

## 6.7 PINE LAKE

### GENERAL DESCRIPTION AND LOCATION

The 8.4-acre Pine Lake Natural Area is located within the 30.3-acre Pine Lake Park (Figure 1-1 and 6.7-1). Located in western San Francisco, Pine Lake Natural Area is bounded in part by Wawona Way on the north and Crestlake Drive on the west and south sides. The eastern edge of Pine Lake abuts the Stern Grove Park Recreation Area. Public access is provided through Stern Grove and numerous parking areas along local streets. Pine Lake (also known as Laguna Puerca) itself has a water surface area of approximately 1.7 acres. Most of Pine Lake Park's undeveloped areas are covered with non-native blue gum forest. As a relatively small natural area within a densely populated area of San Francisco, Pine Lake receives high numbers of visitors. A designated Dog Play Area (DPA) exists in the meadow to the east of the Natural Area. Recreational use is one of the most important values of Pine Lake. Surrounded on three sides by an urban forest, Pine Lake is one of the few natural lakes within the City and supports significant wetland habitat, habitat for a variety of bird species, and possible habitat for western pond turtles.

### GEOLOGY, HYDROLOGY, AND TRAILS

The park geomorphology is an elongated valley with steep, wooded valley walls. Pine Lake occupies the western portion of the valley floor. To the east of the Natural Area lies an open grass field (a DPA) and parking area. Pine Lake receives landscaping and sheet runoff via a curbed asphalt path along the southern edge of Pine Lake Park and its parking lot, just west of Stern Grove (SFPUC 2004).<sup>1</sup>

Like most of the San Francisco Peninsula, the underlying soils at Pine Lake Park are sandy in nature (Figure 6.7-2). This makes the steep banks along the edges of the park highly susceptible to erosion. Park users have established multiple access points and social trails leading down the steep sandy slopes from neighborhood streets and yards (Figure 6.7-2). In some areas on the northern slope, eucalyptus logs have been placed on contour to control erosion by acting as water bars and sediment traps. The logs have been used as barriers to deter the use and creation of social trails.

The trail surveys conducted for this project indicate that there are approximately 3,100 feet of trails within the Pine Lake Natural Area. Of these, approximately 2,500 feet will remain. Social trails cover just over 600 feet and are subject to closure or re-routing.

---

<sup>1</sup> Stormwater runoff and global treatment measures are described in the Stormwater Management Plan for San Francisco.

## VEGETATION

Based on aerial photo interpretation and ground-truthing, the vegetation of the Natural Area at Pine Lake was classified into nine series (Table 6.7-1; Figure 6.7-3). These series represent four subformations: 48 percent is forest; 26 percent is scrub; less than 4 percent is wetland subformations; and 22 percent is classified as “other” (ornamental and developed areas). Pine Lake itself accounts for 19 percent of the area.<sup>2</sup>

### Forest

Only two forest series were mapped within the Natural Area. Blue gum forests wrap almost all the way around Pine Lake and account for 4.00 acres. A small (0.10 acre) patch of cypress occurs on the western side of the park. The understory of these forests varies in composition. In some areas it is heavily infested with invasive species, while in other locations (e.g., on the southern side of the lake) some native scrub species persist.

### Scrub and Wetland

Only two scrub formations were mapped at Pine Lake: California blackberry and willow. Approximately 0.53 acre of California blackberry scrub occurs along the southern edge of the Natural Area, forming two breaks in the blue gum forest. The 1.68 acres of willow scrub exist along the periphery of Pine Lake and in two smaller patches to the east of the lake at the base of the southern bank. The two wetland series mapped were bulrush marsh and swamp knotweed wetland that account for 0.26 and 0.10 acres, respectively.

### Other

The 1.69 acres of open water account for the surface area of Pine Lake itself. The only ornamentals are in a small area (0.01 acres) on the western edge of the Natural Area near the cypress grove.

### Sensitive Plant Species

The California Natural Diversity Data Base (CNDDDB) reports the occurrence of three sensitive plant species at Pine Lake Park (Table 6.7-2); however, none of these species are presumed to still exist at Pine Lake. Of these, beach layia (*Layia carnosa*) is a historic record from 1904 that was mapped throughout most of San Francisco (CNDDDB 2005). San Francisco owl's-clover (*Triphysaria floribunda*) was described as being in the Lake Merced area (CNDDDB 2005), which could have included Pine Lake. The only species potentially still present according to the CNDDDB is Kellogg's horkelia (*Horkelia cuneata* var. *sericea*). Efforts to relocate this species in

---

<sup>2</sup> These calculations were based on conditions in 2000. Since that time, the water level has risen as part of the Pine Lake Park Improvement Plan. New calculations are currently not available.

the 1980s and 1990s have been unsuccessful (CNDDDB 2005) and this species is reported as extirpated from San Francisco County (Wood 1996).

As part of on-going conservation efforts, one sensitive plant species, San Francisco gumplant (*Grindelia hirsutula* var. *maritima*) has been reintroduced above and below the trail on the north side of Pine Lake.

### **Invasive Plant Species**

Non-native vegetation cover accounts for just over 4 acres of the land within the Pine Lake Natural Area. This is almost entirely blue gum forest. The only other series of which non-native species are an important component is the cypress forest (0.1 acres). Water primrose (*Ludwigia* sp.) was first reported from Pine Lake in 1993 (DPW 2001). This species spread rapidly through the lake and the first removal efforts took place in 1996; in May 2001 it covered approximately 40 percent of the lake surface (DPW 2001).

## **WILDLIFE**

### **Birds**

The multi-storied complex habitat of the park provides suitable foraging, nesting, and roosting habitat for a wide variety of species. The forests of Pine Lake provide nesting habitat for raptors and owls. Habitat for smaller birds (passerines) is available in the willows and bulrush wetlands. The complex understory (blackberries and other shrubs) provides nesting and foraging habitat for smaller passerines. The birds that are expected to use Pine Lake itself include a variety of waterfowl, American coot (*Fulica americana*), grebes, cormorants, herons, and egrets. The upland habitats offer suitable habitat for California towhee (*Pipilo crissalis*), American robin (*Turdus migratorius*), and mourning dove (*Zenaida macroura*) amongst others (Appendix Table C-4). The tule marsh at Pine Lake supports a red-winged blackbird (*Agelaius Phoeniceus*) nesting colony.

### Sensitive Bird Species and Important Bird Habitat

Pine Lake Natural Area supports sensitive bird species and important bird habitats. Sixteen species of sensitive birds have been reported from Pine Lake (Table 6.7-2). Of these, four species are known to breed within the Natural Area. The CNDDDB reports that California black rail (*Laterallus jamaicensis coturniculus*), saltmarsh common yellowthroat (*Geothlypis trichas sinuosa*), and bank swallow (*Riparia riparia*) occur at Pine Lake. Bank swallows currently nest in the sand dunes at Fort Funston and may forage over Pine Lake on occasion. California black rails have not been reported from within the City since the late 1930s and do not occur at Pine Lake. Saltmarsh common yellowthroat are a subspecies of common yellowthroat which currently nest at Lake Merced. The status of the saltmarsh subspecies at Pine Lake is unknown, but suitable nesting habitat occurs in the bulrush wetlands and willow scrub habitats around the lake.

An olive-sided flycatcher (*Contopus copperis*) was observed at Pine Lake in May 2001, but is not suspected to nest at this location (DPW 2001). The urban forest of Pine Lake on the western side of the Natural Area has supported a red-shouldered hawk (*Buteo lineatus*) nest in the past; this is a species of local concern.

The areas at Pine Lake that support or have the potential to support sensitive species of birds have been designated important bird habitat. These areas include the urban forests in which the red-shouldered hawk nests. The willows adjacent to Pine Lake itself, the bulrush marsh within the lake, and the willows along the bluff to the east of the lake are all considered important bird habitat (Figure 6.7-4). These areas provide nesting habitat for Wilson's warbler (*Wilsonia pusilla*) and Hutton's vireo (*Vireo huttoni*) may also nest here. Other resident and migratory birds are likely to use this habitat but detailed occurrence records are not available.

### **Mammals**

Surveys of small mammals were conducted in Pine Lake in the spring of 2000 (Paquin and Reading 2000). An array of approximately 40 live traps was placed near the edge of the pond at Pine Lake at dusk and serviced the next morning. This pattern was repeated for four consecutive nights (160 trap nights) on June 26-30, 2000. Despite this effort, no small mammals were captured at Pine Lake. A dead pocket gopher (*Thomomys bottae*) was found in Pine Lake (EIP field visit, April 5, 1999), which suggests that some common small mammals such as pocket gophers and house mice (*Mus musculus*) exist in Pine Lake Park. Raccoon (*Procyon lotor*) tracks were observed in May 2001 (DPW 2001). Large mammals likely to use Pine Lake area such as striped skunks (*Mephitis mephitis*) and Virginia opossum (*Didelphis virginiana*) are typical of urbanized parks in general.

### **Reptiles/Amphibians**

Seven surveys for reptiles and amphibians, totaling approximately nine hours of field effort, were conducted at Pine Lake in March 2000 (Paquin and Reading 2000). These surveys, conducted by walking transects, resulted in the capture of California slender salamanders (*Batrachoseps attenuatus*) and observations of western pond turtle (*Clemmys marmorata*), red-ear slider (*Trachemys scripta*), and spiny soft-shell turtle (*Apalone spinifera*). California slender salamanders were the most common species captured overall, and were found most frequently near the lake margin (Paquin and Reading 2000). These data are consistent with the results of walking surveys conducted by EIP biologists on April 5, 1999, when 10 California slender salamanders were found at Pine Lake. In addition, EIP biologists observed one western pond turtle during a site visit on April 18, 2000.<sup>3</sup> Most of the salamanders were discovered under rocks and logs in the blue gum forest (EIP unpublished data). During these surveys, three San Francisco alligator lizards (*Elgaria coerulea coerulea*) and a western fence lizard (*Sceloporus*

---

<sup>3</sup> The details of this observation were not included in the 2002 CTF Draft (EIP 2002).

*occidentalis*) were also observed. Two of the alligator lizards were engaged in mating or territorial display when observed.

#### Sensitive Reptile/Amphibian Species

The western pond turtle is a species of management concern; this species was observed at Pine Lake during field efforts in 2000, but has not been observed more recently. A document that evaluated the biological impacts associated with the Pine Lake Improvement Project concluded that the only “Federal and state special-status animal species known to either seasonally or permanently reside in the Pine Lake vicinity are limited to the western pond turtle, which is a State and Federal species of special concern” (EDAW 2004). This report assumed that western pond turtles were still present at Pine Lake and described mitigation measures required to protect this species. The California Department of Fish and Game (CDFG) participated in the development of these mitigation measures. To avoid mitigation, CDFG typically requires substantial evidence that a species has been locally extirpated. The CDFG has no reason to believe that the pond turtles are not present at Pine Lake, but characterizes the habitat as very poor primarily because there is very limited terrestrail nesting habitat (D. Johnston, CDFG, pers. comm). This plan assumes that this species is still present and makes management recommendations accordingly for the following reasons:

1. this species was observed by professional biologists on two separate surveys conducted as part of this planning effort;
2. the CNDDDB reports an occurrence at Pine Lake that was challenged and upheld by CDFG;
3. focused surveys have been conducted to establish the absence of this species;
4. CDFG recommended measures to avoid impacts to western pound turtle and has indicated that there is no reason the turtles should not still exist; and
5. aquatic habitat for this species is present.

#### Invasive Reptile/Amphibian Species

Non-native red-ear sliders and soft-shell turtles were observed in Pine Lake. Both of these species are aggressive predators that consume other young turtles, juvenile amphibians, and fish. These turtles have become common in the lakes throughout San Francisco, probably from the release of unwanted pets.

### **MANAGEMENT AREAS**

The most sensitive of the Management Areas (MAs) designated at Pine Lake are associated with the wetland habitat in the lake (MA-1). The bulk of the open water, willow habitat, and buffer area around the MA-1 area have been designated MA-2. This area supports a potential western pond turtle population, wetland vegetation, and is susceptible to human-generated disturbance

(Figure 6.7-5). Those areas less sensitive and not a priority for direct management (MA-3), include the urban forest on the slopes that surround Pine Lake.

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

- increased patch size of willows and coastal scrub and increase in the structural diversity of these habitats;
- increased riparian habitat along the margin of Pine Lake providing improved wildlife habitat;
- protection of western pond turtles;
- improved access on designated trails;
- no change to the existing DPA but restricted dog access in the lake;
- increased educational use with native plant demonstration gardens;
- restoration of the degraded shoreline;
- increased structural diversity to improve wildlife habitat in surrounding forest; and
- decreased sedimentation and erosion from surrounding hillsides.

Implementation of the following recommendations will improve native willow riparian habitat, which in turn will enhance habitat for a variety of nesting birds. Improved access to the lake on formalized trails will increase the quality of a Natural Areas visitor's experience. The actions that formalize and restore trails when coupled with shoreline restoration will improve the aquatic habitat of Pine Lake.

## ISSUES AND RECOMMENDATIONS

In the following discussion, the system-wide issues and recommendations that apply to the Natural Area at Pine Lake are presented first within each topical discussion, followed by site-specific issues and recommendations. The recommendations in this management plan will guide restoration, enhancement, and maintenance work (Figure 6.7-5).

### Vegetation

The biodiversity and ecological function of the Natural Area at Pine Lake are being threatened. In addition to the following specific recommendations, control of invasive plants (GR-1) and re-introduction of sensitive plant species (GR-2), will help preserve and enhance the biodiversity of Pine Lake. 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). The urban forest that surrounds Pine Lake will be retained and managed through implementation of GR-15.

**Issue PL-1:** The natural resources of Pine Lake, including the shorelines themselves, wetlands, and open water are being degraded due to habitat loss and invasive vegetation (e.g., blue gum, water primrose, Cape ivy (*Delawarea odorata*), etc.). Habitat quality for wildlife is reduced as native plants are displaced and diversity is reduced. Also, as the invasive forest alters the soil chemistry and light conditions around the lake, the wetlands, willow and water quality within the lake can be degraded, which may also adversely affect wildlife.

**Recommendation PL-1a:** To preserve the bulrush and swamp knotweed wetlands in MA-1a, populations of invasive plants within MA-1a and MA-2a shall be reduced. In order to preserve the open water of Pine Lake (MA-1a and MA-2a), periodic removal of water primrose shall occur.<sup>4</sup> Invasive tree species in all MA-1a, MA-2a, and MA-2b areas will also be prevented from becoming established. A total of 132 invasive trees, primarily eucalyptus, shall be removed in Pine Lake Park as per the *Sigmund Stern Grove and Pine Lake Park Improvement Plan – Recommendations Report* (SFRPD 2003). Of these trees approximately 50 occur within the Natural Areas of Pine Lake Park. These trees, most of which are unhealthy and hazardous, are scheduled to be removed in summer 2006. No additional trees are recommended for removal. Approximately 1,000 trees will remain. This same plan also calls for the creation of light windows into the urban forest to encourage plant growth in the understory (MA-3a). In spring or summer of 2006, invasive trees (mostly blue gum eucalyptus (*Eucalyptus globulus*) on the southern side of the lake will be pruned to create openings that will allow light to reach the forest floor and the nearby shoreline. Within upland areas, including the terrestrial buffer of MA-2a and the urban forest (MA-3a), invasive terrestrial plants (e.g., wild radish (*Raphanus sativus*), Cape ivy, and European grasses) shall be reduced. Invasive 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).

**Recommendation PL-1b:** Areas where invasive species have been removed shall be revegetated with appropriate native plants. Existing wetlands and willow riparian areas shall be enhanced and diversified as necessary, especially in the area between the trails and the lake (MA-2a) where substantial benefit to wildlife could be achieved by increasing the riparian and native scrub habitats. Care shall be taken to not over-plant willow, thereby blocking views down the lake. The area between the trail and the urban forest shall be managed primarily for native shrub (California lilac (*Ceanothus thyrsiflorus*)) and tree species (oaks, toyon (*Heteromeles arbutifolia*)), with scattered cypress, eucalyptus, and pine, an action that will also benefit wildlife (MA-2a). To increase available habitat for birds, a continuous riparian corridor to Pine Lake at the base of the slope on the south side of the Natural Area (MA-2a, MA-2b, and MA-3a) shall be developed and maintained. Install native plant species that are consistent with the planting plans for the Pine Lake Park Improvement Project and with the diversity, cover,

---

<sup>4</sup> SFRPD does not currently have the equipment to routinely cut back water primrose; however, water primrose will be cut back as part of the Pine Lake Improvement Project in spring or summer 2006.

and density of reference plots in similar habitats within and around San Francisco (Appendix B). Modify planting plans and design to favor showy, perennial shrubs, trees and herbs especially at trail junctions and access points around the lake. In MA-3 areas, plant the understory and forest gaps in accordance with the recommendations of the urban forest management recommendation (GR-15) and the Pine Lake Improvement Plan (SFRPD 2003).

## Wildlife

Wildlife issues at Pine Lake focus on protecting western pond turtles and improving riparian habitat for resident and migratory birds. 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 PL-2:** Raptors routinely nest in the urban forest that surrounds Pine Lake. Raptor nesting is a relatively uncommon occurrence within San Francisco. Nest re-use by red-tailed hawks is relatively common, but the rate of re-use declines over time and a new nesting site is eventually located (Johnsgard 1990).

Therefore, because hawks change nest sites, management of the urban forest could impact these species if trees are removed too close to nests or in the wrong season.

**Recommendation PL-2a:** Raptor nests shall be located on an annual basis and avoided while active. Additionally, no tree removal activities shall affect trees used by these species and should not occur within 500 feet of the nest when the nest is active. This recommendation should be implemented in MA-2b, MA-2c, and MA-3a.

**Issue PL-3:** Habitats important to many bird species are limited in distribution and complexity at Pine Lake. Examples of this include the willow riparian and coastal scrub habitats.

**Recommendation PL-3a:** Increase the patch size of willows and coastal scrub by removing invasive species such as Cape ivy that threaten these habitats (MA-2a and MA-2b). Create larger habitat units by encouraging willows to form a continuous riparian corridor to the lake (MA-3b).

**Recommendation PL-3b:** Increase the structural diversity of these habitats by installing native plants that are different in height from the existing habitats. For example, planting red alder (*Alnus rubra*), coast twinberry (*Lonicera involucrata*), or elderberry within the

willow patches would enhance structural and food diversity. This recommendation should be implemented in MA-2a, MA-2b, and 3b.

**Recommendation PL-3c:** Install native hydrophytic vegetation along the currently degraded shoreline of Pine Lake. Plants that provides cover and foraging habitat for resident and migratory waterfowl should be selected for installation. Species suitable for planting are presented in Appendix A of *Sigmund Stern Grove and Pine Lake Park Improvement Plan – Recommendations Report* (SFRPD 2003) and Appendix B of this report. This recommendation should be implemented in MA-1a and MA-2a.

### Reptiles/Amphibians

**Issue PL-4:** A western pond turtle, a sensitive species, was observed at Pine Lake; however, it is not known if this species currently exists at the lake. The CDFG has determined that habitat surrounding the lake is of poor quality. Vegetation surrounding the lake may not allow for successful nesting because it is too dense and does not allow sunlight to reach the forest floor. Typical nesting sites for western pond turtles tend to be along pond or stream margins or open, southern-facing slopes when suitable habitat is not available near the watercourse (Ernst et al. 1994). These habitats are limited at Pine Lake.

**Recommendation PL-4a:** Determine the status of pond turtles at Pine Lake including presence, population, and reproduction status (MA-1a and MA-2a).

**Recommendation PL-4b:** If western pond turtles are found at Pine Lake, the animals will be relocated to the higher-quality habitat at Lake Merced, located one-half mile away. Approval from CDFG may be required before this action could occur.

**Issue PL-5:** Pacific chorus frogs (*Pseudacris (Hyla) regilla*) were once abundant, but now are essentially unknown within the City of San Francisco. The exact reason for this is not clear. Water quality within Pine Lake appears to be adequate for reproduction. One of the biggest issues facing this species is predation by bullfrogs (*Rana catesbeiana*), non-native turtles, and birds.

**Recommendation PL-5a:** San Francisco Recreation and Parks Department (SFRPD) shall consider the feasibility of re-introducing this species into Pine Lake. Before this is done, it is necessary to know if bullfrogs exist within Pine Lake. Bullfrogs are a voracious predator and would likely quickly eradicate any introduced amphibians. If no bullfrogs are present, re-introduction of Pacific chorus frogs may be feasible. This recommendation should be implemented in MA-1a and MA-2a.

**Recommendation PL-5b:** Prior to any introductions, SFRPD will consult with the CDFG because CDFG has regulatory authority over this type of action (see also PL-4b). Any re-introduction should include a sufficient number of frogs or tadpoles to minimize any

genetic bottle-neck and allow for the maximum chances of success. This recommendation should be implemented in MA-1a and MA-2a.

### **Soils, Erosion, and Public Use**

Public use of Pine Lake is very high given the relatively small size of the park. This level of use has resulted in the formation of social trails and erosion problems. All social trails are subject to closure (GR-11) and erosion issues are described within GR-12 and the Best Management Practices in Section 5.3. This plan proposes no changes to the DPA in the meadow, upper meadow, and trail experience at Pine Lake. Because of its high level of use, Pine Lake presents the opportunity for SFRPD to increase the education outreach to the public through improved signage (GR-14).

**Issue PL-6:** One of the main access points to Pine Lake is a 338-foot long hazardous concrete trail on the western end of the Natural Area. The concrete was placed here on a sandy substrate and is not safe to use (MA-3a). There are another approximately 608 feet of social trails within the Natural Area that are either unsafe to use or are contributing to poor water quality in Pine Lake.

**Recommendation PL-6a:** If the concrete trail cannot be reopened to allow for safe access, close this hazardous trail and develop a nearby alternate route. Once the trail is closed, the old concrete should be removed and the site revegetated in accordance with Recommendation PL-1b.

**Recommendation PL-6b:** Maintain and improve 2,144 linear feet of primary trails throughout the Natural Area. Reroute or close degraded areas and social trails per recommendations in GR-11 and revegetate areas as discussed in Recommendation PL-1b.

**Issue PL-7:** The lake, shoreline, wetland riparian vegetation, and the wildlife that use them are being degraded by dog and human access at multiple points around Pine Lake. Because there is no formal access point to the water at Pine Lake, people and their pets access the water at numerous locations. During the small mammal, reptile, and amphibian surveys conducted for this project, biologists observed large numbers of off-leash dogs (at times almost 40) at Pine Lake (Reading 2000). This level of use has created areas of the bank that are completely bare. Eroding soils from these areas degrade the water quality and increase nutrient input to the lake, which in turn fertilizes the growth of invasive aquatic vegetation. Dog activities in the lake can disturb sensitive wildlife species. At the same time, it is important to maintain public access to the shoreline so that users can enjoy Pine Lake.

**Recommendation PL-7a:** Provide dedicated access points to Pine Lake and reduce uncontrolled shoreline access. As part of the Park Improvement Project, two access points will be developed, one at the beach at the east end and one overlooking the lake at the west end. Install a buffer of native vegetation along the perimeter of Pine Lake (MA-

1a) that discourages access to the water's edge, provides habitat for wildlife, and is aesthetically pleasing. In order to encourage establishment of this vegetated buffer, install a low temporary fence. These later two recommendations will be implemented in 2006 as part of the park improvement project *Sigmund Stern Grove and Pine Lake Park Improvement Plan – Recommendations Report* (SFRPD 2003).

**Recommendation PL-7b:** Restrict dog access into the lake (1.7 acres). Dogs are allowed on-leash on all trails in Pine Lake Natural Area and off-leash in the adjacent meadow. For logistical and aesthetic reasons, access to the water cannot be fenced at the east end beach. Therefore, at Pine Lake, signs stating that dog access to the water is restricted shall be posted at the east end access.

**Recommendation PL-7c:** Post signs at the lake regarding prohibitions against dog access in the lake and the legal requirements to keep dogs leashed when outside a designated DPA. No changes to the existing DPA are required.

**Table 6.7-1. Vegetation series mapped at Pine Lake.**

	<b>Vegetation Series</b>	<b>Total Acreage</b>
<b>Forest</b>	blue gum forest	4.00
	cypress forest	0.10
	<b>Subtotal</b>	<b>4.10</b>
<b>Scrub</b>	California blackberry scrub*	0.53
	willow scrub*	1.68
	<b>Subtotal</b>	<b>2.21</b>
<b>Wetland</b>	bulrush marsh*	0.26
	swamp knotweed wetland*	0.10
	<b>Subtotal</b>	<b>0.36</b>
<b>Other</b>	ornamental	0.01
	developed	0.13
	open water	1.69
	<b>Subtotal</b>	<b>1.83</b>
<b>Grand Total</b>		<b>8.50</b>

\* Indicates vegetation type is dominated by native species.

**Table 6.7-2. Sensitive species historically and presently known to occur at Pine Lake**

<b>Species</b>	<b>Common Name</b>	<b>Status Federal, State, CNPS</b>	<b>Occurrence Status</b>
<b>ANIMALS</b>			
<i>Eucyclogobius newberryi</i>	Tidewater Goby	FPD (FE), CSC	Historically reported.
<i>Rana aurora draytonii</i>	California Red-legged Frog	FT	Historically reported.
<i>Clemmys marmorata</i>	Western Pond Turtle	CSC	Presumed extant, but not recently observed.
<i>Anas strepera</i>	Gadwall	SLC	Historic breeder, now winter resident
<i>Butorides striatus</i>	Green Heron	SLC	Presently occurs.
<i>Geothlypis trichas</i>	Common Yellowthroat	CSC	Historically reported, current status unknown.
<i>Vireo huttoni</i>	Hutton's Vireo	SLC	Potentially breeds
<i>Laterallus jamaicensis coturniculus</i>	Black Rail	ST	Historically reported.
<i>Hirundo rustica</i>	Barn Swallow	SLC	Presently breeds
<i>Anas strepera</i>	Gadwall	SLC	Historic breeder. Winter resident
<i>Bubo virginianus</i>	Great Horned Owl	SLC	Presently breeds
<i>Vermivora celata</i>	Orange-crowned Warbler	SLC	Presently occurs.
<i>Carpodacus purpureus</i>	Purple Finch	SLC	Presently occurs.
<i>Sitta pygmaea</i>	Pygmy Nuthatch	SLC	Presently breeds
<i>Sitta canadensis</i>	Red-breasted Nuthatch	SLC	Winter resident
<i>Buteo lineatus</i>	Red-shouldered Hawk	SLC	Presently occurs.
<i>Wilsonia pusilla</i>	Wilson's Warbler	SLC	Presently occurs.
<i>Podilymbus podiceps</i>	Pied-billed Grebe	SLC	Presently breeds
<i>Riparia riparia</i>	Bank Swallow	ST	May forage in area from nesting colony at Ft. Funston.
<b>PLANTS</b>			
<i>Layia carnosa</i>	Beach Layia	FE, SE, 1B	Historically reported.
<i>San Francisco lessingia</i>	San Francisco Lessingia	FE, SE, 1B	Possibly extirpated
<i>Triphysaria floribunda</i>	San Francisco Owl's-clover	1B	Possibly extirpated
<i>Horkelia cuneata</i> ssp. <i>sericea</i>	Kellogg's horkelia	1B	Historically reported, not found in 1980 or 1990 surveys.

**Table 6.7-2. Sensitive species historically and presently known to occur at Pine Lake**

**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.

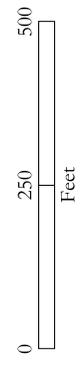
***Golden Gate Audubon Society***

- SLC* Species of Local Concern



**FIGURE 6.7 - 1**  
**AERIAL PHOTOGRAPH,**  
**PROPERTY BOUNDARIES,**  
**AND NATURAL AREAS**  
**Pine Lake**  
 Significant Natural Resource Areas  
 Management Plan  
 San Francisco, California

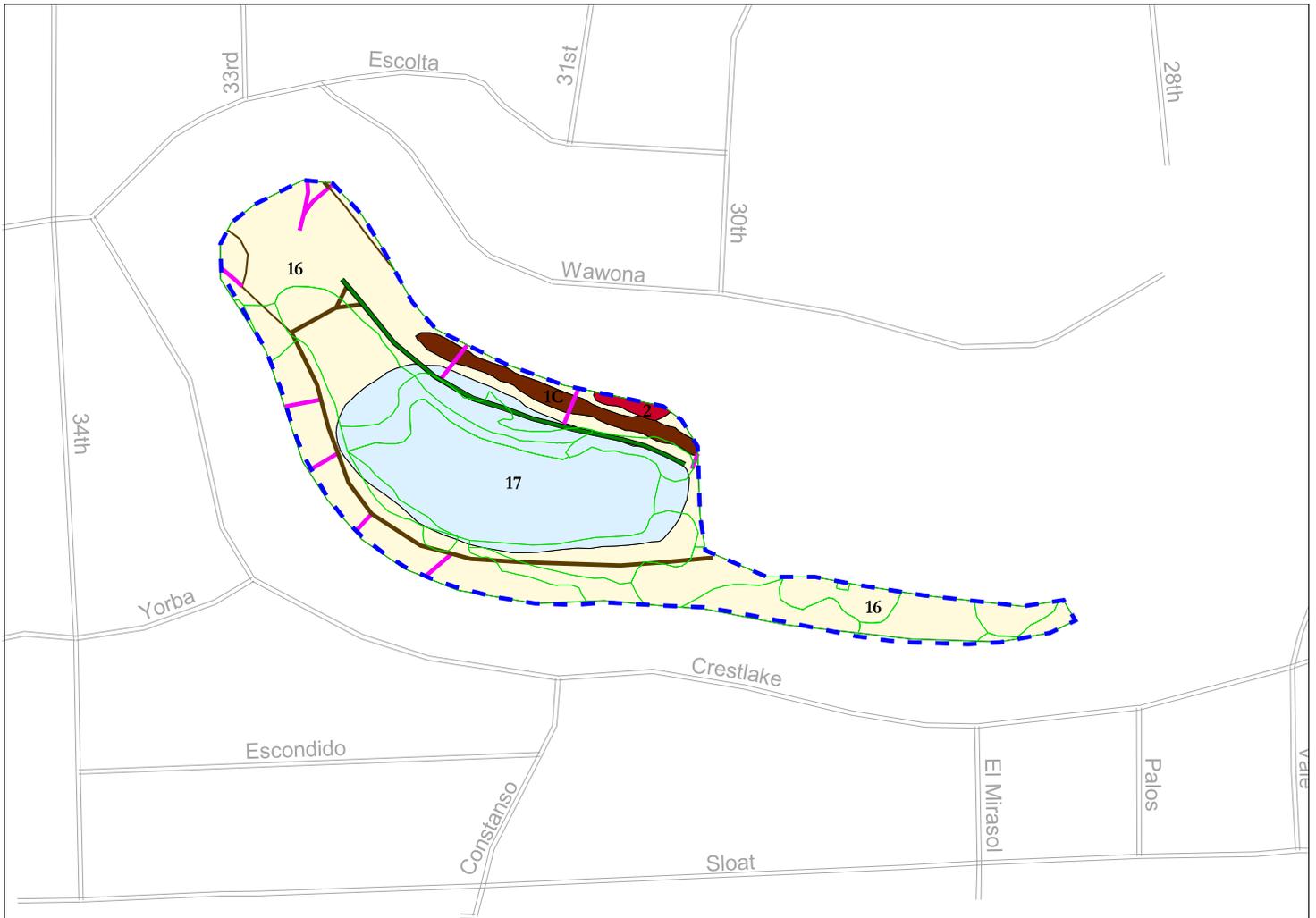
-  Natural Area Boundary
-  SFRPD Jurisdiction (SF City Property)
-  Natural Area Boundary and SFRPD Jurisdiction (SF City Property)
-  10-Foot contour line



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 June 10, 2005.



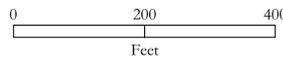


Soils, Land Features, and Trails

- |   |                            |   |                         |
|---|----------------------------|---|-------------------------|
|  | escarpments                |  | asphalt or gravel road  |
|  | erosion control area       |  | earthen road            |
|  | sandy soil                 |  | primary earthen trail   |
|  | pond/lake                  |  | secondary earthen trail |
|  | vegetation series boundary |  | proposed trail          |
|   |                            |  | closed trail            |
|   |                            |  | Natural Area boundary   |

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 (SFSU IGIS), 2000, 2005; trails data digitized by SFSU IGIS, 2005; natural area boundary created by SFSU IGIS from data determined by NAP, 2005; streets data excerpted from ArcView StreetMap 2000 Data, copyright 1998-2000, Environmental Systems Research Institute, Inc. (ESRI).

Created by Debra Dwyer of San Francisco State University Institute for GISc, March 20, 2001, revised December 11, 2005.



**FIGURE 6.7 - 2**  
**SOILS, LAND FEATURES,**  
**AND TRAILS**

**Pine Lake**

**Significant Natural Resource Areas**  
**Management Plan**

**San Francisco, California**





**Vegetation Subformation and Series**

**Wetland**

- WB** bulrush wetland
- WK** swamp knotweed wetland

**Central Coast Riparian Scrub**

- RW** willow scrub

**Non-native Forest**

- EB** blue gum forest
- EC** cypress forest

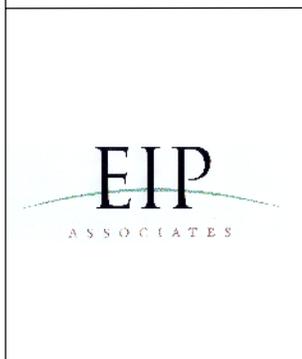
**Northern Franciscan Coastal Scrub**

- FB** California blackberry scrub

**Other**

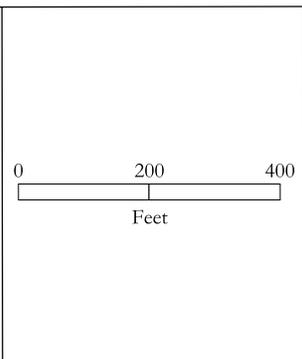
- OD** developed
- OW** open water

**- - - -** Natural Area boundary



Source: Vegetation data collected by San Francisco Recreation and Park Department Natural Areas Program (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 - 2002; natural areas 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.

Created by D. Dwyer of San Francisco State University Institute for GISc  
March 13, 2001, revised June 5, 2005.

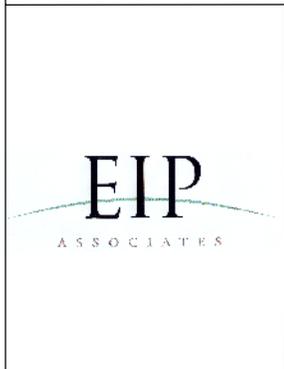


**FIGURE 6.7 - 3**  
**VEGETATION**  
**Pine Lake**  
**Significant Natural Resource Areas**  
**Management Plan**  
**San Francisco, California**



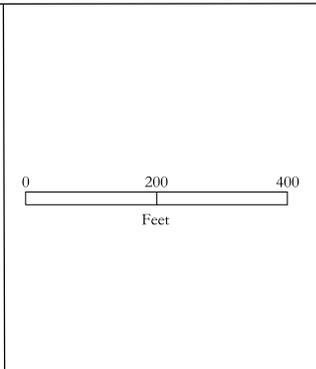
Sensitive Species and Important Bird Habitat

-  Natural Area boundary
-  Red-shouldered Hawk
-  Western Pond Turtle
-  San Francisco Gumplant
-  Bulrush Marsh
-  Swamp Knotweed Marsh
-  Important Bird Habitat
-  Pond
-  vegetation series boundary



Source: Sensitive species data collected by San Francisco Recreation and Park Department Significant Natural Areas Program (NAP) 2001-2002; 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 areas 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).

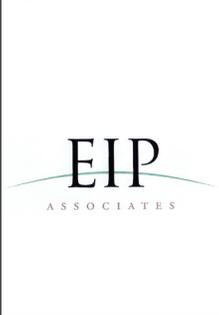
Created by Debra Dwyer of San Francisco State University Institute for GISc, March 26, 2001, revised June 5, 2005.



**FIGURE 6.7 - 4**  
**SENSITIVE SPECIES AND IMPORTANT BIRD HABITAT**  
**Pine Lake**  
 Significant Natural Resource Areas Management Plan  
 San Francisco, California

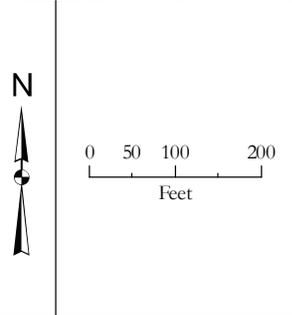


Mgmt Area	Action
MA-1a	<ul style="list-style-type: none"> <li>Maintain tule marsh</li> <li>If found, relocate western pond turtle to Lake Merced</li> <li>Consider reintroducing Pacific chorus frog</li> <li>Reduce and contain invasive aquatic plant species, such as <i>Ludwigia</i></li> <li>Restrict dog access to tule marsh and water's edge</li> </ul>
MA-2a	<ul style="list-style-type: none"> <li>Maintain and enhance riparian and coastal scrub</li> <li>Maintain and enhance oak woodland-coastal scrub mosaic</li> <li>Maintain views</li> <li>If found, relocate western pond turtle to Lake Merced</li> <li>Reintroduce sensitive plants</li> <li>Limit access including dogs to designated trails, platforms and overlooks, install temporary fencing, if necessary</li> </ul>
MA-2b	<ul style="list-style-type: none"> <li>Maintain and enhance riparian habitat</li> </ul>
MA-2c	<ul style="list-style-type: none"> <li>Protect red-tailed hawk nest</li> </ul>
MA-3a	<ul style="list-style-type: none"> <li>Maintain and enhance urban forest</li> <li>Improve or re-route concrete trail at west end</li> </ul>
MA-3b	<ul style="list-style-type: none"> <li>Maintain and enhance a riparian corridor</li> </ul>
<b>Natural Area Wide Management Actions</b>	
<ul style="list-style-type: none"> <li>Reduce and contain herbaceous and woody weeds</li> <li>No invasive tree removal unless specified above</li> <li>Prevent recruitment of invasive trees unless specified above</li> <li>Total trails to remain (including possible new trails): 2,562 linear-feet</li> <li>Provide access on designated trails only</li> <li>Social trails subject to closure</li> <li>Total invasive trees to remove: 0; Total invasive trees to remain: 1,000</li> <li>Implement erosion control as required (GR-12)</li> <li>Implement wildlife enhancements as appropriate</li> <li>No change to existing Dog Play Area</li> </ul>	



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 (SFSU IGIS), 2005; streets data excerpted from Environmental Systems Research Institute (ESRI), Inc.'s Street-Map 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; revised August 23, 2005.



**FIGURE 6.7 - 5**  
**MANAGEMENT AREAS AND TRAIL PLAN**  
**Pine Lake**  
**Significant Natural Resource Areas Management Plan**  
**San Francisco, California**