

## 6.21 BERNAL HILL

### GENERAL DESCRIPTION AND LOCATION

The Bernal Hill Natural Area is located in the Bernal Heights neighborhood of San Francisco (Figure 1-1). Elevations within the area range from approximately 275 to 475 feet above sea level. A microwave radio transmission station is located in a fenced enclosure at the summit of Bernal Hill; it is not owned by San Francisco Hill (not owned by SFRPD). Recreation and Park Department (SFRPD). A paved limited access road provides pedestrian access to the summit of Bernal Hill. The remainder of this approximate 24-acre Natural Area is primarily grassland. Bernal Heights Boulevard circumnavigates the Natural Area and forms the eastern and southern boundaries of the park. A portion of Bernal Heights Boulevard is closed to vehicle traffic and is used extensively for recreation (Figure 6.21-1). A designated Dog Play Area (DPA) exists on and above Bernal Heights Boulevard. Bernal Hill has high recreational and natural resource values for San Francisco citizens that include: excellent City views; high levels of recreational use; good raptor foraging habitat; extensive grasslands providing habitat for butterflies and other insects; populations of sensitive plant species; and suitable habitat for a variety of bird species.

### GEOLOGY, HYDROLOGY, AND TRAILS

This Natural Area is underlain by Franciscan chert and “greenstone” bedrock. Greenstone is an altered volcanic rock. At Bernal Hill, it is mostly buried under slope debris, but is known from observations in nearby quarries. These quarries are mostly now redeveloped, but the remnants of one can be seen at the south side of the Natural Area. Most of the bedrock is chert, appearing in outcrops around the lower edges of the park, but generally mapped in its decomposed stage as “thin rocky soil over bedrock” (Figure 6.21-2). There is a large soil slip in the northwest corner of the Natural Area that faces Bernal Heights Boulevard. The disrupted surface of the slide has revegetated and generally is now stable. The ancient terrace at the east end of the park is underlain by chert, but has a fairly thick cover of sandy soil developed on slope debris.

There is no permanent surface water at the site. Drainage of the area is by overland flow and through a series of gullies on each hillside. Some rainfall percolates into fissures in the rock, but runoff generally is rapid, forming gullies as deep as ~~three~~3 feet in areas denuded of vegetation. Some of the percolation comes out as seeps at road cuts along the north side.

An extensive network of very well defined earthen trails has developed throughout the park, with many trails closely paralleling each other over the same terrain. Extensive foot and animal traffic has worn most of the trails through the thin soil and into the underlying bedrock. Runoff channeled along some of these trails greatly increases erosion problems.

## VEGETATION

The vegetation of Bernal Hill was classified into 10 series (Table 6.21-1; Figure 6.21-3). These series are within four sub-formations: approximately 82 percent of the area is grassland; 6 percent is forest; 2 percent is scrub; and 11 percent is classified as “other” (developed and rock outcroppings). Two of these series, willow scrub and purple needlegrass prairie, are dominated by native species.

### Forest and Scrub

Unlike many other Natural Areas, forests do not dominate the landscape at Bernal Hill. Only two forest series, mixed exotic (0.77 acres) and blue gum forest (0.56 acres), were mapped at Bernal Hill. Two scrub series, including a small patch of native willow scrub (0.12 acres), were mapped in the Natural Area. The other scrub series, invasive Himalayan blackberry scrub, is found in isolated pockets through the Natural Area.

### Grassland

Bernal Hill is a grassland-dominated Natural Area where four grassland and herbaceous series were mapped and cover just under 20 acres. The majority of the acreage was mapped as wild oat grassland (19.27 acres). There were small areas of wild radish (0.24 acres) and fennel (0.09 acres). Purple needlegrass prairie (0.07 acres), a series dominated by native vegetation, occurs within Bernal Hill. Point count data within the grasslands at Bernal Hill revealed that 42 of 75 species observed were native and native plants represented 51 percent of the grassland cover.

### Other

Two series were mapped as “other” habitats at Bernal Hill: developed areas and rock outcrops. Developed areas account for the largest coverage within this series, 1.46 acres, series (1.46 acres) and include all of the roads and other human structures. The rock outcrops (1.25 acres) are mostly the result of road cuts and historic quarrying activities that exposed the underlying bedrock.

### Sensitive Plant Species

Six of the sensitive plant species designated as sensitive for this management plan have been reported from Bernal Hill (Table 6.21-2). Most of the sensitive species are found on the north west grassland slope below the microwave towers (Figure 6.21-4). These include shooting star (*Dodecatheon clevelandii*), Johnny-jump-up (*Viola pedunculata*), common muilla (*Muilla maritima*), and star lily (*Zigadenus fremontii*). Johnny-jump-up serves as a larval food plant for the San Francisco silverspot butterfly (*Speyeria callippe callippe*), a Federally Federally endangered species, and is therefore considered a sensitive species. Fragrant fritillaria (*Fritillaria*

*liliacea*), a California Native Plant Society List 1B species, is found on the far eastern point of the Natural Area. A single occurrence of hummingbird sage (*Salvia spathacea*) can be found along the southern boundary of Bernal Hill. It is located on the downhill side of Bernal Heights Boulevard in a small parcel owned by ~~the San Francisco Recreation and Park Department (SFRPD)~~. ~~SFRPD~~. Big squirrel tail (*Elymus multisetus*) is also reported from the grasslands of Bernal Hill, but the specific location is not known. The California Natural Diversity Data Base (CNDDDB) does not report the occurrence of any sensitive plant species at Bernal Hill (CNDDDB 2005).

### **Invasive Plant Species**

Six vegetation series dominated by invasive species account for more than 22 acres of the land cover within the Natural Area at Bernal Hill. Wild oat grassland (19.27 acres) covers the largest area of vegetation within the Natural Area. The remaining five series (mixed exotic forest, blue gum forest, Himalayan ~~blackberry~~, ~~blackberry~~ (*Rubus discolor*), fennel, and wild ~~raddish~~ ~~radish~~ (*Raphanus sativus*)) are all scattered through the Natural Area, and individually they all cover less than an acre of land.

## **WILDLIFE**

### **Birds**

Bernal Hill provides some foraging, nesting, and roosting habitat for birds. The grassland and scrub habitats of Bernal Hill provides foraging habitat for raptors ~~like~~ ~~such as~~ the ~~frequently~~ ~~observed~~ American kestrel (*Falco sparverius*) ~~that is frequently observed~~ and ~~the~~ western meadowlark (*Sturnella neglecta*). Habitat for smaller birds (passerines) is limited by the available scrub habitats throughout the area, but this Natural Area likely supports sparrows such as white-crowned sparrow (*Zonotrichia leucophrys*) and savannah sparrow (~~Passareulus~~ ~~(Passerculus)~~ *Passerculus sandwichensis*) that forage in the grasslands.

### Sensitive Bird Species and Important Bird Habitat

Two species considered sensitive for purposes of this plan have been observed at Bernal Hill. Say's phoebe (*Sayornis saya*), a flycatcher, is a winter resident that forages over the grasslands. Wilson's warbler (*Wilsonia pusilla*) is also reported from Bernal Hill and likely occurs in the small areas of willow and blackberry scrub. No other sensitive species have been documented on Bernal Hill (CNDDDB 2005). A single area of important bird habitat has been identified for Bernal Hill that encompasses the entire grasslands of the Natural Area (Figure 6.21-4).

## Mammals, Reptiles, and Amphibians

To date, no small mammal surveys have been conducted at Bernal Hill. A focused survey for reptiles and amphibians of the Bernal Hill area did not locate any of these animals (EIP field visit, May 3, 1999). The CNDDDB does not report the occurrence of any sensitive species within the Natural Area (CNDDDB 2005). However, the grasslands likely support populations of gophers, California meadow vole (*Microtus californicus*), and western fence lizard (*Sceloporus occidentalis*). Larger mammals such as ~~raccoons, skunks, and opossum~~ raccoons (*Procyon lotor*), striped skunks (*Mephitis mephitis*) and Virginia opossum (*Didelphis virginiana*) are typical of urbanized parks in general and are expected to occur within the Natural Area.

## Invertebrates

### Sensitive Invertebrate Species

At least four special-status species of butterflies potentially occur within the City of San Francisco: mission blue butterfly (*Icaricia icarioides missionensis*), bay checkerspot butterfly (*Euphydryas editha bayensis*), San Bruno elfin butterfly (*Incisalia mossii bayensis*), and San Francisco silverspot. Larval host plants for the mission blue and bay checkerspot butterflies are relatively common (various lupines, plantain, owl's clover, etc.) (Garth and Tilden 1986). The larval host plant for the San Bruno elfin butterfly is ~~broadsword~~ broadsword stonecrop (*Sedum spathulifolium*). The larval host plant for the silverspot is Johnny-jump-up. However, due to high levels of recreation use and dogs on ~~hill~~ Bernal Hill, none of these species are expected to occur there.

## MANAGEMENT AREAS

Management ~~areas (MA)~~ Areas (MAs) at Bernal Hill are mapped based mainly on the occurrence of sensitive species and habitats (Figure 6.2-5). Four MA-1 areas occur on the slopes of Bernal Hill where the native grasslands and sensitive species are found. Surrounding each MA-1 area is a single MA-2 area which may also contain sensitive species and habitats, but which provides a buffer between the extensive urban forests and the MA-1 areas. The MA-3 areas at Bernal Hill are those portions of the Natural Area that do not support populations of sensitive species or diverse native grasslands, but do contain habitat for wildlife. The following text presents issues and recommended management actions by ~~management area~~ Management Area.

## ISSUES AND RECOMMENDATIONS

Several conservation and recreation-related issues have been identified for the Bernal Hill Natural Area. 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, example~~; see Chapter 5) that apply to the entire Natural Area at Bernal Hill 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.

**VISION Site Improvements** – Implementation of management recommendations at Bernal Hill would not change significantly the overall look of the park and would result in:

- preservation and enhancement of native grasslands;
- increased habitat complexity that benefits wildlife populations;
- improved educational opportunities;
- decreased bluff erosion;
- improved public access on designated trails;
- partially modified off-leash DPA; and
- ~~maintain~~continued off-leash dog use of Bernal Hill; ~~protect~~Hill, while protecting sensitive habitat areas by reconfiguring and reducing the existing DPA by 17 percent.

Over the life of this management plan, implementation of the following recommendations is expected to result in expansion of native grasslands and scrub mosaic habitats. These changes to the Natural Area will be visible to visitors, but will not result in substantial changes in access or allowed uses. In the long run, the grasslands and coastal scrub at Bernal Hill may be compared to those of the eastern slope of San Bruno Mountain.

## Vegetation

Issues relating to vegetation management at Bernal Hill 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). Grassland management is also necessary to ensure that the existing grasslands do not become substantially degraded (GR-3). 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). In addition to these general recommendations, the following ~~site-site~~ specific issues should be addressed.

**Issue BH-1:** ~~The grasslands at~~ Bernal Hill supports populations of sensitive ~~plants and grasslands.~~ plant species and grassland habitat. Because of habitat loss and invasive species, these areas and species are at risk of diminishing in number and diversity and could even become locally extinct.

**Recommendation BH-1a:** To help protect native grasslands and sensitive plant species, reduce and contain woody and herbaceous invasive plants such as radish, Himalayan blackberry, Italian thistle (*Carduus pycnocephalus*), bur clover, and sweet fennel, within all ~~management areas.~~ Management Areas. To help preserve grassland habitat,

recruitment of invasive tree species should not be allowed in any ~~management area~~ **Management Area** except for MA-3b. All of the approximately 100 trees in the Bernal Hill Natural Area will remain. Within the MA-3 areas, allow some invasive plants such as radish, thistles, plantain, and fennel that are important nectar, seed and larval habitat for wildlife to persist; however, they shall be monitored to ensure that they are not encroaching on sensitive habitats, and managed accordingly.

**Recommendation BH-1b:** To maintain and enhance existing grasslands in MA-1, MA-2, and MA-3 areas, revegetate using appropriate native plants where invasive plants have been removed. Existing grasslands 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 species (see Appendix B). No sensitive species will be planted in MA-3a areas.

**Recommendation BH-1c:** Focus sensitive plant species ~~mangagment~~ **management** and conservation in existing habitat areas MA-1a and MA-1b. To further enhance the biodiversity of the Bernal Hill Natural Area and ~~the~~ **to** help maintain diverse populations of sensitive species through the Natural Areas System, consider augmenting existing sensitive plant species such as big squirrel tail, shooting star, star lily, ~~shooting star~~, fragrant fritillary, Johnny-jump-up, and bladder parsnip (*Lomatium utriculatum*) (MA-1a and MA-1b) ~~all MA-1 areas~~. In order to contribute to countywide conservation efforts, consider the reintroduction of species such as San Francisco ~~collinsia (Collinsia houses (MA-1a)-multicolor)(MA-1a)~~, broadleaf aster (*Aster radulinus*) (MA-1a and MA-1b), meadow white (*Cerastium arvense*) (MA-1a and MA-1b), California saxifrage (*Saxifraga californica*) (MA-1b), yellow mariposa lily (*Calochortus luteus*) (MA-1a), western goldenrod (*Euthamia occidentalis*) (MA-1b), ~~farewell-to-spring (Clarkia rubicunda) (MA-1c, MA-1d, and MA-2a)~~, and California fescue (*Festuca californica*) (MA-2a).

**Recommendation BH-1d:** To help preserve the overall diversity of this Natural Area, in MA-3b, maintain the urban forest-grassland mosaic. ~~For tree dominated areas, There are an estimated 100 trees in the Bernal Hill Natural Area. No trees are proposed for removal anywhere on Bernal Hill. In the tree-dominated areas of MA-3b,~~ follow the urban forest recommendation ~~(GR-14)-(GR-15), which outlines tree preservation and replacement and urban forest enhancement activities.~~ For grassland maintenance see **Recommendations** BH-1a and BH-1b.

## Wildlife

Wildlife issues at Bernal Hill involve the protection and enhancement of habitat, food sources, and shelter. Vegetation management during the breeding season can impact nesting birds ~~(GR-4);(GR-4);~~ however, vegetation management also can provide materials to create artificial

habitat for ground-dwelling birds, small mammals, and reptiles (GR-9). Installation of plants required by California's native butterflies can help increase these populations (GR-10). Finally, reduction in predation pressures will benefit all animals within the Natural Area (GR-7). Implementation of the general recommendations for wildlife when coupled with the vegetation management issues discussed previously will help preserve and enhance wildlife habitat at Bernal Hill.

### Soils, Erosion, and Public Use

The erosion and soil issues at Bernal Hill all relate to the trail system and public use. A network of earthen trails ~~and~~ winds through all Management Areas at Bernal Hill (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)~~ GR-12. Interpretive signs regarding the ecosystem of Bernal Hill should also be considered ~~(GR-13)~~ (GR-14).

**Issue BH-2:** The primary, secondary, and social trail system at Bernal Hill is ~~over~~ 12,200 feet ~~approximately~~ 12,239 feet long; part of ~~which~~ this system is a paved loop that follows an old road around the perimeter of the Natural Area. There are numerous informal access points from this road up into the grassland. Many of these go directly up the slope and have eroded channels in the bank that are several feet deep. Within the interior of the Natural Area, there is a very dense network of social ~~trails, over 4,500 feet,~~ trails (4,544 feet), that meander through the grassland (Figure 6.21-2). Many of these trails closely parallel one another through similar terrain and have resulted in loss of vegetation and erosion of topsoil. Runoff channeled along these trails greatly increases erosion problems. One of these erosion gullies has created a hazardous condition for Natural Area users. A trail on the north east side of the hill (MA-1a) is dangerously close to a cliff. ~~Over 8,100~~ Overall, a total of 8,159 feet of designated trails will remain ~~within this Natural Area.~~

and 4,544 feet of social trails will be closed.

**Recommendation BH-2a:** In addition to the implementation of GR-11, which discusses trail designation, trail improvements, closure of social trails, and restoration methods, at Bernal Hill people and dogs should be encouraged to stay on designated trails and discouraged from climbing the steep slopes and causing erosion on the north side of the Natural Area. Install signs directing people to designated trails and requesting owners to keep dogs off of steep cliffs and slopes. Install temporary erosion control measures to slow erosion and discourage use of ~~erosion-prone~~ erosion-prone gullies. If barriers and signs are not effective at controlling use of these banks, install low fencing in site-specific erosion-prone spots along Bernal Heights Boulevard (MA-1a). Reroute the lowest trail through MA-1a to eliminate the hazardous condition there. This reroute would create approximately 460 feet of new trail.

**Issue BH-3:** The existing DPA at Bernal Hill is described as the top of the ~~hill.~~ ~~All~~ ~~hill and~~ ~~includes 21 acres.~~ ~~However, all the~~ areas on, above, and below Bernal Height Boulevard ~~Road~~ are extensively used as off-leash areas. Several sensitive plant species occur on the steep north side of the hill (see Figure 6.21-4). Off-leash dog activities, especially running up and down slopes and digging, causes erosion and loss of plant habitat (GR-8).

**Recommendation BH-3a:** On- and off-leash dog use of Bernal Hill should ~~remain.~~ ~~There are no sensitive habitat areas (i.e., no access areas) identified by this plan.~~ ~~remain throughout the entire Natural Area.~~ ~~There are no areas where access by dogs would be prohibited.~~ However, off-leash activities should be limited to the flat ~~and less-steep~~ areas on and around Bernal Hill. These relatively flat areas are currently the most heavily used off-leash areas and are most suitable for the ~~run-around~~ ~~run-around~~ use associated with DPAs. These ~~flat~~ off-leash areas include: 1) the quarry at ~~the~~ southwestern portion of the ~~park,~~ ~~park;~~ 2) the quarry at the eastern end of the ~~park,~~ ~~park;~~ 3) the closed portion of Bernal Heights Boulevard; and 4) the terrace on top of the hill east of the radio tower. An off-leash trail loop, linking all of these off-leash ~~areas could also be developed.~~ ~~areas,~~ ~~should remain.~~ Areas with steep slopes, some of which contain locally significant plants, should be converted to ~~on-leash / on-trail~~ ~~on-leash/on-trail~~ areas in order to prevent erosion caused by dog running. Dogs and people would still be able to experience the ~~trials,~~ ~~view~~ ~~trails,~~ ~~views,~~ and wildflowers in these ~~areas but would be required to remain on-trail.~~ ~~This recommendation would reduce the existing off-leash DPA at Bernal Hill by 6 acres (from 21 acres to 15 acres).~~ ~~Of these 6 acres above the road,~~ ~~approximately 2.5 are largely inaccessible with slopes between 45 and 8 acres.~~ ~~Finally,~~ ~~there is opportunity to expand the DPA~~ ~~90 degrees.~~ ~~Therefore the accessible acreage of current off-leash that would be converted to on-leash use is 3.5 acres.~~ ~~In addition, there are 4.5 acres below Bernal Heights Boulevard to mitigate for the reduction in DPA above the road.~~ ~~If the DPA is expanded to include the area below the road, then the overall reduction in DPA acreage would be 3.5 acres or approximately 17~~ ~~that could be converted to off-leash use to help offset the reduction.~~ ~~Although portions of this area below the road are also very steep, some percent of the existing DPA areas could be developed with trails to accommodate public use and access.~~

Slipsheet for Table 6.21-1. \_\_\_\_\_

Slipsheet for Table 6.21-2

Slipsheet for Figure 6.21-1.

Slipsheet for Figure 6.21-2.

Slipsheet for Figure 6.21-3.

Slipsheet for Figure 6.21-4.

Slipsheet for Figure 6.21-5.