle to riparian corridors and other sensitive areas as determined by City. Fencing shall be designed to accommodate wildlife movement to and through riparian corridors. Within the west and east meadows, additional fencing may be installed as needed to encourage grazing in targeted areas.
- ◆ The grazing contractor will be responsible for inspection and repair of fencing needed to contain cattle. The City will periodically inspect the fencing.
- ◆ Water troughs will be provided in locations approved by the City. Salt and mineral blocks shall be placed by the grazing contractor near the water trough. Salt and mineral blocks should be placed in areas of tall rescue infestation wherever possible.
- ◆ The grazing contractor will provide supplemental feed at a location mutually agreed on by the contractor and the City.
- ◆ The grazing contractor shall not conduct any activities on the Preserve that would be incompatible with habitat conservation objectives. Prohibited activities shall include, but are not limited to, the establishment of any road; dumping of any objects or materials; use of biocides or other agriculturals; use of vehicles except for the purposes of performance of grazing service; placement of structures, whether temporary or permanent with the exception of water troughs; cutting or burning vegetation; hunting; trapping; bearing firearms; planting of vegetation; leaving animal carcasses or parts; starting or maintaining fires; and disposing of waste.
- ◆ Vehicles and trailers shall remain on established moved service roads to the maximum extent possible. No off-road vehicles shall be used except strictly for range management purposes, and use of such vehicles off-road shall be kept to a minimum. Vehicle access shall be minimized during wet season.
- ◆ As necessary, the City shall provide and install appropriate signs stating "Do Not Disturb/Feed Livestock."
- ◆ Pedestrian entrance gates to the property shall be designed to ensure cattle cannot pass through the gates.
- ◆ Vehicle entrance gates to the property shall remain closed and locked when not in immediate use.

6

MAINTENANCE AND MANAGEMENT

This Chapter addresses management and maintenance responsibilities and staffing for Moore Creek Preserve. Management of Moore Creek Preserve is a cooperative effort between the City of Santa Cruz and the Land Trust of Santa Cruz County. The Land Trust has responsibility for management of the State of California conservation easement along the Moore Creek corridor. As the owner, the City still holds responsibility for the entire property, however, within the Moore Creek canyon area there will be shared management.

Specific management actions and maintenance responsibilities have been included in the preceding chapters. This section addresses management and maintenance from a staffing perspective. Assignment of specific responsibilities between the City and the Land Trust will be addressed in a separate document, subsequent to adoption of this Interim Plan. This future cooperative management agreement will be developed as a service agreement, subject to approval by the City Parks and Recreation Department and the Land Trust.

6.1 MAINTENANCE AND MANAGEMENT RESPONSIBILITIES

Maintenance and management responsibilities for Moore Creek Preserve can be organized under four general

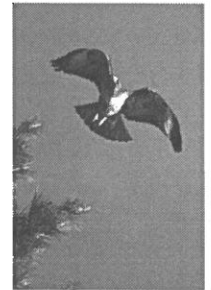
categories: resource management; facility maintenance; law enforcement; and interpretation and education. These areas of responsibility are described in greater detail below.

NATURAL RESOURCE MANAGEMENT

Natural resource management includes monitoring sensitive species, invasive species removal, habitat enhancement, erosion control, grazing operations, and wildland fire management. Because of the sensitive species and habitats within the Preserve and the requirements of the conservation easements, natural resource management is the most critical area of responsibility. Specific management actions related to natural resource management are discussed in Chapter 2 Natural Resources, Chapter 3 Hydrology and Erosion Control, and Chapter 5 Grazing.

FACILITY MAINTENANCE

During the interim phase, facility maintenance at Moore Creek Preserve will primarily involve trails, service roads, signs and fencing. Clean up of refuse and illegal camping debris in the lower end of Moore Creek canyon is also needed periodically. Maintenance guidelines for trails and services roads are presented in Chapter 4.



PATROLS AND LAW ENFORCEMENT

The City's Park Rangers provide security and law enforcement patrols at Moore Creek Preserve. Park Rangers enforce park regulations regarding trail use, illegal camping, and other violations. In addition to the Park Ranger response, the Police Department responds to specific requests for assistance from Park Rangers or the public.

INTERPRETATION AND EDUCATION

Moore Creek Preserve offers many opportunities for interpretation and educational opportunities. The City Natural History Museum has organized public nature walks each spring. Various research and educational projects have also been coordinated through the City's Resource Ecologist. City Park Rangers can provide interpretive services in addition to patrols.

6.2 CITY OPERATIONS STAFFING

Management of Moore Creek Preserve lies within the area of responsibility of the Parks Division of the City of Santa Cruz Parks and Recreation Department. The Parks Division is under the operational supervision of the Superintendent of Parks. Within the Parks Division, various Parks personnel fulfill management and maintenance responsibilities at Moore Creek Preserve. Personnel include the City's Resource Ecologist, Greenbelt Planner, Park Maintenance Workers, and Park Rangers.

The City's Resource Ecologist coordinates monitoring and habitat enhancement activities at Moore Creek Preserve. Often, the Resource Ecologist works with contract and volunteer biotic specialists on both research and survey efforts. The Greenbelt Planner manages planning for the Preserve and implementation of facility improvements, such as new trail construction. Technical assistance, such as that provided by trail contractors and erosion control specialists, will be utilized as needed to implement this Interim Plan. Maintenance and some resource management responsibilities are fulfilled by the Park Maintenance Workers as-

6.3 COOPERATIVE MANAGEMENT AGREEMENT

Park Rangers conduct routine patrols within the Preserve and ensure compliance with park regulations. In the future, Rangers will also be available to educate the public about the Preserve and provide interpretive services.

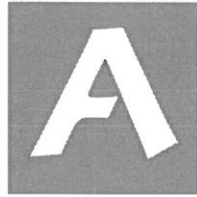
signed to the City's greenbelt properties (Moore Creek Preserve, Pogonip and Arana Gulch). At present, Maintenance Workers conduct primarily clean-up of debris, removal of non-native vegetation, and fence repairs. As trails improvements occur, the Maintenance crew will also provide for maintenance and signs.

A Cooperative Management Agreement between the City of Santa Cruz and the Land Trust of Santa Cruz County will be developed to identify specific management responsibilities within Moore Creek Preserve. The Land Trust holds management responsibilities for the conservation easement held by the State of California that encompasses Moore Creek canyon. The intent of the agreement will be to clarify management and maintenance responsibilities within this easement area.

The management agreement will be developed subsequent to approval of this Interim Plan. The City of Santa Cruz Parks and Recreation Department will prepare the agreement in consultation with the Land Trust of Santa Cruz County and the California Department of Fish and Game.

Implementation of facility improvements, such as trail construction, will be the primary responsibility of the City as the property owner. However, the City will coordinate with the Land Trust regarding funding, maintenance and management of these facilities.

The agreement will address management and maintenance during the interim phase until a long-term management plan is completed. After completion of the long-term plan, it will be necessary to develop a new agreement that reflects the long-term uses.



APPENDIX

CONSERVATION EASEMENT

The language below is excerpted from the conservation easements held by the State of California for the Moore Creek Preserve property.

WHEREAS, the property has scenic, natural and aesthetic value in its present state as a natural area; and

WHEREAS, the Grantor is willing to grant a conservation easement to the State over the property, thereby restricting and limiting the use of the property; and

WHEREAS, the purpose of this Conservation Easement is to ensure the Easement Area will be retained forever in a natural condition and to prevent any use of the Easement Area that will significantly impair or interfere with the conservation values of the Easement Area. Grantor intends that this Conservation Easement will confine the use of the Easement Area to such activities, including without limitation, those involving preservation and enhancement of native species and their habitat in a manner consistent with the habitat conservation purposes of this Easement.

The covenants, conditions and restrictions of the conservation easement are as follows:

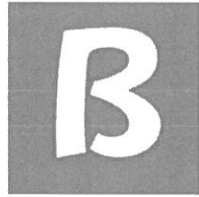
1. No building, billboard, sign (except for interpretive and directional signs), fence (except along the perimeter of the Easement Area or as necessary to control

grazing) or any other structure of any kind, shall be erected in the Easement Area unless such structure is approved by the State of California and is consistent with the conservation purposes of this Easement.

2. There shall be no depositing of soil, trash, ashes, garbage, or waste within the Easement Area. Nor shall any other material be deposited unless such deposit is approved by the State of California as being consistent with the conservation purposes of this Conservation Easement.
3. There shall be no excavation, dredging or removal of loam, gravel, soil, rock, sand or other material, nor any building of roads or other change in general topography of the land, excepting as follows:
 - (a) Improvement to the City's secondary access standards, of the existing roadways running (i) from Meder Street, in a northerly direction, to the northern boundary of the Property; (ii) from Highway One, a portion of which is /may be an improved access to the adjacent property; (iii) of the access easement from the adjacent parcel on Grandview; and maintenance of these roadways and access easement.

- (b) Maintaining existing foot trails or roads, performing erosion control measures, and constructing new foot trails, roads, public restrooms and/or parking spaces with are consistent with the conservation purposes of this Conservation Easement.
4. There shall be no removal, destruction or cutting of trees, shrubs or other vegetation except as may be necessary for (a) fire breaks, (b) construction and maintenance of foot trails and roads, (c) prevention or

- treatment of disease, (d) erosion control, (e) control of non-native species, or (f) good husbandry practices consistent with the conservation purposes of this Conservation Easement.
5. No advertising of any kind or nature shall be located on or within the Easement Area.
6. There shall be no activities, actions or uses within the Easement Area detrimental to water conservation, erosion control, soil conservation or fish and wildlife habitat preservation.



APPENDIX

REFERENCES

- Bulger, John. October 1999. *Results of a Survey for California Red-Legged Frogs on the Moore Creek Preserve, Santa Cruz, California*. Prepared for the Land Trust of Santa Cruz County.
- City of Santa Cruz. 1992. *General Plan and Local Coastal Program*.
- City of Santa Cruz. 1994. *Greenbelt Master Plan - A Planning and Feasibility Study*.
- City of Santa Cruz. 1987. *Moore Creek Corridor Access and Management Plan*.
- Environmental Science Associates. April 1998. *Bombay Project Draft Environmental Impact Report*. Prepared for the City of Santa Cruz.
- Hayes, Grey. July 1999. *Interim Grazing Assessment and Management Plan*. Prepared for the City of Santa Cruz.
- Hayes, Grey. July 2000. *Moore Creek Greenbelt Biotic Surveys (San Francisco popcornflower and Ohlone tiger beetle)*. Prepared for the City of Santa Cruz.
- Zembsch, Steve. 2001. Letter to City of Santa Cruz Parks and Recreation Department dated January 8, 2001 regarding Moore Creek Preserve.



