Park Landscape

Alvord Lake
Park Landscape

The landscape of Golden Gate Park is its most prominent feature, and is what attracts people to the park. The park landscape is the sum of many components: terrain, forests, meadows, horticultural displays, lakes, athletic fields, and climate. The buildings, structures and roads are also components of the landscape in its larger context.

The landscape of Golden Gate Park has its origins in nineteenth century “picturesque” landscape design, the purpose of which was to provide a setting for relaxation and escape from the harsh urban environment. Wilderness was seen as the ideal landscape, but the rural or pastoral landscape was more appropriate for parks and for supporting the park activities. Although the landscapes appeared natural, they were in fact highly contrived, and great effort was taken to shape the land and arrange elements to maximum advantage.

Golden Gate Park is a remarkable achievement, given that the vision of this pastoral landscape was created out of sand dunes and the harsh coastal environment. Although it appears very natural, the park landscape is almost completely manmade, and requires much more management and maintenance than a truly natural landscape. All trees were planted except for oak trees and a few other native trees in the northeast portion of the park. All of the lakes are manmade. The meadows were created in low valleys and sheltered by trees to create warmer microclimates. The general terrain was not altered drastically, but the impression of hill and dale was exaggerated by planting tall trees on the ridges and hills and leaving the low areas as meadows. This technique was very successful in creating the park’s rolling terrain with a minimum of grading.

How we view the landscape today is different from how people viewed it in the past. One hundred years ago people viewed the park and its landscape as a sublime experience, like walking through a landscape painting. There was plenty of undeveloped land, but people came to the park to partake in its fine creation. William Hammond Hall expressed this concept of park experience when he wrote the following in 1873:

“A park... should be an agglomeration of hill and dale, meadow, lawn, wood and coppice presenting a series of sylvan and pastoral views, calculated to banish all thoughts of urban objects, and lead the imagination to picture space beyond as a continued succession of rural scenes and incidents.”

Today we view the park as a green oasis in an urban context that did not exist when the park was built. The concept of open space is highly valued by city dwellers today. The park is also viewed as a tremendous recreational resource, with many kinds of facilities. The landscape is now mature and parts of it are hard to distinguish between naturalistic and truly natural. The blurring of what is manmade and what is natural is the ultimate success for a picturesque landscape design.
This success is also what has lead to some of the park maintenance problems that we now face. The forest and landscape is not regenerating as a natural landscape would. The problems are much greater than appearances would indicate. The forest is green, but in serious decline. The lakes are scenic, but their problems are just below the surface. The meadows and fields host many activities and events, but need intensive maintenance to recover. The recommendations on the following pages lay out the steps necessary to preserve this magnificent landscape. Without action, this landscape could be lost.
Landscape Design Framework

Understanding the landscape of Golden Gate Park is important for all those who seek to preserve and maintain it. The following landscape design framework, and the accompanying map, describe the park’s landscape elements and characteristics, and provide a basis for making decisions about the park landscape.

The Original Park Site

An understanding of the site conditions before construction of the park provides insight into how the plan was developed. Knowledge of the original conditions also assists in making decisions about maintaining the park today.

“The Golden Gate Park contains about 1,000 acres, of which 270 acres at the eastern end, is good arable land, covered in many places with trees and shrubbery; this portion may at once be converted into an attractive resort. The remaining 730 acres, stretching down to the ocean beach, is a waste of drifting sand.”

First Biennial Report, 1870-71

Description of the original park site:

“Strawberry Hill, itself being the larger and higher one of these three knobs, was, before the Park survey were made, known as ‘The Island’ from the fact of its appearing as a mound of vegetation surrounded by a billowy waste of sands fittingly likened to the sea. . . . All that portion west of Strawberry Hill ridge was new and shifting sand drift; and this new drift covered also about 120 acres east of Strawberry Hill ridge, leaving about 270 or less acres available for park improvement without the preliminary process of reclama-

tion. . . . The pronounced hills and ridges of this eastern 270 acres...carried a scrubby live-oak growth, which seldom attained a height of more than ten feet, and for the most part was under seven feet high. The north ridge and central hill were especially well grown with this scrub. The intervening valleys in this portion of the park were unsightly, hummocky surfaces of sand, held by the rough native sand-plant growth, in which the blue lupine and prostrate escalonia predominated. The hummocks were densely overgrown, the intervening depression generally bare. Through the winter and spring, water to the depth of a foot or two accumulated in the three larger depressions making ponds each an acre or less in area, where frogs croaked and snakes wriggled. . . .

A rugged sand ridge, carrying very low scrub oak growth, extended from the southern base of the northeast corner hill, southwesterly more than half way across the park area, and somewhat sheltered this valley from the prevailing winds.

The present conservatory valley was no more inviting. . . . it was more closed at its west end, by a sand ridge, than now, and yellow lupine predominated in the rough growth upon the sand hummocks, whereas blue lupine was the most plentiful elsewhere. The present ball-ground valley was the most presentable space in appearance, but even that had . . . sand.”

In the western part of the park

“In accordance with the theory of Park improvement which has heretofore been advocated, the plantations at Golden Gate Park have been arranged in heavy masses upon the higher grounds for the purpose of affording the greatest attainable shelter to the intervening glades and valleys.”

William Hammond Hall

Spatial Relationships

The landscape design of Golden Gate Park is a complex amalgamation of forests and open spaces. In large part, the design remains true to the original planting from the 1870’s. The forests were planted, primarily on the slopes and hills, to provide shelter from the harsh winds for the meadows that were located in the valleys. The relationship between forest and meadow, solid and open spaces, and design elements such as drives and lakes should be studied and retained to preserve the park’s historic landscape design for its next century.

“In accordance with the theory of Park improvement which has heretofore been advocated, the plantations at Golden Gate Park have been arranged in heavy masses upon the higher grounds for the purpose of affording the greatest attainable shelter to the intervening glades and valleys.”

William Hammond Hall

Second Biennial Report, 1872-73
The park provides a variety of spaces for many activities: active play, strolling, running, biking, picnicking, sports, sunbathing, reading, conversation, and contemplation. Some of the park’s spaces are designed for specific uses but the vast majority of the spaces are designed to be adaptable and appropriate for a wide variety of recreational uses.

**Forest and Meadow Relationship**
The relationship of forest and meadow, the convoluted edges of the forest, and the vistas they create, contribute to the visual interest of the park. The “naturalistic” design emulates trees and meadows in nature. It is also intended to lead the eye to the space beyond and suggest the continuation of open spaces out of view. The play of light and shade highlights sunlit meadows surrounded by shadowed forests.

> “Nothing gives a more park-like appearance, or a more agreeable impression to the landscape, than broad lawns and long vistas,...with its charming variety of outline flanked with the tall pines, amongst the shadows of which the grassy nooks are lost, giving an idea of much greater extent than there really is.”
> John McLaren, 1889 Annual Report

Preserving this relationship between forest and meadow, and the intricate outlines, is critical to retaining the park’s historic design. Reforestation efforts should strive to maintain the existing outline of meadows. (The edges of meadows could be surveyed and plotted on the park’s CAD map.)

**Other Open Spaces**
In addition to the meadows, there are other open spaces that are important elements of the park’s design and serve as view spaces. Other open spaces include recreation areas and fields, play areas, gardens, plazas, lakes, lake settings, and building settings. Vistas to and from within these spaces should be preserved and maintained as important view areas.

**Visual Characteristics**
In addition to the spatial relationships shown on the map, other visual characteristics such as texture, color, form, and plant species contribute to the unique character of Golden Gate Park. The mature pine and cypress trees create the park’s unique skyline of dark green horizontal silhouettes. The tall eucalyptus trees, which were planted primarily on the park’s ridges and hilltops, exaggerate the topographic relationship with meadows. The park’s evergreen forest may be more the result of the high survival rates of pine, cypress, and eucalyptus than design intent but the result is a park landscape that is unique to San Francisco and its special climate. This San Francisco landscape sets Golden Gate Park apart from other large urban parks across the country. The visual characteristics should be recorded and understood to preserve the park’s image.

**Park Roads and Paths**
The park’s curving roads and paths were designed to provide changing vistas as visitors travel along them. They serve as important view corridors, and most of the roads are unchanged from their original layout. Changes to park roads should respect and preserve the curvilinear, sequential nature of the drives.

> “Roads, pads and paths are required to facilitate driving, riding and walking, and thus, by affording ready avenues of communication, they open up the beauties and intricacies of the natural scenery, and promote the enjoyment of the rural elements of the place. ...they do contribute to the landscape effect, when their smooth and elastic surface promotes the enjoyment of locomotion, and when, by their gentle and graceful curve into the obscurity of the distance, they invite to continued research, and engender an interest in the view which they promise to present.

> “The charm of a drive or ride is greatly enhanced by smooth and elastic roads, but reaches its fullness when these roads lead through varied scenes of interest and ennobling influence, under favorable climatic conditions [protected from winds].”
> William Hammond Hall, Second Biennial Report, 1872-73

**Eastern Park/Western Park**
William Hammond Hall’s original design divided the park into two distinct parts, roughly east and west of Strawberry Hill. The eastern park was to be:

> “a more finished park, with its tree plantations in smaller masses or groups, principally on the higher grounds, and its several notable valleys occupied by such special features as a picnic ground; a garden - including a conservatory and semi-tropical exhibit; a children’s quarter
- including a dairy-house and play grounds; a recreation ground for sports of older people; a lawn, with lake and water terrace; a manor house and grounds, with concourses for carriages and pedestrians; and an open air concert auditorium.”

The western park was to be:
“simply treated as a woodland or forest, with all the hills and ridges more or less heavily timbered, and the valleys covered with lower-growing shrubs or field grasses.”

Over the years, facilities have been added to the western park, but the character of the landscape has remained as more wooded, less refined parkland. This distinction should be maintained, with different landscape treatments for the eastern and western portions.

**Rural Setting**

One of the key principles of nineteenth century park design was to provide contrast and relief from the urban environment. This was done by creating rural, pastoral, or wilderness landscapes and screening the edges from views to adjacent urban areas. It is particularly important to maintain the rural character in the western park.

“The class of pleasing scenery most easily attained to some degree of perfection within the limits of a city park reservation, will partake strongly of a pastoral nature. The monotony which would inevitably result from a too close adherence to this character of treatment, being broken by passages strongly contrasting therewith - namely in the picturesque. A park therefore, though containing

within itself the appurtenances necessary for the comfort and pleasure of great masses of people, as a whole, should be an agglomeration of hill and dale, meadow, lawn, wood and coppice presenting a series of sylvan and pastoral views, calculated to banish all thought of urban objects, and lead the imagination to picture space beyond as a continued succession of rural scenes and incidents.”

William Hammond Hall, Second Biennial Report, 1872-73

“The more important is that of obtaining the apparently natural outlines and growths constituting a park fit for occupation by a city’s crowds, and suitable for the distinctly rural recreation of people, as a relief and counterpoise to the urban conditions of their ordinary circumstances of life.”

Frederick Law Olmsted, The Development of Golden Gate Park, 1886

**Multistory Landscape**

Much of the park landscape is characterized by a multistory or layered landscape with small shrubs and understory at the bottom, large shrubs and smaller trees as a middle layer, and tall canopy trees providing an overstory. In some areas of the park, one or more of the layers have been lost to age or lack of maintenance. A healthy multistory landscape is important to preserve the park’s design character, particularly along the edges of meadows.

**Microclimates**

Much of the early planting was done to create warm, inviting spaces in what had been a cold, windswept landscape. By taking advantage of topography and with the planting of trees, sheltered spaces were successfully created. Trees and other plantings that shelter spaces from wind should be maintained, or replaced where they are lacking, to ensure that the spaces they shelter remain usable.

**Vistas**

The park design is essentially a sequence of changing vistas. Some vistas provide long distance views, while others provide shorter views of spaces that bend out of sight, suggesting continuation and enticing the visitor. With few exceptions, the vistas are internal and contained by a dense perimeter planting to shield the surrounding city from view. Some vistas have been lost as plantings mature. Where appropriate, historic vistas should be restored (such as the panoramic views from the top of Strawberry Hill).

**Perimeter Planting**

The planting around the perimeter of the park was designed to shield the visitors from views of the city, so their minds can remain free from the pressures of urban life. Some of the perimeter planting has been lost over the years and should be replaced. Perimeter planting in some areas has been removed for security reasons. New landscape treatments should be pursued in these areas (particularly the Haight Street entrance area).
**Western Park Character**

"It was designed that the six hundred or more acres of the reservation including and lying west of Strawberry Hill, and its connecting ridge, should be simply treated as a woodland or forest, with all the hills and ridges more or less heavily timbered, and the valleys covered with lower-growing shrubs or field grasses"

William Hammond Hall, *The Development of Golden Gate Park*, 1886
Eastern Park Character
"...the four hundred or less acres east of the hill and ridge should be treated as a more finished park, with its tree plantations in smaller masses or groups, principally on the higher grounds, and its several notable valleys occupied by such special features as a picnic ground; a garden - including a conservatory and semi-tropical exhibit; a children’s quarter - including a dairy-house and play grounds; a recreation ground for sports of older people; a lawn, with lake and water terrace; a manor house and grounds, with concourses for carriages and pedestrians; and an open air concert auditorium”

William Hammond Hall, *The Development of Golden Gate Park*, 1886

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**Legend**
- Meadows and other important open spaces
- Forest areas
- Special horticultural areas
- Park perimeter and screen planting
- Major park entries
- Important vistas

**Scale in feet**
- North
- 0 500 1000 2000
Screen Planting
Most park buildings and maintenance facilities are partially screened from view by planting of dense screening vegetation. The purpose is to hide from view those objects that detract from the rural landscape. Some of the screen planting is in need of replacement.

Entry Planting
The landscape at park entries should provide an inviting setting for visitors. The level of the landscape treatment should reflect the status of the entry. Major entries should have more elaborate landscapes that may include turf, flowering plants, and accent trees. At important entries the perimeter landscape is opened to provide an inviting view into the park.

Lakes and Water Features
The park’s naturalistic water features are an integral part of the picturesque landscape. The design intent was to make them appear as if they had always been a part of the landscape, rather than constructed. Several of the lakes were constructed by enlarging seasonal ponds. The lakes should be maintained with natural edges in well planted settings, and the water should remain as natural as possible.

“Water seems to have a fascination for everybody. People will stand or sit for hours watching its restlessness; or if in repose, they seem riveted in admiration of the truthful reflections its surface gives back. The rocks and trees and shrubs about the lakes will be constantly duplicated and landscapes more remote will be mirrored there. These attractions delight and fascinate and never weary.”
Park Commissioner’s Report, 1893

Flowering Plants
The park’s landscape is intended to be primarily evergreen, except in special horticultural areas and gardens. Colorful flowering plants should be used carefully elsewhere in the park, particularly in the western park. It is preferable to use flowering plants in naturalistic masses of flowering shrubs and perennials, which are more in keeping with the park’s naturalistic landscape, rather than seasonal color beds.

Signs
The basic design concept of the park is to create a rural, natural landscape. Signs are generally contrary to this goal and should be minimized wherever possible. Where signs are necessary, they should be designed and adapted to be appropriate for the park setting.

The Challenge Ahead
The biggest challenge in preserving the landscape of Golden Gate Park will occur in the next few years as the majority of the forest will be replanted, replacing the trees that have reached the end of their lifespans. Although the individual trees cannot be preserved indefinitely, the spaces and patterns that they create can be recorded and preserved. The other challenge to preserving the landscape is the cumulative effect of many small changes and maintenance practices that are contrary to the landscape design framework. Through training, the park staff’s understanding of the park’s landscape design framework, its elements and characteristics, will ensure that the park’s unique and historic landscape is preserved.

Maintenance Issues
Golden Gate Park’s landscape is almost completely manmade, and as such has maintenance requirements that belie its naturalistic appearance. As maintenance resources are reduced, there is a tendency to concentrate maintenance in the most visible, high use, and intensively cultivated areas. As a result, other areas less visible have suffered. These include the perimeter landscape, the forest shrub layer, and interior forest trees. Maintenance-deficient areas should be identified, and steps taken to raise the funds needed to restore these areas and ensure adequate maintenance in the future.
Landscape Preservation

The overall landscape design of the park has evolved over the years. Its basis was the original plan by William Hammond Hall. John McLaren provided strong leadership in landscape design during his reign. In recent years there has been a lack of direction in the area of landscape design. There is no one person whose chief responsibility is to oversee the landscape design of the park. There are existing policies to guide landscape design, but the lack of landscape design professionals to provide direction concerning landscape design issues is resulting in subtle and gradual changes in parts of the park that are contrary to the existing policies.

Much of the park’s design and structure is composed of dynamic living plants that change over time. Maintenance procedures, or lack of maintenance, can accelerate the gradual changes that destroy the historic design. Preserving the design and structure of the landscape must be a proactive process that recognizes its significance and the forces that alter it. The first step in preserving Golden Gate Park’s historic landscape is to understand and document it. The landscape design framework provides a description of the landscape characteristics. Further research and documentation of the historic landscape should be undertaken through analysis of written records, park maps, and photographs (particularly the 1935 aerial photo to identify changes made in recent decades). The landscape design framework and the goals of preserving the historic landscape should be communicated to all park employees.

Recommendations

- Establish a position with expertise and training in park planning and landscape design with the responsibility and authority, in conference with the Park Supervisor and the Park Planning office, to review and approve all landscape and architectural designs, modifications, structures, features, as well as prepare landscape design plans, to ensure continuity of the park design and implementation of adopted policy.

- Park features should be accurately mapped on computer maps (CAD). This is particularly important in preserving the relationship of forest and meadow as the forest trees are replanted.

- Where appropriate, historic plantings that have been removed or altered should be identified and steps taken to restore historic designs. This should only be undertaken with definitive information on what previously existed. Rehabilitation of the historic landscape should follow the Secretary of the Interior’s Guidelines for the Treatment of Cultural Landscapes (1996, National Park Service).

- Historic buildings and features should be restored and maintained. Treatments of historic structures should follow the Secretary of the Interior’s Standards for Historic Preservation Projects and the Guidelines for Rehabilitation of Historic Buildings. New construction should be appropriate for the historic park setting. New structures can be contemporary in design, but should be compatible with the historic character of the park’s landscape.
1935 Aerial Photograph

This 1935 aerial photograph is the earliest complete record of the park landscape. The photo shows the original planting design as it existed 40 to 60 years after much of the park was planted. The photo will be a valuable resource as the park reforestation program will be replanting much of the forests in the next few years.
Park Landscape
Forest Management

The forested areas of Golden Gate Park comprise one of the premier urban forests in the United States. This is all the more remarkable when one considers that it is a plantation in an area some experts said trees could not grow. One of the greatest challenges in preserving the park’s landscape will occur over the next few years as the majority of these forests will be replanted, replacing trees that have reached the end of their lifespans. The park’s forests are in a condition that requires more aggressive reforestation efforts to sustain the many values they provide. It is estimated that 30 to 40 percent of the forest will disappear in twenty years if reforestation is not pursued aggressively.

Efforts to regenerate the park’s forest began in 1980. The goals of the reforestation program are to reverse the trend of forest decline in Golden Gate Park and to establish and maintain a multi-aged forest. It was recognized at that time that a comprehensive forest management program was needed to preserve the future of the Park and its trees. Because new trees had not been routinely planted to offset the uniform aging of the forest, almost all of the trees in the forested sections of the park are now between 85 and 115 years old. Overmature trees are susceptible to a variety of pests and diseases, windthrow, and potentially hazardous weakening defects. Today, forest management proceeds according to the adopted 1980 Forest Management Plan (FMP), which received environmental review (#EE80.69, 11/81). The implementation of the FMP has been hindered in recent years by redirection of park staff to other functions, as well as reductions in their numbers.

Condition of Golden Gate Park Forests

An assessment of the condition of the park’s forest was made possible by inventories performed in 1979 and 1993. The following describes conditions of the park’s forests based on these inventories.

Tree Mortality

The 1993 tree survey found 27,192 trees over six inches in diameter and greater than 20 feet in height in the forest. Over 6,150 trees were lost between 1980 and 1993 — a mortality rate of 18.5 percent over 13 years (Table 1). Forest composition in 1980 was 22 percent Monterey pine, 25 percent Monterey cypress, 18 percent eucalyptus, and 35 percent other species. In 1993, Monterey pine comprised only 17 percent of all trees, Monterey cypress 24 percent, and eucalyptus has increased to 20 percent. The lifespan of the majority of Monterey pines in the forest has been exceeded and the species will continue to yield its position of prominence to longer-lived species. Pitch pine canker has become a serious disease threat to the park’s pine trees.

The other minor species show significant losses, especially understory hardwooods and gateway plantings such as acacias, pittosporum, and elms. The landscape screens and perimeter plantings —walls of shrubs and tree canopies designed to screen facilities in the park and give visitors relief from the surrounding urban environment — exhibit innumerable gaps within them.

Table 1: Forest Composition in Golden Gate Park, 1980 - 1993

<table>
<thead>
<tr>
<th>Forest Composition</th>
<th>1980</th>
<th>1993</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monterey Pine</td>
<td>22% (7,370)</td>
<td>17% (4,722)</td>
<td>-5</td>
</tr>
<tr>
<td>Monterey Cypress</td>
<td>25% (8,222)</td>
<td>24% (6,650)</td>
<td>-1</td>
</tr>
<tr>
<td>Eucalyptus</td>
<td>18% (6,136)</td>
<td>20% (5,386)</td>
<td>2</td>
</tr>
<tr>
<td>Other</td>
<td>35% (11,614)</td>
<td>39% (10,537)</td>
<td>4</td>
</tr>
<tr>
<td>TREES (Total)*</td>
<td>33,342</td>
<td>27,192</td>
<td>-18.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trees lost between 1980 and 1993:</td>
<td>6,150</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trees planted between 1980 and 1993:</td>
<td>12,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Includes only trees larger than 6” diameter trunks
**Condition**

Approximately 23 percent of the trees inventoried are in good or excellent condition. This is a marked decline from the 41 percent that was measured in the 1980 inventory and represents the expected trend for an Overmature forest. Consistent with this trend is the finding that 14 percent of the forest trees are in poor condition, a slight increase (two percent) over 1980. It is apparent from these data that proportionally more trees are now in fair condition. The number of dying and dead trees has been reduced dramatically from 1,670 trees in 1980, to 400 in 1993. This change is likely a result of increased park forest maintenance targeting potentially hazardous trees started over a decade ago.

Tree condition directly relates to the potential for a tree to cause damage to the public and to property, since condition characterizes the structural integrity of the tree. The program to reduce potential hazards associated with structurally weakened trees has been successful in reducing immediate tree hazards, but the number of trees in potentially hazardous conditions has increased.

**Reforestation**

Reforestation efforts have prevented serious forest decline since 1980. From 1980 to 1993, 12,000 new trees were planted. Planting continues today at a rate of approximately 1,000 trees per year. The reforestation program, however, has not entirely reversed the trend of forest decline. Most of the effort thus far has targeted the western part of the park where the windbreak is in need of immediate replanting. Reforestation has been more limited in other areas of the park. The primary constraint on reforestation has been the lack of personnel to implement it. Potential sites have been restricted also by a desire to avoid the visual disturbance caused by reforestation in areas of more intense use by park visitors.

The number of young trees in areas where reforestation has occurred has greatly increased and most of these trees are in good to excellent condition — a reversal of conditions observed in 1979. The reforestation program is operating at a 50-year replacement cycle, instead of the originally intended 25- to 30-year cycle outlined in the 1980 FMP. The inventory data confirm that reforestation should continue to be concentrated in the west end of the park, but that it is also needed in the other forest areas.

**Wood Waste Recycling**

Reforestation activities, as well as other vegetation management work, generate large quantities of wood waste. All wood waste (approximately 28,000 cu. ft. annually) is now recycled, with most of it used as mulch within the park. Some brush is removed off site and reprocessed as fuel. Recent winter storms resulted in a dramatic increase in downed and damaged trees that created a large backlog of wood waste. Logs are chipped by a contractor when there is a sufficient quantity to be cost effective. Acquisition of a drum-type grinder has reduced the brush chipping and log storage problems.

**Recommendations**

Park forests continue to decline through the natural aging process. Most of the larger trees will be lost in the next few decades. The park landscape will change during this period, but increased reforestation efforts will mitigate the loss of older trees with the planting of new ones. The ongoing long-term reforestation program is necessary to establish a multi-aged forest. Resources available to date have only succeeded in slowing the decline of the park’s even-aged forest. Native vegetation, including oak woodlands, is not regenerating at sustainable levels. Management of waste wood can be improved through increased recycling and the potential development of a fuel source for cogeneration facilities.

The park forests are a collection of areas designated for functional, aesthetic, and special uses (e.g., golf course), each possessing unique requirements for forest treatments. These areas must be clearly delineated and their forest functions preserved based on the historical intent of the design which the Master Plan seeks to preserve. Forest functions are ecological and aesthetic and include:

- **Windbreaks** - ensure conditions suited to forest growth; create microclimates conducive to users’ activities in meadows, playing fields, and around lakes.
- **Habitat** - multistory landscape provides diversity of habitat, canopy cover, understory cover, and food source.
• Screening - perimeter planting, screening of buildings and maintenance facilities.

• Aesthetic - framing of vistas, defining open spaces, accentuating topographic relief of the park landscape, and providing color and visual accents.

The following recommendations are viewed as essential for preserving Golden Gate Park’s forests:

• Extend reforestation to all parts of the park. Provide the public with information about the reforestation process through signs at reforestation sites and an informational brochure.

• Structurally weak trees that pose a significant risk to the public and to property need to be identified, monitored and removed as part of an ongoing safety program.

• Preserve eucalyptus forest, historically part of the park’s design, but contain within designated areas.

• Preserve remnant native plants, predominantly oaks, in designated oak preserves that are managed to perpetuate the oaks and other oak woodland related species, and at other locations.

• Reforestation areas should generally replace the previous trees in kind, using a range of similar species. Historical data, such as the 1935 aerial photographs, should be referred to for planning of replacement plantings.

• Individual large trees should be replaced in kind with similar species. Specimen sized trees should be used where judged to be feasible.

• Reforest high use and high visibility areas in the eastern park with larger trees, rather than seedlings.

• Increase the efficiency of wood and brush recycling within the park, and reduce storage needs. Acquiring and staffing new equipment for this purpose should have a high priority.
Shrubs and Ground Covers

The multilayered landscape of trees, shrubs, and ground covers is one of the primary characteristics of the park. The shrubs play an important role in screening the park along the perimeter landscape, and in screening facilities within the park. The aging shrub layer has suffered in recent years, losing its form and becoming less dense. Unlike the reforestation program for the trees, there has been no systematic replacement of shrubs. Shrubs are planted occasionally, but there is no systematic replacement program, particularly for more remote locations and along the park’s perimeter.

The planting of the shrub layer was based on its relationship to the forest canopy and light levels. As the forest changes, the shrubs have changed also. Some areas receive less light now due to a denser forest canopy, resulting in a diminished shrub layer. Other shrubs, such as the rhododendrons, are dependent upon forest shade, and have suffered due to the loss of trees. Reforestation will continue to change light levels around the park.

Recommendations

• Establish a systematic restoration program for the shrub layer similar to the reforestation program.

• Shrubs should be selected for proper light levels within the forest.

• As maturing reforestation sites are thinned of trees, shrubs should be planted that are appropriate to replace the smaller trees being removed.

Meadows and Turf Areas

The park’s open spaces are composed primarily of its meadows and turf areas. These are important elements of the landscape both visually, as the primary characteristic of pastoral landscapes, and functionally, as they support many of the park activities. They are generally tough and able to handle these activities, but there are limits and they do require considerable maintenance, especially when under heavy use.

Athletic fields take the hardest regular use. Turf is difficult to maintain in areas of concentrated activity. Most fields are closed for occasional maintenance periods and after heavy rains. Some meadows and fields such as Sharon Meadow and the Polo Field have become popular sites for special events that draw large crowds, structures, and equipment. The impacts of these events may damage the areas beyond the point that regular maintenance can repair.

Small turf areas are labor intensive, but their value to the park’s design is important. Turf strips between paths and roadways are an example of these small turf areas. They serve an important function, separating pedestrians from vehicles with an attractive landscape element that is appropriate for the park setting. To reduce maintenance, these have been removed in some areas and replaced with asphalt or other materials.

Recommendations

• The use of meadows and fields for large events should continue to be evaluated through regular review of the Permit and Reservation Policy. Potential uses should be judged in relation to impacts and the ability to maintain the meadows. Events should be monitored and use restrictions enforced to prevent damage.

• Enforce athletic field closures to facilitate proper maintenance and to prevent damage following heavy rains. Coordinate field maintenance schedules with field use permit schedules.

• Where feasible, continue to shift field locations to even wear, and to permit rotation of fields for maintenance periods.

• Any changes in turf areas should be reviewed to assess the impact on the park’s overall landscape design.

• Where feasible, maintain turf borders between paths and roadways. Borders should be designed to be at least 36” wide. Where space permits, borders should be as wide as possible.
Golden Gate Park Master Plan

4-16
Contour Interval: 10 Feet

Topography
Legend

- Pine
- Cypress
- Eucalyptus
- Mixed (predominantly pine/cypress)
- Redwood
- Oak
- Reforestation plots

Scale in feet

North 0 500 1000 2000

Forest Canopy
(As of 1993)
Horticultural Attractions

Some of the park’s primary attractions are the horticultural displays such as Conservatory Valley, the rhododendron dell, the rose garden, the tulip garden, the tree ferns, the Shakespeare Garden, and several other displays. Foremost of the park’s horticultural attractions is the Strybing Arboretum and Botanical Gardens, which contain significant botanical collections from around the world. These areas require and receive intensive maintenance and resources. Many of the horticultural attractions are reliant on the forest trees for creating the microclimates that make these features possible.

Recommendations

• Balance the maintenance needs of horticultural attractions with other park areas.

• Carefully assess the impacts of reclaimed water on special horticultural areas. Where feasible, enable the option of using only well water in certain areas, or the ability to dilute reclaimed water with well water.

• Effective reforestation is needed to preserve the climate-altering qualities of park trees in and near horticultural areas.

• Upgrade irrigation systems in horticultural areas with systems that can water turf, shrubs, and trees separately.
Lakes and Water Features

The lakes in Golden Gate Park are among the scenic highlights of the park landscape. Like much of the park’s landscape, these manmade features were created to appear naturalistic (with the exception of Spreckels Lake), fitting into the park landscape as if they had always been there. The lakes serve a number of functions in addition to their visual qualities such as wildlife habitat and recreation. There are several primary problems with the lakes: integrity of lake liners, lake edge deterioration, poor water quality, and significant accumulation of bottom sediment.

Lake Liners

The lakes were constructed with clay-lined bottoms to hold the water and to permit naturalistic edges. The sandy soil beneath the lakes is highly permeable, so the integrity of the clay liner is critical. Several of the lakes have significant leaks resulting from deterioration of the clay liners over the last 80 to 100 years. The amount of water loss has been measured at approximately 560,000 gallons per day. The lost water recharges the aquifer under the park, which supplies the park’s wells.

Lake Edges

There are three primary types of lake edge conditions in the park, including natural soil edges, rock/boulder edges, and concrete edges. Some lakes have one edge condition around the entire perimeter, while other lakes have a combination of edge treatments. The most common edge condition on the park’s lakes is a naturalistic soil edge. When well maintained, the soil edge supports marsh and riparian plants that hold the soil and provide wildlife habitat. Stabilization of natural soil edges is dependent upon maintaining healthy plant growth along lake edges. Lake edge erosion at natural soil edges is caused by several factors, including varying water levels, wind generated waves, steep bank conditions, ducks, and human activity. The rock/boulder edges provide a hardened edge while still maintaining a naturalistic appearance. The concrete edges also provide a stabilized edge; however repairs, when needed, can be more extensive.

Water Quality

The water quality of the lakes varies depending on their water source. Stow Lake, Elk Glen, and South Lake have regular water supplies that...
cycle water through the lakes. Mallard, Metson, and North Lakes have the least flow, and the poorest water quality. The shallow lake depths, made worse by bottom sediment, result in warmer water and eutrophication. Eutrophic lakes have reduced oxygen levels which increase algae growth and reduce conditions that are conducive for fish and other organisms.

**Bottom Sediments**
Erosion and siltation have resulted in sediment collecting in the lake bottoms, reducing depths. The sediments contain organic debris, soil, litter, and other deposits, and range in thickness from a few inches to over two feet. The shallow water depths result in poor water quality and the choking growth of vegetation and algae. When the water level of Stow Lake is low, some parts of the lake are too shallow for boating. Preliminary testing of the sediments found that they do not contain any unsafe concentrations of hazardous materials.

**Waterfalls**
There are two major waterfalls: Huntington Falls at Stow Lake was reconstructed in 1984 and is in good condition; and Rainbow Fall on Prayer Book Hill, which may have some structural problems from undermining of soil beneath the concrete-rock structure. There are several small waterfalls, some of which are abandoned, that feed several of the lakes. A waterfall and cascade in the De Laveaga Dell has also been abandoned, as well as a channel connecting Metson Lake and South Lake.

For additional information on lakes, see the Golden Gate Park lake evaluation report.

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**Lake Restoration**
Restoration of park lakes will be performed under work funded by the 1992 Golden Gate Park Infrastructure Bond.

- Some of the lakes will be reconstructed with new liners and edge treatments. Liners and edge treatments will preserve the historic design context of the lakes. Reconstruction will preserve features which are irreplaceable and are in serviceable condition. Each lake is unique, and a separate restoration plan will be prepared for each lake. Wildlife habitat, circulation, and other park issues will be considered in developing lake restoration plans.

- A natural clay lake bottom is the preferred liner material.

- Some water loss should be tolerated to retain naturalistic edges.

- Lake edge treatments in naturalistic lakes will permit the growth of vegetation and improve wildlife habitat.

- Where feasible, edge designs will permit disabled access to lakes at key points.

- The lakes will have a well water supply system that improves water quality. Locations of water inlets and outlets should result in flow through all parts of lakes.

- Lake levels will be controlled automatically to minimize variations in levels.

- Sediment will be removed from some lakes with excessive accumulations. Erosion and runoff should be controlled around lakes to minimize future deposits. Drainage pipes that flow into lakes will be intercepted and runoff diverted into the storm drainage system. If suitable, sediment may be used as soil amendment in other areas of the park.

- Drainage from roadways into lakes will be minimized.

- A lake management program will be established to develop regular lake maintenance procedures. Lake redesign will facilitate efficient maintenance of lakes.

- Rainbow Falls should be examined for structural integrity. If reconstruction is necessary, the historic design of the falls should be retained and reproduced.

- Wildlife habitat values should be improved at all lakes, within the context of existing lake function and character.

- Reconstruction of lakes and water features will minimize disturbance to park activities and impacts on wildlife and the surrounding park landscape.
Erosion Control

The creation of the soil that covers Golden Gate Park and supports the trees and other plants was the largest task in the construction of the park. Topsoil from various excavations around San Francisco was carted in, wagonload by wagonload, and mixed with manure from street sweepings. A thin mantle of nourishing soil was placed on top of the sand to promote the growth of the plants.

Today the park's topsoil remains a fragile, thin layer that is subject to erosion if the bond of soil-holding plants is broken. The erosion in the park is generally a spot problem, caused by overuse that has resulted in loss of ground cover and bare soil. The problem is accelerated when it occurs on a slope.

Erosion problems were surveyed by the Department of Public Works in late 1993. With the help of Golden Gate Park section supervisors, approximately thirty areas of spot erosion (with problems ranging from minor to severe) have been identified in the park. Over half of these eroded areas are caused by foot and/or off-trail bicycle traffic in locations that are not designated as part of the park circulation system. These areas of erosion are exacerbated by water runoff. Several areas with severe tree root exposure have been caused primarily by water runoff. Strawberry Hill, with its steep slopes and sandy soil, has a significant amount of spot erosion, caused by a combination of foot/bike traffic and water runoff. The remainder of spot erosion areas occur at existing service roads and wooded stairways around the park.

The survey resulted in an Erosion Control Plan that gives a prescription for correcting each of erosion areas. Erosion problems are being addressed through the 1992 Golden Gate Park infrastructure bond work.

Erosion Control Techniques

- **Selective Canopy Thinning:** Depending on the location, selective thinning of the canopy vegetation may be required to provide more light for revegetation. Tree canopy work will be performed prior to other erosion control work being done.

- **Irrigation:** Lack of irrigation to support vegetation has contributed to some of the erosion problems. Irrigation lines will be brought to many of the areas where revegetation will be done.

- **Slope Stabilization:** Wattling is recommended to help stabilize slopes in eroded areas. Wattling is typically composed of branches and limbs 1" to 4" in diameter, mounded 18" to 24" high, and arranged perpendicular to the slope.

- **Regrading:** Some areas will require regrading to divert water and prevent further erosion.

- **Fencing:** Fencing will be used selectively in sensitive areas. Its purpose is to direct or restrict pedestrian and bicycle traffic away from areas where restoration work or plant re-establishment is underway. Fencing will generally remain until the plant establishment period is complete. In some areas, fencing, railings, or other barriers may be needed permanently to direct traffic.

- **Signs:** Informational signs describing the work being conducted will be installed at areas undergoing erosion control measures. Signs will also be used to educate park users where certain activities are damaging to the park.

Erosion Areas

Source: GGP Erosion Control Plan, Department of Public Works (1995)
Erosion Control Recommendations

• **Spot erosion in areas that are not part of the park's circulation system:**
  These off-trail erosion areas will be addressed by removal or thinning of existing vegetation (to promote new growth), stabilization practices, and planting. Efforts will be made to eliminate travel in the effected areas through the use of planting, barriers, and selective fencing.

• **Eroded service roads, pathways, and wooden stairways:**
  Roads and pathways will be rebuilt and regraded to divert water runoff. Stairways will be removed or rebuilt after careful consideration of appropriate location and material. Slopes adjacent to the stairways will be stabilized and replanted.

• **Areas to be coordinated with the reforestation plan for the park:**
  Erosion control recommendations and implementation for certain areas such as Strawberry Hill will be coordinated with reforestation efforts.
Wildlife Habitat

As the surrounding land has developed, Golden Gate Park’s value to wildlife has grown in importance. The park’s forests, meadows, and lakes provide food, nesting sites, and cover for many animals, particularly resident and migratory birds. Overall availability of habitat in the park has decreased in recent years and some species of wildlife are less frequently sighted. Many factors combine to create this condition: reduced amount of shrub and understory vegetation, reduced water quantity, loss of aquatic plants, as well as direct pressures on wildlife, such as possible predation by, and competition with, domestic and feral animals released in the park.

Balancing the often conflicting objectives of improving conditions for wildlife and encouraging public use of the park will continue to be a challenge. The park’s designers, however, made the challenge less formidable by dividing the park into two distinct parts, roughly east and west of Strawberry Hill. Preserving the historic naturalistic design of the park, including this division — a principal goal of the Master Plan — will also preserve habitat value for wildlife.

The eastern park is more actively used, while the western part is more naturalistic and densely wooded. Maintaining this distinction goes a long way toward maintaining wildlife habitat in the park. Beyond this critical feature of the original design, other special areas within the park are the focus of wildlife management. These include the Chain of Lakes, as well as other lakes, the oak woodland preserves, and the arboretum area — principal areas of the park where large numbers of visitors can experience wildlife.

The greatest diversity of wildlife, and the wildlife of greatest interest to the public, is found in the park’s avian creatures. Birds, both resident and migrant, have numerous habitat requirements which the park has provided over the years but which have declined in quality recently. The disappearance of California quail from the park in recent years is an example of what ill-fate may come to other avian and non-avian species if careful management of habitat is not pursued. Inventories of non-avian wildlife have not been systematically performed, and less is known about the dynamics of this component of park wildlife.

Habitat Condition in Golden Gate Park

Food, Water, and Cover
The needs of wildlife are best served by habitat diversity, or a mosaic of small areas of one type of habitat that serves part of a species’ needs adjacent to another type of habitat serving other requirements. This mosaic must provide food, water, and cover.

Golden Gate Park forests support a diverse selection of food-providing plants. Live oaks and pines, distributed throughout the forest, provide both browse and mast (a compound of edible material found on the forest floor). The shrubs that exist in the understory also provide browse and fruit. Ground cover is a bountiful source of insects, which in turn supply birds and animals with food. Eucalyptus trees provide nectar during winter and are thus an important seasonal source of food. Many species of native plants are also excellent sources of winter food. Native plants are not regenerating at sustainable levels, however, largely due to invasive species out-competing them.

The best sources of water for wildlife are constructed lakes, streams, dew, and succulent vegetation. Water quality in some of the park’s lakes is impaired by the eutrophic condition evidenced by dense, invasive vegetation at shorelines. Seepage is also a problem at some lakes, resulting in occasional shortages of water for wildlife.

Forest cover quality in the park is fairly diverse yet limited in quantity. Forest fragmentation, occurring mostly in the eastern part, and understory decline are the principal problems for this feature of wildlife habitat. The pine forest structure varies from area to area, providing a desirable mosaic of canopy densities in the western part of the park. Pine snags and fallen trees provide cover as well. Shrub thickets are being trimmed in places to deter homeless encampments, reducing this critical source of cover.

Domestic and Feral Animals
Domestic and feral animals intentionally and unintentionally released into the park compete with wildlife for food, water, and cover, and at times prey upon wildlife. The humane treatment of all animals will be an essential part of any effort to address the domestic animal problem.
which already exists. Emphasis should be placed on preventing an increase in the feral animal population by improved enforcement of existing regulations.

**Recommendations**

The original design of Golden Gate Park which the Master Plan seeks to preserve is well suited to the continuous and abundant presence of wildlife. Park habitat is diverse and extremely valuable to wildlife as a relief from the highly urbanized surroundings. The principal elements of habitat, food, water, and cover are in a state of moderate decline resulting from direct and indirect pressures of heavy public use of the park.

Wildlife will benefit from an approach that improves each element of habitat. The following are the principal recommendations for Golden Gate Park wildlife which would greatly improve habitat and likely result in a more stable wildlife population:

- Employ a resource management approach to wildlife in Golden Gate Park
- Encourage a multi-age, structurally diverse forest, with variation in height and density. Forest and vegetation diversity provide the basis for diverse wildlife.
- Preserve the woodland/meadow edge zone for the resources it provides wildlife, especially resident birds and southbound migrants.
- Leave ground cover intact to provide protective cover for wildlife, except perhaps in areas where unwanted weeds may be removed in favor of a desired or native species.
- In the western portion of the Park, leave snags, dead trees and branches standing as long as possible, unless they present a danger to people or structures.
- Control domestic animals released into the park through strict enforcement of leash requirements. Establish humane strategies to reduce existing populations of feral animals.
- Prohibit feeding of pigeons in the park.
- Post signs and distribute information explaining why the public should not feed animals, and the consequences of and penalties for doing so.
- Conduct systematic inventories of avian and nonavian wildlife to improve knowledge of wildlife dynamics and aid in preserving an abundant and diverse population of wildlife.
- Limit human disturbance. Keep the park relatively free of refuse and encourage visitors in the forest to use designated pathways.
- Remove and discourage invasive aquatic and terrestrial weeds. The planting of California native shrubs and trees will increase both the number and diversity of desirable animal species.
- Maintain water features in the landscape in a manner which supports wildlife dependent on water related ecosystems.
- Increase interpretive programs that focus on nature and wildlife with guided walks conducted by volunteers, exhibits at proposed visitor centers, and self-guiding interpretive trails (using brochure guide maps rather than signs).
- Designate important habitat areas in Golden Gate Park and manage these areas for habitat values as a priority use. Likely areas to include are Chain of Lakes, Mallard Lake, Elk Glen Lake, oak woodland preserves, and selected forest areas.