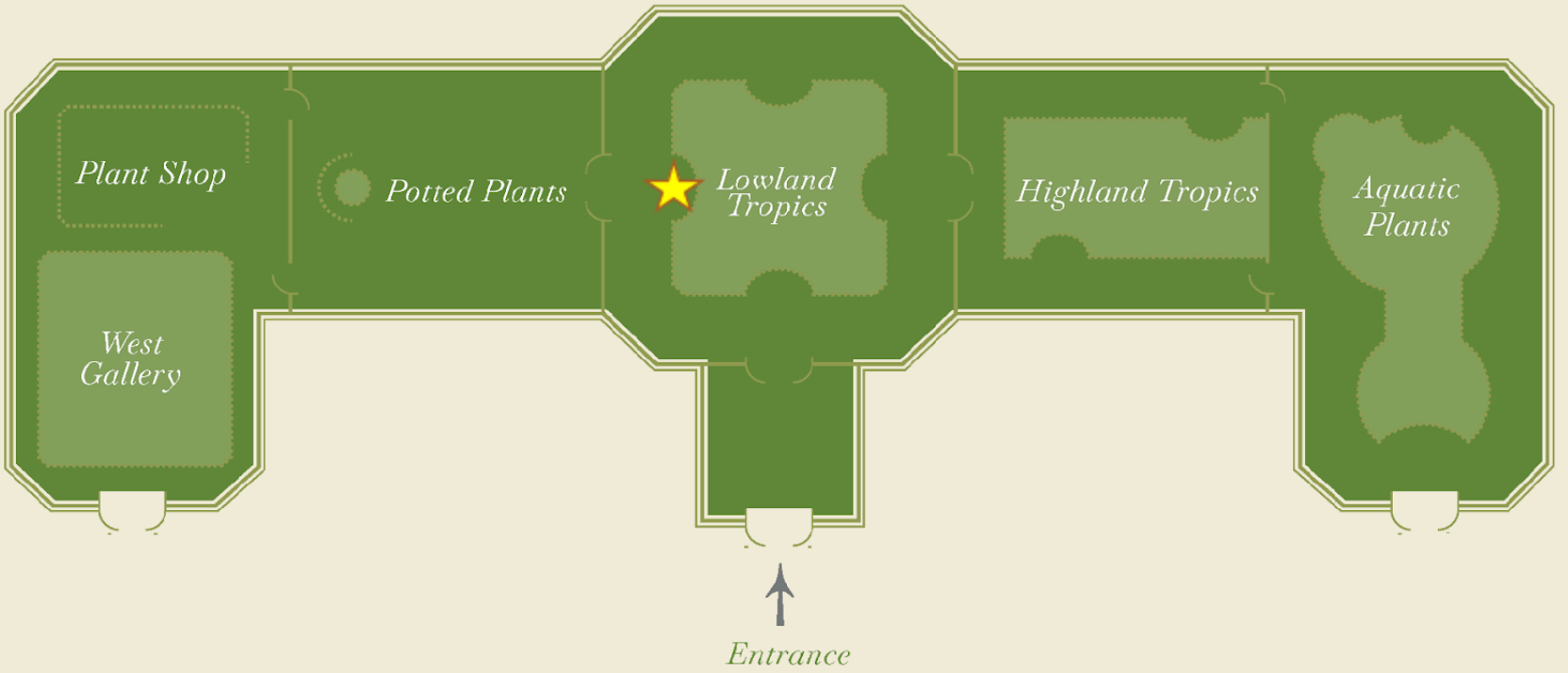
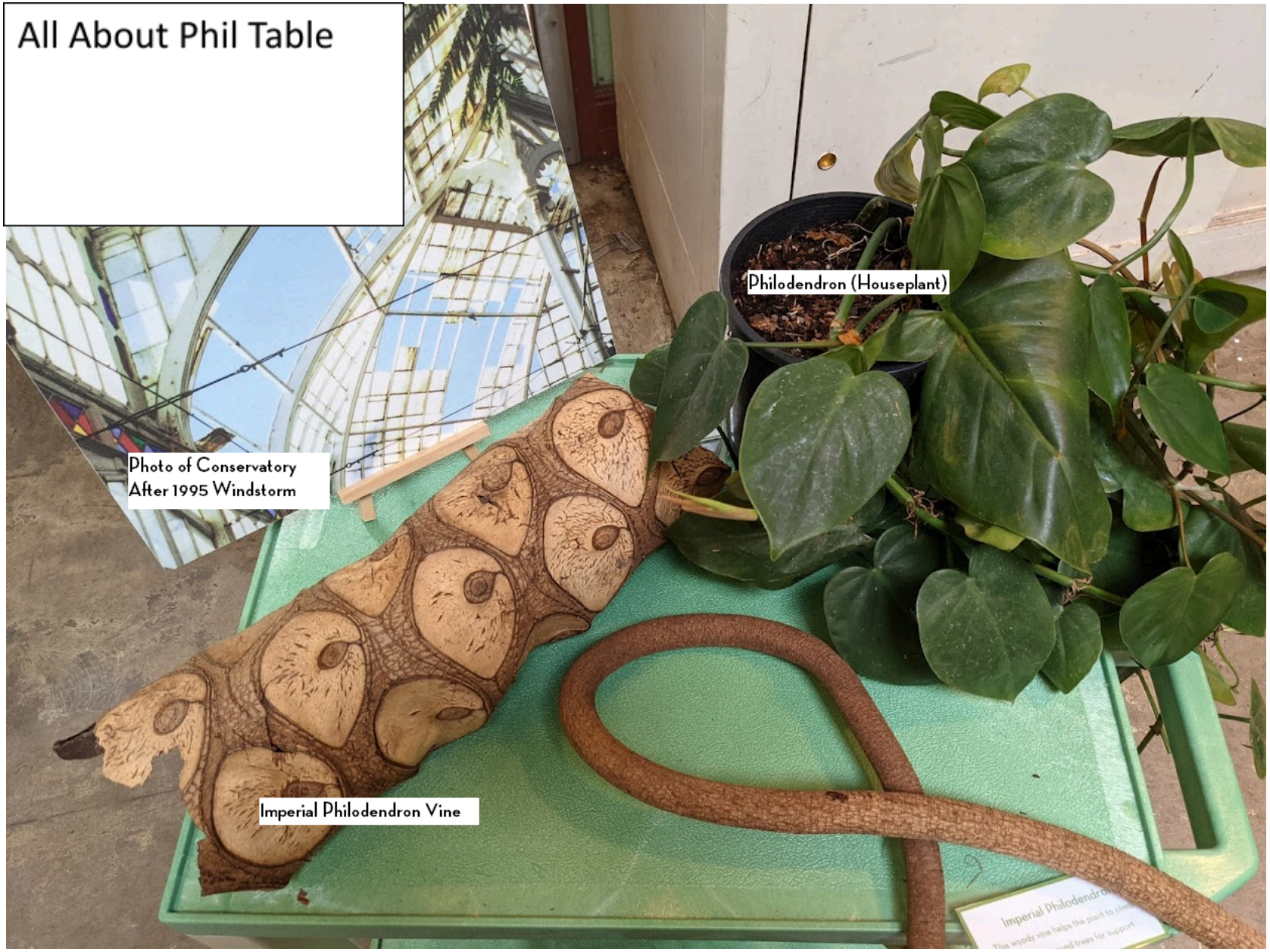
All About Phil

(the Philodendron)

All About Phil: Lowland Tropics Location



All About Phil Table



All About Phil

Vines like Phil are adapted to compete with other plants for sunlight in the densely leafy Lowland Tropics by climbing up into the forest canopy. Rainforests thick with lush vegetation like Phil are vital to taking up carbon dioxide from the earth's atmosphere and mitigating climate change.

Focus Species:
Imperial Philodendron (*Philodendron speciosum)*

Live Plants:
- Imperial Philodendron (*Philodendron speciosum)* leaf if available.
- Golden Pothos (Potted)

Props:
- Dried Phil Vine
- Measuring Tape

Photos:
- Imperial Philodendron Inflorescence
- Golden Pothos in Wild
- Carbon Store/Sink
- Historical Photos

Welcome to the Lowland Tropics Gallery

In dense low-elevation tropical rainforests, plants are constantly competing for sunlight. Some plants grow to be as tall as possible, others have adapted to have large leaves to have as much sun-catching surface area as possible. Some, like the Imperial Philodendron, do both! As a vine, the Imperial Philodendron can climb up into the forest canopy. There, leaves as long as 6-feet can soak up sunlight and shade out competitors.

Phil's Story

The large leaf you see here is an Imperial Philodendron we've nicknamed "Phil" – feel free to touch this leaf. Can you look up and spot the vine that this leaf came from?

This massive vine has grown all the way from the Lowland forest floor to up to the Conservatory roof, and has wrapped its stem around the building supports to support itself. Here is a piece of the stem of the Philodendron – you can see the circles where its leaves were once attached!

While we don't know how old this individual specimen is, we believe it to be one of the older plants in the Conservatory's collection and some records indicate it might be over 100 years old, though we cannot verify this. This plant is an iconic part of the Conservatory collection and provides a unique opportunity to see this species at this remarkable size, which otherwise could likely only be seen in the wild.

While we can't be sure of this plant's age, we know it's a tenacious survivor. When the Conservatory was badly damaged in a 1995 windstorm, many of the plants perished but Phil did not. During the multi-year reconstruction of the Conservatory, this individual plant was outfitted own temperature-regulated temporary greenhouse to protect this plant since it could not be relocated. The scaffolding and plastic sheeting succeeded in keeping the plant sufficiently warm, as the Conservatory was reconstructed around it, until the restored Conservatory opened in 2003.

More about the Conservatory's History

First built in 1879, the Conservatory of Flowers is the oldest building in Golden Gate Park. It opened just a few years after Golden Gate Park's founding in 1870. It is unique in that the frame was built from old-growth redwood rather than a metal frame as most other similar glass houses are constructed.

The Conservatory has served as a public greenhouse for the people of San Francisco through its history. Today the Conservatory houses a botanical collection that focuses on tropical plants, featuring approximately 2000 species including many rare and endangered plant species. Our plants showcase the biodiversity of the tropics, where more plant and animal species are found than anywhere else on earth. We display a variety of tropical ecosystems (Lowland Rainforest, Highland Cloud Forest, and Aquatic Wetlands), and raise awareness of the threats that plant diversity and tropical ecosystems face. In 2022, the Conservatory of Flowers joined the Gardens of Golden Gate Park, a non-profit organization that manages the Conservatory, Botanical Garden and Japanese Tea Garden in tandem with the city's Recreation and Parks Department.

Why Do Plants Need Sunlight?

The Lowland Tropics gallery is home to the Conservatory's tall dome, allowing us to model both the height and layers of a tropical rainforest. All plants need sunlight to survive, and in a Tropical Rainforest light is a scarce resource. Phil's massive leaves and vining growth habit are both adaptations that help this plant to climb upward and get access to as much sunlight as possible, even in the Lowland Tropics where plants grow in dense layers and competition for light is fierce.

Why do plants need sunlight? They need it to generate their primary food and energy source – sugar – through photosynthesis. During photosynthessis, sunlight triggers a process inside the plant in which water and carbon dioxide is turned into sugar (glucose) and oxygen. But without light, photosynthesis

can’t happen, the plant can’t produce that sugar and has no food. That’s why you can’t leave your house plant in the dark – it will starve!

Photosynthesis isn’t just an important process for plants - it benefits all life on earth. Photosynthesizing plants help remove carbon dioxide from our atmosphere and create oxygen that we breathe! That is why protecting tropical rainforests is crucial to slowing climate change. Rainforests are sometimes called the “lungs of the planet” because they give us air to breathe and regulate our planet’s climate.

Protecting Rainforests

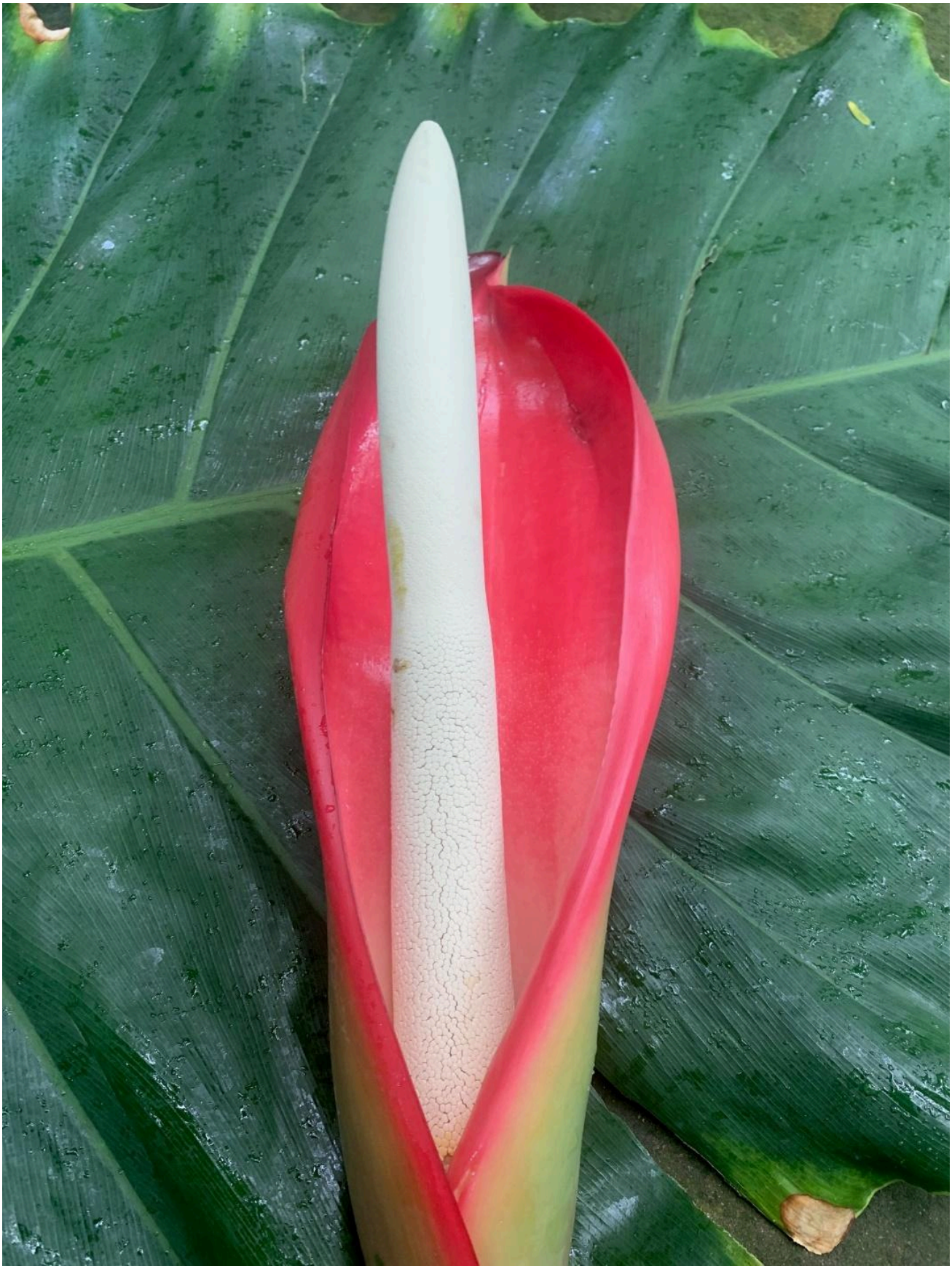
A dense forest like the lowland tropics filled with plant matter, is what we call a carbon “sink” – a place in which large amounts of carbon dioxide are stored. Every massive tree and leaf can photosynthesize, suck up carbon dioxide, and lock it away so that it’s stored in plants rather than our atmosphere.

When tropical rainforests are removed by people, it’s not just plants and animals that disappear - the carbon-storing capacity of that forest is also lost. Protecting tropical forests is crucial to protecting tropical species and slowing climate change. One of the greatest drivers of tropical deforestation is the clearing of land to grow animal feed or pasture. Reducing our meat consumption – or replacing red meat with chicken and fish - is one of many ways people can help to reduce our impact on tropical forests.

Although tropical forests across the world have been impacted by people, there is still much that can be protected. In places where forests have already been lost, efforts to restore and regrow tropical forests can be effective both in restoring plant and animal life and restoring the forest as a carbon sink. Although it is much more effective to protect existing tropical forests than it is to restore damaged ones, both are important tools to ensure tropical ecosystems can continue to mitigate climate change.

The Imperial Philodendron is an exceptionally large species of Philodendron. But its close relatives often dwell in our living rooms as popular houseplants. It turns out that in the right environment, household varieties of Philodendron and Pothos can also grow as large vines in the wild, where they have adequate time and space! Pictured is a Golden Pothos, a Philodendron Relative, growing as a wild vine.

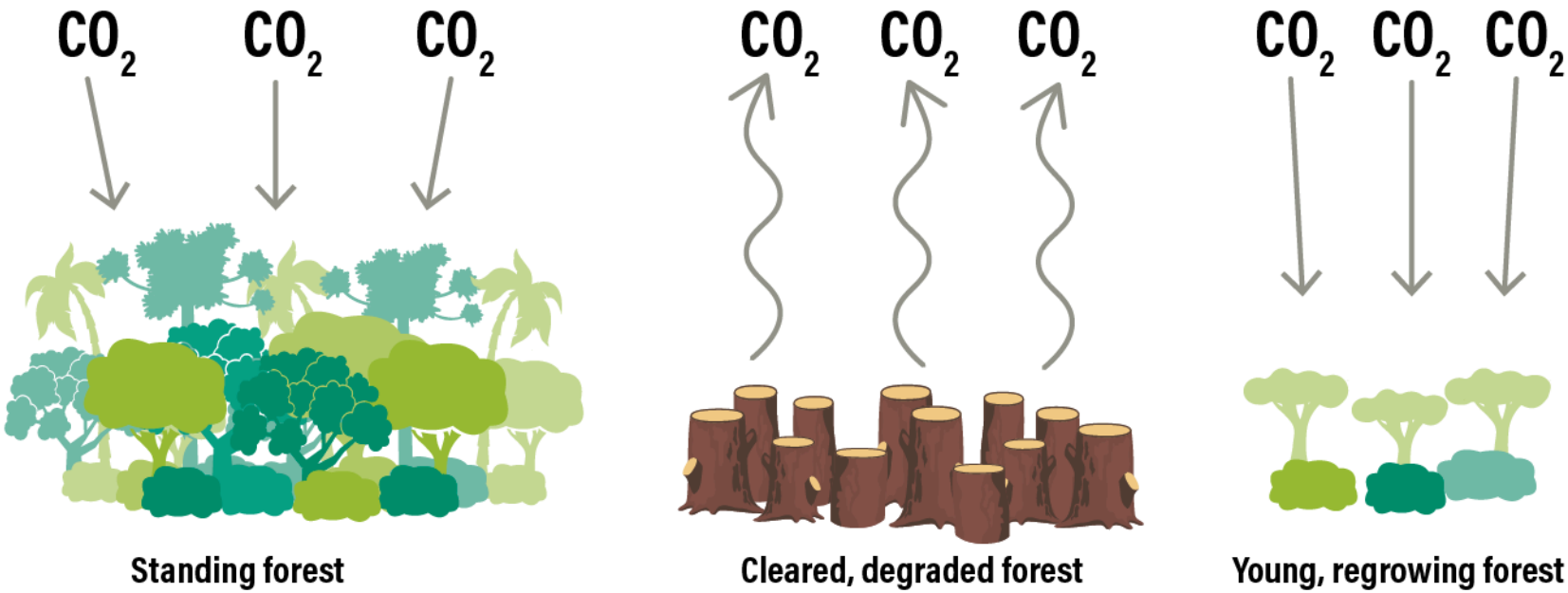
(Photos: Photo by Tau ʻolunga licensed under CC BY-SA 3.0; Pixabay)



Imperial Philodendron inflorescences (groups of flowers) tend to be over 1 foot in length and have the typical shape of an Aroid (member of the family Araceae).

The white spathe is an inflorescence consisting of many small flowers, while the red spadix is a bract (modified leaf) that surrounds the flowers.

Forests Act As Both a Source and Sink For Carbon



Source: Global Forest Watch

20.01.21

GLOBAL FOREST WATCH

WORLD RESOURCES INSTITUTE

Our planet's climate is changing, but our choices today will determine how much the climate changes in the future. Tropical rainforests are vital to mitigating climate change.

When we burn fossil fuels, carbon dioxide is released into our atmosphere. The atmosphere is like a heat-trapping blanket, and the more carbon dioxide in our atmosphere the thicker that blanket and the more our climate changes and warms.

We must reduce our use of fossil fuels to produce less carbon dioxide. An additional climate solution is protecting natural habitats that absorb and store carbon dioxide, keeping some of that carbon out of our atmosphere. Forests – especially rainforests – are excellent at storing carbon. As they photosynthesize, trees and plants take up carbon dioxide from our atmosphere and store that carbon in the plant's tissues. If a standing forest is cut down, that carbon is released into the atmosphere, so leaving tropical rainforests intact is essential for mitigating climate change.

However, even in areas where forests have been lost, there is still hope! A regrowing forest also takes up tremendous carbon dioxide from the atmosphere as trees grow and absorb carbon. Tropical forest restoration is also a powerful climate solution.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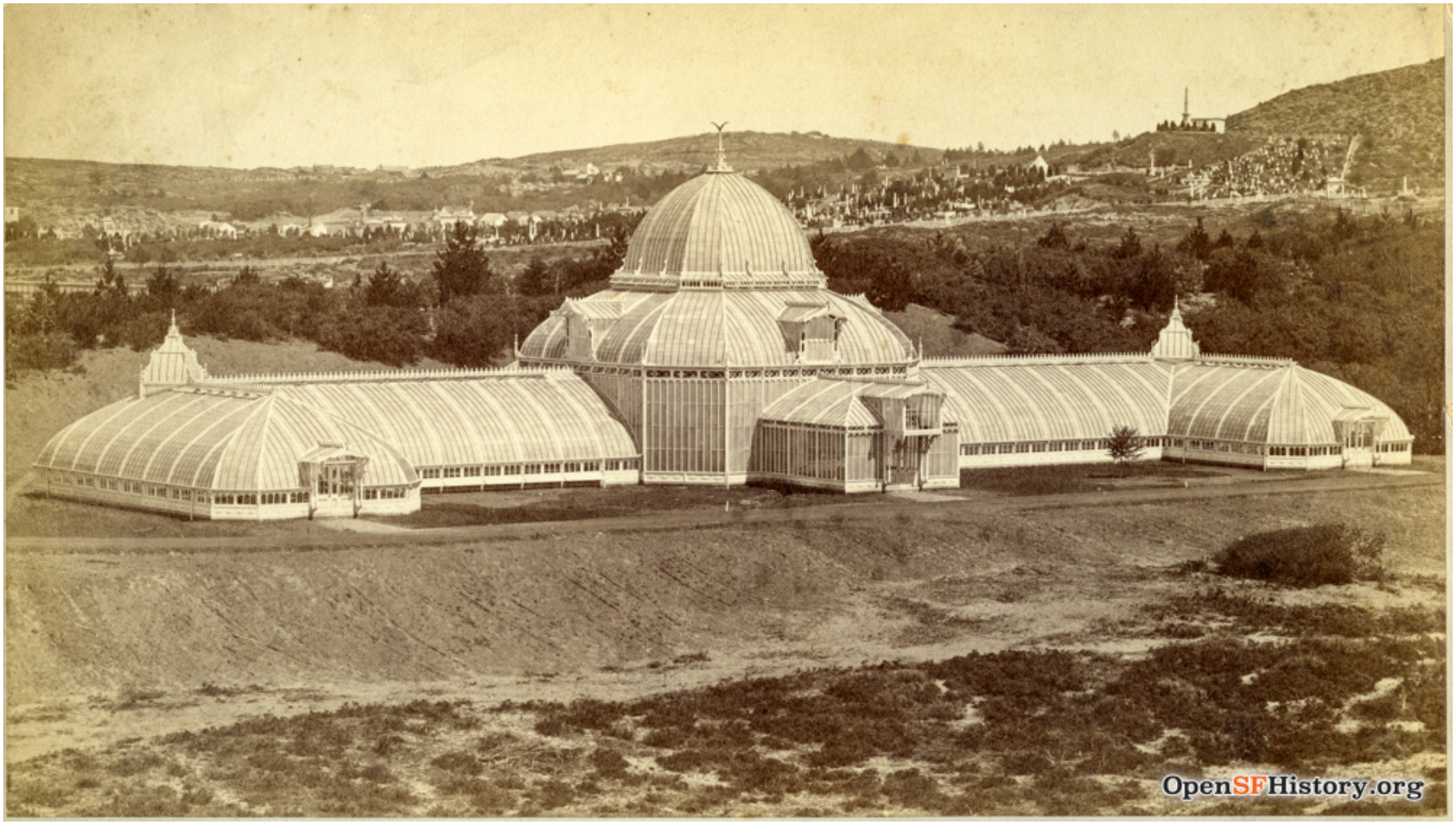
The lifting of the Conservatory dome during its restoration. After major storm damage in 1995 closed the Conservatory, an extensive reconstruction and restoration effort occurred from 2000-2003. Note how the Lowland Tropics was enclosed during this time, allowing plants rooted in place to survive while the Conservatory was reconstructed around them.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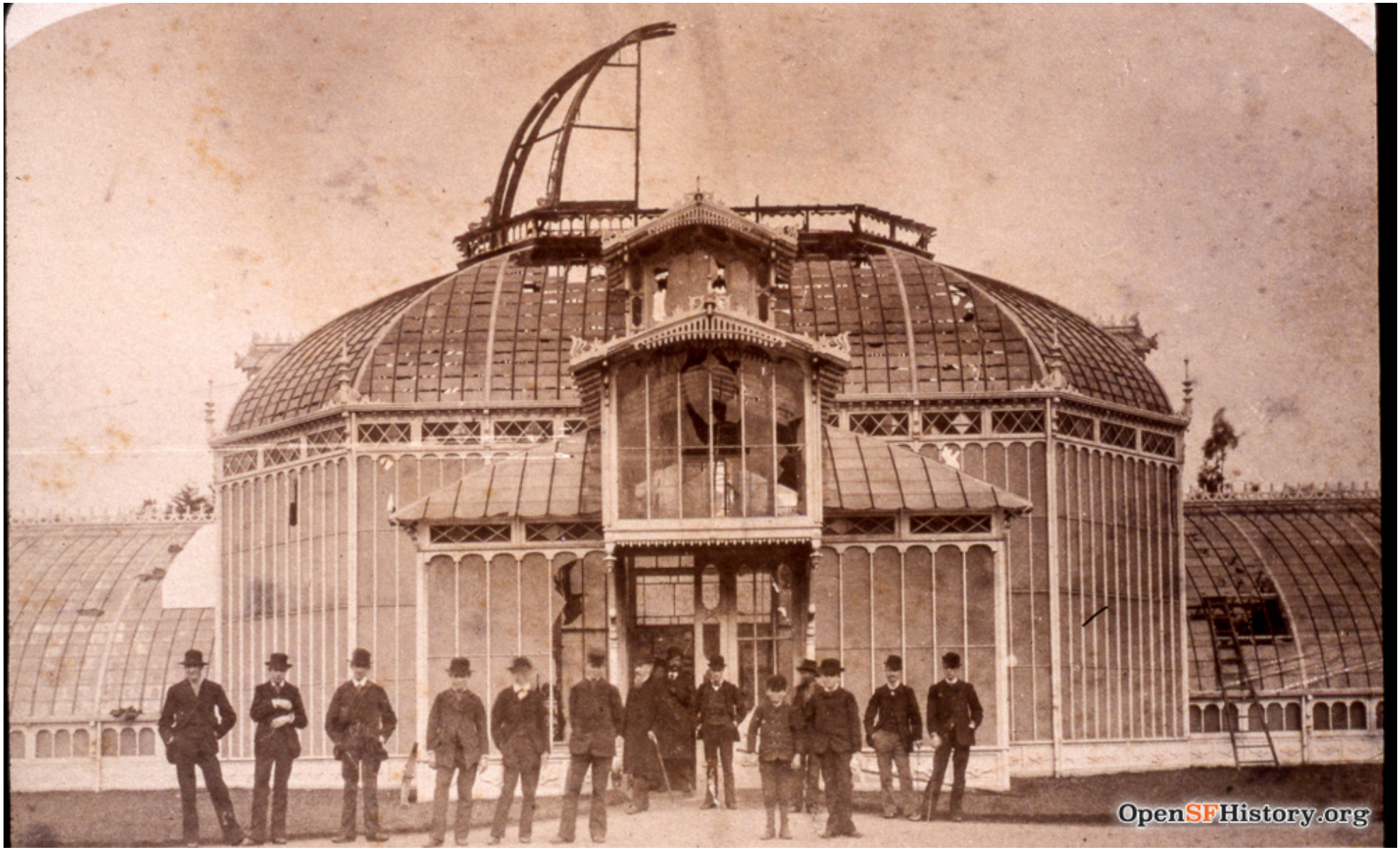
The Conservatory of Flowers in 1880, the year after the building opened to the public. Much of the western half of the city (including Golden Gate Park) was still sand dune, you can also see a cemetery in the background (Richmond District) - this was before graves were relocated to Colma and the Richmond was developed.


14 — Golden Gate Park, Conservatory, S. F.
OpenSFHistory.org
Photo., San Francisco

It is hard to imagine that Golden Gate Park (and western San Francisco) was originally nothing but sand dunes. A massive tree planting effort meant that even in 1880, ten years after the parks' opening, we can see much established plant life.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A boiler fire caused major damage to the Conservatory dome in 1883, just a few years after it opened. It was restored, though it looks slightly different than its original form.

The Conservatory weathered San Francisco's two major earthquakes in 1906 and 1987 with minimal damage. In 1906, Conservatory Valley was one of the major areas where San Franciscans who lost their homes camped out.


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Conservatory of Flowers in 1890. The Conservatory of Flowers has always housed some tropical species which thrive in this indoor greenhouse environment. In more recent history (particularly post-reconstruction in 20223) the Conservatory shifted to more naturalistic displays depicting tropical environments. As tropical plants are facing increased threats in the wild, the Conservatory has increased its effort to deliberately build and catalog a botanical collection of tropical plant species, including rare and endangered tropical plants.