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A patch of Humboldt County milkvetch (*Astragalus agnicidus*) discovered by hobby naturalist Dean Lyons in the Santa Cruz Mountains. Credit: Via Dylan Neubauer

ENVIRONMENT

Rare plant spotted for first time in Santa Cruz County reveals hidden ecosystem reborn in fire



BY ALIX SOLIMAN

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Dean Lyons was mushroom-hunting in the Santa Cruz Mountains last spring when he came across what he thought, at first, was a huge patch of weeds.

Lyons, a hobby naturalist, snapped pictures and posted them on a wildlife mapping and identification platform called iNaturalist, hoping botanists would weigh in to identify the species.

Experts on the app suggested that it might be Humboldt County milkvetch (*Astragalus agnicidus*), an endangered plant that had never been seen south of Mendocino County.

Dylan Neubauer, a local botanist and rare-plant expert, hiked to the site and confirmed the identification, photographing the distinct red, hairy fruit pods. She and Lyons published an article about the discovery in the California Botanical Society's journal, Madroño, in March, detailing the fraught history of this struggling plant.

Humboldt County milkvetch is known as a fire-following plant, one that primarily appears after a great disturbance, such as a timber harvest or fire. Botanists believe that its emergence in Santa Cruz County, 155 miles south of its native habitat, is directly tied to the 2020 CZU Lightning Complex fire and that Lyons' discovery offers a window into how the landscape has been reshaped as forestry practices have shifted from regular burning to intense fire suppression.

Named after the county where it was discovered, Humboldt County milkvetch was first reported in 1931 by a sheep rancher in Northern California, who believed it was a weed toxic to livestock and tried to eradicate it. A plant specialist, Rupert Barneby, visited the ranch in the 1950s and published the description of the new species, naming it *agnicidus*, Latin for "lamb-killer."

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No one saw the perennial herb again for another 30 years. It was presumed extinct until a crew of botanists searched for it and found a small patch in 1987 on the same ranch in Humboldt County.

More patches popped up after that, appearing primarily on private timberlands. Studies revealed that Humboldt County milkvetch thrives just after disturbance and drops sturdy seeds with a hard outer shell.

Finding it so far south in Santa Cruz County was surprising, but it wasn't the only species that emerged in the aftermath of the 2020 fire. Other fire-following plants have risen from the ashes, including the Ben Lomond wallflower and Santa Cruz cypress, helping paint a picture of the Santa Cruz Mountains 300 years ago when the Amah Mutsun and other Native peoples carefully stewarded this landscape with fire. Community members have tracked the resurgence of such plants after the fire, posting over 19,000 observations within the burn scar on iNaturalist.



The aftermath of the CZU fire seen in 2021. Credit: Kevin Painchaud / Lookout Santa Cruz

Humboldt County milkvetch is thought to have long existed in Santa Cruz County but remained dormant because the area had not experienced any significant fires for decades. Before 2020, the Santa Cruz Mountains previously burned in the 1920s. Scientists believe that the milkvetch seeds lay in the soil for almost 100 years, waiting for fire to spring them to life again.

Historically, fire was much more common in the county than it is today. The Amah Mutsun and other tribes practiced cultural burning, regularly introducing fire to the land to help shape plant growth for food, basketry, building and other purposes. This practice was severely punished by Spanish colonists and was then outlawed in 1850 when California gained statehood and stripped tribes of their lands.



Rob Cuthrell (left), director of native plant stewardship at the Amah Mutsun Land Trust, with interns from the land trust's Native Stewardship Corps. Credit: Via Rob Cuthrell

The “Amah Mutsun Tribal Band believes Creator placed them in their homelands to care for all living things,” Rob Cuthrell, director of native plant stewardship at the Amah Mutsun Land Trust, wrote in an email. “Cultural landscape burning systems were the most powerful tools they used to fulfill this mandate, using fire to maintain more biodiverse and productive biotic communities.”

Burning the forest understory allowed large, old trees more space to grow, killed pests that prey on nut trees and encouraged grasses and wildflowers to proliferate — proffering food for people and wildlife.

However, over the past 250 years, those traditional practices gave way to modern forest-management policies. Land managers, who didn’t understand how fire shaped California ecosystems, suppressed fire, supporting an intense timber industry in the Santa Cruz Mountains.

Without fire, the continuous forest we see today — with many young trees growing close together — might have choked out small meadows thought to be scattered throughout in the past, potentially limiting the range

of plants like Humboldt County milkvetch.

As a plant becomes more rare or its range more confined, its genetic diversity — sometimes called “cryptic diversity” — can be reduced. “That’s something that we’re not really quantifying, the loss of that ‘cryptic’ diversity,” said Lucy Ferneyhough, native plant program project manager at the UC Santa Cruz Arboretum.

Losing genetic diversity within a species has consequences over time, from giving invasive weeds the upper hand to making a plant more vulnerable to disease or disaster. The more genetic diversity that exists within a species, the more likely it is to survive challenges like a rapid change in forest management.

Finding an endangered plant 155 miles south of its known range is an example of finding a small pocket of untold genetic diversity, since this patch of Humboldt County milkvetch has likely not bred with populations farther north in over a century.



Close-up of Humboldt County milkvetch (*Astragalus agnicidus*) in the Santa Cruz Mountains. Credit: Via Dylan Neubauer

Cuthrell says forest managers need to return to more active approaches of land stewardship such as burning, sowing seed, propagating plants and tending patches in open spaces to support the growth of such rare plants in the Santa Cruz Mountains.

Lyons revisited the patch of Humboldt County milkvetch several times to collect seeds for the Amah Mutsun Land Trust to save in its seedbank. He says his discovery shows how non-experts can make an impact by recording observations about the natural world surrounding them.

“Oftentimes, it’s the people who are just walking around their backyard or some place they hike all the time and see something, just take a photo, and it turns out to be a really significant discovery,” Lyons said.