6.2 MOUNT DAVIDSON

GENERAL DESCRIPTION AND LOCATION

Mount Davidson, the highest point in San Francisco, is located in south-central San Francisco just south of Portola Drive (Figure 1-1) and partly adjacent to Juanita Avenue, Dalewood Way, and Molimo Drive in the Miraloma neighborhood. Elevations range from approximately 600 to 900 feet above sea level. Primary public access to this 40.2-acre Natural Area is through several informal parking areas and trails at the ends of local residential streets. Developed facilities are minimal and include trails, access roads, a bus turnaround, Work Projects Administration (WPA) stairs and retaining walls, a water tank, and the cement cross (owned by the Council of Armenian-American organizations of Northern California). Forests dominate the landscape at Mount Davidson, covering three-quarters of the Natural Area (Figure 6.2-1).

As a highly visible focal point within the City that supports a diverse array of habitats, plants, and animals, Mount Davidson has high natural resource and recreational values for the citizens of San Francisco. These values include: outstanding migratory and resident bird habitat; outstanding City views; high levels of recreational trail use; rare reed grass-huckleberry plant community; important habitat for native plants and populations of sensitive plant and animal species; extensive urban forest; suitable habitat for special-status species of butterflies; and diverse native grassland and scrub communities providing foraging habitat for raptors, butterflies, and other insects.

GEOLOGY, HYDROLOGY, AND TRAILS

Most of the park is underlain by Franciscan chert. This is a hard grayish red silicon rock similar to quartz that occurs in layers. Chert walls and knobs outcrop along the trails at numerous elevations throughout the park (Figure 6.2-2). The northwest and northeast corners of the park are underlain by Franciscan sandstone. The rock is dark gray in its fresh condition (rarely seen), but weathers easily to yellowish brown and yellowish gray. It forms a residual soil that is difficult to distinguish from the slope debris that accumulates on bedrock hillsides as a product of exposure to rain and wind. The lowest portion of the southern slope of the park is underlain by Franciscan greenstone. This is an altered volcanic rock (mostly basalt) that weathers very easily. In fresh cuts (none are visible in the park) the rock is grayish olive and hard. It weathers to a firm to soft material that is yellowish orange to light brown. Like the sandstone, it has a rubble-covered surface that is difficult to distinguish from the accumulated debris on the slope. Franciscan greenstone is different in chemical make-up from the sandstone and historically supported plant species capable of surviving on this substrate. For example, a population of Raven's and Franciscan manzanita (*Arctostaphylos hookeri* ssp. *ravenii* and ssp. *franciscana*) were reported from the greenstone on Mount Davidson in 1923 (CNDDB 2005).

Overall, trails throughout the park are stable with little or no erosion. The established trails consist of thin rocky soils over bedrock, reflecting the general soil condition throughout the park. Heavy vegetative cover in many areas aids in preventing trail and slope erosion.

Some erosion is evident at the Molimo Drive access point, where several informal trails have been established (Figure 6.2-2). Just north of this access point, some erosion also occurs where a social trail cuts straight up the hillside. There is a large area of bare ground that could be susceptible to erosion where the trail widens near the top of the mountain north and east of a concrete tank pad. No major erosion is apparent on the open, grassy eastern slope of Mount Davidson. The urban forest on the western portion of the Natural Area (area 12 on Figure 6.2-2) has steep, but stable, slopes. A groundwater seep occurs at the base of the outcrop.

Formal trails on Mount Davidson are composed of Franciscan chert steps and retaining walls constructed by the WPA in the 1930s, as well as some maintained and unmaintained earthen trails (Figure 6.2-2). There are over 15,400 feet of trails on Mount Davidson. Most are stable primary trails (11,148 feet) and roads (1,441 feet) that are not susceptible to erosion. One exception is the triangular junction of informal short-cut trails located below and to the west of the seep (Figure 6.2-2). In all, social trails subject to closure account for approximately 2,867 feet, or 19 percent of the total trails on Mount Davidson.

VEGETATION

The vegetation of Mount Davidson has been classified into 13 series (Table 6.2-1, Figure 6.2-3). These series represent five subformations: approximately 75 percent of the area is forest; 8 percent is scrub; 4 percent is a mosaic of different subformations; 12 percent is grassland; and 1 percent is classified as “other” (rock outcropping and developed areas). The western two-thirds of Mount Davidson is almost entirely dominated by invasive vegetation (blue gum forest and Himalayan blackberry scrub). The eastern-facing slope is predominantly grassland with scrub and rock outcrops.

Forest

Only two forest series were mapped within the Natural Area at Mount Davidson; however, they dominate the landscape. The 30.06 acres of forest within Mount Davidson is almost entirely invasive blue gum forest (29.96 acres), primarily in the western two-thirds of the park. Small areas of cypress forests (0.10 acres) occur in the eastern edge of the Natural Area and north western edge of forest. Most of the blue gum forest supports an understory of invasive Cape ivy (*Delairea odorata*), English ivy (*Hedera helix*) and Himalayan blackberry (*Rubus discolor*). Sections of the blue gum forest understory contain remnant coastal prairie areas. Although the overstory is dominated by eucalyptus, when all species were considered within the urban forest at Mount Davidson (point data), native species accounted for 36 percent of the understory cover and 21 out of 50 species were native.

Scrub and Mosaic

Five scrub formations were mapped within the Natural Area at Mount Davidson, three of which are dominated by native species. The invasive Himalayan blackberry series accounts for the majority of acreage within this subformation, covering 1.17 acres. These acreage figures do not include understory dominated by invasive species in the blue gum forest. The remaining series all cover less than 0.60 acres each. Most of the native scrub formations are located at the transition zone between the forests and grasslands on the eastern half of the mountain. Some native scrub areas, mostly comprised of red elderberry, still hold on in the eucalyptus understory.

Similarly, the scrub-grassland mosaic series are located in the transition zones between the grassland and shrub communities. Two mosaic series were mapped at Mount Davidson: Italian ryegrass/California sagebrush (0.43 acres) and reed grass/California huckleberry (1.16 acres). The reed grass/California huckleberry mosaic series is dominated by native species and can be found on the north and east-facing slopes of Mount Davidson uphill from the grasslands. This later series is unique in San Francisco and is deserving of special management consideration. Much of Mount Davidson was likely composed of this vegetation type before eucalyptus were planted by Adolph Sutro (Section 3).

Grassland and Rock Outcrops

Native reed grass prairie is the most notable series in this group, comprising merely 0.26 acres. It persists on the north-facing slopes on the northeastern side of the mountain. Within the grasslands, natives outnumber invasive species almost 2 to 1 (43 to 23); however, they represent only 48 percent of the cover. Isolated rock outcrops exist among the non-native grasslands on the mountain's eastern side.

Sensitive Plant Species

The California Natural Diversity Data Base (CNDDB) reports the occurrence of four sensitive plant species from Mount Davidson (CNDDB 2005) (Table 6.2-2). When combined with the CNPS list of locally sensitive plants, there are a total of 15 locally sensitive species that are thought to occur on Mount Davidson. San Francisco gumplant (*Grindelia hirsutula* var. *maritima*) was collected from an open north-facing slope in 1974, but it has not been found in recent surveys. A population of less than 50 San Francisco campion (*Silene verecunda* ssp. *verecunda*) plants were observed on a Franciscan graywacke (a type of sandstone) outcrop on Mount Davidson as late as 1994 (Wood 1996). Less than 10 individuals were found on Mount Davidson during recent survey efforts. Presidio and Franciscan manzanita were reported from the vicinity of Mount Davidson in 1923 (Wood 1996). Both of these populations are now believed to be extirpated (CNDDB 2005; Wood 1996). Because Mount Davidson is within the historic range of these species and the appropriate substrate can be found within the park, the

U.S. Fish and Wildlife Service has expressed interest in re-introducing the Presidio or Franciscan manzanita to this Natural Area (Baye 2000).

Surveys conducted as part of this project have found individuals or populations of seven species that are considered sensitive for this project (Section 3) (Table 6.2-2). Coast rock cress (*Arabis blepharophylla*) is a California Native Plant Society (CNPS) List 4 species (plants of limited distribution). Less than five individuals occur on the northeastern edge of Mount Davidson (Craib and Cartier 1999, Natural Areas Program surveys). Pacific reed grass (*Calamagrostis nutkaensis*) does not have a state or federal special-status rating, but San Francisco is at the southern edge of this species' range. This species can be found in several locations on Mount Davidson (Figure 6.2-4, see forest and grasslands above). Muilla (*Muilla maritima*) is found within the northern edge of the annual grassland on the north facing slope. California fescue (*Festuca californica*) is found within the wild oat/coyote bush mosaic, downslope from the Pacific reed grass populations. This species covers a relatively large area, but not at levels sufficient enough to dominate the vegetation type.

Two other species considered sensitive for this report are stonecrop (*Sedum spathulifolium*) and Johnny-jump-up (*Viola pedunculata*), which also occur on Mount Davidson (Craib and Cartier 1999). Johnny-jump-up is found primarily in the thin soiled annual grassland on the eastern slope of Mount Davidson (Figure 6.2-4). These plants are important larval host and food sources for the San Bruno elfin butterfly (*Incisialia mossii bayensis*) and the San Francisco silverspot butterfly (*Speyeria callippe callippe*), respectively. Because both of these butterflies are federally listed under the Endangered Species Act, stonecrop and Johnny-jump-up are important species to consider when managing Mount Davidson.

Invasive Plant Species

Invasive vegetation cover accounts for over 36 acres of the land within the Natural Area at Mount Davidson. Blue gum forest dominates the landscape, accounting for approximately 29 acres over the western three-quarters of the park. The understory of the blue gum forest is often densely covered with Cape and English ivy and/or Himalayan blackberry. Himalayan blackberry is the dominant species in three other areas of the Natural Areas, providing a foothold from which it can spread. Himalayan blackberry (along with the native red elderberry (*Sambucus racemosa* var. *racemosa*) are important food sources for native birds. Two areas of French broom scrub along the southeastern edge of the Natural Area are also potential sources of invasion. Bermuda buttercup (*Oxalis pes-caprae)* and ehrharta grass (*Ehrharta erecta*) are major concerns in the grassland areas.

WILDLIFE

Birds

The multi-storied complex habitat provides suitable foraging, nesting, and roosting habitats at Mount Davidson for a wide variety of species. The forest habitat of Mount Davidson provides potential nesting habitat for raptors. Red-shouldered (*Buteo lineatus*) and red-tailed hawks (*Buteo jamaicensis*) have been observed on site (EIP field visits, April 19, 1999, and December 8, 2000) but nesting was not confirmed. The complex understory (blackberries and other shrubs) provides nesting and foraging habitat for smaller songbirds. Other passerines likely to use the Natural Area include spotted towhee (*Pipilo maculatus*), white-crowned sparrow (*Zonotrichia leucophrys*), band-tailed pigeon (*Columba fasciata*), and American robin (*Turdus migratorius*) (Appendix Table C-4).

Sensitive Bird Species and Important Bird Habitat

Eighteen species of birds considered locally sensitive are known to occur at Mount Davidson, of which six species breed there (Table 6.2-2). Three areas have been identified at Mount Davidson that are considered important bird habitat (Figure 6.2-4). The first of these is the ecotone boundary between the eucalyptus forest and the grassland. Growing within this edge habitat are dense stands of Himalayan blackberry that provide an important source of food and cover for a number of species such as hummingbirds, thrushes, band-tailed pigeons and other resident frugivores. This area is also important habitat for migrant flycatchers. The urban forests at Mount Davidson are also considered important bird habitat. Although largely dominated by invasive species of trees, these areas provide habitat for black-headed grosbeaks (*Pheucticus melanocephalus*), winter wren (*Troglodytes troglodytes*), Wilson's warbler (*Wilsonia pusilla*), Swainson's thrush (*Catharus ustulatus*), and song sparrow (*Melospiza melodia*) among others. The third important bird area on Mount Davidson is the open grassland on the east-facing slopes. This area is used by foraging raptors and provides nesting habitat for grassland species such as western meadowlark (*Sturnella neglecta*), lesser goldfinch (*Carduelis psaltria*), orange-crowned warbler (*Vermivora celata*), and savanna sparrow (*Passerculus sandwichensis*), and nesting and foraging habitat for species such as the white-crowned sparrow.

Mammals

Common mammals are expected to use Mount Davidson. Surveys of small mammals were conducted in Mount Davidson in the spring of 2000 (Paquin and Reading 2000). Approximately 40 live traps were placed in the grassland habitat on Mount Davidson at dusk and serviced the next morning. This pattern was repeated on the four consecutive nights (160 trap nights) of June 20-23, 2000. Despite this effort, no small mammals were captured on Mount Davidson. Evidence of small rodents (small burrows and gopher mounds) was observed in grassland habitats (EIP field visit, December 8, 2000). In addition to gophers, species such as house mice (*Mus*

musculus), black rat (*Rattus rattus*), and California meadow vole (*Microtus californicus*) are expected within the appropriate habitat at Mount Davidson. Larger mammals found in the Mount Davidson area such as raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*) and Virginia opossum (*Didelphis virginiana*) are typical of urbanized parks in general. Recently, a coyote (*Canis latrans*) has been reported from Mount Davidson.

Reptiles/Amphibians

Seven surveys for reptiles and amphibians, totaling approximately 21 hours of field effort, were conducted on Mount Davidson in April and May 2000 (Paquin and Reading 2000). These surveys, conducted by walking transects through coastal scrub and grassland habitats, resulted in the capture of California slender salamanders (*Batrachoseps attenuatus*) in both habitats, western fence lizard (*Sceloperus occidentalis*) in the grasslands, and California alligator lizard (*Elgaria multicarinata*) in the coastal scrub. California slender salamanders were the most common species captured overall, and were found most frequently in the coastal scrub habitat (Paquin and Reading 2000). These data are consistent with the results of walking surveys conducted by EIP biologists on April 19, 1999, when 15 California slender salamanders were found on Mount Davidson. Most of these were under rocks and logs in the blue gum forest (EIP unpublished data). Natural Areas staff has also documented the presence of Ensatina salamanders (*Ensatina* spp.) at Mount Davidson.

Other species likely to occur at Mount Davidson, but not observed during field efforts, include Pacific chorus frog (*Pseudacris (Hyla) regilla*) and western toad (*Bufo boreas*). It is unlikely that there is suitable breeding habitat for these species on site; however, nonbreeding habitat may be found through most of the underbrush and forested areas. No known populations or occurrences of sensitive reptiles or amphibians have been documented on Mount Davidson.

Invertebrates

Sensitive Invertebrate Species

At least three special-status species of butterflies potentially occur within the City of San Francisco: mission blue butterfly (*Icaricia icarioides missionensis*), San Bruno elfin butterfly, and bay checkerspot butterfly (*Euphydryas editha bayensis*). Stonecrop, the larval host plant for the San Bruno elfin butterfly, occurs on Mount Davidson. Larval host plants for the other two species are also relatively common (various lupines, plantain, owl's clover, etc.) (Garth and Tilden 1986).

MANAGEMENT AREAS

Management Areas (MAs) at Mount Davidson fall into two general categories: the grassland scrub areas and the forested areas (Figure 6.2-5). Two MA-1 areas occur on the east-facing slope

where the native Franciscan coastal scrub (huckleberry and reed grass) and grasslands are found. Another MA-1 is found in the understory of the eucalyptus forest where populations of Pacific reed grass persist. Surrounding each MA-1 is an MA-2 which may also contain sensitive species and habitats, but which provides a buffer between the extensive urban forests and the MA-1 areas. These MA-2 buffer areas are active restoration areas where the public is most likely to see changes in the park landscape, such as tree and shrub removal and native planting. At Mount Davidson, the MA-3 area is entirely comprised of urban forest. The following text presents issues and recommended management actions by Management Area.

ISSUES AND RECOMMENDATIONS

Several conservation and recreation-related issues have been identified for Mount Davidson. Recommendations developed for each of these issues will guide restoration, enhancement, and maintenance work. In the following discussion, system-wide issues and recommendations (GR-1 for example; see Chapter 5) that apply to the entire Natural Area at Mount Davidson are presented first within each topic area, followed by site-specific issues and recommendations. Site-specific recommendations are keyed to the Management Area in which they should occur.

Site Improvements – Implementation of management recommendations at Mount Davidson would not change significantly the overall look of the park and would result in:

- establishment of a stable boundary between the eucalyptus and grassland habitats;
- thinning of sapling and mature eucalyptus and replacement with higher wildlife value native vegetation;
- improved public access and views on designated trails;
- increased and more sustainable populations of sensitive plant species;
- enhancement of native scrub habitats;
- improved health and diversity of the urban forest;
- improved foraging, nesting, and sheltering habitat for resident and migratory birds;
- increased educational use with native plant demonstration gardens;
- restoration of native grasslands within the existing scrub and grasslands areas; and
- improved educational opportunities.

Overall, implementation of the following recommendations will improve the productivity of grassland and coastal scrub habitats at Mount Davidson similar to those on the western slopes of San Bruno Mountain. Creation of a stable boundary between the urban forest and the open grasslands of Mount Davidson will allow restoration of grassland and scrub habitats so that they may be compared to similar habitats at the Marin Headlands, although the grassland habitat at Mount Davidson will never be as expansive.

Vegetation

Issues relating to vegetation management at Mount Davidson involve the protection of sensitive species and habitats, typically through the control of invasive plants (GR-1) and management of sensitive species and vegetation series of limited distribution (GR-2). Issues relating to the general safety of visitors and surrounding homes, fire hazards posed by vegetation and trees, and illicit activities must be considered during management of the Natural Areas (GR-13). Management of the urban forests at Mount Davidson will follow the general urban forest management practices (GR-15). In addition to these general recommendations, the following site-specific issues should be addressed.

Issue MD-1: Native grasslands, rare habitat types (reed grass/huckleberry scrub) and populations of sensitive plant species are at risk of diminishing or being extirpated on Mount Davidson because of habitat loss and invasive species. Invasive vegetation (blue gum eucalyptus (*Eucalyptus globulus*), French broom (*Genista monspessulana*), European grasslands, Himalayan blackberry, etc.) occurs throughout Mount Davidson and threatens the long-term survival of its grassland and scrub habitats, as well as sensitive species that persist there.

> ***Recommendation MD-1a*:** Woody and herbaceous invasive plants such as French broom, ehrharta grass, Bermuda buttercup, Cape ivy, English ivy, hairy cat's ear (*Hypochaeris radicata*), and wild radish (*Raphanus sativus*), and Himalayan blackberry in all MA-1 and MA-2 areas shall be reduced (Figure 6.2-5). Invasive tree species in all MA-1 and MA-2 areas will also be prevented from establishing (see also MD-1b). Understory plants in MA-3 urban forests may also be reduced in order to improve tree health and wildlife habitat (see Urban Forest Recommendations in GR-15). Within MA-3a, some invasive plants may remain in place to provide nectar, seed, and larval habitat for butterflies or birds.
>
> ***Recommendation MD-1b*:** In order to enhance the sensitive species habitat that persists in the urban forest understory and at the forest-grassland ecotone, invasive blue gum eucalyptus trees will be removed in select areas. Coastal scrub and reed grass communities require additional light to reach the forest floor in order to persist. Approximately 1,600 of an overall 11,000 trees on Mount Davidson would be removed from MA-1 and MA-2 areas (Appendix F). Approximately 9,400 trees would remain in the urban forest at Mount Davidson. Not all trees in MA-1 and MA-2 areas will be removed. Some scattered large individuals will remain in order to minimize large scale disturbance and disruption to wildlife and to promote a gradual conversion to reed grass prairie. However, eucalyptus seedlings and saplings will not be allowed to establish in these areas. An average of 50-100 or 100-200 square feet of basal area per acre will be

retained in MA-1 and MA-2 areas respectively.[1] The short- and long-term impacts of tree removal are discussed in Appendix F. Below is a description of where tree removal would occur (see also Figure 6.2-5):

- Remove approximately 1,000 small and medium sized eucalyptus trees, leaving large cypress and eucalyptus trees in MA–1c.
- Remove approximately 200 eucalyptus, leaving some large trees for structural diversity (MA-2c).
- Remove approximately 300 small to medium sized and 100 large eucalyptus trees, some large trees will remain (MA-2e).
- All MA-3 areas will be managed as urban forests (GR-14).

***Recommendation MD-1c*:** In MA-1 and MA-2 areas where invasive plants have been removed, revegetate using appropriate native plants. Existing grasslands and coastal scrub habitats (MA1a, MA-1b, MA-1c, MA-2a, MA-2b, MA-2d, MA-2e) areas shall be enhanced and diversified as appropriate. Using diversity, cover, and density targets generated from reference sites within and around San Francisco, plant native grassland and scrub species (see Appendix B). In MA-3 areas plant the understory and forest gaps in accordance with the recommendations of the Urban Forest Management Plan (GR-15).

***Recommendation MD-1d*:** In order to prevent extinction of existing rare or uncommon species, consider augmenting populations of existing species by direct seeding or planting. Species to consider include coast rock cress (MA-1a), Johnny-jump-up (MA-1a), San Francisco campion (MA-1a), purple owl's clover (*Castilleja exserta* ssp. *exserta*) (MA-1a), muilla (MA-1a), Pacific reed grass (MA-2c-2e, Ma-1b, and MA-1c), California huckleberry (*Vaccinium ovatum*) (MA-2c-2e, Ma-1b, and MA-1c), wood rose (*Rosa gymnocarpa*) (Ma-2e and MA-1c), California fescue (MA-2c-2e and MA-1c), stonecrop (MA-1b and MA-1c) and columbine (*Aquilegia formosa*)(MA-1b).

***Recommendation MD-1e*:** In order to reduce the potential for local extinction of sensitive species in San Francisco, consider reintroduction of rare plants such as beach paintbrush (*Castilleja wightii*) (MA-1a), meadow white (*Cerastium arvense*) (MA-1a), coast larkspur (*Delphinium decorum*) (MA-1a), western goldenrod (*Euthamia occidentalis*) (MA-1a), thimbleberry (*Rubus parviflorus*) (MA-2c–2e, MA-1b and MA-1c), and blue violet (*Viola adunca*) (MA-1a), western choke cherry (*Prunus virginiana*) (MA-2c and MA-2e), fairy bells (*Disporum hookeri*) (MA-1b and MA-1c), Raven's manzanita (all MA-1 areas), and Franciscan manzanita (all MA-1 areas).

[1] For comparison, 25 square feet of basal area per acre could equate to 11 trees with diameters of 20 inches, or 45 trees with diameters of 10 inches, in a single acre.

Wildlife

Wildlife issues at Mount Davidson involve the protection and enhancement of habitat, food sources, and shelter. Vegetation management during the breeding season can impact nesting birds (GR-4), however, vegetation management also can provide materials to create artificial habitat for ground-dwelling birds, small mammals, and reptiles (GR-9). Artificial nesting structures may benefit some species, especially cavity nesters such as titmice, chickadees, and woodpeckers (GR-6). Finally reduction in predation pressures will benefit all animals within the Natural Area (GR-7). In addition to these general recommendations, the following site-specific issues should be addressed.

Birds

Issue MD-2: Habitats important to many resident and migratory bird species are limited in distribution and complexity at Mount Davidson. Examples of this include the native coastal and Franciscan scrub habitats and prairies.

> ***Recommendation MD-2a:*** Increase the patch size of native scrub by removing invasive species that border these areas and allowing natural recruitment into the newly opened areas. Focus the work on areas of invasive annual grasses and low-density shrub areas. Connect isolated patches of shrubs with plantings and brush piles. Larger habitat units would create interior habitats that are more sheltered from outside disturbance. This recommendation should be implemented in MA-1b, MA-2a, and MA-2b.
>
> ***Recommendation MD-2b:*** Increase the structural diversity of these habitats by installing native plants that are different in height from the existing habitats. For example, planting toyon (*Heteromeles arbutifolia*), native oaks, coffeeberry, or elderberry within the scrub patches and at the urban forest interface would enhance structural and food diversity. This recommendation should be implemented in MA-1b, MA-2a, and MA-2b.

Issue MD-3: Removal of fruiting invasive plants (e.g., Himalayan blackberry) can reduce habitat complexity and the food available to nesting birds. Resident and migratory species use late-season fruits as a fall food source.

> ***Recommendation MD-3a*:** Within the Management Areas, remove fruiting plants after the breeding season. Plant fruit-bearing native species as replacements and allow them to mature to a fruiting stage, preferably before invasive species are removed. This recommendation should be implemented in all Management Areas at Mount Davidson, but is especially important at the grassland forest ecotone where the relatively high light environment produces abundant blackberry and elderberry fruits and where bird species diversity is high.

Issue MD-4: A small seep was noted on the southern slope of Mount Davidson and the presence of willows in the northwestern edge indicate that water is at or near the surface. Currently, there is no permanent water supply on Mount Davidson that is accessible to wildlife.

> ***Recommendation MD-4a:*** The San Francisco Recreation and Park Department (SFRPD) shall evaluate the feasibility of establishing a permanent water supply at Mount Davidson that could provide breeding habitat for amphibians and a water source for birds and other native animals. This could be as simple as conducting minor spring improvements and installing small artificial ponds or spring boxes. Prior to the installation of small artificial water sources, it should be ensured that they will not be located in areas, such as near trails or within off-leash DPAs, that would be easily accessible to off-leash dogs or undesirable human use. These activities could potentially render the artificial water sources unusable to birds, amphibians, and other wildlife, thus defeating their purpose. Artificial water sources should be able to be drained periodically in order to remove bullfrogs that would prey on smaller animals using the water sources. This work shall not interfere with sensitive plant communities. This recommendation should be implemented in MA-2e.

Soils, Erosion, and Public Use

The erosion and soil issues at Mount Davidson all relate to the trail system and public use. A network of roads and designated and social trails wind through all Management Areas at Mount Davidson (Figure 6.2-5). The issue of erosion and habitat impacts related to social trails is addressed through implementation of GR-11 and GR-12 (Section 5). In all, approximately 2,867 feet of social trails, 19 percent of the trails on Mount Davidson, will be closed and restored by implementing this recommendation. Interpretive signs regarding the ecosystem of Mount Davidson should also be considered (GR-14).

Table 6.2-1. Vegetation series mapped at Mount Davidson.

	Vegetation Series	Total Acreage
Forest	blue gum forest	29.96
	cypress forest	0.10
	Subtotal	**30.06**
Scrub	oceanspray scrub*	0.50
	red elderberry scrub*	0.60
	coyote brush scrub*	0.48
	French broom scrub	0.56
	Himalayan blackberry scrub	1.17
	Subtotal	**3.30**
Mosaic	Italian ryegrass/California sagebrush mosaic	0.43
	reedgrass/California huckleberry mosaic*	1.16
	Subtotal	**1.59**
Grassland	reedgrass prairie*	0.26
	wild oat/rattlesnake grassland	4.45
	Subtotal	**4.71**
Other	rock outcrop	0.16
	developed	0.12
	Subtotal	**0.28**
Grand Total		**39.95**

* Indicates vegetation type is dominated by native species.

Table 6.2-2. Sensitive species known to occur at Mount Davidson.

Species	Common Name	Status Federal, State, CNPS	Occurrance Status
ANIMALS			
Carduelis tristis	American Goldfinch	SLC	Presently occurs
Falco sparverius	American Kestrel	SLC	Presently occurs
Columba fasciata	Band-tailed Pigeon	SLC	Presently breeds
Hirundo rustica	Barn Swallow	SLC	Presently breeds
Icterus cucullatus	Hooded Oriole	SLC	Presently occurs
Carduelis psaltria	Lesser Goldfinch	SLC	Presently breeds
Vermivora celata	Orange-crowned Warbler	SLC	Presently breeds
Empidonax difficilis	Pacific-slope Flycatcher	SLC	Presently occurs
Carpodacus purpureus	Purple Finch	SLC	Presently breeds
Sitta pygmaea	Pygmy Nuthatch	SLC	Presently breeds
Sitta canadensis	Red-breasted Nuthatch	SLC	Winter resident.
Buteo jamaicensis	Red-tailed Hawk	SLC	Presently breeds
Sayornis saya	Say's Phoebe	SLC	Winter resident.
Pipilo maculatus	Spotted Towhee	SLC	Presently occurs
Cyanocitta stelleri	Steller's Jay	SLC	Presently occurs
Tachycineta thalassina	Violet-green Swallow	SLC	Presently occurs
Aeronautes saxatalis	White-throated Swift	SLC	Presently occurs
Wilsonia pusilla	Wilson's Warbler	SLC	Presently breeds
PLANTS			
Aquilegia formosa	Red Columbine	LS	Presently occurs
Arabis blepharophylla	Coast rock cress	CNPS List 4	Presently occurs
Arctostaphylos hookeri ssp *franciscana*	Franciscan manzanita	FE, SE, CNPS List 1A	Believed extirpated. Single record from 1923.
Arctostaphylos hookeri ssp *ravenii*	Presidio manzanita	FE, SE, CNPS List 1B	Believed extirpated. Single record from 1923.
Calamagrostis nutkaensis	Pacific Reedgrass	LS	Presently occurs
Castilleja exserta	Owl's Clover	LS	Presently occurs
Festuca californica	California Fescue	LS	Presently occurs
Grindelia hirsutula var. maritima	San Francisco gumplant	FSC, CNPS List 1B	Presently occurs
Muilla maritima	Muilla	LS	Presently occurs
Rosa gymnocarpa	Wood Rose	LS	Presently occurs
Sedum spathulifolium	broadleaf stonecrop	-	Presently occurs
Senecio aronicoides	Groundsel	LS	Presently occurs
Silene verecunda ssp. *verecunda*	San Francisco campion	FSC, CNPS List 1B	Presently occurs
Vaccinium ovatum	California or Evergreen Huckleberry	LS	Presently occurs
Viola pedunculata	Johnny-jump-up	-	Presently occurs

Table 6.2-2. Sensitive species known to occur at Mount Davidson.

Status Key:

Federal Status

FE Endangered. Species in danger of extinction throughout all or significant portion of its range.

FT Threatened. Species likely to become endangered within foreseeable future throughout all or a significant portion of its range.

FPE Proposed for listing as endangered.

FC Candidate for listing as endangered. Candidate information now available indicates that listing may be appropriate with supporting data currently on file.

FSC Species of Concern. Former Category 2 Candidate for listing as endangered.

FPD Proposed de-listing.

California State Status

SE Endangered. Species whose continued existence in California is jeopardized.

ST Threatened. Species, although not presently threatened with extinction, that is likely to become endangered in the foreseeable future.

SSC Species of Concern.

SFP State Fully Protected under Sections 3511 and 4700 of the Fish and Game Code.

Sens Considered a sensitive species by the California Department of Forestry.

California Native Plant Society

1A Plants presumed extinct in California

1B Plants that are rare or endangered in California and elsewhere.

2 Plants that are endangered in California, but more common elsewhere.

3 Plants about which more information is needed.

4 Plants of limited distribution (a watch list).

LS Locally Significant.

Golden Gate Audubon Society

SLC Species of Local Concern

EIP ASSOCIATES

Source: Aerial photography San Francisco Department of Public Works, 2002, Orthophoto - San Francisco - 1-foot resolution, 2001; property boundary data derived by San Francisco Recreation and Park Department (RPD) 2005 from data provided by San Francisco Department of Telecommunications and Information Services, 2002; natural area boundary data created by San Francisco State University Institute for GISc from information provided by RPD's Natural Areas Program (NAP), 2005; contour lines provided by San Francisco Department of Conservation; all data are California State Plane Zone III, NAD 83.

Created by Debra Dwyer, San Francisco State University Institute for GISc, May 5, 2002, revised October 12, 2005.

N

0 200 400
Feet

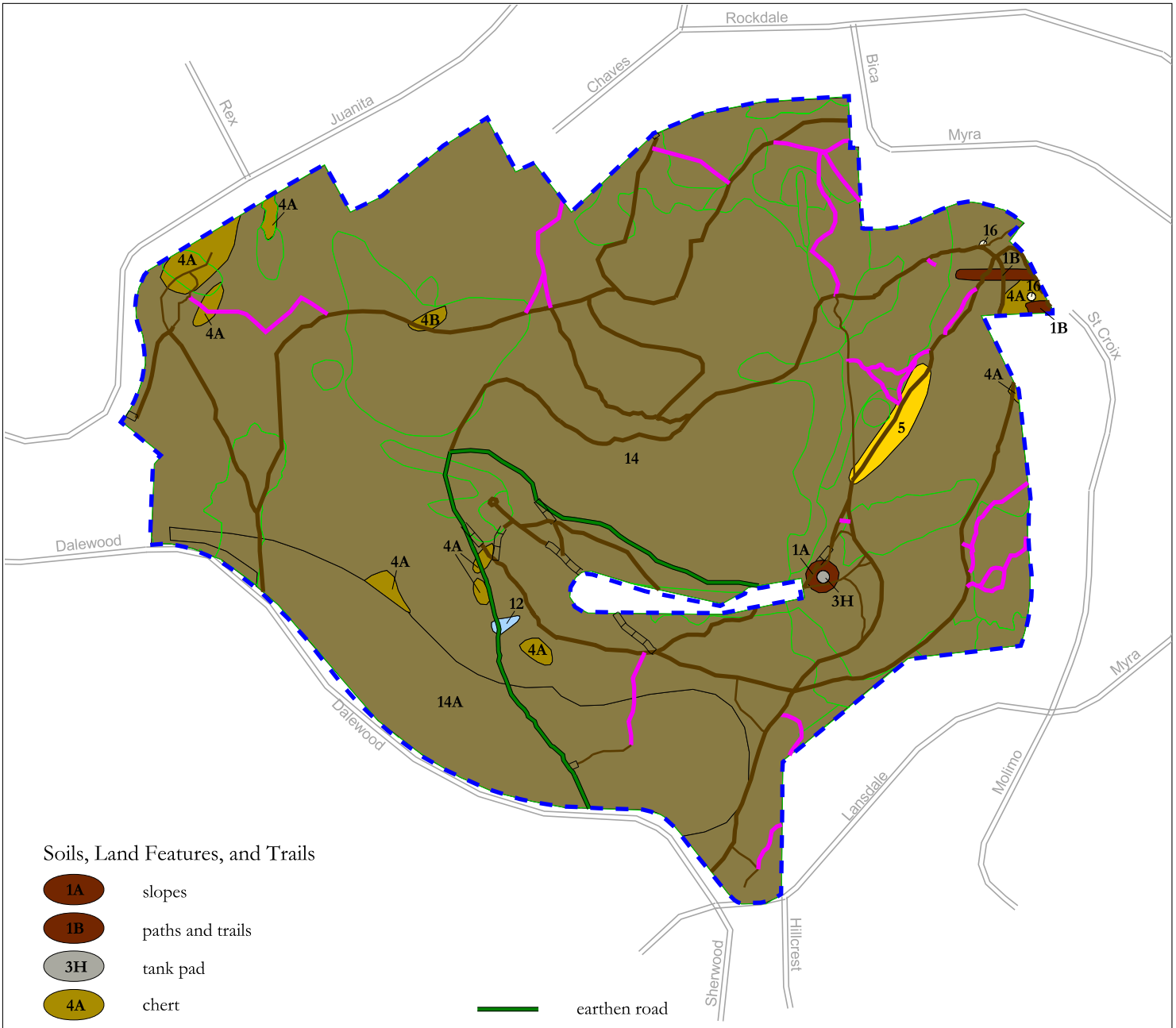
FIGURE 6.2 - 1

AERIAL PHOTOGRAPH, PROPERTY BOUNDARIES, AND NATURAL AREAS

Mt. Davidson

Significant Natural Resource Areas Management Plan

San Francisco, California



Soils, Land Features, and Trails

1A	slopes
1B	paths and trails
3H	tank pad
4A	chert
4B	sandstone
5	bare ground
12	wet/seepage or marsh area
14	thin rocky soils over bedrock
14A	thin rocky soils underlain by greenstone
16	sandy soil

	earthen road
	primary earthen trail
	steps
	secondary earthen trail
	closed trail
	Natural Area boundary
	vegetation series boundary

EIP ASSOCIATES

Source: Vegetation data collected by San Francisco Department of Recreation and Parks Significant Natural Areas Program (NAP), San Francisco State University Biology Department, and EIP Associates, 1999-2000; soil and land features data collected by EIP Associates, 1999 - 2002; trails data collected by NAP, 2005; data layers digitized by Geotopo, Inc., 1999 - 2000; edited and corrected by San Francisco State University Institute for GISc (SFSUGIS), 2000, 2005; trails data digitized by SFSUGIS, 2005; natural area boundary created by SFSUGIS from data determined by NAP, 2005; streets data excerpted from ArcView StreetMap 2000 Data, copyright 1998-2000, Environmental Systems Research Institute, Inc. (ESRI).

Created February 19, 2001, revised December 11, 2005 by Debra Dwyer, San Francisco State University Institute for GISc.

N

0 150 300
Feet

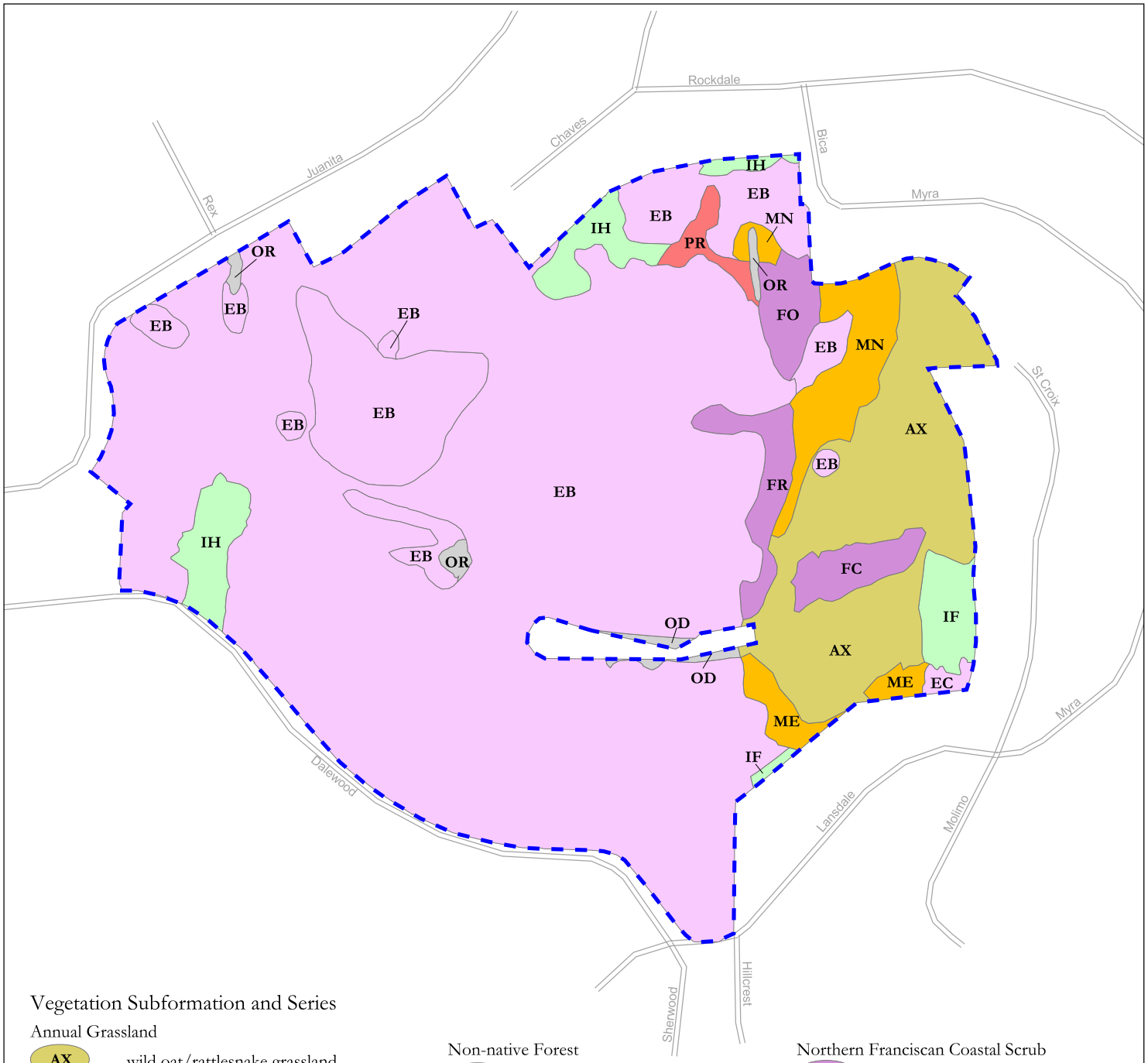
FIGURE 6.2 - 2

SOILS, LAND FEATURES, AND TRAILS

Mt. Davidson

Significant Natural Resource Areas Management Plan

San Francisco, California



Vegetation Subformation and Series

Annual Grassland
- AX — wild oat/rattlesnake grassland

Central Coast Riparian Scrub
- RW — willow scrub

Mosaic
- ME — bee plant/California blackberry mosaic
- MN — wild oat/coyote brush mosaic

Perennial Grassland
- PR — reedgrass prairie

Non-native Forest
- EB — blue gum forest
- EC — cypress forest
- EP — pine forest

Non-native Scrub
- IF — French broom scrub
- IH — Himalayan blackberry scrub

Northern Franciscan Coastal Scrub
- FC — coyote brush scrub
- FO — oceanspray scrub
- FR — red elderberry scrub

Other
- OD — developed
- OR — rock outcrop
- Natural Area boundary

EIP ASSOCIATES

Source: Vegetation data digitized by Geotopo, Inc. from data collected by San Francisco Recreation and Park Department Natural Areas Program (NAP), EIP Associates, and San Francisco State University Department of Biology, 1999-2000; vegetation shapefile edited by San Francisco State University Institute for GISc, 2000-2002; natural area boundary created by SFSUGIS from data provided by NAP, 2005; streets data excerpted from ArcView StreetMap 2000 Data, copyright 1998-2000, Environmental Systems Research Institute, Inc. (ESRI).

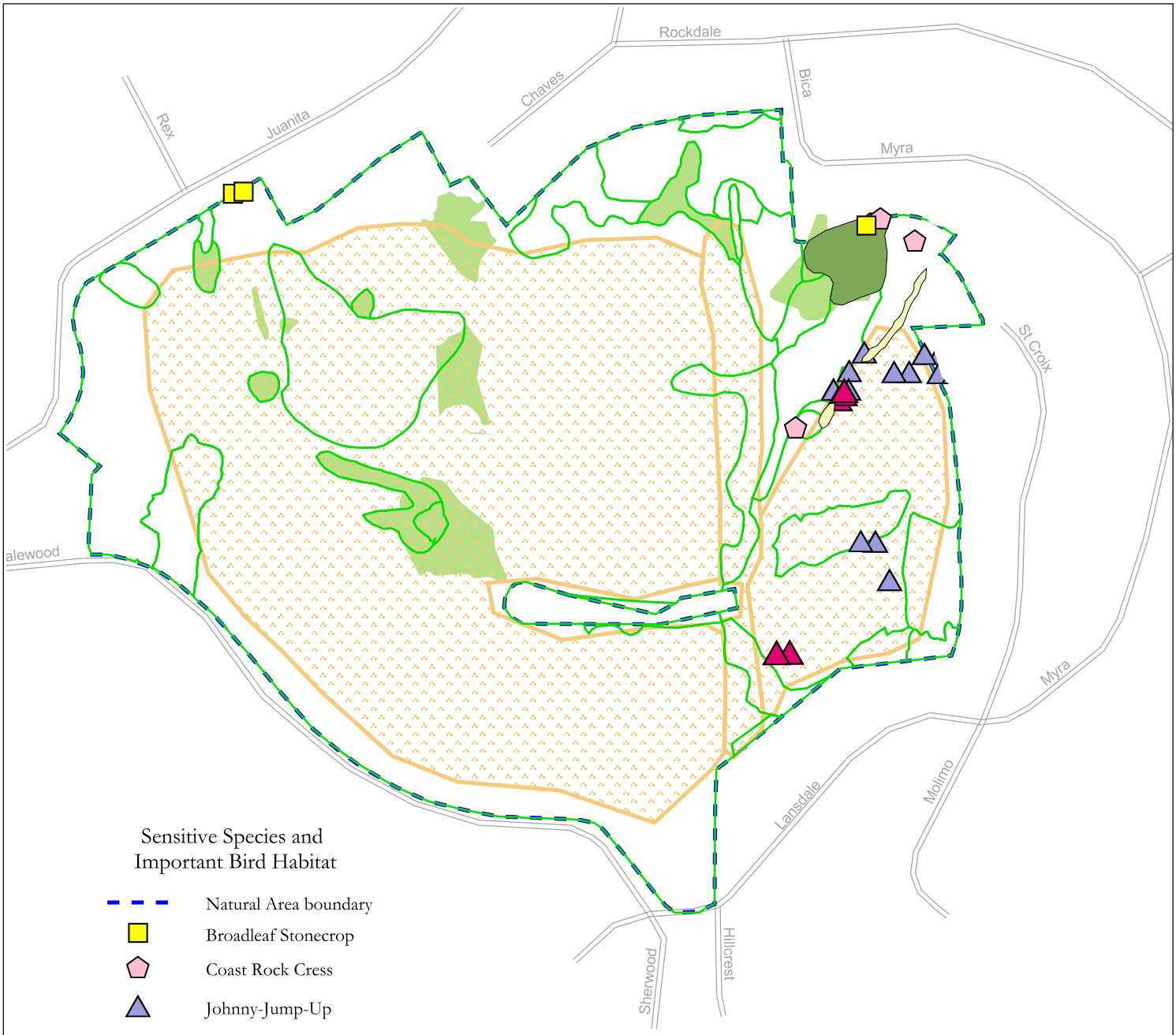
Created December 3, 2001, revised June 6, 2005 by D. Dwyer, San Francisco State University Institute for GISc.

N

0 200 400
Feet

FIGURE 6.2 - 3
VEGETATION
Mt. Davidson
Significant Natural Resource Areas Management Plan

San Francisco, California



Source: Sensitive species data collected by San Francisco Recreation and Park Department Significant Natural Areas Program (NAP), 1998-2005; vegetation data collected by NAP, San Francisco State University Biology Department,and EIP Associates, 1999 - 2000; data layers digitized by Geotopo, Inc., 2000, edited and corrected by San Francisco State University Institute for GISc (SFSUGIS), 2000 - 2005; natural area boundary created by SFSUGIS based on a determination by NAP, 2005; streets data excerpted from ESRI's StreetMap 2000 data, copyright ESRI 1998-2000.

Created February, 2001, revised June 5, 2005 by Debra Dwyer, San Francisco State University Institute for GISc

N

0 200 400

Feet

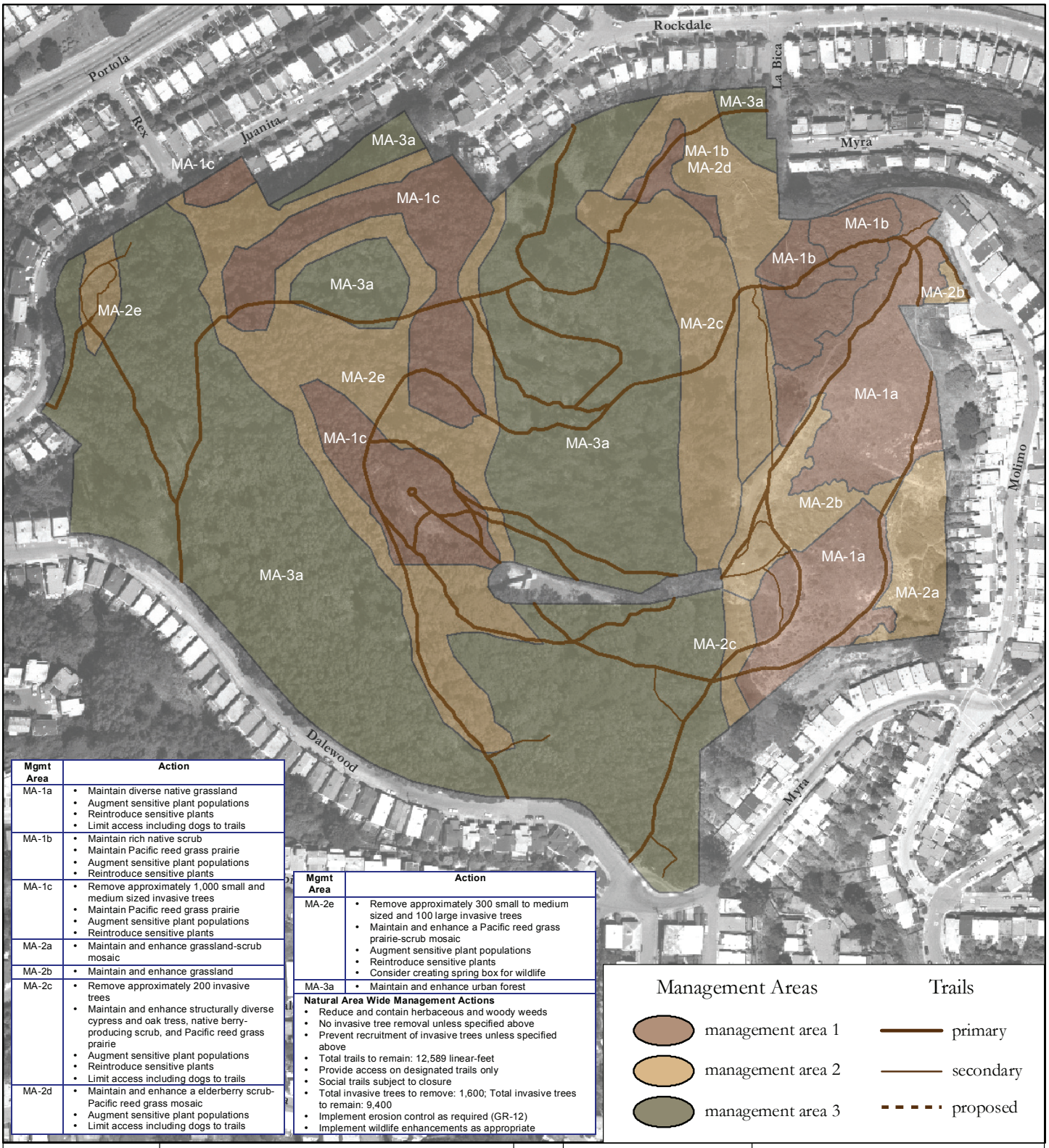
FIGURE 6.2 - 4

SENSITIVE SPECIES AND IMPORTANT BIRD HABITAT

Mt. Davidson

Significant Natural Resource Areas Management Plan

San Francisco, California



Mgmt Area	Action
MA-1a	• Maintain diverse native grassland • Augment sensitive plant populations • Reintroduce sensitive plants • Limit access including dogs to trails
MA-1b	• Maintain rich native scrub • Maintain Pacific reed grass prairie • Augment sensitive plant populations • Reintroduce sensitive plants
MA-1c	• Remove approximately 1,000 small and medium sized invasive trees • Maintain Pacific reed grass prairie • Augment sensitive plant populations • Reintroduce sensitive plants
MA-2a	• Maintain and enhance grassland-scrub mosaic
MA-2b	• Maintain and enhance grassland
MA-2c	• Remove approximately 200 invasive trees • Maintain and enhance structurally diverse cypress and oak tress, native berry-producing scrub, and Pacific reed grass prairie • Augment sensitive plant populations • Reintroduce sensitive plants • Limit access including dogs to trails
MA-2d	• Maintain and enhance a elderberry scrub-Pacific reed grass mosaic • Augment sensitive plant populations • Limit access including dogs to trails

Mgmt Area	Action
MA-2e	• Remove approximately 300 small to medium sized and 100 large invasive trees • Maintain and enhance a Pacific reed grass prairie-scrub mosaic • Augment sensitive plant populations • Reintroduce sensitive plants • Consider creating spring box for wildlife
MA-3a	• Maintain and enhance urban forest

Natural Area Wide Management Actions

- Reduce and contain herbaceous and woody weeds
- No invasive tree removal unless specified above
- Prevent recruitment of invasive trees unless specified above
- Total trails to remain: 12,589 linear-feet
- Provide access on designated trails only
- Social trails subject to closure
- Total invasive trees to remove: 1,600; Total invasive trees to remain: 9,400
- Implement erosion control as required (GR-12)
- Implement wildlife enhancements as appropriate

EIP ASSOCIATES

Source: Management areas and trails data collected by San Francisco Department of Recreation and Park Natural Areas Program (NAP), 2005; trails data digitized by San Francisco State University Institute for GISc (SFSUGIS), 2005; streets data excerpted from Environmental Systems Research Institute (ESRI), Inc.'s StreetMap 2000 data copyright ESRI 1998-2001; aerial photography San Francisco Department of Public Works, 2002, Orthophoto - San Francisco - 1-foot resolution - 2001; all data are in California State Plane Zone III projection, NAD 1983; map produced using ArcGIS 9.0 software by ESRI.

Map created May 29, 2005 by Debra Dwyer, San Francisco State University, Institute for Geographic Information Science (SFSU IGIS); revised August 22, 2005.

N

0 75 150 300

Feet

FIGURE 6.2 - 5

MANAGEMENT AREAS AND TRAIL PLAN

Mt. Davidson

Significant Natural Resource Areas Management Plan

San Francisco, California