

About the Presidio Trust's Reforestation Program

Surveying the landscape today, it feels as though the Presidio's Eucalyptus, pine, cypress, and Redwood trees have always been there. Yet, the first human inhabitants of the land at the Golden Gate encountered a very different landscape – windswept dunes, serpentine scrub, and coastal marshes punctuated by native oaks and willows concentrated along Presidio streams and ponds.

The document summarizes how the Presidio forest came to be, and how it is cared for today as part of the complex mosaic of Presidio landscapes.

Creating the Presidio Forest

Visitors who enjoy the fresh air, solitude, and recreation the Presidio's urban forest provides have US Army Major William A. Jones to thank. In March 1883, Jones proposed an ambitious tree planting program in his *Plan for the Cultivation of Trees Upon the Presidio Reservation* that would dramatically alter the military post's landscape. An Army staff engineer experienced in landscape engineering and forestry, Jones was inspired by the country's new urban parks – including San Francisco's Golden Gate Park. His goal was to create wind barriers in the Presidio's notoriously sandy dune environment, “crown the ridges, border the boundary fences” to set the Presidio apart visually from the surrounding city, and make the post seem larger than it actually was.

Jones was transferred before his plan was put into action in 1886. Six years later, more than 300,000 trees had been planted with Army labor, with help from citizens and Scout troops. As the forest grew to nearly 420 acres by the early 1900s, Jones and others – including a forester from the newly formed U.S. Forest Service – recommended thinning as a long-term maintenance strategy, “keeping the distance between trees about equal to their height.”

Despite many initiatives and plans by various Army officers, the Presidio forest continued to grow without an overall design or reduction in density. Major Jones' original plan, to accentuate the topography of the Presidio, had also been blurred as the forest expanded into valleys and view areas Jones had intended to remain open. The forest had replaced the dunes as the dominant feature of the landscape.

From Military Post to National Park

In 1962, the U.S. government declared the Presidio a National Historic Landmark District, with the forest included as the single largest contributing feature. Recognizing that the forest was failing due to lack of active management, in 1981 the Army sought the advice of local experts, including Joe McBride, Professor of Landscape Architecture & Environmental Planning at UC Berkeley, and environmental consultants Jones & Stokes Associates, Inc. The resulting management plan was shelved due to the impending closure of the Presidio as an Army post.

When the Army finally departed in 1994, the Presidio was transferred to the National Park Service (NPS) as part of the Golden Gate National Recreation Area. The NPS engaged the local community in a planning process for the park that resulted in the General Management Plan Amendment (GMPA, 1994) for the Presidio. The GMPA recognized the forest as a significant cultural landscape feature, not only of the Presidio but of San Francisco as a whole, and that it was aging and in need of rehabilitation.

Again, Jones & Stokes was engaged to perform a tree survey. It was determined that due to the advanced age of most trees, breakage, tree death, and storm damage could substantially reduce the extent of the forest over the next 20 years. Ultimately, the revitalization of the forest would be in the hands of the Presidio Trust (Presidio Trust Act, 1996), the federal agency that took over management of the noncoastal areas of the Presidio in 1998.

Planning for a Healthy Forest

In 2001, the Presidio Trust and the National Park Service published the *Presidio Vegetation Management Plan*, a blueprint for caring for the park's open spaces, including its natural areas, historic gardens and parade grounds, and the forest planted by the US Army.

The *Vegetation Management Plan* calls for restoring the historic forest within its historical boundaries, managing it as part of the cultural landscape, and maintaining the visual quality of the Presidio. The Trust also looks for guidance to the 2009 *Historic Forest Character Study*.

To accomplish this, the Trust recruited an experienced forester, Peter Ehrlich, from Golden Gate Park. He brought all the lessons he learned from his work there and applied them to the Presidio. Ehrlich and Michael Boland, then the Trust's Director of Planning and now Chief Park Development & Visitor Engagement Officer, formally launched the reforestation program in 2003. The goal was to gradually transition the aging forest into new stands of young, healthy trees to diversify the forest's age and address the density of the trees.

Because the forest had never been actively managed, the Trust began by experimenting with pilot projects to understand the unique qualities of the Presidio forest. Pilots looked at ways to increase species diversity, develop a multi-layer forest structure, diversify the understory, and safely remove hazardous or dead trees – all while balancing the compliance requirements of the National Environmental Policy Act (NEPA), the Endangered Species Act (ESA), and the National Historic Preservation Act (NHPA).

A Record of Success

The Presidio's historic forest includes 75,000 trees across 306 acres. Five species make up 95 percent of the forest: Monterey cypress, Monterey pine, blue gum eucalyptus, blackwood acacia, and coast redwood. Each year the Trust's reforestation team removes and replants two to three acres of historic forest. To date, the Trust has reforested 40 acres with more than 5,000 young trees. The young trees are raised at the Presidio Nursery from seeds collected in the Presidio. The Trust's reforestation effort has contributed to an uptick in bird diversity in the Presidio, a clear indication of a sustainable ecosystem.

Additionally, the Trust conducts regular tree risk assessment to create a roadmap for ongoing maintenance to keep the forest as safe and healthy as possible. A survey determines which trees pose the highest risk so the Trust can proactively remove trees based on their risk score. The surveys also help determine where reforestation efforts are focused in a given year.

The work begun by forester Peter Ehrlich is now carried on by Blake Troxel, the Presidio's forester since fall of 2017, and a team of arborists and forest restoration technicians.

In areas slated for reforestation, the removal of aged and declining trees is followed by the application of well-cured compost to improve water-holding capacity in the Presidio's sandy soils. Drip irrigation systems are used to help establish the new seedlings. Reforested sites are actively maintained for five to eight years and thinned periodically to achieve a density of approximately 50 trees per acre when mature.

Understanding Climate Change

In 2019, the Trust completed a fire analysis and management study. The analysis, using fire modeling software and climate predictions found at Cal-Adapt.org, indicated that there is a very low risk of wildfire in the Presidio due to the park's low annual average temperatures and high humidity. The fire ecology and climate of our specific location are not predicted to change drastically in the near future, keeping our wildfire risk low.

Getting Involved: Volunteer Forest Stewards

The public can play a role in caring for the Presidio forest through the Trust's Volunteer Forest Stewards program. Volunteers help with planting, weeding, mulching, and other stewardship work. From 2007 to 2019, approximately 2,195 volunteers contributed over 13,116 hours taking care of young trees. To get involved, visit www.presidio.gov/volunteer.

Fast Facts

- The 1,491-acre Presidio includes 991 acres of open space.
- The historic Presidio forest, planted by the US Army beginning in 1886 based on a plan by Major William A. Jones, is 306-acres and comprised of approximately 75,000 trees.
- Five species make up 95 percent of the Presidio's forest: Monterey cypress, Monterey pine, blue gum eucalyptus, blackwood acacia, and coast redwood.
- Management of the historic forest is guided by the 2001 Presidio *Vegetation Management Plan* and the 2009 *Historic Forest Character Study*.
- From 2003 to 2018, the Presidio Trust's forestry crew has planted more than 40 acres of young trees. In total, more than 5,000 trees have been planted.
- The Presidio forestry team includes a head forester, a tree crew supervisor, six arborists, and two forest restoration technicians.
- The typical life span of Monterey pine is 80 to 100 years, while the life span of Monterey cypress ranges from 100 to 150 years or more. Although subject to large-limb breakage,

crown dieback, and blowdown after 80 years, blue gum eucalyptus can continue to live much longer and often resprouts when it does fall or break.

- From 2007 to 2019, approximately 2,195 volunteers contributed over 13,116 hours taking care of young trees
- Dying trees often get a second life in the park, repurposed as benches, fencing, and even artworks like Andy Goldsworthy's *Spire*, *Wood Line*, and *Tree Fall*, and *Earth Wall*, viewed by thousands of visitors each year. The Presidio also provides logs to local schools as nature play material.