



The eucalypts of Albany Hill may have had their heyday, and scientists have figured out why. (Photo by Kate Golden)

Botany

The Nearly Unkillable Eucalyptus Meets Its Match

Climate change plus fungus could spell doom for the trees

by *Guananí Gómez-Van Cortright*

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In This bump of urban forest, popular with joggers and dog-walkers, rises sharply some 338 feet from the East Bay floodplain, though it looks taller from afar thanks to its shaggy eucalyptus hairdo. Tasmanian blue gums (*Eucalyptus globulus*) reach for the sky at its summit and down its steep flanks, filling the air with their minty-sharp scent, while a tangle of live oaks grasp the northern slope down to Cerrito Creek. The hill is home to native wildflowers, coast live oaks, riparian habitat along the creek, toyon and monarch butterflies.



Blue gum eucalyptus trees on Albany Hill. (Photo by Kate Golden)

Albany Hill was hit particularly hard in a blight that came for the Bay Area's eucalyptuses in 2020. That year, eucalyptus trees began to suffer from a dieback—a creeping decline of mysterious origin that left the trees with blotchy, withered leaves. The trees struggled to photosynthesize, and without food, they began to waste away. Arborists hired by the city of Albany, which owns about half of the hill, deemed many of the brittle, drought-parched trees a fire and falling risk for residents and park visitors.

Now, the city parks department has cut down fifteen of the most decrepit and hazardous eucalyptus trees and milled them into wood chips and planks for use right on the hill itself.

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The removal of blue gums on Albany Hill is just the latest chapter in the saga of one of California's most controversial invasive species.



Messy, messy, messy. (Photo by Kate Golden)

The eucalyptus wars

For some, eucalyptus trees are dangerous intruders that must be eradicated.

They are, undeniably, pervasive invasives. They're messy, leaving curls of peeling bark draping toward the ground. They guzzle water, dominate landscapes, and are difficult to remove.

Their planting was "really a huge, gigantic mistake, that we are suffering from now for decades," says U.S. Forest Service plant pathologist Susan Frankel.

A lot of public vitriol over eucalyptus can be traced back to the 1991 Oakland Hills fire, which tore through dense eucalyptus stands and razed 1,500 acres, killed twenty-five people, and

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Eucalyptus also has its benefits. Supporters appreciate their fresh scent and majestic appearance. The trees also provide shade and habitat for nesting raptors and migrating monarch butterflies.



Odd but natural: Albany Hill pokes straight up from the floodplain, as this Google Earth image looking north shows. (Map data © 2020 Google)

How the bump got its trees

Albany Hill may seem out of place, but it's naturally formed. It's made of sandstone that formed back in the Cretaceous Period, some 70 to 83 million years ago. This strip of ancient bedrock is called the Novato Quarry Terrane, which is also exposed at Piedmont in Oakland, Point Richmond, and Point San Pablo. Movements in the San Andreas fault system remixed layers of existing bedrock and separated parts of the terrane into the string of bumps we see

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It wasn't always topped with a forest. According to Cunningham, Albany Hill and the surrounding plain were once covered in grassland dotted with oaks. Eucalyptus arrived in California in the **1850s** as an ornamental tree. During the Gold Rush and the Bay Area's rapid urbanization through the 1880s, settlers were planting it in droves for lumber, firewood, windbreaks, and along streets. The Giant Powder Company—the nation's first dynamite manufacturer—planted hundreds of blue gums on Albany Hill to buffer nearby neighborhoods from explosions. The Golden Gate Fields horse-racing track and Interstate 80 have long since taken the Giant Powder Company's place—but over 140 years since its heyday, neighborhood residents and forest managers are still dealing with the repercussions of the company's eucalyptus planting frenzy as the trees struggle in an increasingly dry climate.



Judson Powder Works explodes some dynamite at Albany Hill, 1905. Giant Powder Co. wasn't the only explosives business in town. (Photo by Chas Johnson, courtesy of the Contra Costa County Historical Society Collection)

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That spree, however, created new butterfly habitat, according to Stuart Weiss, a longtime conservation biologist and butterfly expert.

On Albany Hill, endangered monarchs roost in the eucalyptus stands in colorful clumps by the tens, hundreds or **thousands**, depending on the year, according to the Xerces Society, an invertebrate conservation organization that conducts annual monarch counts across California. Weiss wants to preserve the eucalyptuses—invasive non-natives that they are—for the butterflies' sake.



Monarch butterflies roost in eucalyptus at Ardenwood Park. (Photo by Stuart Weiss)

“The monarchs made their choice,” says Weiss. “They go for the eucalyptus, so we have to honor that.”

The key to a cozy roost, according to Weiss, is a configuration of mature trees that provide just the right mix of sunshine and protection from wind and storms. Monarchs prefer to cluster along Albany Hill's city-owned ridgetop early in the season. Later in winter, they cluster on the hill's privately owned southwestern slope, and near the condos at the foot of the hill's western flank. The fate of the trees and the butterflies roosting on that land is unclear.

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When scientists investigated what was behind the eucalyptus blight, they found that the enemy came from within.

Matteo Garbelotto, a UC Berkeley professor and forest pathologist for the University of California system, led a team that tested tissues from sickened eucalyptus trees from six sites across the Bay Area, including Albany Hill. Only one species of fungus, *Pseudosydowia eucalypti*, was found in all the affected trees across the **six sites**. Not much is known about this fungus, but researchers think it is endophytic, meaning that it usually lives inside eucalyptus trees wherever they are found and coexists harmlessly—until it doesn't.



Blighted eucalyptus tree samples from Albany Hill (Photo courtesy of [UC Berkeley Forest Pathology Laboratory](#))

“The primary infection is caused by these fungi,” Garbelotto says. “But it’s only triggered when there is some kind of physiological stress.”

Garbelotto’s team concluded that the eucalyptus dieback was driven by the environmental stressors of drought and heat. The trees’ stress response triggered an abrupt shift in how the fungus operated, transforming it from a peaceful roommate into an opportunistic plague.

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“The only treatment,” Garbeletto says, “would be to make the trees happy.”

That is, give them more water and cooler weather to de-stress the trees and restore microbial harmony. But as climate change drives a hotter, drier, and less foggy climate in the Bay, Garbelotto says, eucalyptus is unlikely to be able to thrive in California as it has in the past.



Two years after the blight, Albany Hill's eucs shamle toward the sun. (Photo by Kate Golden)

Albany Hill's living dead

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packed trunks from their stumps after being cut down. They can persist even after being burnt by wildfire—and apparently after plagues of drought, heat and fungal betrayal. The Albany Hill stands that were leafless in 2020 are now covering the hill with fresh green fuzz.

“Eucs continue to sprout from their stumps after they’re cut down,” says Cunningham. “They don’t give up easily.”

But like zombies, many of the trees resprouting from the dieback are damaged or rotting from the inside, even as they shamble up toward the sun.



A tree that refuses to die, on Albany Hill. (Photo by Kate Golden)

The arborists who evaluated Albany Hill’s dieback agreed with Garbelotto. They recommended removing the trees, because they will never fully recover and will only become more hazardous as they fall apart. Plus, allowing the few trees that escaped the worst of the dieback to remain will expose them to higher winds, increasing the chances of them falling and hurting someone.

“Removal of all eucalyptus trees is the most efficient course of action,” the **arborists** wrote.

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stack of scented two-by-six planks laid out in the sun to dry. Cunningham's team is pursuing grants to cut down the rest of the blue gums and plant the hill with a mix of native species and more drought tolerant trees for monarchs to roost. Even if most of the existing eucalyptuses recover their foliage, drought and heat driven by climate change are likely to continue, haunting Albany Hill's fragrant wig with future cycles of blight. But if the park's long-term plan works, the butterflies will still have a home.

About the Author

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