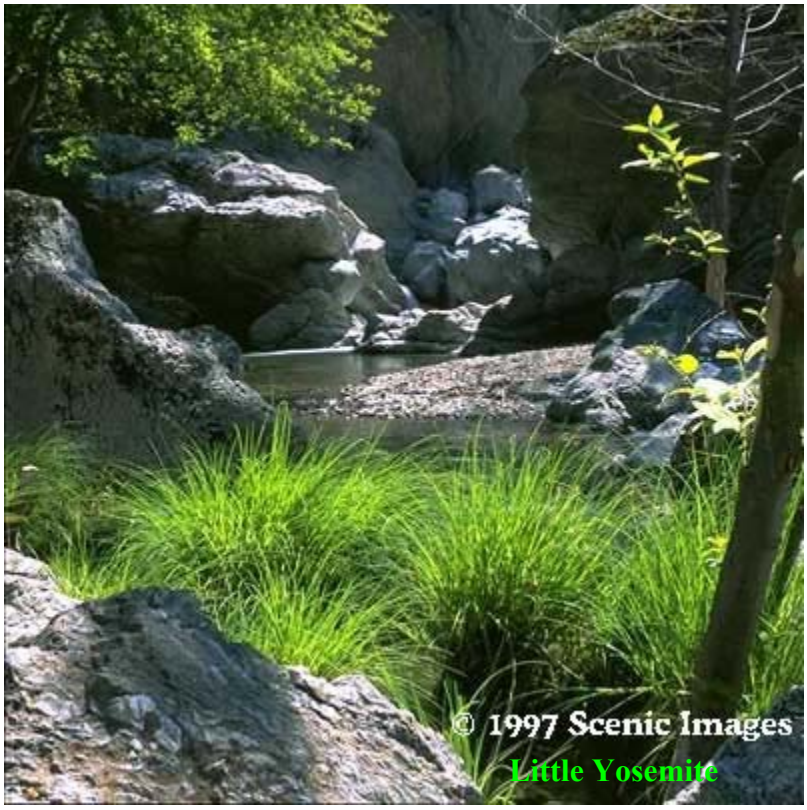
LAND USE PLAN

SUNOL AND OHLONE

WILDERNESS REGIONAL PRESERVES



ALTERNATIVE W

THE WILDERNESS ALTERNATIVE

Proposed by

ALAMEDA CREEK ALLIANCE

CENTER FOR BIOLOGICAL DIVERSITY

LIVERMORE FLYFISHERS

MISSION PEAK FLY ANGLERS

REGIONAL PARKS ASSOCIATION

SOUTHERN ALAMEDA COUNTY GROUP - SIERRA CLUB

August 2003

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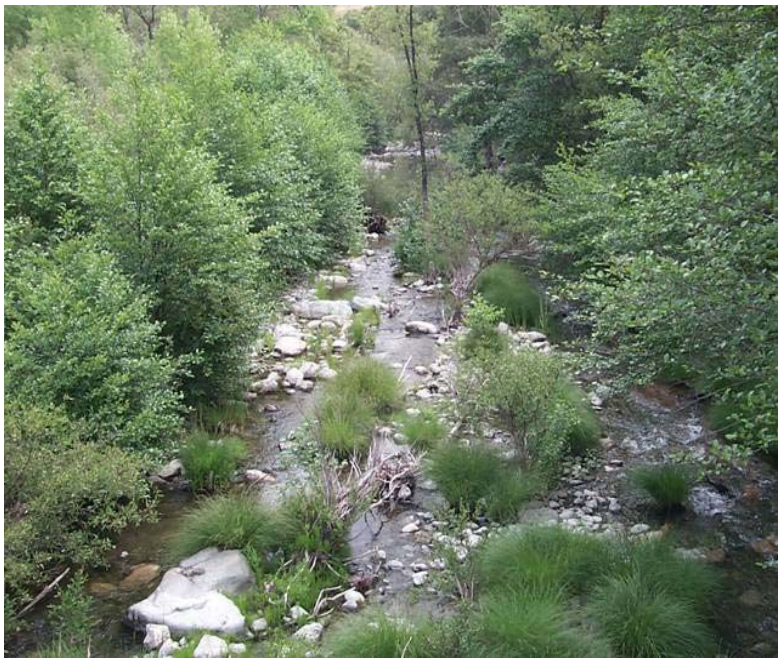
2 BACKGROUND

Sunol and Ohlone Regional Wilderness Preserves are arguably the crown jewels of the East Bay Regional Park System. The two preserves encompass over 16,500 acres of oak woodlands, grasslands, riparian corridors, sage scrub/chaparral, and pine forest. These parkland habitats support numerous wildlife species including mountain lions, tule elk, golden eagles, rainbow trout, red-legged frogs, and Alameda whipsnakes. Alameda Creek is the centerpiece of the parks, providing aquatic and riparian habitat for native fish and amphibians and offering recreation and solitude for park visitors. Sunol and Ohlone Preserves are renowned for their springtime explosions of native wildflowers and scenic landmarks such as Little Yosemite.



Alameda Creek from Camp Ohlone Rd. Bridge

The East Bay Regional Park District ("EBRPD") is currently preparing a 20-year Land Use Plan for Sunol and Ohlone Preserves, mapping the goals and future projects for the preserves. As part of the environmental scoping process, the Alameda Creek Alliance, Center for Biological Diversity, Livermore Flyfishers, Mission Peak Fly Anglers, Regional Parks Association and the Southern Alameda County Group of the Sierra Club hereby propose Alternative W, a wilderness alternative, for management of Sunol and Ohlone Preserves.

Organizations Supporting Alternative W

- **Alameda Creek Alliance** (www.alamedacreek.org) is a non-profit community watershed group dedicated to protecting and restoring the natural ecosystems of the Alameda Creek watershed, which includes the entirety of Sunol and Ohlone Preserves.
- **Center for Biological Diversity** (www.biologicaldiversity.org) is a non-profit environmental organization dedicated to the protection of native species and their habitats, and works to protect many imperiled species within the Alameda Creek watershed.
- **Livermore Flyfishers** (www.livermoreflyfishers.org) is a local group of sport flyfishers who support projects to rehabilitate, restore, and/or enhance the fish habitat in the general Livermore area. The organization has actively participated in the efforts to restore the steelhead trout fishery to the Alameda Creek watershed.
- **Mission Peak Fly Anglers** (www.missionpeakflyanglers.org) is a Fremont flyfishing organization that works to protect the environment and fishery habitat through membership and participation in environmental and restoration efforts. The organization has actively participated in the efforts to restore the steelhead trout fishery to the Alameda Creek watershed.
- **Regional Parks Association** ("RPA") (www.RegionalParksAssociation.org) is an independent, non-profit organization formed in 1949 with a focus on the EBRPD and its parklands. The

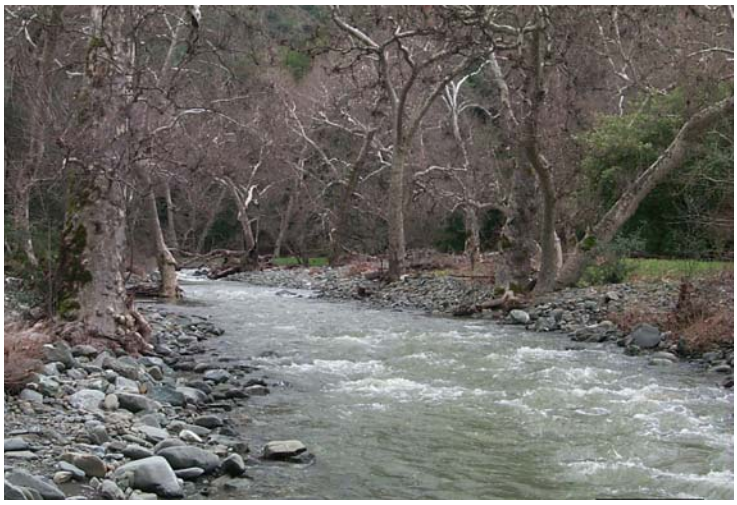
primary goal of the RPA is to facilitate the preservation of natural landscapes and ecosystems in the parks.

- **Sierra Club (Southern Alameda County Group)** (www.sierraclub.org) encompasses all Sierra Club members residing in Castro Valley, San Lorenzo, Hayward, Union City, Newark and Fremont.

3 ALTERNATIVE W OBJECTIVES

The goal of Alternative W is to restore true wilderness values to the Preserves and to initiate an adaptive parkland management plan that emphasizes ecological restoration, education, and community participation. This plan is intended as a starting point for addressing wilderness values in the land use planning process and for developing an ecologically sensitive management strategy for the Sunol and Ohlone Preserves.

4 PRESERVING WILDERNESS VALUES



Alameda Creek near the "W" Tree

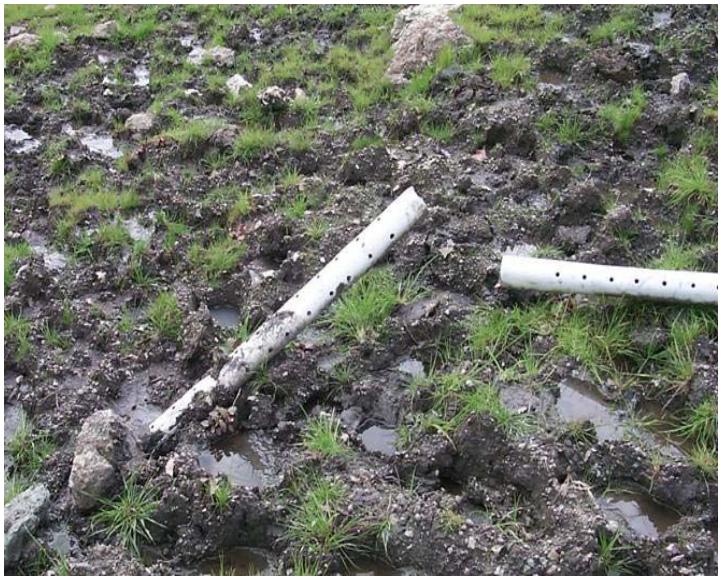
The stated core mission of the EBRPD is to "acquire, develop, manage, and maintain a high quality, diverse system of interconnected parklands which balances public usage and education programs with protection and preservation of our natural and cultural resources." Sunol and Ohlone Preserves are among the more remote parklands in the East Bay Regional Park system, and contain many features of regional ecological significance. The highest priorities for management of parks designated as "Wilderness Regional Preserves" should be restoring natural ecosystem functions and processes, protecting habitat for native species, and providing educational and low-impact recreational opportunities. Private commercial operations that conflict with these values should not be allowed in a Wilderness Regional Preserve.

The EBRPD currently leases over 12,550 acres, or 76% of Sunol and Ohlone Preserves, for private commercial cattle grazing. The grazing program is conducted under the auspices of the Wildland Management Policies and Guidelines, a vague set of principles with no explained or justifiable scientific basis and no monitoring or enforcement provisions. Grazing in the Preserves proceeds without any existing park Land Use Plan and with no meaningful environmental review process or opportunity for public input.

This proposal will not go into great detail about the negative impacts of cattle grazing on stream and riparian habitat in Alameda Creek and on habitat for other sensitive species within Sunol and Ohlone Preserves, as these issues have been extensively researched by the U. S. Fish and Wildlife Service, California Department of Fish and Game, and private biological consultants, and repeatedly brought to

the attention of the EBRPD during its grazing review process from 2000-2001 and in other instances by the Alameda Creek Alliance and other environmental organizations (see Appendix A).

Information submitted to the EBRPD includes a reference list of over 150 scientific, peer-reviewed research papers and articles detailing the detrimental environmental impacts of livestock grazing in the western U.S.; a 13 page summary of livestock grazing impacts on soil, stream, wildlife, and ecosystem function from peer-reviewed, scientific studies, with references; and a comprehensive survey of livestock influences on stream and riparian ecosystems in the western United States (Belsky et al. 1999).[1]



Wetlands seep damage caused by cattle on McCorkle Trail

Domestic cattle are an introduced species that cause considerable damage to native ecosystems and habitats. Livestock grazing in Sunol and Ohlone Preserves has negative impacts on water quality and seasonal quantity, stream channels, soils, riparian vegetation, and wetlands, and overgrazing has damaged wildlife habitat, particularly for aquatic and riparian-dependent species.

5 KEY ELEMENTS OF ALERNATIVE W

The basic elements of Alternative W are:

1) Make preservation of wilderness qualities and restoration of natural ecosystem processes the priority for the Preserves.
2) Phase out commercial agricultural operations in the Preserves.
3) Immediately protect riparian and aquatic areas.
4) Immediately protect habitat for sensitive species.
5) Assemble baseline data on parkland conditions, such as vegetation, soil condition, sensitive species habitat, water quality, and aesthetic and recreational values.
6) Initiate a phased adaptive management plan addressing grazing impacts, native vegetation, and habitat for sensitive species.
7) Assess and inventory roads and other sediment sources, prioritizing problem areas for removal and/or remediation.
8) Remove unneeded infrastructure that detracts from wilderness values or degrades habitat, such as roads, culverts, fencing, and instream barriers.
9) End the use of pesticides and herbicides in the Preserves, unless needed for invasive plant eradication/native-vegetation enhancement.

[1] Belsky et al. (1999) conducted a systematic literature review, surveying over 140 peer-reviewed studies on the biological and physical effects of livestock on western rivers, streams, and riparian areas, specifically searching for peer-reviewed experimental studies showing the positive environmental impacts of grazing, of which none could be found. The EBRPD grazing review process also did not produce a single peer-reviewed scientific study demonstrating any positive environmental impacts from cattle grazing anywhere in the East Bay.

10) Explore replacement fire management techniques.
11) Conduct an educational campaign explaining parkland management changes for wilderness values and identifying sensitive habitats and visitor impacts.
12) Involve the public by explaining motivations and goals of management actions, affording public input, and providing volunteer opportunities in parkland restoration projects.

The remainder of this section addresses each of the specific elements of Alternative W.

Make preservation of wilderness values the priority for the Preserves.

The goal of this proposal is to make wilderness preservation the top management priority for Sunol and Ohlone Preserves. If the Preserves are not going to be managed for wilderness attributes and values, they should not be designated as "Wilderness Regional Preserves." We believe that there is immense value in preserving wilderness adjacent to urban areas and that there is strong public support for this. The ideal of wilderness is preserved land where natural ecosystem functions and processes proceed unhindered by human impact and management. To "restore" wilderness or wilderness values will require active human management in the short term, particularly to undo or recover past human-caused impacts. Again, the ideal of restoration is to move toward the point where minimal human management is required for long-term maintenance of natural systems. This proposal is not intended to restrict or limit educational or recreational access to Sunol and Ohlone Preserves, except in specific areas where actual damage to natural resources is occurring. It is recommended that the EBRPD consult with National Park Service and California State Parks staff at federal and state parks in the Bay Area regarding management strategies for preserving and restoring wilderness values.

Phase out commercial agricultural operations in the parks

Commercial agricultural operations are not compatible with wilderness areas, and maintenance of viable cattle ranching operations in the Preserves conflicts with the prioritization of wilderness values and ecosystem restoration. Cattle are an introduced species that have caused significant ecosystem damage and impacts to native flora and fauna (see Appendix A).

The EBRPD should phase out the existing cattle grazing program in the Preserves. As a control, we recommend immediately removing a portion (1/3) of the acreage of Sunol and Ohlone Parks currently leased for cattle grazing from the grazing program. This contiguous area should be fenced with wildlife-friendly fencing, with monitoring and repairs done as needed to ensure livestock do not have access to the area. The numbers of cattle on the remaining 2/3 of the grazing area should be proportionally reduced so that the stocking level and grazing pressure on this land does not increase.

Baseline biological data should be gathered and annual monitoring conducted in grazed and ungrazed areas, as discussed below. After 3-5 years, the area excluded to cattle should be evaluated in relation to the baseline condition before removal of cattle and compared to the condition of the land remaining in grazing leases. If after 3-5 years the ecological condition in the area of cattle exclusion has improved or remained relatively similar, an additional portion (1/3) of the parks should be excluded to cattle for 3-5 years. If after this 6-10 year period the ecological condition of the portion (2/3) of the parks excluded to cattle has improved or remained relatively similar, grazing should be excluded from both parks entirely, and the grazing lease program ended.

If at any time there are significant problem areas identified, the EBRPD should initiate adaptive management measures, as discussed below. If after 3-5 years an area excluded to cattle has shown an overwhelmingly negative ecological response, the EBRPD should initiate adaptive management measures, as discussed below, and delay cattle exclusion measures on additional areas until a suitable management strategy has been developed and monitored for 3-5 years. If after the cumulative 9-15 years the ungrazed areas have shown an overall negative ecological response, and adaptive management measures have not improved their condition, a carefully managed grazing program should be developed and implemented. This grazing program should be operated primarily as an ecological management tool, not as a private commercial venture; should explore alternative grazers such as elk, goats or horses; and should use appropriate seasonal timing, duration, and levels of grazing to reach ecological management objectives. It is recommended that the EBRPD consult with National Park Service biologists and staff at Point Reyes National Seashore regarding the management and potential enhancement of tule elk grazing in the Preserves.

Immediately protect riparian and aquatic areas

Alameda Creek and its tributaries throughout Sunol and Ohlone Regional Preserves support a unique assemblage of native fish, amphibian, and reptile species, many of which are endangered, threatened, or sensitive species. Stream, riparian, and wetland habitat for species such as rainbow trout (and future ocean-run steelhead trout), Pacific lamprey, California red-legged frog, foothill yellow-legged frog, California tiger salamander, and western pond turtle, all of which occur in Sunol and Ohlone Preserves, is being damaged and degraded by cattle grazing.

The negative impacts of cattle grazing on habitat for trout and other salmonids are particularly severe and well documented (see Appendix A). Fisheries biologists have documented site-specific impacts of cattle grazing during several surveys of Alameda Creek within the Sunol Preserve (see Appendix A). The damaging impacts cattle can have on amphibian habitat have also been extensively documented (see Appendix A).

The entirety of Alameda Creek and its tributaries that are suitable habitat for trout or other sensitive species should be immediately fenced out with wildlife-friendly fencing. Similarly, sensitive riparian and wetland habitat should also be identified and fenced for protection from cattle grazing. Assessment of which areas contain suitable habitat should be done in conjunction with the Alameda Creek Fisheries Restoration Workgroup, the National Marine Fisheries Service ("NMFS"), the U. S. Fish and Wildlife Service ("USFWS"), the California Department of Fish and Game ("CDFG"), and the San Francisco Public Utilities Commission ("SFPUC").

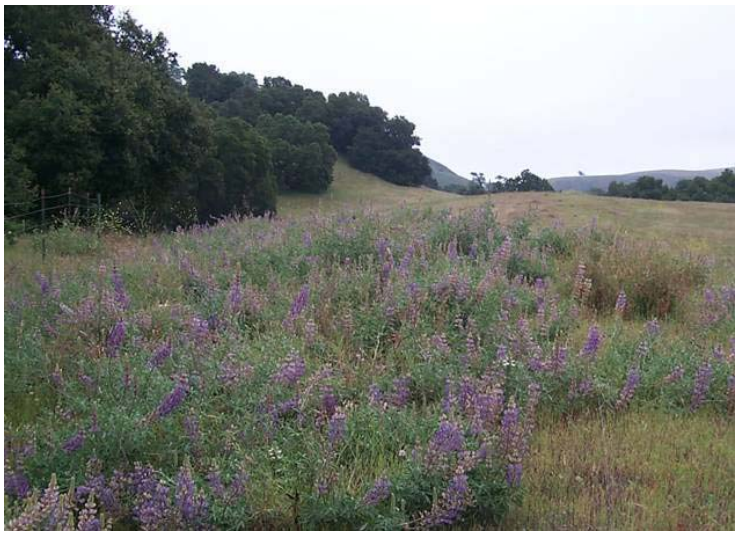
Immediately protect habitat for sensitive species

Habitat preservation for sensitive species (defined as federal and state listed threatened and endangered (T&E) species, candidate species, and species of special concern, as well as plants in the California Native Plant Society ("CNPS") Rare Plant Inventory) should be a priority. EBRPD wildlife staff and biologists should consult with the USFWS, NMFS, CDFG, CNPS, and other entities involved in endangered species recovery and consult all draft and published recovery plans to ensure that park management activities are not conflicting with recovery goals for sensitive species. Cattle should be immediately excluded from areas where negative effects from grazing are known or grazing is damaging sensitive habitat. Known species recovery plans relevant to Sunol and Ohlone Regional Parks include: Recovery plan for the California red-legged frog (USFWS 2002); Draft recovery plan for chaparral and scrub community species east of San Francisco Bay,

California (USFWS 2003); Recovery plan for serpentine soil species of the San Francisco Bay Area (USFWS 1998); and Steelhead restoration and management plan for California (CDFG 1996).

Assemble baseline data on parkland conditions,

In order to assess the effects of removing cattle from areas of the Preserves, existing baseline data should be assembled on the condition of leased grazing areas, including vegetation composition (locations of sensitive plants, native wildflowers, invasive species, etc.), soil condition, sensitive species habitat, water quality, and aesthetic values (such as scenic views and road, agricultural, and park management infrastructure). The EBRPD and other agencies such as the SFPUC will likely already have some of this data. It is recommended that the EBRPD follow a similar framework as is suggested by the CNPS for analyzing grazing impacts and health indicators of soil conditions in "Impacts of Livestock Grazing on Soils and Recommendations for Management" (Roberson 1996).



Wildflowers on cattle excluded section of Hayfield Rd. Trail

Independent biological consultants, with public input and participation, should summarize the baseline data, which should be peer reviewed by biological experts in wildlife management, botany, fisheries, etc. This process should not be overseen or exclusively conducted by EBRPD staff, as the EBRPD upper management and grazing program staff in the past have shown significant bias toward the status quo grazing program to the point where clearly identified problems have been denied and ignored rather than addressed (e.g. Friends of Sycamore Valley 2002). It is important that any data collection and summary of existing conditions be done in an objective manner, and with a transparent process. Identification of meaningful baseline data and collection and summary of this information should involve the Sunol and Ohlone Parks Supervisor, park rangers and naturalists, EBRPD wildlife and fisheries staff, interested specialists on sensitive species, biologists from regulatory agencies such as USFWS, NMFS, and CDFG, and the interested public.

Initiate a phased adaptive management plan

As discussed above, annual monitoring should be conducted in grazed and ungrazed areas of the Preserves to determine the impacts of the cessation of commercial grazing. An annual report should be prepared comparing the conditions in the grazing exclosure areas to the previous conditions and to the conditions in similar and comparable habitats in remaining grazed areas. As discussed above, independent biological consultants, with public input and participation, should prepare these reports, which should also be peer reviewed.

If problem areas or negative ecological responses are identified with the cessation of commercial grazing and there is a need for active management, management options should be identified and

prioritized according to their ecological impact and compatibility with wilderness values, although the cost of various management options will obviously play a role. The rationale for management decisions should be scientifically justified and thoroughly explained to the public.

There is a valid local model for managing the Preserves without cattle grazing. The California Department of Parks and Recreation (CDPR) eliminated commercial grazing from Mt. Diablo State Park in 1990 (and conducted an extensive environmental review of the negative impacts of cattle grazing) and manages the state park for ecological values while maintaining fire control and recreation opportunities (CDPR 1989). The EBRPD should consult with the CDPR regarding their experience with ecosystem restoration and adaptive management in the 13 years since the exclusion of cattle grazing.

Assess and prioritize problem areas

Improperly designed and maintained roads are a major source of erosion and sedimentation on most managed ranch lands (PWA 1994). Compacted road surfaces increase the rate of runoff, and road cuts intercept and bring groundwater to the surface. Ditches concentrate storm runoff and can transport sediment to nearby stream channels. Culverted stream crossings can cause gullies or washouts that deliver additional sediment to streams. Excessive sedimentation is likely degrading fish and amphibian habitat in Alameda Creek and its tributaries in Sunol and Ohlone Preserves. Independent consultants with expertise in hydrology should conduct an assessment of sediment and erosion sources, and identify problem areas in the Preserves. Improperly drained roads and failing culverts should be identified and prioritized based on their impact on aquatic habitat. It is advised that EBRPD consult the "Handbook for Forest and Ranch Roads" (PWA 1994) regarding planning, design, construction, maintenance, reconstruction, and closing of wildland roads.

Remove unneeded infrastructure

In areas closed to commercial grazing, agricultural infrastructure (roads, culverts, fences, etc.) should be removed to restore a wilderness aesthetic to the Preserves. Roads and culverts not necessary for emergency access or public access to Camp Ohlone should be prioritized for removal or conversion to trails. Potential fish passage barriers in the Preserves should be identified and removed. The removal by EBRPD in 2001 of two swim dams from Alameda Creek in Sunol Park was a good example of how to improve fish habitat with the involvement of a variety of agencies and the public.

End the use of poisons in the Preserves

EBRPD currently broadcasts poisons in Sunol Preserve to prevent ground squirrel overpopulation (Freemire 2002). Poison grain pellets similar to Warfarin are apparently used near squirrel entrance burrows. Warfarin is an anti-coagulant that acts by thinning the blood and causing internal bleeding when ingested. Some studies have shown Warfarin and similar poisons can be moderately toxic to upland game birds and waterfowl; it is highly toxic to mammals and can secondarily poison carnivores that eat poisoned squirrels (Extoxnet 2003). Magpies and jays in Sunol Preserve have been observed eating the poison pellets and catching poisoned squirrels, which are slowed down by the poison (Freemire 2002). If rodent control is truly needed, EBRPD should modify human-made squirrel-friendly habitat (such as removing the boulders which define parking areas, preventing trampling of meadows by defining walkways and educating the public, and discouraging visitors from feeding ground squirrels).

It is unknown whether any pesticides or insecticides are currently used in the Preserves. Limited use of low-level biodegradable herbicides may be needed in some situations for invasive plant eradication, to enhance native vegetation. Any use of poisons and their potential impacts on native species, particularly amphibians, should be evaluated.

Explore replacement fire management techniques

The EBRPD should explore alternatives to cattle grazing for fire suppression and fuel load management in Sunol and Ohlone Preserves, particularly the feasibility of reintroducing fire in the form of controlled burns to the upper Alameda Creek ecosystems, to restore habitat and ecosystem function. EBRPD should look to research the CDPR has conducted on grazing and its effect on standing biomass and fire hazard reduction on Mount Diablo State Park (CDPR 1989) and CDPR's experience in managing wildlands without livestock grazing.

Cattle excluded section of Canyon View Trail above Little Yosemite

Conduct an educational campaign to minimize visitor impacts

An educational campaign using interpretive signage, written materials, and naturalist-led programs should be initiated to explain parkland management changes for wilderness values, to identify sensitive habitats, and to reduce visitor impacts. Areas which could use interpretive signs include: Little Yosemite, where visitor impacts are high (dogs and people in pools which are summer refugia or breeding areas for trout and frogs, trash and pollutants introduced into the stream); the former site of the swim dams (explaining why the swim dams were removed); and along Alameda Creek in areas that are potential or identified trout spawning habitat (to prevent siltation and trampling of redds (nests)).

Involve the public in the process

All of the above management actions should involve the interested public by explaining the motivations and goals of management actions and affording public input. These actions also provide opportunities for the public to volunteer, whether it be removing fencing, gathering biological data, or installing interpretive signs. Public involvement leads to increased education and awareness, promotes stewardship, protects natural resources, and also will allow the EBRPD to economically implement restoration actions. The organizations proposing these management alternatives commit to working with the EBRPD to secure funding grants to support this work and to recruit and provide volunteers.

Appendix A Impacts of cattle grazing

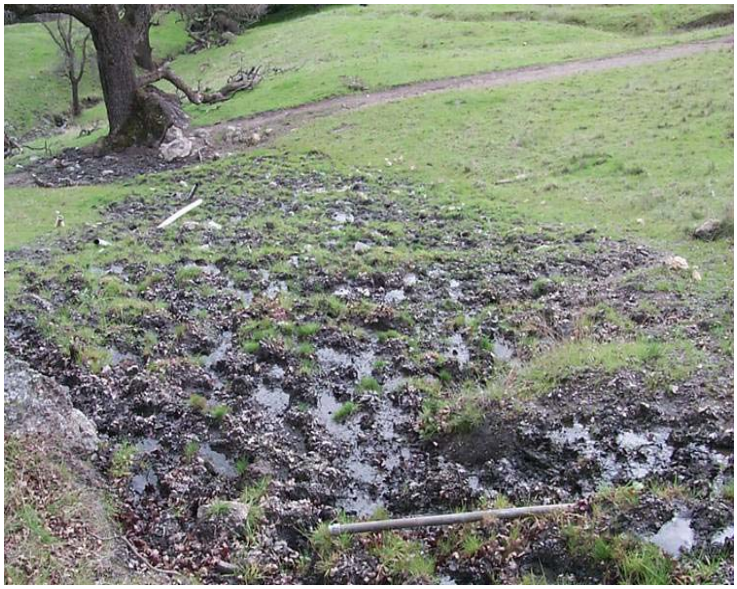
Negative impacts of cattle grazing on trout and other salmonids

Livestock grazing within stream riparian corridors can harm riparian ecosystems and stream channels (Schultz and Leininger 1990; Platts 1991; Armour et al. 1994). Grazing may alter natural riparian and channel processes and cause upland and streambank erosion, channel sedimentation and widening, increased stream temperatures, decreases water quality, and changes in the water table (Elmore and Beschta 1987; Platts 1991). Platts (1991) reviewed 19 scientific studies of grazing impacts on salmonids, of which 15 reported either decreased fish abundance with livestock grazing or an increase in fish abundance with cessation of grazing.

Algae blooms & floating cow feces in pond on Hayfield Rd. Trail

The increased sediment load in the creeks due to grazing impacts eliminates spawning habitat by burying the larger size gravel needed for redd (nest) building, suffocating eggs, and filling spaces in the gravels. This reduces habitat for aquatic invertebrates, thereby reducing food for juvenile salmonids. Both sedimentation and actual trampling can damage spawning beds. Grazing impacts such as greater water turbidity, increased siltation, higher bacterial counts, lower summer flows, and low dissolved oxygen in the water column and intra-gravel environment reduce fish survival. Streambank damage and filled-in pools due to sedimentation decreases the hiding cover for steelhead.

Loss of riparian vegetation, expanded and accelerated flows, and loss of creek banks due to cattle grazing causes streams to become shallower and wider, raising water temperatures. Increasing stream temperatures can be lethal to salmonids. Higher water temperatures increase salmonid mortality (by breaking down physiological regulation of vital processes such as respiration and circulation), and negatively affect fish spawning, rearing, and passage. Loss of riparian vegetation has also reduced the amount of large woody debris that is deposited in streams, a key factor in



Wetland seep damage on McCorkle Trail

creating pools for young fish and otherwise maintaining suitable salmonid habitat. Removal or exclusion of cattle from riparian areas has been documented to improve salmonid habitat and salmonid populations.

Site-specific impacts of cattle grazing on Alameda Creek

In 1993 fisheries biologist Peter Moyle recommended excluding cattle from the riparian zone below Calaveras Dam to allow riparian plants to shade the stream and provide cover for native fish (Moyle 1993). Moyle noted that fencing the stream alone would likely increase trout populations because the water would be cooler in the summer.

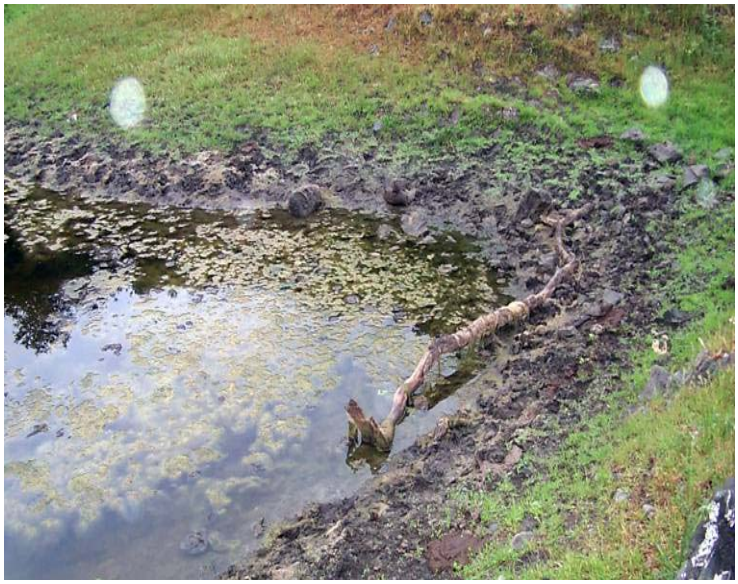
In 1992, fisheries biologists with Bookman-Edmonston Engineering, Inc. walked the length of Alameda Creek from its confluence with Calaveras creek downstream to about Welch Creek, as part of a fisheries habitat survey for the SFPUC for the proposed Calaveras stream release project. Degradation of riparian habitat, erosion, and siltation resulting from cattle grazing and trampling was noted (Bookman-Edmonston 1995, 1995C). The lower reach surveyed had a "lack of deep-water habitat for adults and some degradation of the riparian community because of grazing in certain areas" (3-22), and the biologists observed that "cattle access to the streambed adversely affected riparian vegetation which could impact the fisheries" (7-2). They recommended restricting cattle access to the streambed and riparian zone.

An Alameda Creek re-vegetation and restoration report in 1993 reached the same conclusions (Bookman-Edmonston 1995D). The report stated "Cattle grazing has denuded many areas of vegetation cover along the creek causing increased siltation detrimental to trout spawning and also resulting in higher water temperatures due to lack of vegetation cover" (p. 3). Significant damage was also documented in the stream reach from Calaveras Dam to the Sunol Water Treatment Plant; "There are no barriers preventing cattle grazing on the lease areas west of the creek from crossing the creek and entering onto the wilderness areas to the east...Grazing practices on the western side of the creek have created continuing degradation of riparian vegetation in all areas of this reach where cattle can reach the creek edges. As a result most areas of riparian vegetation found through this reach show either less than 50 percent canopy cover or disturbance...Cattle grazing has continuously degraded vegetation along the edges of the creek and in some sections has done damage to the bank structure. Complete removal of grazing from this reach is recommended...Grazing along the creek has denuded banks in many areas and degraded stream bank profiles...The extensive beds of cattails and thick algal mats found in this reach are probably the result of lowered water flows resulting in sedimentation and stagnant water conditions combined with higher water temperatures brought on by lack of vegetation cover due to grazing."

A stream inventory study of Alameda Creek conducted by the CDFG in 1995 documented damage to stream banks, erosion and sedimentation, and water pollution caused by cattle (Murphy and Sidhom 1996). CDFG biologists walked Alameda Creek from upstream of Calaveras Creek to the confluence with Welch Creek. The report stated "large areas of bank erosion were noted which were actively depositing sediment in the stream, especially in the lower reaches...the result of the presence of cattle in and near the stream. Numerous stream banks have been broken down as the direct result of cattle entering the stream." The report expressed concern that if cattle were not excluded from the stream, then spawning areas could become significantly embedded by fine sediment and useable spawning habitat limited. The report noted large amounts of cow manure in the stream median, leaching pollutants into the stream.

Damaging impacts of cattle grazing on amphibian habitat

Habitat alteration by livestock grazing (due to trampling, water quality impacts, and impacts to riparian vegetation) is an important factor in the decline of red-legged frogs (Rana aurora draytonii) in California (Jennings et al. 1992; Jennings and Hayes 1994; USFWS 1996, 2000). Livestock grazing is known to decrease the suitability of riparian and aquatic habitat in general (Behnke and Raleigh 1978; Buckhouse et al. 1981; Kauffman et al. 1983; Kauffman and Krueger 1984; Bryant 1985; Marlow and Pogacnik 1985; Siekert et al. 1985) and negatively impacts habitat for herpetofauna (Jones 1979, 1988; Szaro et al. 1985; Jennings and Hayes 1994; USFWS 2000).



Pond damage and contamination on Hayfield Rd. Trail

Sedimentation of creeks due to the erosional impacts of grazing mentioned above and trampling of undercut streambanks eliminates the deep pools and other cover habitat needed by frogs. Eggs can be smothered by sedimentation, and deep pools necessary for escape cover are filled in. For red-legged frogs, the loss of undercut banks and reduced water levels is particularly critical because refuge plunge pool habitat is reduced or eliminated. Grazing results in a decline in the structural richness of the vegetative community, with a loss of thermal cover and protection from predators. Vegetation is a crucial component of the frog's habitat. Emergent vegetation, upon which the frogs deposit their egg masses can be trampled and eaten. Loss of stream side vegetation due to cattle grazing can reduce habitat for insects and small mammals (USFWS 2000), which are important dietary components for aquatic species (Cordone and Kelley 1961), including the red-legged frog.

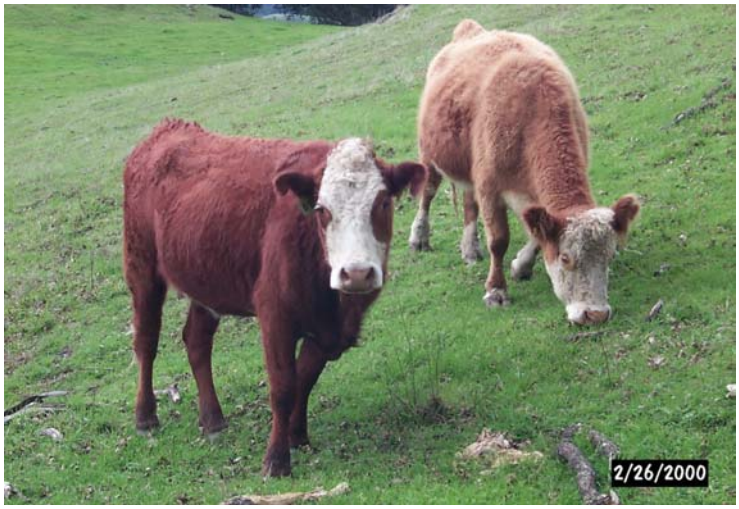
Grazing increases aridity and can raise water temperatures to levels lethal to early life stages of the red-legged frog. Livestock grazing can also cause nutrient loading problems due to urination and defecation in areas where cattle are concentrated near the water (Doran et al. 1981). Cattle can crush and disturb egg masses, larvae, and metamorphosing frogs and also can draw down water levels when drinking from small water bodies, leaving amphibian egg masses desiccated or subject to disease such as fungal infections (USFWS 2000). Frogs require rodent burrows for estivation, which are often trampled by cattle. Over-grazing exacerbates the threat of bullfrog expansion (a major introduced predator decimating red-legged frog populations) by creating dramatic changes in riparian and wetland habitat conducive to the spread of bullfrogs (USFWS 1996).

In the East Bay, red-legged frog habitat at the state Corral Hollow Ecological Preserve has been severely degraded by abusive grazing practices (Jennings et al. 1992), as has frog habitat at EBRPD's Sycamore Valley Open Space in Danville (CBD 1999, 2000). Conversely, exclusion of cattle grazing on EBMUD lands in Contra Costa County was documented to have resulted in reestablishment of suitable habitat and expansion of red-legged frog populations (Dunne 1995).

Cattle grazing also severely damaged vernal pool and uplands habitat for the California tiger salamander (Jennings and Hayes 1994).

Ecosystem damage, weed invasion, and lack of oak tree recruitment

The role of cattle grazing in spreading weeds is thoroughly discussed in Livestock Grazing and Weed Invasions in the Arid West (Belsky and Gelbard 2000), a summary of 189 peer-reviewed studies on livestock grazing's contribution to weed introductions. Invasive exotic weeds have eliminated numerous sensitive plant species in California and the East Bay.



Cattle grazing on overgrazed land near the Canyon View Trail.

It is widely acknowledged and study results show that grazing is a factor in the failure of several species of California oaks to reproduce and recruit new members (CDPR 1989; COF 2001). Cattle directly destroy young oak trees by trampling them and eating them. Historically, oaks have been cut down for many reasons, including by ranchers to try to get more forage production. Loss of these oaks translates into loss of biodiversity (over 300 species of vertebrates and 5000 invertebrates directly or indirectly require oaks). Areas of the Preserves with heavy cattle grazing exhibit poor or no oak regeneration (Freemire 2002).

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