

## **5. AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES**

### **5.1 PHYSICAL RESOURCES**

#### **5.1.1 Affected Environment**

Much of the base material for Presidio soils is loose unconsolidated sediments and dune sands that are subject to soil erosion. The soils of the Presidio have undergone major changes since pre-settlement times because of physical disturbance from development, erosion, and compaction. Changes are also the result of forest growth that has increased organic matter, soil fertility, and soil acidity.

The Presidio's three principal drainages have been greatly altered through past construction activities. Riparian areas and surface water can be found along the El Polin drainage, at Lobos Creek, Mountain Lake, Tennessee Hollow, and in the Fort Scott youth center area. All of the water that is used at the Presidio comes from the Lobos Creek drainage and affects that natural system. Because available water is insufficient to provide for both potable water needs and extensive irrigation, water conservation is an important concern.

#### **5.1.2 Impact Assessment**

##### ***Alternative 1: Selected Alternative***

Restoration of stream drainages and riparian areas at Lobos Creek and El Polin Spring/Tennessee Hollow would enhance water resources by restoring natural drainage patterns, improving water quality through reduced sedimentation, and increasing riparian and wetland habitat. Specific action plans for each wetland and creek restoration project would identify any specific impacts on water quality. If needed, Section 402 and 404 permits in compliance with the Clean Water Act would be obtained.

Identified erosion problems would be corrected and soil loss would be reduced with a long-term beneficial impact on soils. Control of foot traffic by construction of a trail system that can accommodate visitor use patterns would minimize the potential for future erosion problems and allow repair of existing problems.

Plant restoration efforts and rehabilitation of historic forest would require soil disturbance as invasive plants and trees are removed. Soil erosion would increase temporarily, but would be minimized by mitigating measures to minimize compaction and control erosion.

Where forested areas are restored to native plant vegetation, soils would be treated to restore them to more natural conditions. The removal of layers of forest litter would reduce hydrophobic conditions that have developed in some forested areas (Jones & Stokes Associates, Inc. 1997). Soils in restoration areas would become less acidic and more capable of rainfall infiltration. Serpentine soils would be returned to a more natural

condition by the removal of organic material and forest litter, allowing growth of native species that are adapted to low-nutrient serpentine soils. Erosion in restoration areas would be limited by replanting and soil stabilization whenever soils are disturbed. In native plant communities, native plants grown in the Presidio nursery and salvaged native plants would be used.

To conserve limited water resources, water consumption would be taken into account in selecting plants for replacement and revegetation. The selection of drought-tolerant plants and efforts to minimize irrigation whenever possible would reduce impacts on local water resources.

No significant effect on air quality is expected. Some large equipment use would be required to prepare native plant restoration areas, but use of equipment would be short term. Much of the restoration activity would require concentrated human labor rather than machine use.

### ***Alternative 2: No Action***

Initially physical resources would change little. Identified erosion problems and gullying would continue to result in annual soil loss and cause degradation of runoff water quality in natural drainages. The sandy soils of the Presidio are particularly susceptible to erosion, and gullies form easily. Over time, additional erosion problems and more erosion sites would occur as off-trail hiking continued and existing problems were not repaired. Root exposure from unchecked foot traffic and soil erosion would be expected to increase and more forest tree loss would be anticipated. In the future, when tree cover is lost and not replaced, more wind erosion would occur. Wind, a very minor erosion factor today, might become the cause of future erosion problems. As more breaks occur in the western windbreak, blowing sand may have a greater effect on park users and adjacent residential areas.

Soil would continue to be affected and changed from its natural condition by forest trees within the historic forest areas as well as in adjacent areas where trees have invaded and naturalized.

Sustainable maintenance practices and water conservation would not be a primary focus in this alternative. Therefore, water consumption to care for landscape vegetation, using the Presidio's limited water resources, might be at higher levels for this alternative than for the other alternatives that would emphasize use of drought-tolerant plants in landscaping.

### ***Alternative 3: Selective Forest Cuts and Alternative 4: Increase Tree Diversity***

Impacts under Alternatives 3 and 4 would be similar to those under Alternative 1. Minor, short-term impacts to soils would occur as small blocks of forest are cleared for rehabilitation within the historic forest management zone. When the small blocks are cut and the tree cover and litter layers are removed, the soil surface would be temporarily

disturbed. Some minor soil loss might occur until the areas can be replanted. However, replanting of forest stands would ensure long-term soil stability. The need to use heavy equipment would be higher for these alternatives because they would include proactive clearing of small forest areas, which could increase soil compaction. However, the mitigating measures incorporated in the alternative to reduce equipment compaction would assure that this impact would be insignificant.

## **5.2 NATIVE PLANT COMMUNITIES**

### **5.2.1 Affected Environment**

Currently, native plants dominate approximately 150 acres of the Presidio. The Presidio's native plant communities are described in previous sections (see Section 3.2.1, Description of Native Plant Communities).

### **5.2.2 Impact Assessment**

#### ***Alternative 1: Selected Alternative***

Native plant communities and associated habitat for special-status plant species would be increased in size, enhanced, and preserved by the proposed actions. Removal of invasive introduced plants and restoration of disturbed area and erosion sites would be beneficial to these plant communities and reduce current threats. Native plant communities would be perpetuated over the long term by policies to remove invasive non-native species when they invade native plant communities, and by more restrictive landscape practices to avoid aggressive species that tend to escape into natural areas.

Native plant communities would be restored on approximately 250 acres of the Presidio. This would bring total acreage proposed for native plant communities to 384 acres (or about 26 percent of the Presidio). In consideration of public comment received, 62 acres in the southwest corner of the Presidio are designated as a Special Management Zone (SMZ) in anticipation of the issuance of a USFWS Recovery Plan that would identify all or part of the SMZ area as important habitat for the long-term recovery of the San Francisco Lessingia. The final vegetation community zoning for the SMZ would be developed through a future planning process following the publication of the final Recovery Plan. There is a range of issues including viewshed, wildlife habitat, etc. that will be considered in planning the SMZ. The size and extent of native plant communities, including dune scrub, coastal prairie, serpentine grassland, serpentine scrub, oak woodland, riparian woodland, foredune, and coastal salt marsh would increase by an amount determined through the planning process. Restoration of native plant communities using species that are adapted to the Presidio's site conditions would have a number of beneficial impacts, including:

- maintaining and potentially increasing species diversity,
- providing more contiguous habitat by increasing the size of the area of plant communities and connecting small islands and fragments,

- ensuring the survival of native plant species, including a number of rare species that might otherwise be lost,
- controlling erosion on bare soils and steep slopes, and
- reducing fire hazard by replacement of trees with native vegetation that has a lower fuel volume.

As the area of native plant communities increases, the spread of weedier non-native annual grasses and herbs would be reduced. Over the long term, it would become easier to manage and maintain the native plant communities, because non-native species would be contained within historic forest and landscape vegetation zones. Changes in microclimate and soil conditions that favor non-native species over native species would be reversed to benefit native plants within restoration areas. The creation of buffer plantings between vegetation of historical value (historic forest and landscape vegetation) and native plant communities would create a transition area to assist in the containment and control of non-native species that could threaten native plant communities. Direct competition from non-native trees would be reduced to the benefit of native species.

Habitat for special-status plant species would be restored and enhanced. By restoring the associated plant communities that naturally occur with endangered species, conditions would be more favorable for variety of native plants, including rare and endangered plants. Specific actions to enhance populations of thirteen special-status species have been developed that would promote their long-term preservation and recovery to the benefit of these species. No negative impacts are anticipated that would affect any species that is listed as threatened or endangered by U.S. Fish and Wildlife Service, a candidate or proposed for listing as threatened or endangered, listed by the state as rare or endangered, or listed as special-status species by the California Native Plant Society. All actions taken in areas known to provide habitat for special-status species would be protective of these plants. Continued inventory and monitoring would detect any changes, and corrective actions would be taken if needed. The designation of the SMZ will allow the NPS to be responsive to the guidance provided by the USFWS in the forthcoming Recovery Plan for Coastal Plants of the Northern San Francisco Peninsula once it is circulated to the public.

Once established, additional acreage of native plant communities would be more self-sustaining than the more maintenance-intensive landscapes. These communities would continue to require management to keep invasive non-native plants at bay and repair damage that may result from visitor use. They would not require tending, replanting, and maintenance to the extent that is required in landscape vegetation zones. This would increase the sustainability of the Presidio's vegetation.

As resource management activities are conducted there is a potential for work crews or equipment to have an impact on adjacent native vegetation as dead trees, forest slash, and limbs are removed or sites are prepared for native plant restoration. However, mitigating measures to salvage native plants within work sites, carefully train work crews, and limit the size of project areas would mitigate this potential impact.

### ***Alternative 2: No Action***

Naturalized forest trees would continue to threaten native plant communities by invading their habitat and directly competing for limited space and resources. Over time, continued deterioration of native plant communities and diminution of natural areas would occur. Invasive non-native species would eventually displace some native plant communities and the loss of some species from the Presidio altogether could result.

Since the introduction of non-native species has fundamentally changed the structure of many natural areas of the Presidio as well as the microclimate and soil, the process of deterioration to native plant communities would not be reversed without aggressive intervention and restoration programs. The Presidio's existing native plant communities that remain are small and are separated from one another by other landscape features. Of the at least 312 native plant species that were historically found on the Presidio, 228 species remain.

It is reasonable to speculate - based on island biogeographical principles - that another quarter of the Presidio's species would be lost if conditions do not change significantly (Vasey 1997). Such a species loss would be a significant adverse impact to native plant communities. Volunteer restoration efforts would continue, and over the short term, changes to habitat would be minimal. Over the long term, however, additional and expanded restoration and endangered species enhancement efforts as outlined in the proposed actions would be needed; otherwise, the diversity of native plant species would likely decline and native plant communities would become even more fragmented.

Special-status species would receive the protection required by law, and long-term inventory and monitoring programs that are underway would continue; however, new habitat enhancement programs would not be undertaken that could provide additional habitat enhancement and recovery potential for these species. Natural regeneration and encroachment into the remaining native vegetation areas by introduced trees, especially eucalyptus and Monterey pine, would continue, eventually jeopardizing many of the remaining natural areas and resulting in the loss of some special-status species.

### ***Alternative 3: Selective Forest Cuts***

Impacts on native plant communities would be the same as under Alternative 1 because the proposals in this alternative affect historic forest areas. All native plant restoration and special-status species enhancement actions would be the same for Alternatives 1 and 3, and the beneficial impacts to native plant communities would also be the same.

### ***Alternative 4: Increase Tree Diversity***

The impacts of Alternative 4 on native plant communities would be the same as those of Alternative 1 in most respects - beneficial impacts would result from native plant restoration projects and special-status species enhancement.

Because this alternative would introduce consideration of a variety of native and non-native tree species into the historic forest management zone, the effects of any new species on native plant communities would need to be carefully evaluated prior to planting. Trees that could threaten native plant communities by aggressive invasive or cross-pollinating tendencies or trees that could significantly change microclimatic conditions for native species would be avoided to reduce any potential impact.

## **5.3 WILDLIFE RESOURCES**

### **5.3.1 Affected Environment**

Much of the following information is summarized from Jones & Stokes Associates, Inc. (1997). Because of its isolation, the Presidio is characterized by a low diversity of reptiles, amphibians, and mammals. However, in the urbanized environment of San Francisco, the Presidio provides important remnant wildlife habitat for these animals.

Most of the vertebrates that have been recorded are birds (225 species) and the Presidio represents a particularly important habitat area for migrants and non-breeding birds. The Presidio and Golden Gate Park are the only large areas of open space habitat that offer shelter, food, and water for migratory birds on the northern San Francisco peninsula. Bird use of the Presidio is part of the migratory path known as the Pacific Flyway. Many migratory species may only use the Presidios forests or riparian areas for a few days a year, but this habitat is critical to their survival.

Birds breed throughout the Presidio because it is one of the only large areas of native and naturalized habitat on the northern San Francisco Peninsula, and 49 species have been confirmed as nesters. Presidio forests also provide essential habitat for wintering birds and for locally declining species, including California quail, western screech owl, wren tit, and Hutton's vireo, that have been extirpated elsewhere in San Francisco. A total of 29 special-status bird taxa have been observed at the Presidio.

Aquatic animals include the only native fish (the threespine stickleback in Lobos Creek) and introduced species of fish and turtles in Mountain Lake.

Areas of the Presidio have been evaluated for their overall value to wildlife (Jones & Stokes Associates, Inc. 1997). Factors in the evaluation included the species diversity of the wildlife using particular tree species, forest stand size, tree species diversity, connectivity to other forest stands, forest vigor, midstory vegetation, understory cover, proximity to sources of fresh water, and presence of special-status wildlife.

Tree species providing the most valuable habitat based on observed bird diversity are the native coast live oak and willows (oak and willow forests occur at Mountain Lake and along Lobos Creek). Next in value is eucalyptus; several large blocks of high-value habitat occur in the central and southern portions of the Presidio in eucalyptus stands. Flowering eucalyptus and the insects attracted to them draw large numbers of migratory birds. The sturdy branches provide nesting sites for raptors, and cavities offer habitat for

cavity-nesting species. Coniferous forests, such as Monterey pine forest, also have moderate wildlife value and are important as roosting sites for larger species, as well as for species such as red-breasted nuthatch, red crossbill, and pine siskin, especially in years when cone production is high.

In terms of habitat characteristics, large blocks of forest habitat with multistoried vegetation and an herbaceous or shrub understory are considered to have the highest value. Stands that are near water or that provide nesting are also considered valuable.

### **5.3.2 Impact Assessment**

#### ***Alternative 1: Selected Alternative***

Forest stands of high wildlife value, as well as other important habitat areas, would be enhanced by the proposed action. Important native wildlife habitat for diverse bird populations is found in the native vegetation communities along the western and northern edges of the Presidio and in riparian forests near Mountain Lake and along Lobos Creek. Preservation and restoration of these areas would have a beneficial impact on the bird population.

In general, native plant communities to be restored would have higher wildlife value than the introduced forest they would replace. However, some of the forest stands have high to moderate-quality wildlife habitat. For example, considerable removal of existing forest would occur near Inspiration Point. These forest stands have been rated as having high wildlife value. When native scrub and serpentine grassland communities are restored, the number and variety of wildlife using the area should increase.

Serpentine grasslands would provide foraging habitat for a variety of raptors and other birds as well as native mammals, reptiles, and amphibians. Native plant communities would provide an increased winter food source and additional shelter for large flocks of wintering finches, sparrows, and juncos, and nesting sites for ground nesting birds. Together with other elements of the native and non-native plant communities, the area from Inspiration Point to El Polin Spring would be of vital importance as a winter area for common bird populations.

The mosaic of forested and grassland areas that would result in some restoration areas may increase the quality of habitat for some birds such as raptors that often perch in trees and hunt small mammals found in grassland areas.

The value of the historic forest would increase for wildlife habitat with the gradual change of much of the historic forest from monotypic, single-aged stands to more mixed species and multi-aged stands. Large blocks of forest habitat with multi-storied vegetation and an herbaceous or shrub understory received high rankings in the wildlife habitat value analysis (Jones & Stokes Associates, Inc. 1997). More diverse forests would provide a greater variety of habitats and possible nest sites than uniform, even-aged stands.

An understory of native plants would be encouraged in historic forest areas through additional canopy openings and removal of aggressive non-native plants. These native plants would provide additional food sources for wildlife. Forest rehabilitation and native plant restoration activities would increase the forest/native plant community edge zone, which would also increase habitat diversity.

Restoration of native riparian habitats and restoration of natural creek channels would benefit aquatic animals and invertebrates, as well as riparian bird species, by increasing habitat and riparian plant species used as food sources.

Tree hazard treatment activities would result in a direct loss of bird nesting sites and bat roosts. Trees and forest stands that are used, or have recently been used, for raptor nesting would be excluded from any forest management activity with the exception of hazardous trees that require urgent treatment.

Short-term impacts to wildlife from equipment noise would occur as dead trees and invasive trees outside of historic forest areas are removed. In general, vegetation management activities would not be conducted between February and August 15 if they could be disruptive to breeding birds. Mitigating measures that are included in the plan (such as biological evaluation to determine any site-specific impact to wildlife, seasonal timing of operations, and protection of critical habitat elements) would avoid most adverse wildlife impacts. Mitigating measures have been specifically developed to avoid adverse impacts to any wildlife species that has been designated threatened, endangered, or of special-status.

Some direct losses of small or immobile species, such as small mammals, reptiles, amphibians, and many invertebrates, would probably be unavoidable as forest duff layers are removed for native plant restoration efforts or if heavy equipment is used.

### ***Alternative 2: No Action***

Wildlife habitat would remain unchanged initially, but because additional native plant communities might not be restored, no additional benefits to wildlife could be expected or ensured.

Over the long term, both forested and native plant community areas would change. Additional areas of native plant communities that are of high wildlife value could be lost to non-native species, both weedy understory plants and invasive forest species. Depending on which species invaded natural areas, the amount and quality of the wildlife habitat would change. Many native habitats, and especially riparian and woodland habitats, are highly valuable for birds and other wildlife.

If Alternative 2 resulted in a reduction of these native habitats through invasion by non-native species, the habitat quality would be reduced over the long term. On the other hand, if naturalized eucalyptus forest groves increased, they might increase important and high-value wildlife by providing additional nesting and roosting sites.

No attempt would be made to manage habitat to increase structural or species diversity. Factors that reduce the quality of Presidio wildlife habitats would continue, including habitat isolation, fragmentation, and scarcity, and dominance by non-native species. Over time, additional habitat degradation could result.

### ***Alternative 3: Selective Forest Cuts***

As in Alternative 1, wildlife habitat would be enhanced by restoration of native plant communities that provide valuable wildlife habitat. The option which distinguishes this alternative of using small cut blocks for historic forest rehabilitation would result in systematic replacement of historic forest areas and in a mosaic of tree groups of different ages. The small block cuts would encourage a more diverse and multistoried forest by increasing light penetration to the forest floor and by encouraging natural regeneration of both forest trees and native plants in the understory. As a result, this management technique might increase the overall wildlife habitat value of the historic forest, since large areas of forest habitat with multi-storied vegetation and an herbaceous or shrub understory received high rankings for wildlife habitat value.

As this alternative provides for more proactive management and greater degree of forest manipulation and activity than Alternative 1, it would also be more disruptive to wildlife. Migrant wildlife as well as resident populations would be affected by this increased activity. As in Alternative 1, mitigating measures would reduce any direct impacts to nesting birds and special-status species.

### ***Alternative 4: Increase Tree Diversity***

Wildlife (especially migrating birds) might benefit by an increased diversity of food and cover from the wider variety of tree species that would be considered in this alternative. Since Monterey pine and Monterey cypress forests have moderate value as wildlife habitat, it is possible that replacement species, especially if planted as mixed stands, would have increased wildlife value. Specific evaluation of selected species and their value to wildlife would be needed to determine the extent of this possible impact.

## **5.4 HISTORIC FOREST AND CULTURAL RESOURCES**

### **5.4.1 Affected Environment**

See Section 3.3.1, Description of Historic Forest.

### **5.4.2 Impact Assessment**

#### ***Alternative 1: Selected Alternative***

The Presidio forest would be rehabilitated within the historic forest management zone, an area that generally coincides with the extent of the planted forest. Over the long term, the forest would be managed to mimic more natural forest conditions, increasing the degree

to which the forest is self-sustaining as well as increasing forest health and longevity. The removal of trees where the forest has expanded into native plant communities beyond the design intent would reduce the extent of the forest, but the historically significant forest areas and the character of the forest would be retained. No adverse impacts on historic features or landscapes would result with incorporation of the guidance and treatment strategies developed in the Historic Forest Study. This Historic Forest Study will use the Secretary of the Interior's Standards for Treatment of Historic Properties with Guidelines for the Treatment of Cultural Landscapes and will explore whether and to what extent alternative tree species could be introduced into the zones of the historic forest without adversely affecting the unique cultural landscape and character of the historic forest as guided by the National Historic Preservation Act (VMP Staff Report, October 2000). Any subsequent plantings in the historic forest zone (for example, other species of cypress or eucalyptus of lower stature) will be tested through pilot projects to assess its ability to survive site conditions and evaluated as to its physical appearance and characteristics.

The inherent problems of the three dominant species would continue to be management factors. By rehabilitation of small areas of the forest at a time in response to storm damage or natural events, the cycle of even-age maturation can be broken. However, the forest would continue to be dominated by relatively short-lived trees with life spans of 100 to 150 years and tree species diversity would remain low. Removal of exotic understory plants, planting native shrubs and trees along forest transition areas, and encouragement of several age classes in an area would increase structural diversity.

Problems associated with blue gum eucalyptus, including fire volatility, large height, and brittle branches, would continue. However, efforts would be made to minimize these effects by containment of eucalyptus in existing areas and through not planting additional eucalyptus (except in landscape areas or to replace heritage trees).

In a few key visible areas, the historic planting configurations would be maintained through intensive management. Because these key stands have a character-defining appearance, they would require additional maintenance and an intensive management scheme. However, the appearance of the forest would continue to change over time, because the scale and configuration of the current forest cannot be duplicated as new trees replace mature trees. These changes are not viewed as adverse impacts of this alternative, but as changes to a dynamic, and living, historic resource. Clearing to restore historic view sites would enhance the Presidio's historic setting by reestablishing visual linkages and reinforcing original forest design plans.

If pine pitch canker or eucalyptus longhorn borer become serious pests of Presidio trees, the historic forest and the character of this historic resource could undergo a drastic change in appearance in a relatively short time. Conscientious monitoring, sanitary cutting and wood disposal practices would mitigate the potential effect of these pests, but their effects could be widely disruptive to historic forests if an outbreak occurs. In the case of a pest outbreak, impacts to significant historic resources would be reduced by the consideration of replacement species that would maintain the character of the historic

forest in conformance with the guidance and treatments provided in the Historic Forest Study.

Wind patterns may change as windfall areas are cleared and rehabilitated and the windscreening effect of mature trees is lost. As forest vegetation is rehabilitated on ridgelines and along the western buffer and mature trees are lost or replaced with young trees, the effectiveness of the trees as windscreens would temporarily be lost. There may be some domino effect as winds then act more forcefully upon other areas of the forest or developed and recreation sites. Prevailing winds in spring and summer from the west and northwest may have a greater effect on the forest and other nearby vegetation until windscreen trees grow and again become effective.

To mitigate effects of wind on the remainder of the forest, important windbreak areas west of Lincoln Boulevard and along ridgetops would be replanted promptly. When possible, tree clearings of storm-damaged trees or sanitation cuts to control disease would be designed to lie perpendicular to winter storm winds that generally blow from the southwest to reduce wind funneling and excessive forest damage. The current lack of an understory in many forest stands creates a wind tunneling effect. As uneven-aged stands are created with uneven heights and more understory, this wind tunneling effect would be minimized.

The removal of naturalized forests and restoration of native plant communities and riparian corridors could have an impact on undiscovered archeological resources, particularly prehistoric sites. Actions and projects that involve ground disturbance will be subject to the provisions of the agencies' PA's addressing archeological monitoring and process initiated if unexpected archeological resources are uncovered. To reduce the impact on surface and subsurface resources, stumps would generally be cut at the ground surface and left in soils that are not sandy dune soils. Stumps would be removed from dune soils where necessary. Removal activities, as well as other restoration actions, could uncover and disturb previously unknown archeological resources, which would require evaluation.

Removal of hazardous trees could also have an impact on subsurface archeological resources. Restoration of both historic forest and native plant communities in the Wherry housing area would require buildings and pavement to be removed with a potential impact to subsurface archeological sites. If unknown resources are uncovered during tree removal or restoration activities, any potential impact on archeological resources would be mitigated by immediately stopping work and consulting with appropriate parties as required by law and federal regulations before proceeding.

### ***Alternative 2: No Action***

Over the long-term, changes in the aging historic forest would occur. If rehabilitation of the historic forest is not undertaken, the character of the Presidio would dramatically change over time. Over the next 50 years many of the original trees (especially Monterey cypress and Monterey pine) planted by the Army would die.

Without significant forest management, the Presidio forest could decline in extent by 45 percent by 2015 (Jones & Stokes Associates, Inc. 1997). While some natural regeneration would continue, the extent and location of the forest would change in ways that cannot be accurately predicted; the forest would likely expand beyond the areas where it was originally planted. Forested areas would include historic forest and naturalized forest. Eucalyptus would resprout and would continue to occupy areas now forested with eucalyptus, as well as expanding into other areas. Relative to their present abundance, losses of the mixed-species and cypress stands would be the most severe. Historic forest areas now occupied by Monterey cypress and Monterey pine would be reduced in size and the areas they occupy would be colonized by non-native grasses, as well as by young trees that regenerate from seeds and other non-native weedy species.

Forests in the windswept western areas of the Presidio may not regenerate without replanting and maintenance care. If the windbreak is lost, additional wind tunneling would be expected to quickly affect the more inland forest stands. Blowing sand and wind erosion might also increase with tree loss. Historic configuration and species composition of individual forest stands would change. While it is assumed that the three primary species would still be the most common tree species, Monterey cypress would be less common than at present since it is the least likely of the forest species to regenerate naturally. Some areas within the historic forest would remain barren and would not be restored. These changes could be significant impacts on this historic resource which contributes to the National Historic Landmark status of the Presidio.

### ***Alternative 3: Selective Forest Cuts***

Small, systematic cut blocks would be the fastest way to rehabilitate the historic forest. Over a 30- to 50-year time frame, all of the existing old growth would be removed and replaced with a mosaic of groups of trees of varying ages. Selective cuts would be a more proactive way to treat the forest than relying on storms, windfall, and death of trees by old age to determine areas for rehabilitation as in Alternative 2. Cuts would provide openings for the light needed for forest seedling survival and growth. Because the most highly visible key historic forests would be maintained with their historic configuration, the historic flavor and military appearance of the forest would be retained. Overall the historic location, species composition, and character of the forest would be maintained, and impact on the forest as a historic resource would be beneficial.

### ***Alternative 4: Increase Tree Diversity***

The diversity of planted trees would increase, assuming the variety of trees planted could successfully grow in Presidio site conditions. Additional testing would be required to determine which of the proposed species would actually grow and thrive, considering that a very large variety of species were initially planted at the Presidio, but only a few species actually dominate the forest lands today.

Some of the inherent problems associated with the primary planted species (lack of longevity, breakage, and low stand diversity) would be reduced. If species-specific

disease or pests became a major problem in the future, damage would be reduced by having several species, rather than one, in a forest stand. It would also be less likely that an entire forest stand would become senescent, with many aging trees approaching life span limits at the same time, since trees with a variety of life spans would be included in the forest.

The forest species composition and the character of some historic stands would be substantially altered by using a broader variety of tree species for rehabilitation. A more multi-storied, and species-diverse forest would result. Because the most highly visible key historic forests would be maintained, the historic flavor and military appearance of the forest would be retained. Canopy areas as viewed from a distance would change over time, and the visual dominance of the eucalyptus canopy might be reduced.

## **5.5 VISUAL RESOURCES**

### **5.5.1 Affected Environment**

The Presidio is a major visual resource for the San Francisco Bay Area from a variety of perspectives. From a distance, the distinct forested landscape appears as a natural wooded series of low ridges in marked contrast to surrounding urban landscapes. From within the Presidio, scenic vistas to nearby landmarks such as Golden Gate Bridge, Marin Headlands, Angel Island, Alcatraz, as well as to the ocean and bay greatly enhance opportunities for visitor enjoyment of the park area.

Visitors experience a sense of visual enclosure from within the Presidio's natural areas and especially from within the forests, in strong contrast to the visual experiences of the nearby cityscape outside of the Presidio. Three historic vistas, Inspiration Point, along Washington Boulevard on the western slope of Rob Hill, and on Lincoln Boulevard overlooking Crissy Field, were designated by the U.S. Army when roadways and developed areas were planned. Maintenance of these historic viewpoints is of particular importance.

### **5.5.2 Impact Assessment**

#### ***Alternative 1: Selected Alternative***

The overall appearance of the historic landscape would gradually change as the age and size of trees change. Over the long term, the visual qualities of the area would be enhanced. As small areas within the forest are rehabilitated, a short-term impact would affect the visual quality of the historic forest as dead or down trees are cleared and replaced. However, continual planting, natural regeneration, and growth would retain the overall appearance of the forest. As native plant restoration efforts replace naturalized forests outside of historic forest boundaries visual qualities would be enhanced. Prairies and shrublands rich with wildflowers would emerge in restored native plant communities.

The impact of management activities on visual resources would vary greatly depending upon the point of perspective.

**Regional Perspectives** (viewpoints into the Presidio from the Golden Gate Bridge, Marine Headlands, bayside communities, and the north waterfront of San Francisco). Individual stands cannot be differentiated. Forest rehabilitation projects and native plant restoration projects generally would not be noticed. The appearance of a forest canopy on ridges and the green open space would remain.

**Highway Views** (views into the Presidio from U.S. Highway 101 and Route 1). Rapidly passing highway travelers would not likely notice much change. Maintenance and retention of vegetation screening along these heavily traveled roadsides would obscure views of the waterfront and post facilities from the highway.

**Neighborhood Views** (perimeter residential neighborhoods). Replacement of topped trees with trees of lower stature would enhance the visual quality of current perimeter views into the Presidio and to distant views of the bay, especially from neighborhoods in the southeast portions of the Presidio near Julius Kahn Playground. Unsightly topped trees would be removed and replaced with lower growing and more attractive vegetation. Near other neighborhoods (at Presidio Gate and along the southwestern perimeter) forest rehabilitation and native plant restoration programs would provide screening vegetation. The treatment for the trees within the Special Management Zone (SMZ) in the southwestern corner of the Presidio will be the subject of a future planning effort.

**Presidio Vista Points** (public use areas and historic vistas). Naturalized forest stands have encroached on the views from Inspiration Point and Rob Hill over the years. Clearing to maintain these scenic vistas has been initiated and would continue. Treatment of these areas would be highly visible as it is conducted, but would greatly enhance the visual quality of the Presidio and maintain it over the long term. Management of vegetation at scenic viewpoints and in view corridors would increase the number and variety of regional views and increase scenic viewing and photography potential. Maintenance and management of screening vegetation along Lincoln Boulevard and Doyle Drive would enhance internal views and help to reduce highway noise.

Several computer-assisted photo simulations have been developed to illustrate how the appearance of the Presidio might change over time under the plan actions and alternatives. Photo simulations modeling the following visual changes are included in Appendix D so that visual impacts, which are subjective and in the eye of the beholder, can be evaluated by the reader. The photo simulations depict:

- Historic forest rehabilitation to increase structural and species diversity,
- A key historic forest stand as it is rehabilitated, and
- Perimeter forest areas where topped trees are replaced.

### ***Alternative 2: No Action***

Opportunities for scenic viewing from viewpoints within the Presidio would become further obstructed if historic vistas are not cleared and maintained. Screening vegetation might be lost in some areas over time through tree aging, and without restoration, the beneficial screening of some undesirable views might be lost.

Because tree topping for private view preservation has been discontinued, trees that were topped in the past would remain, possibly growing laterally and eventually upward again, or dying because of structural weakness and old age.

### ***Alternative 3: Selective Forest Cuts***

The degree of site disruption and severity of visual impact of block cutting would be proportional to the size of the cut block. With small blocks of one-half to three-quarters of an acre, impacts on the views inside the Presidio would be minimal. From a distance, the canopy would appear variable, rather than continuous, but small openings would not be visually dominant. Rehabilitation activity would be most visible when it occurred near trails and roadsides. Aesthetics would be temporarily degraded until the cut areas were restored and replanted. Over the long term, visual resources would be enhanced and similar to those under Alternative 1.

### ***Alternative 4: Increase Tree Diversity***

The addition of new tree species to the mix of the historic forest would add visual variety and interest, but would also detract from the simplicity and visual form of the historic forests. Other impacts would be similar to those under Alternative 1.

## **5.6 VISITORS AND AREA RESIDENTS**

### **5.6.1 Affected Environment**

The Presidio contains many of San Francisco's finest recreation and large open space areas. Millions of people visit the Presidio each year for recreational, educational, and business purposes. Visitors come from all over the country and the world, as well as from the city and nearby neighborhoods. As opportunities for use increase and additional educational and recreational programs are developed, this multipurpose area will serve more and more visitors. Neighborhood users visit routinely, to walk, bicycle, jog, walk dogs, and use playgrounds and playing fields. Regional visitors and tourists visit scenic attractions, tour military structures and a museum, and participate in interpretive and educational programs.

### **5.6.2 Impact Assessment**

#### ***Alternative 1: Selected Alternative***

Education programs that increase direct participation in the restoration of native plant communities and forest rehabilitation would increase the interpretive value of the

Presidio for environmental education purposes. Education programs including cultural use of original plants by Native American Indians, cultural uses of resources and the landscape throughout periods of European settlement, and the contributions to and changes in land use throughout the Presidio's history can be demonstrated and interpreted. Management of planted forests so that they can become more self-sustaining would be educational because it requires an experimental approach preceded by evaluative design and followed by monitoring to provide feedback for appropriate management changes.

Continuation of successful volunteer restoration programs would promote public understanding of the importance of native plant restoration, continue the involvement of area residents in management of the Presidio's resources, and provide recreational stewardship activities to diverse urban populations.

Visitors would notice the changes in the appearance of the forest and the natural vegetation communities. For some visitors, these changes would be undesirable and would temporarily reduce their enjoyment of the area as naturalized forests are removed and solitude is disrupted. Photo simulations of changes that might occur in forest appearance are included in Appendix D.

Noise levels would temporarily increase during forest rehabilitation efforts, removal of hazardous trees, and restoration of stream drainages, because heavy equipment would be required. The use of chain saws, loaders, chippers, and other equipment would be required to clear dead or down trees and remove wood products. The VMP proposes to temporarily close work areas to the public when loud machinery is in operation to avoid exposing visitors to high noise levels. To further reduce the potential for VMP projects to generate high noise levels, tasks, such as wood chipping, would be conducted at less intrusive areas or moved offsite whenever feasible and would be limited to daylight and weekday hours and scheduled to periods of heavier visitor use.

Following revegetation and restoration, natural features would rebound quickly. While it may take many years for some species to fully reestablish within restoration areas, wildflowers and solitude would quickly return. Passive recreational activities such as bird watching and photography would be enhanced as wildlife habitat is improved.

Fire hazard would be managed by proactive prevention and the maintenance of an on-site suppression capability. Fire risk and hazard, which is much lower than in warmer Bay Area communities because of cool summers and ocean influence on the Presidio, would remain unchanged. Forest debris and dead trees that could increase fuel loads would generally be removed so that hazardous conditions would not develop. Hazardous tree identification, tree removal, and treatment would maintain an acceptable level of risk to life and property.

### ***Alternative 2: No Action***

Opportunities for visitor use would remain unchanged. Neighboring residents on the southeast perimeter would continue to experience view obstruction because of Presidio forest growth and no effort would be made to convert the Monterey cypress forest to another species of lower stature.

The involvement of the community in restoration efforts would continue at existing levels to complete current projects, but additional opportunities to demonstrate a variety of vegetation management treatments and to use rehabilitation efforts as an interpretive tool for park visitors would be lost.

If forest debris were allowed to build up and dead trees were not removed, an increased potential for fire might develop. However, hazardous trees would continue to be removed and treated, maintaining a low level of risk for visitors.

### ***Alternative 3: Selective Forest Cuts***

For some visitors, cut blocks would be unsightly and the cutting of live trees within the historic forest areas would be an unacceptable management practice. Other impacts would be similar to those of Alternative 1.

### ***Alternative 4: Increase Tree Diversity***

The use of a variety of species in replanting efforts would reduce the dominance of eucalyptus in forest stands. Depending upon the fuel characteristics of replacement species, fire hazard may be reduced. Other impacts would be similar to Alternative 1.

## **5.7 CUMULATIVE IMPACTS**

### **5.7.1 Alternative 1, Alternative 3, and Alternative 4**

The effects of these alternatives added to the effects of other past, present, and reasonably foreseeable related projects would have a positive cumulative effect. Restoration actions would aid in the perpetuation of individual species and native plant communities within the context of a major urban area where much native plant habitat has already been lost. The importance of the protection of remaining native plant habitat and the restoration of additional native plant communities cannot be underestimated within the regional context of the almost totally developed San Francisco peninsula. The Presidio will play an important role in providing habitat crucial to the long-term survival and recovery of rare plant species - at least one of which occurs nowhere else in the world.

Rehabilitation of the historic forest and landscape vegetation would enhance the Presidio's historic setting and have the cumulative effect of preserving significant historic resources in conjunction with other projects to preserve and enhance historic buildings. The Historic Forest Study will provide the basis for rehabilitating the key forest stands and the historic forest as a whole, while preserving the integrity of the forest as a contributing element to the National Historic Landmark status. Scenic viewing

opportunities and visual qualities would be enhanced, increasing the overall visual attractiveness of the Presidio.

### **5.7.2 Alternative 2**

More individual species and native plant communities might be lost through lack of management action. If conditions do not change and forest trees are not managed, both natural and historic resources values would be adversely affected.