

# FLORA



CALIFORNIA'S PLANTS | PEOPLE | PLACES

## When Landscapes Flourish



CALIFORNIA  
NATIVE PLANT  
SOCIETY

California  
Native Plant Society

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## A Message from CNPS Executive Director Jun Bando

Every new year brings new opportunities and challenges, and this feels especially true this January. As we welcome 2024, I've been reflecting on reasons to be hopeful this year. Here are a few:

- With a few pen strokes, President Biden could save more than 700,000 acres of public lands that support California's rare plants, are culturally important to Tribes, and provide communities with access to nature. Read this issue's *In the News* to see how you can help.
- After shifting to online meetings during the pandemic, many CNPS chapters are now transitioning to in-person and hybrid events. More opportunities to connect in person will help us build relationships, work together, and warmly welcome new members and volunteers.
- New CNPS tools and partnerships will help more people across the state to protect and care for native plants. (Stay tuned for big changes to Calscape.org and other exciting developments!)
- California's progress in protecting biodiversity and building climate resilience is boosting confidence that we can achieve ambitious goals like protecting 30% of our lands and coastal waters by 2030—and even bigger goals like protecting 50% of our lands and coastal waters by 2050.

The themes of community, resilience, and the future weave throughout this issue of *Flora*. We hear from Dr. Ganesh Raman, California State University (CSU) Assistant Vice Chancellor for Research, about the CSU's contributions to building a more resilient future. As one example, Cal Poly Humboldt researchers are working with CNPS and other partners to map vegetation in the Klamath Mountains. Their work will help land managers understand how local habitats are changing, and how they can be protected in the face of a changing climate.

On page 9, Ian Vorster describes a special educators' conference created to help youth connect with their local ecosystems. And Álvaro Palacios Casanova's reflections on conservation, community, and resilience highlight how Indigenous and community leaders are coming together to protect sand dune ecosystems in Humboldt Bay.

These are just a few examples of efforts that give me hope for the future. As we face the year ahead, I'm so grateful for our CNPS community and optimistic about the progress we'll make together.

**COVER:** The high-altitude snow plant (*Sarcodes sanguinea*), pokes through a patch of snow during a Sierra Nevada alpine zone floral bloom. Photo: Robert David Siegel, MD, PhD, Stanford University



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## A Wet West and the Hunt for Slimjim

Botanists brave a wet west on the hunt for a rare plant.

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## Snowy and Showy

Plants that bloom when it snows



## Hello! A Note from CNPS Publications Editor Ian Vorster

My introduction to biodiversity and its provisions came at an early age. Born in South Africa, I had a grandfather whose passion was the African bushveld. He taught me the language of nature. Every morning we would walk his property and identify by their spoor the animals that had paid their nocturnal respects. He would identify birds by their calls. I learned those from him long before I could recognize the flighty fellows by sight.

Lions drank from his birdbath. A giant dark-maned specimen once roared with a rumble so deep as to rattle the panes in Gramp's windows. As we played cards around the fire at night, a leopard would cough, kudu antelope would bark, and hippo would grunt in the nearby Crocodile River.

Gramps called that place Marlothi. He named it for the great mountain aloe, *Aloe marlothii* that grows prolifically in the region.

Upon immigrating to the US, I found that the one change I could not have calculated for was the sense of displacement. I had been uprooted from a place I loved profoundly and had explored deeply. In one year alone, I had tracked 42 weekends spent far from home, sleeping beneath the Milky Way, in the bush. Multiply that by 20. We travelled by bicycle, on foot, by kayak and by Land Rover.

I eventually realized two things: It was now about my children, and despite being the most densely populated state in the nation, California has the largest roadless areas open to the public in the lower 48 states. I began to root my family in the Eastern Sierra Nevada and along the coastline. We camped, hiked, and rode the backcountry trails, and surfed, dived, and kayaked the shores for 15 years. Our children were rooted. My sense of loss was assuaged.

Aside from my professional experience as an environmental writer, photographer, and editor, that connection is primarily what I bring to CNPS as your new publications editor. For I know what it means when somebody says, "I love *that* landscape; we need to protect it."

Marlothi has been trammed. Where once there were three homes in around 9,000 acres of raw beauty, now 3,500 homes exist. Place has become space. CNPS is committed to retaining the native plant life, all its glorious biodiversity, and the majestic landscapes they together create, and it is my privilege to tell that story.



Ian Vorster captures his love for the California landscape in his photography.

TOP TO BOTTOM:  
Mt. Whitney as seen from the north along the John Muir Trail.

Alpenglow over Kings Canyon National Park paints Bubb's Creek in a roseate glow.

Marlothi, a grandfather's home from an oil painting by Nola Emslie.

## IN THE NEWS

### AN IMPORTANT MOMENT FOR CALIFORNIA CONSERVATION

Tribal and community leaders across California have come together to champion four national monument efforts that would total almost one million new acres of conserved lands. These include expanding the San Gabriel Mountains National Monument, adding Molok Luyuk to expand Berryessa Snow Mountain National Monument, and two new efforts to designate Chuckwalla and the Sáttítlá—Medicine Lake Highlands National Monuments.

The expansion of the boundaries of the San Gabriel Mountains National Monument would add an additional 109,167 acres of National Forest System lands. Located about 30 miles from Mount Shasta, Medicine Lake Highlands—also known as Sáttítlá—

holds deep cultural significance for the Pit River Tribe, Modoc, Shasta, Karuk, and Wintu Nations. The Chuckwalla National Monument is a critical desert habitat adjacent to Joshua Tree National Park that would protect public lands that contain rare and threatened native California plants, many of which are found nowhere else on Earth. The designation for Molok Luyuk would allow for its ongoing management to be informed by generations of tribal knowledge. This special landscape is a botanical treasure with one of the most biodiverse concentrations of plants in the state.

Per a 2019 United Nations report that almost a million plant and animal species worldwide are now at risk of extinction, these four campaigns support the nation's America the Beautiful goal to protect 30% of lands and waters by 2030 (30x30) and help California meet its commitment to conserve 6-million acres as part of

national and international efforts. You can help by signing your name in support at [cnps.org/nationalmonuments](https://cnps.org/nationalmonuments).

### Native Plant Advocates Regroup after Assembly Bill is Withdrawn

Last year, Assemblymember Laura Friedman (D-Burbank) introduced a transformative bill to create California's first requirement for the inclusion of low-water native plants in public and commercial landscapes. Sponsored by CNPS and formally supported by dozens of organizations, AB 1573 passed the Assembly with a strong majority vote before it was derailed by last-minute amendments in the Senate Appropriations Committee. Though the bill reached a stopping point and subsequently withdrawn, the work continues.

In the future, CNPS and partners will explore new legislative opportunities to advance the intent behind AB 1573. The bill offered a direct response to recent data showing the alarming risk of extinction in California—and the potential for landscaping to help by creating native habitat. CNPS remains committed to working with leaders like Assemblymember Friedman to activate the untapped power of landscaping to support biodiversity.



The U.S. Secretary of the Interior Deb Haaland visited Molok Luyuk in September, where she toured the proposed national monument expansion, met with representatives of the Yocha Dehe Wintun Nation, and visited with community leaders and organization representatives. Pictured here (left to right): CNPS Conservation Program Director Nick Jensen, Secretary Haaland, CalWild Senior Policy Director Ryan Henson, Tuleyome Executive Director Sandy Schubert, and Conservation Lands California Program Director Elyane Stefanick.



## California's 30x30 Goal Codified into Law

In October, Governor Gavin Newsom signed Senator Dave Min's (D-Orange County) Senate Bill 337 into law. The Governor's actions ensure California's goal to protect 30% of its lands and coastal waters by 2030 persists beyond his administration.

"Our wilderness and coastlines are at the heart of who we are as Californians, and the passage of SB 337 will safeguard this key part of our California identity for generations to come and serve as a buffer against climate change and the extinction crisis," Senator Min said. Defenders of Wildlife sponsored SB 337, with strong support from CNPS and other members of the 30x30 Power in Nature coalition.

## Mural Highlights Indigenous Stewardship

Artists gathered at the Box Springs Mountain Park and Two Trees Trail trailhead in Riverside to paint gorgeous native plants on a prominent wall. Coordinated by local high school art teacher Selena Wilson, the mural highlights Indigenous stewardship of adjacent lands, where native plants provided medicine, food, and fibers in abundance. Wilson says she noticed that the roadside in front of the wall had been polluted with garbage, and so she decided it was time to introduce to the setting a more nature-worthy display.

Wilson worked with Lorene Sisquoc and Sherman Indian School students to showcase the cultural importance of native plants, their beauty, and ecological value. The educational artwork includes a QR code, so people can learn more about the plants, artists, area history, and the original land stewards and inhabitants.



## CNPS Receives Four-Star Charity Navigator Rating

CNPS has earned a Four-Star rating from Charity Navigator for the fifth year in a row! Charity Navigator is the gold standard in assessing the health, financial transparency, and effectiveness of nonprofits. The ranking means that CNPS exceeds industry standards.

ABOVE: Riverside mural highlights Indigenous stewardship of the land.  
Photo: Selena Wilson

## CHAPTER HIGHLIGHTS



### SEQUOIA CHAPTER BOTANY CAMPOUT

Last summer, the Sequoia Chapter held a Botany Campout in the Sierra National Forest near Patterson Mountain (Fresno County). The chapter's rare plant expert, Chris Winchell, led the group to a fen meadow where all could savor the sight and aroma of the rare Yosemite bog orchid (*Platanthera yosemitensis*). The plant's flowers smell like poop to attract flies to pollinate it!

"We also saw a nice population of the Western false asphodel (*Triantha occidentalis*), which captures tiny insects with sticky hairs on its stem and leaves, and digests them to obtain nitrogen," says member Leslie Porter.

A month later, chapter treasurer and Fresno State professor Kate Waselkov held a plant preservation workshop. Participants were able to prepare herbarium specimens obtained during the campout, and they learned about the role natural history collections play in the study of plant biodiversity. The specimens will be accessioned into the Fresno State Herbarium and are being digitized by the Consortium of California Herbarium, with the data and images available through CalFlora.

ABOVE: Chapter members take a break for a photo in the forest at the campout.  
Photo: Leslie Porter

### MILO BAKER CHAPTER ADVANCES LOCAL STEWARDSHIP

The Milo Baker Chapter Invasive Plant co-chairs partnered with Sonoma County Regional Parks on an \$80,000 grant to restore sand dunes alongside the Doran Beach Park boardwalk. The chapter hand-removed invasive ice plant and European beachgrass over four months last year, and in late November planted native plant starts grown by The Laguna de Santa Rosa Foundation. This chapter hopes to encourage the growth of native plants, and improve snowy plover habitat.



The California Native  
Plant Society

# Rare Plant Inventory

Thank you to the CNPS Rare Plant Program Committee and the countless volunteers and individuals who have contributed their time and expertise over the years.

From government agencies to college classrooms, California relies on the CNPS Rare Plant Inventory for the **science-backed** information we need today, to protect rare and endangered plants for tomorrow.

Since 1974, CNPS and a **trusted network** of partners have reviewed more than 3,500 species, creating the gold standard for rare plant review and **actionable data**. Today, more than 35% of California flora receives some form of **protection** thanks to the Rare Plant Inventory.



Be part of the tradition!

Visit [cnps.org/rareplant50](http://cnps.org/rareplant50)  
to learn how you can help and get involved.



# SNOWY and Showy

by IAN VORSTER

Like all high-elevation environments, California's peaks are snow-covered, sunbaked, and wind swept at one time or another throughout the seasons. The stressful weather is often excruciatingly hard on plants. To survive they have adopted short, compact forms to combat the climate stressors and soil quality issues. Tiny hairs cover their leaves and lend them a gray appearance to reflect the intense sunlight. The fur-like covering shields them from the never-ending wind, which sucks them dry.

The plants also need to compete for pollinator attention in short, cool, dry growing seasons, and so produce spectacular splashes of color. For that reason, botanists have ranked the Sierra Nevada Mountain's high-altitude floral bloom as one of California's foremost wildflower displays.



**Sky pilot**  
(*Polemonium eximium*)



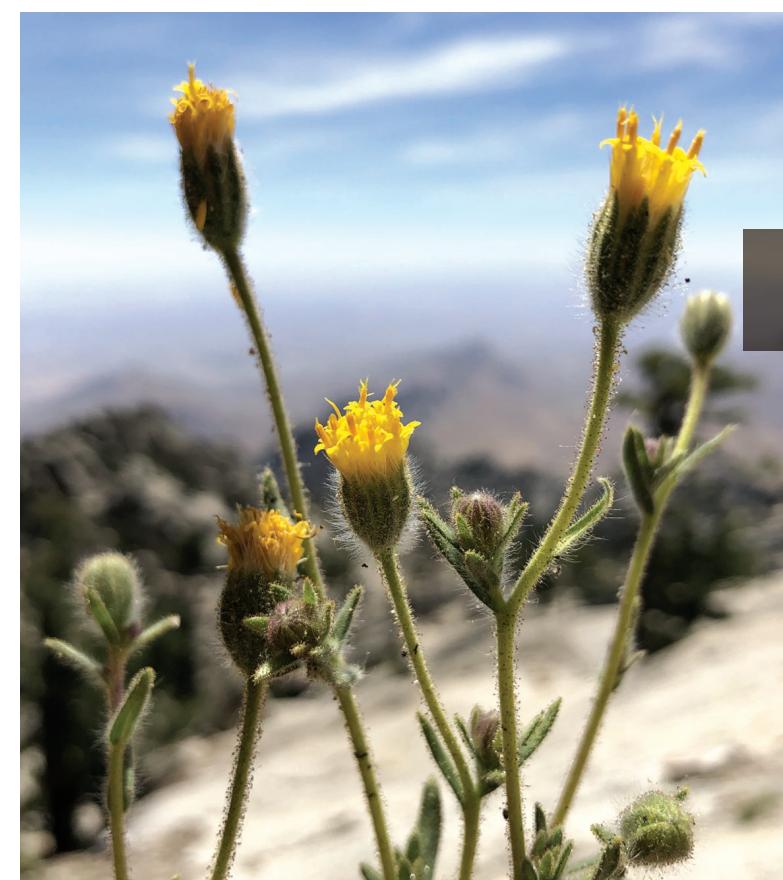
**Davidson's penstemon**  
(*Penstemon davidsonii* var. *davidsonii*)

The luminescent blooms of the sky pilot are found at elevations from 10,000 to 14,000-feet, and is among the most beautiful of the Sierra Nevada wildflowers.

Photo: Will Beback

Growing from 9,000 to 13,000-feet above sea level, Davidson's penstemon resides only in California, forming a woody mat with masses of large blue flowers that cover the plant. "Penstemon" refers to the fifth stamen (the male fertilizing organ of a flower), which in some species like *P. davidsonii* is sterile, and bearded with golden hairs.. When you see the plant on your next Sierra hike, crouch down and take a peek!

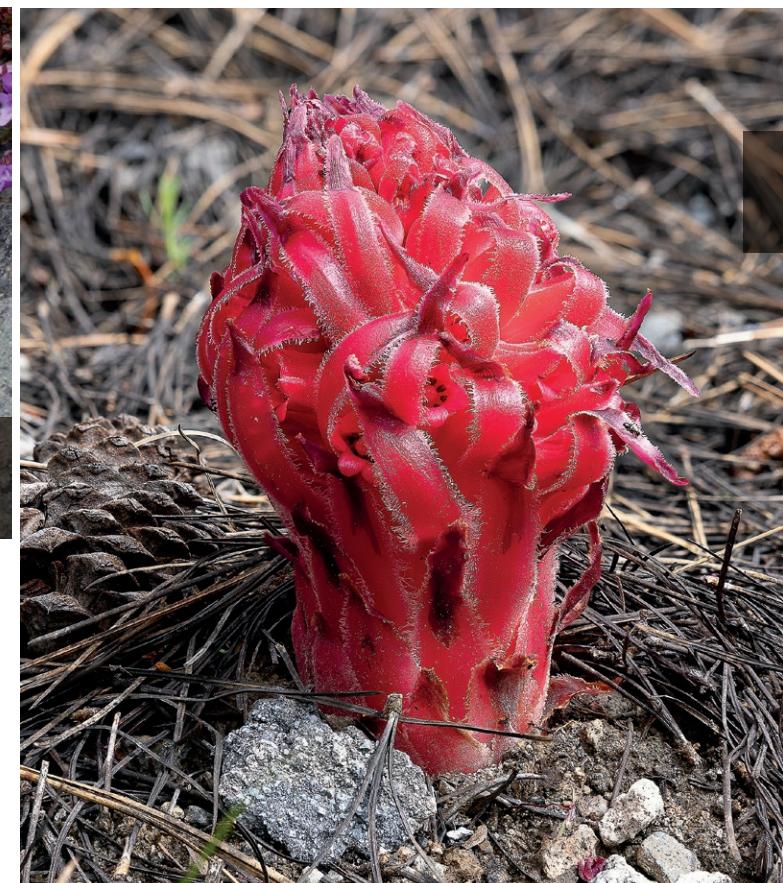
Photo: Jonathan Fox



**Muir's tarplant**  
(*Carlquistia muirii*)

Growing at elevations of between 3,500 and 8,200-feet, Muir's tarplant is considered a forebear of the silversword alliance of Hawaiian plants. As reported in a past issue of this magazine, botanists believe that a dispersal event around 5-million years ago spread the ancestors from mainland California to Hawaii. These became the charismatic Hawaiian plants.

Photo: Duncan Bell



**Snow plant**  
(*Sarcodes sanguinea*)

The snow plant has no green leaves. Botanists believed for a long time that it was a saprophyte—a plant that survives on decaying matter. Then in the late 1950s, Erik Björkman, a researcher with Sweden's Institute of Forest Botany, injected radioactively tagged sugars into the sap of neighboring trees. Lo and behold, a Geiger counter detected sugars in the nearby snow plants. They derive nutrition from fungi in the soil, and for this reason the plant is "mycotrophic". The fungi are the fungus-roots of conifers. ■

Photo: Frank Schulenburg

# ROOTING INTO PLACE:

## *Teaching Native Plants In & Out of the Classroom*



Native plants provide a conduit for learning.

by IAN VORSTER Photography by NATALKA KENT

**When Kyoko Bristow first heard about an educator conference at the Natural History Museum of Los Angeles County, she quickly rustled up a team of teachers at her school to accompany her.** A speech therapist at Malabar Elementary School in Los Angeles, she says, "We were excited to go as a team. It was our first experience with an educator conference, so we didn't know what to expect, but we have gardens on site at the school, and were really interested in what comes next. How can we get students engaged?"

The Educator Summer Conference was designed by CNPS, the Natural History Museum, and the Theodore Payne Foundation with two goals in mind: to inspire educators to view the outdoors as enriching teaching spaces,

and to connect with native plants across classroom content areas. "It was a wonderful opportunity to join forces with the Natural History Museum of Los Angeles County and the Theodore Payne Foundation to bring together all our communities in one space," CNPS Education Specialist Jen Aguilar says. "With its beautiful gardens and remarkable resources, the museum was the perfect place to do that."

Open to Pre-K–12 formal classroom educators and administrators, homeschool educators, and informal educators, CNPS and partners aimed to provide attendees with a deeper understanding of the critical role California native plants play to shape positive relationships between youth, the outdoors, and local biodi-

versity. Bristow and others found that it did so in spades.

"We were so inspired," says Bristow. "We came away with a million ideas." One of those ideas included applying

LEFT: The Natural History Museum of Los Angeles County provided the ideal location to host the educator conference.

RIGHT: Small groups gathered around the gardens during breaks to share ideas.

for participation in the CNPS School Nature Gardens Project. Funded by the Anthony LaFetra School Gardens Fund, the project provides guided classroom lessons and interpretive signage for school gardens. Malabar Elementary's garden has also received milkweed plants to feed monarch caterpillars from the Santa Monica Mountains Fund. "We have our own monarch butterfly garden now. It has been so exciting to establish a butterfly habitat at the school," adds Bristow.

Conference sessions focused on connecting local ecology and art, community science, how to teach native plants if schools do not have their own native gardens, and a Cahuilla Native perspective on plants and their uses. A guided nature journaling experience through the museum's garden, networking opportunities, a musical performance, milkweed giveaway, photobooth, and resource sharing tables, all contributed to an outstanding event.



"We wanted to introduce educators to native plants and provide them with the tools they need to feel more confident bringing conversations around native plants, local biodiversity, and nature into lessons across the curriculum," says Aguilar. That includes art to science, and everything in between. "It's important that the next generation has the chance to get to know California's native plants and landscapes."



A nature journaling session saw educators enter the world of native plants through sketching, personal observations, and much contemplation.



When we follow the old-school way of teaching, we lose kids. Let's allow them to engage with the world. Many kids just learn better that way—take them outside, bring in support, allow them to collaborate.



Attendees were enthusiastic about the mural painting sessions hosted by artists from Studio Tutto.



According to Aguilar, the mural painting session with Studio Tutto was especially popular. Studio Tutto is an LA-based public art team led by artists Sofia Laçin and Hennessy Christophe, who pair design with site-specific artwork to bring inviting color, organic texture, and appreciation of nature to spaces. Their artwork tells stories that are both big picture—changing seasons, and intimate—the nurturing relationship between the monarch butterfly and milkweed. Whichever story they create, each is told to inspire a sense of awe and respect for the natural world.

Denise Godinez is the site Teacher on Special Assignment at Jersey Avenue Elementary School in Santa Fe Springs. She also serves as lead coordinator for the school's Gifted and Talented Education (GATE) program.

As GATE coordinator, Godinez's role requires her to identify students' individual passions, and very often those are not found in their textbooks.

Jersey Elementary School's GATE program students now research native plants in their habitat, and they have a native plant mural. The students are responsible for everything.

Godinez feels that sometimes teachers fear they need to search outside of the teaching standards to bring in nature. "But really, we do not have to," she reflects. "Any lesson could be tied into our local landscape, whether it's the animals we see outside, or the trees and gardens we have. There is so much more. And to be able to experience art through nature is just like wow! Our students are going to be conducting research, and they're going to be able to express themselves creatively—none of which is found in normal textbooks."

To create their new outdoor learning space, Godinez and 25 students began laying out beds, weeding and planting them last October. Freshly inspired by conference sessions, she built support for teachers through general education and instructional assistance school programs.

"It's inspiring to see educators of all kinds coming together to find new ways to inspire their students and build connections," says Aguilar. "Native plants can be that vehicle in beautiful and unexpected ways." ■

Hello, nature! The Natural History Museum of Los Angeles' gardens were inviting to both educators and native bees.



# Take Your Breath Away

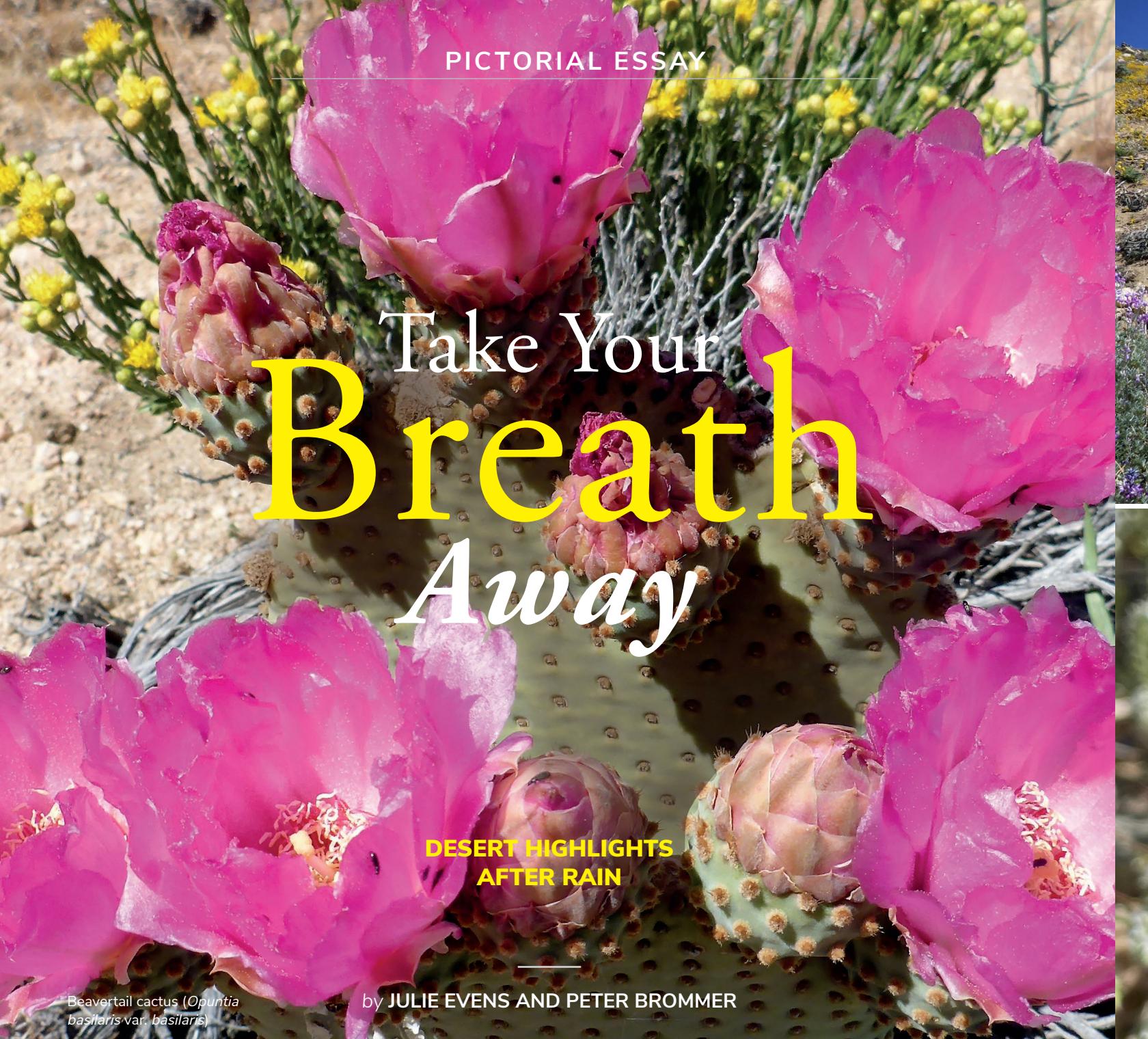
DESERT HIGHLIGHTS  
AFTER RAIN

by JULIE EVENS AND PETER BROMMER

Beavertail cactus (*Opuntia basilaris* var. *basilaris*)

The Mojave Desert is known for its incendiary-like temperatures and arid summer conditions. And yet, even in this parched environment, wet areas exist in basins, arroyos, and washes. They serve as crucial habitats, providing water and refuge for a host of biodiversity including birds, reptiles, amphibians, mammals, as well as short- to long-lived plants.

Many of the annual plants produce hundreds, thousands, even millions of seeds. The seeds rest dormant for years, waiting for the opportunity to enjoy a large reproduction event. The storms that pummeled California last winter provided such an opportunity. They allowed our hardy photosynthetic friends to exhibit a grand display of color palettes as they emerged from the thirsty sands once again to take your breath away.



LEFT TO RIGHT, TOP TO BOTTOM:  
Bigelow's coreopsis (*Leptosyne bigelovii*) bloomed here across a post-fire hillside with grape soda lupine (*Lupinus excubitus*) along the Scodie Mountains.  
Photo: Julie Evens

The desert five-spot (*Eremalche rotundifolia*) along the Mojave River wash near Baker, is a member of Mallow family (*Malvaceae*).  
Photo: Pete Brommer

The desert dandelion (*Malacothrix glabrata*) photographed in Afton Canyon, is a member of the Sunflower family (*Asteraceae*).  
Photo: Mike Heine

The Red Rock Canyon monkey-flower (*Erythranthe rhodopetra*) is only found in the El Paso Mountains in Kern County. This specimen displays its deep pink hues in Red Rock Canyon State Park. Photo: Pete Brommer

Botanists hike through the wind and fire-swept hillsides in the Jawbone area near California City where herbs and shrubs are recovering post-fire. Photo: Mike Heine



All three blanketed the desert floor and hillsides in various shades of pale to bright glowing yellow.

Other native plants that shared the spotlight this season include the desert golden poppy (*Eschscholzia glyptosperma*) and desert five spot (*Eremalche rotundifolia*), along with annual herbs. Some perennial plants with showy blooms characteristic of the Mojave Desert include Mojave woodyaster (*Xylorhiza tortifolia* var. *tortifolia*) and beavertail cactus (*Opuntia basilaris* var. *basilaris*).

The Red Rock Canyon monkeyflower (*Erythranthe rhodopetra*; CRPR 1B.1) is an annual herb that was abundant within its approximately 50-square mile range this year. Seriously threatened, it is only found in the El Paso Mountains in Kern County. (It more recently evolved or "radiated" from *Erythranthe palmeri*.)

The monkeyflower's ephemeral bloom in desert washes was a dramatic showstopper in early April. It quickly faded and spread seeds that reside underground in the desert sand until they receive the signal to begin their next cycle of life. Each generation is imperative to the persistence of the threatened plant, which is why years of heavy rain are so important for this boom-and-bust survival strategy. ■



The peak bloom allowed the CNPS Vegetation Program to collaborate with the Bureau of Land Management to conduct surveys in wet zones throughout the Mojave and the southeastern Sierra Nevada. CNPS ecologists were able to collect these stunning images while at work on the BLM's Assessment Inventory and Monitoring Strategy, and statewide fine-scale vegetation mapping.

Three plants in the sunflower family covered the hillsides in prolific numbers. They include the desert dandelion (*Malacothrix glabrata*), desert scalebud (*Anisocoma acaulis*), and Bigelow's coreopsis (*Leptosyne bigelovii*). All are common desert species, but Bigelow's coreopsis is found only in southern California.



CLOCKWISE:  
The Red Rock Canyon monkeyflower (*Erythranthe rhodopetra*; CRPR 1B.1) put on a spectacular display. Photo: Mike Heine

-  
The desert scalebud (*Anisocoma acaulis*) was seen along the Scodie Mountain Range. Photo: Julie Evens

-  
Beavertail cactus (*Opuntia basilaris*) is a quintessential prickly pear. Pictured here south of the Scodie Mountain Range, it is found in the southwestern US. Photo: Julie Evens

-  
The golden desert poppy (*Eschscholzia glyptosperma*) photographed along the Mojave River wash near Baker, is a member of the Mallow family (*Malvaceae*). Photo: Pete Brommer

-  
Mojave woodyaster (*Xylorhiza tortifolia*) is an endemic subshrub in California's Mojave Desert and beyond. It has delicate lavender ray flowers and glandular leaves. Photo: Julie Evens

# RESEARCH FOR TODAY AND TOMORROW

Cal State University community meets current environmental challenges

by IAN VORSTER



**Ganesh Raman, PhD, is the assistant vice chancellor for research initiatives and partnerships in the Office of the Chancellor at California State University.**

A collaboration-oriented leader who works across disciplines to unite and motivate teams through vision and strategy, he earned his doctoral degree in mechanical and aerospace engineering in 1991 from Case Western Reserve University.

Dr. Raman leads the 23-campus, \$675 million research enterprise for CSU, the nation's largest and most diverse public university system. CSU has more than 500,000 students and 27,000 faculty members, and he oversees 10 multi-campus consortia, which conduct research on issues that range from agriculture to biodiversity, climate change, fire, and water.

Recently, he met with CNPS Publications Editor Ian Vorster to discuss the labyrinth of connections between CSU research, California's diverse population and demands, and the state's much-loved landscape and biodiversity. Since moving to California, he has been learning about California's landscapes and biodiversity, including local native plants that grow near his home in Irvine.

How might he work to ensure a diverse, equitable and inclusive research enterprise for the fourth-largest economy in the world? And what role does he see CSU playing in the future to better facilitate research into practice, and to measure its societal impact.

**Ian Vorster: What would you list as a few highlights from your time growing the research programs, and advancing diversity, equity, and inclusion for CSU?**

**Ganesh Raman:** Our growth in research has occurred as enormous environmental challenges—climate change and biodiversity loss—have come into clearer focus. Our progress in advancing diversity, equity, and inclusion has enhanced student learning experiences and the CSU's contributions to actionable solutions to meet the climate and biodiversity crises. We've seen increased collaboration across disciplines, more system-wide mentoring of students and faculty, and enhanced support for faculty, especially junior faculty, all of which have increased productivity and the generation of innovative, interdisciplinary solutions. For example, if you consider the question, 'What is at the nexus of California water?' It's California agriculture, biodiversity, energy, STEM education, and more. So, we have grown these overlapped areas into our research, not just in terms of research dollars raised, but also in terms of how we grow.

**So, how do you transfer that to the faculty and student level?**

**GR:** Primarily we create opportunities for students to meaningfully connect with the subjects they study, through experiential learning. In addition to classroom instruction, they have an opportunity to experience real life situations. That might take the form of field work, lab work, or other hands-on engagement in research, scholarship, or creative activity. And if we are to attract, hire, and retain top tier faculty, we need to provide a path of scholarship, because faculty do not like to just teach from a textbook. They want to share with their students, from the leading edge of their fields. And the students also like working with faculty who are inventing the future.

That research, scholarship, and creative activity play a role in the economic development of the regions where the campuses are located. We have entrepreneurship, innovation, and startup companies working with the communities in those regions to collaboratively undertake research that meets the needs of communities.

And this community-based research doesn't just involve the community as an afterthought. It has it in the design of the proposal right from the beginning. It might even be community-led research.

**Can you provide a few examples?**

**GR:** Climate change research is a prime example, because that's a multidimensional problem. You have the science piece, the technology piece, the social justice piece, the community engagement piece, the policy piece, and the education piece. There's a broad parallel with the multidimensional way that CNPS approaches your mission, though science, education, stewardship, gardening, and advocacy; you need to work on all dimensions to protect native plants and their habitats. At CSU, we also have a program in health equity and preventive care where the university works closely with communities and engages the vulnerable.

The CSU System is bringing about that societal impact by being an institution of higher learning and both elevating and leveling the playing field. So, in terms of advancing diversity, equity, inclusion and justice, we have become a DEIJ-based system. Our campuses are all upward mobility engines.

**Allow me to pivot—in 1932 Supreme Court Justice Louis Brandeis popularized the notion of states as laboratories of democracy. Why do you think California has often led the nation and the world in addressing tough environmental challenges?**

**What roles do CSU research and education play in fueling policy, science, and technology innovations at the state level?**

**GR:** Regarding the states' autonomy, the federal government allows significant leeway in how their systems are structured. So, the states have an opportunity to experiment with various policies and programs, and then we can learn from successes and failures. California has many examples: We have universal access to preschool; and low-income students have virtually free college tuition, both at community colleges, and in the California State University System—and the fees are low to start with. California also has made advances in healthcare with its Medicare expansion program that covers low-income Californians.

**On that note, health research connects with environmental hazards, and therefore caring for the environment. Can you comment on what the state has achieved on that front?**

**GR:** California has been a leader in enacting a number of policies to reduce pollution, greenhouse gases, and to protect our water resources. It also has a very bold and audacious goal of being 100% carbon neutral by 2045. It recently adopted the 30x30 goal (to protect 30% of lands and coastal waters by 2030) into state law. These are great examples of state policies that lead the way.

 **California is a global biodiversity hotspot, a leader in education, and an innovation engine.**

I also serve on the board of the California Council for Science and Technology (CCST), which was established by the California State Legislature in 1988 to provide objective advice to the state government on science and technology issues. This organization plays a key role in informing California policy. For example, CCST recently released an energy policy primer which covers topics like carbon neutrality and climate change. CCST's existence reflects the value California places on evidence-based decision-making. I note that CNPS also has a strong reputation for science and science-based advocacy, which contributes to your credibility and impact as an organization.

**The traditional metrics for scholarship have been publications, citations, and patents. How might the system be implementing societal impact as a metric for its evaluations?**

**GR:** The traditional metrics are there for a good reason. They're easy to measure—the number of publications, the number of patents. But research productivity is very discipline dependent. For example, if you are doing conservation research, is your work informing management and policy decisions? If you're part of a school of architecture, what is important? Not necessarily the publications, but have you been involved in the design of an iconic building? Or if you are in the arts, what may be important is not the publications, but an exhibit in an art museum, right? And so, while there is a broader recognition of societal impact, it is difficult to measure. And



CNPS Vegetation Program staff and Cal Poly Humboldt students map vegetation in the Klamath Mountains ecoregion as part of a project with the California Department of Fish and Wildlife, the Bigfoot Trail Alliance, the CNPS North Coast Chapter, and other partners. The project will fill key information gaps and inform effective land management to support California's biodiversity, wildfire risk reduction, and climate resilience goals.  
Photo: Michael Kauffmann

the results are not instant, because the labor of today is going to bear fruit in future years.

One example is a community-led research partnership funded by the Department of Health and Human Services. They're looking at the state's preparedness for the next pandemic, whatever it may be. And how is the community going to work with the government and other institutions, public and private?

To answer some of the complex questions, we can refer to already

existing frameworks. The United Nations Sustainable Development Goals (SDGs) is one. The UN has 17 SDGs, which can be roughly grouped into four areas. Health and Nutrition is at the top of the list. Economic Opportunity, Environmental Sustainability, Governance and Justice follow. So, we could examine these in terms of our societal impact, and there are guidelines on how to measure them as well.

**California currently ranks fourth globally in terms of GDP. What is CSU doing to prioritize California's environment through this lens?**

**GR:** California is a global biodiversity hotspot, a leader in education, and an innovation engine. We're also the first of a few trillion-dollar states in the US. Texas, New York, and Florida are others. They all are very conscious about investing heavily in higher education. And they're aware of their diversity. In California and Texas, the ethnic and racial minority makes up the majority. So, to move things forward, we need the right investments in education and innovation, especially in the STEM fields. Silicon Valley and other hubs in the state for the health sciences and the life sciences, grow these because they support actionable



**We have a responsibility for stewardship of our much-loved landscapes and resources, and their perpetuity so that future generations can live healthy lives.**

research in fields that are important to the state. As far as CSU is concerned, with our multi-campus collaborations, we have a significant presence in the Central Valley, and we have a coastal presence, a southern and a northern presence.

**California also has the highest cultural and socio-economic**

**diversity in the nation. Traditionally higher education has aimed to increase underserved and minority STEM enrollees and graduates, but has CSU seen diversification in applicants and the markets, and how has it responded?**

**GR:** CSU recently had a STEM collaborative project, which was a great launchpad. It allowed us to float a new California State University consortium called STEMNET, which connects all 23 campuses in STEM education and research.

STEMNET has been highly active in securing extramural funding—over \$40 million within four years. It has

also reduced barriers for students from historically underrepresented groups. And we have implemented a model of experiential learning and workforce development that will contribute to California's jobs where needed—at all levels.

STEM has become very broad because it is no longer just the more traditional, math- or engineering-based pursuits. People recognize that there are many other dimensions which align with urgent societal needs, like the environmental sciences, social sciences, and emerging technologies like artificial intelligence and cybersecurity.

**These topics are extraordinarily complex. How do you manage each of these to ensure a positive outcome?**

**GR:** I would say that the most important principle is inclusive leadership: leading by example, through persuasion, collaboration, and consultation, and being open to two-way mentoring.



## Recently, 18 CSU campuses were awarded grants by the State of California for climate action and climate adaptation.

Partnering is the second facet. Some of these problems are so huge that we cannot tackle them alone. So, we partner with campuses, other California organizations, private, state, and federal, and we focus on innovation.

Change must occur through collaboration, a series of nudges rather than mandates. One needs to have the perseverance for incremental progress. Some of these problems are overly complex. They present our campuses with unique opportunities. At the system level, we find it's important to empower our leaders and incentivize collaboration. How can we enable more cross-campus and cross-agency collaboration? With STEMNET and the 10 consortia, we are focused closely on climate adaptation, resilience, and action, and on biodiversity conservation and environmental protection.

**What role do you see CSU playing going forward to better close the gap between scientific researchers and their findings, and the botanists and ecologists who need to implement those findings at work every day? How might technology, multidisciplinary collaborations, community partnerships, and diversity facilitate that?**

**GR:** We focus on emerging technologies in many ways. Cybersecurity, climate change, and health are a few. There is also the technology connected to teaching and learning, which has changed quite a lot. It's not just the remote modality. Technology doesn't just change the delivery. It's the whole pedagogical element. How do students learn? What is learning? How do you confirm that learning has occurred?

With regard to the economic opportunity piece, we have system-wide competitions for entrepreneurship. Students have started companies. They're mentored, they're prepared. The idea is to launch a number of companies that focus on science and technology, but also companies which focus on societal impact. And we are training students not just to start companies, but also how to be an entrepreneur within the organization, how to think creatively.

What has changed in innovation and entrepreneurship is the whole democratization of invention. Anyone can produce ideas and start a company. And you don't have to be educated at the rocket scientist level. That you can start a community

science business with a smartphone and an App means you can start quickly. Technology has provided that opportunity.

There is also the fundamental curiosity-based research, and the more practical, actionable research that can convert to products. CSU does both. And we do the community engagement piece.

**Through the research lens, what do you see as the greatest opportunities for societal impact?**

**GR:** The opportunity for societal impact is available in most types of research projects if we apply an equity lens. So, if the smartphone is a great tool to use to track seasonal change in foliage or migrating monarchs, you raise the question, 'Who has access to it?' Some people don't have access. So, what do those people do? What happens if all the flood warnings are only sent out through smartphones?

If you use the United Nations Sustainable Development Goal framework, you can find ways to connect many of our different research projects to societal impact.

Continued on page 41

## FEATURED STORY

# A WET WEST *and the Hunt for Slimjim*



by IAN VORSTER

## "FROM DROUGHT TO DELUGE!" HERALDED THE NEWSPAPERS.

As the interaction between a warming Pacific Ocean and the overlying atmosphere produced prodigious downpours from January 2022 through March 2023, media outlets covered the frequent bouts of heavy rainfall. Atmospheric rivers became terrestrial rivers. The devastating floods affected parts of Southern California, the California Central Coast, Northern California, and through it all, native plant enthusiasts across the state began to wonder if a bumper bloom might be a silver lining. It was!



LEFT TO RIGHT: Fifteen years on the hunt, and ecologist Colin Khoury cheers upon finding the elusive species. Photo: Michelle Balk

—  
The slimjim flower is tiny. Photo: Colin Khoury

For many years, Khoury had hoped to verify the isolated Californian occurrence. Confusingly, it was not near its core range, which encompasses Baja California, southern Arizona, and the New Mexican and Texan borderlands, but rather, was hundreds of miles away in Riverside County. The occurrence represents not only the most northwesterly of the species, but of the entire genus.

Equally confusing, the species had not been seen in California in 40 years. It had only been encountered once, by Andy Sanders of the UC Riverside Herbarium in 1982.

How the plant arrived at its southern California location is a mystery. Wild beans of this kind produce pods, which dry, and crack open explosively to disperse seeds, but certainly not far. They are not known to disperse via birds or mammals, and if this is a remnant of a once more widely spread population under a previous climate, could it be true that there was just one occurrence left?

Khoury, Balk, and colleagues have recorded just 12 plants, and they collected seed from most of the plants for conservation in the Garden's seedbank, as part of the Center for Plant Conservation's California Plant Rescue efforts. The seeds will also be banked within the US Department of Agriculture's National Plant Germplasm System. Given another set of monsoon rains this past summer, they look forward to seeing how the plant fares over multiple years, and whether they will find more slimjim beans in nearby canyons.

**The spot was wild—and not in the way one might expect.** Two-and-a-half hours northwest of San Diego, ecologist Colin Khoury found skeletons of hotels and RV parks, and a mix of defunct and productive farmlands interspersed with signs of drug production.

Khoury, the senior director of science and conservation at San Diego Botanic Garden described this scene in the Colorado Desert as, “a challenging place to work indeed.”

But it was here—in this landscape of marginal existence between the desert and the Salton Sea—that Khoury and his colleagues found the unlikely occurrence of the rare slimjim bean (*Phaseolus filiformis*, 2B.1).

He continues, “In attempting to reach the wild canyons overlooking this area, we tried to navigate our way past an abandoned house, but then lost our nerve and literally bolted because we were so frightened! Still, I am just so happy to be able to live in the West! You can quickly move from high density urban areas into super wild places where very few people have been.”



Santa Ynez groundstar (*Ancistrocarphus keilii*). Photo: Vandenburg Space Force Base/ Santa Barbara Botanic Garden

## OTHER RECENT WET YEAR RARE PLANT FINDS

### Santa Ynez groundstar (*Ancistrocarphus keilii*)

In 2022, the critically rare Santa Ynez groundstar was considered a potential target for conservation seed banking for California Plant Rescue (CaPR). CaPR is a group of institutions trying to seed bank all of California's rare plants. Anxious to save it from extinction, a team of plant scientists from the Santa Barbara Botanic Garden, Vandenberg Space Force Base (VSFB), and CNPS rallied together to find it.

“I knew this would be a shot in the dark, based on the fact that we were working with just a few decades-old observations and no photos of wild plants, but that hasn't stopped us from finding plants in the past,” says Sean Carson, the Garden's rare plant field program manager. Despite a valiant search effort at and around David Keil's 1995 observations at VSFB, the plants were not relocated. Keil is a CNPS Fellow and professor emeritus in the biology department at Cal Poly San Luis Obispo.

“We knew that the Santa Ynez groundstar was a critically rare local species and felt invested in doing what we could to relocate it and safeguard it from extinction,” adds the Garden's senior rare plant conservation scientist, Heather Schneider. Relying on Dieter Wilken's remarkable geospatial memory, a few points on a map directed the team. Wilken, also a CNPS Fellow, is the retired director of research and conservation at SBBG.

With hopes bolstered by one of the wettest years in recent history, they tried again, this time with help from fellow botanists. Following Wilken's hand-drawn map, they began to carefully scan the ground. Suddenly, Matt Guiliams, the Tucker plant systematist and curator of the Clifton Smith Herbarium at the Garden yelled, “It's here!”

Everyone scampered over to look at the extraordinarily small plants. The group was as pleased as a field of bright yellow California poppies to make the first-ever conservation seed collection for the species. The rediscovery serves as a lesson for conservationists about the resiliency of nature, the need for consistent conservation effort over multiple years, and as a reminder that nature does not operate on their timelines.



ABOVE: A group from the CNPS East Bay Chapter and the East Bay Regional Park District hunker down to eye level with their find—the Caper-fruited tropidocarpum (*Tropidocarpum capparideum*). Photo: Angela Pai

## Caper-fruited tropidocarpum (*Tropidocarpum capparideum*)

After 40 years of fruitless searches for the caper-fruited tropidocarpum in Contra Costa County, the East Bay Chapter of CNPS and the East Bay Regional Park District finally re-discovered the plant in the spring of 2023.

During an alkali vernal pool survey, chapter member David Gowen's eagle eyes spotted a patch of small, unimpressive, yellow flowers almost hidden in the non-native grasses of a nearby cow pasture. The group soon found a second small patch and several outliers, to total about 60 plants. This was only the second find in the East Bay since 1980, when Robert Patterson found a population 15 miles to the south in a remote part of northern Alameda County in 2019.

Once a common species in fields, the conversion of many agricultural lands to cattle grazing may have contributed to tropidocarpum's steep decline. The plants may have simply been munched away before they could set seed. Removal of the cattle might seem an obvious solution, and it can work, but it can also backfire, leading to an even quicker demise. As surrounding grasses and other non-natives grow unchecked, they outcompete and smother the rare plants. Rather, carefully timed grazing and other methods may have better results.



**Saline clover**  
(*Trifolium hydrophilum*  
CRPR 1B.2)

Most botanists and field biologists experience a unique sense of disappointment when they search for a species but fail to find it. The questions flood their minds—am I too late, or too early; was it mowed or trampled; is it just another bad

rain year? Those feelings are amplified for a particularly rare species.

Such was the case for Kristen Nelson, rare plant program manager for CNPS, as she went searching for the disjunct, southern range-limit population of saline clover—for the fifth or sixth year in a row. The plant mostly occurs along the coast, radiating out from the San Francisco Bay area, down to Monterey Bay, and over to the Sacramento Valley. Then it skips all of Monterey and the northern half of San Luis Obispo Counties, before popping up again right in the middle of SLO County. The gap is about 120 miles as the crow flies.

Besides not being able to find it during several consecutive years of focused surveys, Nelson's concern for this population was heightened by two things: The last time it was documented it was observed only in very low numbers; and it was last observed only in highly impacted marginal habitat at the edge of an otherwise well-protected open space where it was known to occur.

Given that this annual is associated with seasonally wet areas, the 2022 to 2023 rain year was a superior opportunity to double down on efforts to find and document the population's status.

To cover all her bases, Nelson enlisted the help of David Keil, the last person to see saline clover in that location. They conducted an exhaustive search and after multiple apparent failures, found the plant a mere 10 squishy, muddy steps off the beaten trail in a seasonally moist grassland.

Nelson mapped and documented thousands of abundant, unfamiliar, delicate pink clover blooms in both marginal and more ideal habitat. New duplicate vouchers were collected, and the species was seed banked for permanent conservation.

Successes like this are thrilling, and they fuel the optimism necessary to do this kind of work. It can be challenging to keep sight of, and communicate the significance and importance of tiny, rare plants, but they are an integral part of the ecosystem and saving them matters—and we can't save what we don't know.



Spotted coralroot orchid (*Corallorrhiza maculata*).  
Photo: Ellen Dean

## Spotted coralroot orchid (*Corallorrhiza maculata*)

Spotted coralroot orchid is relatively common in the North Coast Ranges and Sierra Nevada of California, as well as in the mountains of many other U.S. states, Canada, and Mexico. But on a CNPS LA/Santa Monica Mountains Chapter field trip to Mount Pinos, San Gabriel Mountains Chapter member Teresa Spohr found the first known occurrence of the plant for the western Transverse Ranges region. Mount Pinos is a popular and well-botanized destination, but spotted coralroot orchid had never been seen on the mountain.

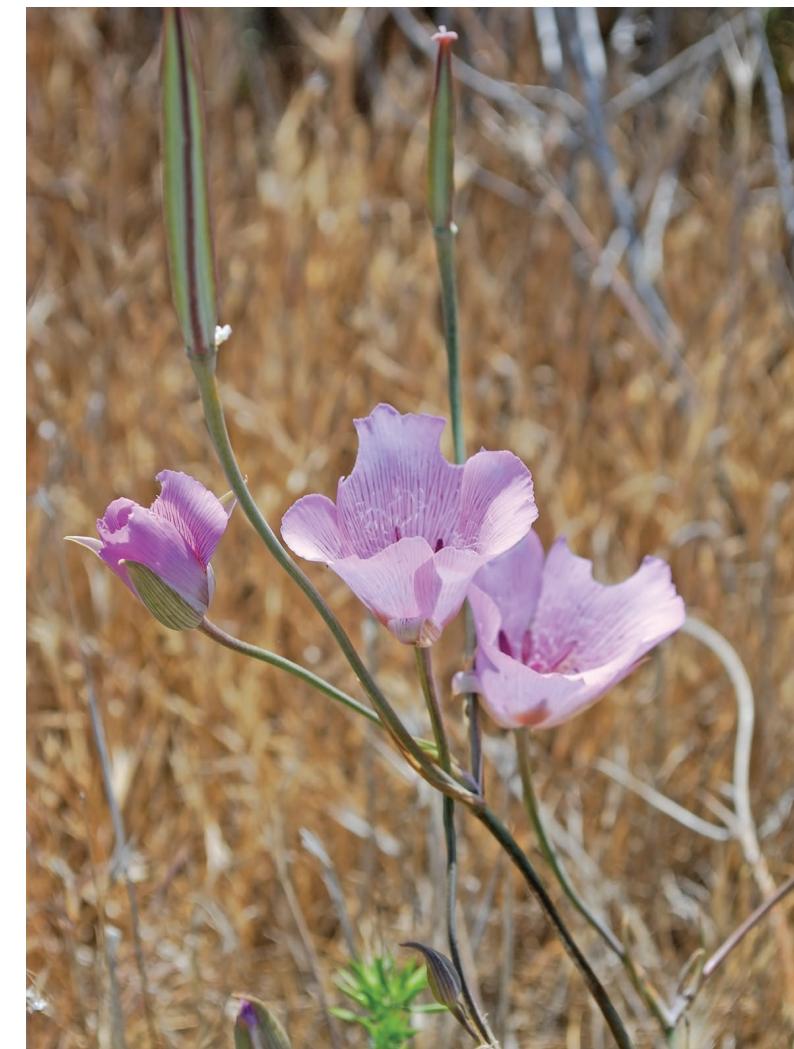
The Mount Pinos location fills an important gap in the known distribution of spotted coralroot orchid which previously had no records in the western Transverse Ranges in Ventura, Kern, and Los Angeles counties. It still has no known locations in the Coast Ranges of San Luis Obispo, and Santa Barbara counties.

The location has now been documented both with an herbarium specimen, and as Calflora and iNaturalist observations. It remains a mystery why spotted coralroot orchid had not previously been discovered in an area as well-documented as Mount Pinos. What is certain is that a CNPS chapter field trip to Mount Pinos in July allowed eyes on the ground to find this interesting plant.

## Alkali mariposa lily (*Calochortus striatus*)

Courtney Matzke, a graduate student at Claremont Graduate University, was conducting a field research project for the California Botanic Garden. Her drive to the Garden took her past a meadow, which her maps showed as private property. But one day, while using a mapping App, she found that the state of California had purchased the parcel. So, she decided to take a stroll through it.

As Matzke walked the meadow, she began to recognize alkali indicator species such as *Distichlis* and *Anemopsis*. Then, out of the corner of her eye, she saw a single *Calochortus*. Matzke kneeled to take a closer look. It was an alkali mariposa lily (*Calochortus striatus*). As her vision adjusted to the scene in front of her, she realized that the entire expansive meadow around her was blanketed with the vulnerable species. ■



Alkali mariposa lily. (*Calochortus striatus*). Photo: Don Davis

# REFLECTIONS ON CONSERVATION, COMMUNITY, AND RESILIENCE



by ÁLVARO PALACIOS CASANOVA,  
CNPS CONSERVATION PROGRAM SPECIALIST

Among the windswept dunes of California's Humboldt Bay, a strong model for community-driven conservation is putting down roots. Recently, I had the opportunity to experience it first-hand on a tour with the CNPS North Coast Chapter and partner organization, Friends of the Dunes (FOD). Here, the Humboldt Bay community is working together to restore and protect the area's unique sand dune ecosystems to increase resilience to climate change impacts, like sea-level rise. The effort is part of a global focus on "nature-based solutions," where healthy ecosystems are key means to help protect communities and support biodiversity.

Friends of the Dunes Outreach Manager Daisy Ambriz, and FOD Executive Director Mike Cipra, along with Joan Tippets from the CNPS North Coast Chapter gave me a tour of Samoa and Ma-le'l dunes. I was awed by the expansive views of sand dunes, the coastline, forests, and wildflowers. We saw the rare and endemic Humboldt Bay wallflower (*Erysimum menziesii*) and beach layia (*Layia carnosa*), and many other native plants, such as yellow sand verbena (*Abronia latifolia*), common yarrow (*Achillea millefolium*), Pacific madrone (*Arbutus menziesii*), and California sea pink (*Armeria maritima* ssp. *californica*).

California's coastal sand dunes have been decimated by development, and given their small distribution, the ecosystem is under immense pressure from sea level rise and invasive plants. Dune ecology in Humboldt Bay has created fascinating ecotones—areas where two biological communities meet and integrate—and areas beyond the foredunes—where sand is deposited along the oceanside of vegetated shorelines. These spaces contain pockets of fresh surface water and forests stunted in height by the ever-present prevailing northwest winds. The dune's "



TOP: Ma-le'l Dunes windswept features with their remnant "skeleton" forests add character to Humboldt Bay.

ABOVE: Coast buckwheat (*Eriogonum latifolium*) Photos: Friends of the Dunes

skeleton forests" were created when they were buried under tons of sand from a tsunami that occurred hundreds of years ago. The Humboldt Bay community uses the sand dunes for hiking, naturalist training, and the annual Humboldt Bay Marathon. It is a natural space that requires increased protection and management.

In my career as an environmental justice advocate, I have learned that every effective advocate should know the land and the people they partner with, as they work to protect it. Solutions must center on the needs of local communities—the people who know what the best solutions are for their health, and the environment.

#### Policies for Protection

In October 2020, Governor Newsom issued an executive order declaring California's commitment to conserve at least 30% of California's land and coastal waters by 2030 (also known as "30x30"). California, the most biodiverse state in the nation, was also the first in the United States to embark on 30x30. President Biden followed suit a year later with an executive order to protect 30% of the United States' land and coastal waters by 2030.



In my career as an environmental justice advocate, I have learned that every effective advocate should know the land and the people they partner with, as they work to protect it.



The dunes are lent a surreal glow with sprawling mats of coastal sand verbena (*Abronia latifolia*).  
Photo: Friends of the Dunes

Humboldt Bay Sand Dunes has all the characteristics that the California Natural Resource Agency and federal agencies are looking for in areas to protect through 30x30: unique ecosystems, special plants and animals, access to nature—places that offer nature-based solutions for climate change resiliency, and importantly provide for Tribal engagement.

Humboldt Bay is on ancestral Wiyot land. The Tribe has mounted a concerted LandBack effort, which is part of a decentralized movement by Native Americans in the United States and Indigenous peoples in Canada, that seeks to reestablish Indigenous sovereignty, with political and economic control. They recently reacquired some of their ancestral lands, which include Tuluwat Island inside Humboldt Bay, and Mouralherwaqh or Wolf's House, a 46-acre wetland marsh.

FOD works hard to restore, steward, and protect the dunes not just for community access and recreation, but for climate resilience. It manages several restoration projects throughout Humboldt Bay that show it is possible, and that it is a vital nature-based solution to combat the dune's greatest threats—sea level rise and invasive plants. ■



## THE OCEAN FRIENDLY GARDEN

Transforming a historic city building into a community space  
that emulates a natural watershed

by MAYA ARGAMAN

Photography by OCEAN FRIENDLY GARDEN

Surfrider LA partnered with Safe Place for Youth (SPY) for garden workdays, and they recruit volunteers who maintain the garden while learning about native and edible plants, and sustainable gardening practices.

**Surfrider's Ocean Friendly Gardens (OFG) program builds awareness of the connection between the built landscape, and local waterways and beaches.** By gardening with native plants, bioswales (vegetated ditches that allow for the conveyance and filtration of stormwater), and rain gardens, these spaces offer a nature-based solution for runoff, while restoring biodiversity in coastal watersheds.

When Beyond Baroque, a leading independent Literary and Arts Center based at the original Venice City Hall, caught the eye of Steve Williams and Tom Rau, they saw an opportunity for the much-loved and storied local space.

LEFT: A monarch butterfly alights on Cedros Island verbena (*Verbena lilacina* 'De La Mina')

BELOW: An ocean friendly garden invites a quiet stroll through an area once covered by lawn.

Williams is a conservation biologist and head of the Los Angeles Chapter of Surfrider's OFG program, and Rau is a landscape architect with Urban Water Group.

Beyond Baroque was built in 1906 on a large corner lot and surrounded with turf grass. Williams—who values the creation of wildlife habitat using California native plants to attract pollinators—collaborated with Rau to incorporate them in the design of an ocean friendly garden at Beyond Baroque.

The establishment of the garden sparked a broader community involvement in the space, and volunteers planted over three workdays in April of 2013. Each installation day served as an informative, hands-on workshop. The group learned how to implement ocean friendly practices at home, and in their communities.

Williams's favorite elements are the two rain gardens. Designed to absorb rainfall from the roof, and prevent stormwater pollution, they funnel hundreds of gallons of runoff away from watersheds each year. Some native plants in the garden include clustered field sedge (*Carex praegracilis*), seaside daisy (*Erigeron glaucus*), and beach strawberry (*Fragaria chiloensis*). While the rain garden basins may not be immediately visible, hidden as they are beneath mulch and vegetation, they pleasantly surprise visitors, and demonstrate that any garden can incorporate rainwater retention into its design.

The remaining landscaped areas around the Ocean Friendly Garden have been transformed into abundant fruit and vegetable plots, tended to by Safe Place for Youth (SPY) volunteers. SPY is an outreach and support program for unhoused youth. Their community garden addresses food inequality by creating a sustainable food system for unhoused youth in West Los Angeles. Surfrider LA partnered with SPY for garden workdays, and they recruit volunteers who maintain the garden while learning about native and edible plants, and sustainable gardening practices.



## ABOUT THE GARDEN

by STEVE WILLIAMS

### Favorite Native Plants

De La Mina Verbena (*Verbena lilacina*) is one much-loved species. It has stunning purple flowers and is an excellent choice for a smaller, pathway-lining shrub. Golden currant (*Ribes aureum*) and bladderpod (*Peritoma arborea*) are among the many plants that bloom in spring and have seed and fruit to feed birds, and other wildlife throughout the summer.



Digging in on workday.



### Irrigation

Drip irrigation was initially installed to help the plants establish during their first summer. Today, the native plants thrive on rainwater and occasional hand watering. Groundwater is recharged by the rain gardens.

### Wildlife

Metallic green sweat bees (*Agapostemon* genus) have been visiting Palmer's Indian mallow (*Abutilon palmeri*), a fairly rare species native to the southwestern US and northern Mexico. These short-tongued bees adore composite flowers. Ladybugs resting on leaves, hummingbirds, swallowtail butterflies, hoverflies (a small pollinator that mimics bees), and monarch butterflies have also all been spotted in the garden.

### Maintenance

Volunteer involvement in garden maintenance has been crucial to the success of the Beyond Baroque Ocean Friendly Garden. The seasonal cycles of native plants may be unfamiliar to gardeners who typically work with non-native plants, so it is important to communicate that these plants do not require summer watering and rest during their summer dormancy. This prevents inadvertent harm to the plants with well-intended watering.

### Challenges

Any public, urban location presents challenges. Wear and tear on the garden due to people and pets walking through and occasionally trampling the plants, is one example. Some people create "social trails" by cutting through the garden, which results in bare ground pathways. To address this, temporary physical barriers like tree branches or boulders have been placed to block these thoroughfares. This allows new plants to establish themselves, and the method is less disruptive, and more visually pleasing than permanent fencing.

### Advice

If you would like to attract native bees and other pollinators, you will need to plant a wide variety of native plant species, especially larval host plants. A native plant garden often naturally attracts pollinators. It is crucial to avoid the use of pesticides, as even "natural" pesticides can harm pollinators and other beneficial predatory insects. Pesticides also contribute to pollution through urban runoff, which harms aquatic environments. ■

# Firescaping Your Home

## FEATURED EXPERTS

Rachel Schleiger and Adrienne Edwards



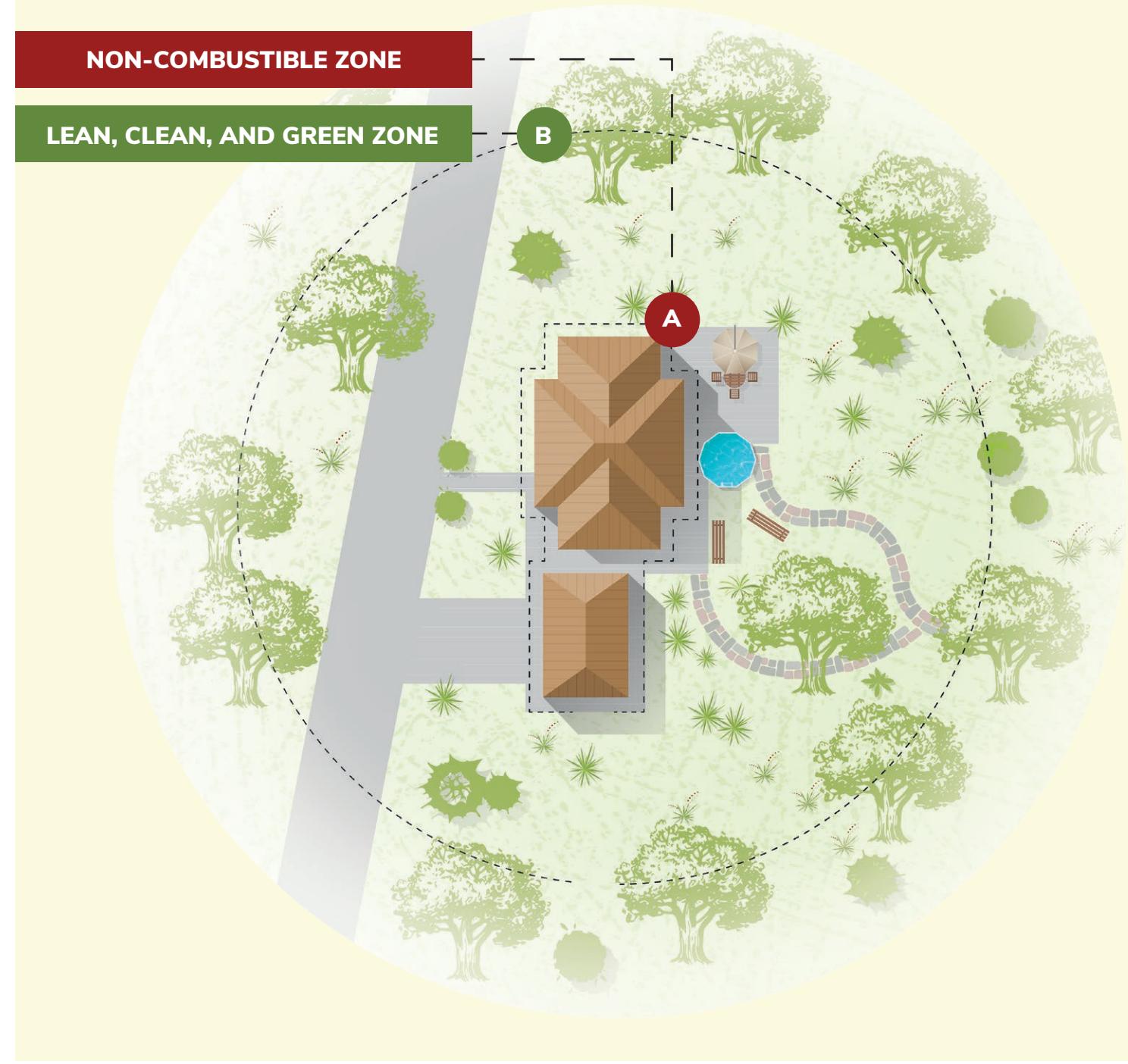
California State University Chico plant ecologists Adrienne Edwards and Rachel Schleiger recently published the new book, *Firescaping Your Home: A Manual for Readiness in Wildfire Country*.

*FIRESCAPING YOUR HOME*  
A MANUAL FOR READINESS  
IN WILDFIRE COUNTRY  
which includes  
more than 600  
recommendations  
for native  
plants and tips  
to support  
wildlife.

**Q:** What advice do you have for people who want to maintain defensible space while providing support to native plants and wildlife?

**A:** Many homeowners believe that to support a fire defensible space around their homes they should plant a 100-foot buffer of green lawn. But lawns are incredibly thirsty, are non-native, and do not provide a wildlife friendly solution.

In contrast, for healthy habitats that support wildlife we like to think of the two most important fire readiness zones as: 1) the Noncombustible Zone, and 2) the Lean, Clean, and Green Zone. Numerous studies have documented declines in insect populations where native plants and habitat have been severely reduced, and these declines correlate with reduced songbird populations. One study for example, published in the *Proceedings of the National Academy of Sciences Journal*, found that populations of Carolina chickadees could only be sustained if nonnative plants made up less than 30% of the total plant mass in gardens (Narango et. al., 2018). So, we advocate that every built landscape should have at least 30%-50% native plant coverage, with a range of blooming seasons and plant forms so that native food webs can proliferate!



We advocate that every built landscape should have at least 30%-50% native plant coverage, with a range of blooming seasons and plant forms so that native food webs can proliferate!

A

## Up to 5 feet from structures, and 15 feet in extremely high fire risk areas

The most flammable part of your landscape is usually your home structure. If you starve a fire of fuel, it could save your home. You can plant spring geophytes (with bulb-like storage underground, like *Brodiaea*, *Calochortus*, *Dipterostemmon*, *Erythronium*, *Fritillaria*, *Trillium*, *Triteleia*, etc.) and/or spring annuals (*Amsinckia*, *Clarkia*, *Claytonia*, *Collinsia*, *Gilia*, *Eschscholzia*, *Layia*, *Lupinus*, *Nemophila*, *Primula*, *Viola*, etc.), then rake the spent aboveground plants away before fire season. (The Noncombustible Zone should be cleared before any possible fire weather.) Succulents can be fire resistant, but keep in mind that they are ignitable if they contain a lot of dead woody stems and dried leaves. One benefit is that bare ground provides habitat for many native bees and other invertebrates. Small diameter gravel and pavers are also easy to keep clean near structures.

## LEAN, CLEAN, AND GREEN ZONE

B

## Between 5 and 30 feet from structures, and 5 and 90 feet in extremely high fire risk areas. The first 30 feet are the most important for reducing risks to fire-resistant structures.

While the Noncombustible Zone can be raked clean for fire weather, the Lean, Clean, and Green Zone requires a more nuanced approach. The first priority should be to thin overall fuels to around 30% to 60% coverage—so that you have more “open space” for air to pass through, while considering your topography and fuel arrangement. For example, if you live on a southwest facing slope you would need to thin out more than if you lived on flat land away from the edges of canyons. As you thin, you should remove most dead material and make the remaining fuels less continuous. If you live in an area with trees or chaparral, properly thinned vegetation can provide protection against high wind velocities and turbulence and reduce the threat of flying embers during fire. Homes surrounded by grassland, however, would have no shelter from wind, so, it would be even more imperative to maintain fire resistant structures and discontinuous fuel loads. The second priority is to keep the plants that remain hydrated and pruned just enough for slow to moderate growth, generally with no fertilizers.

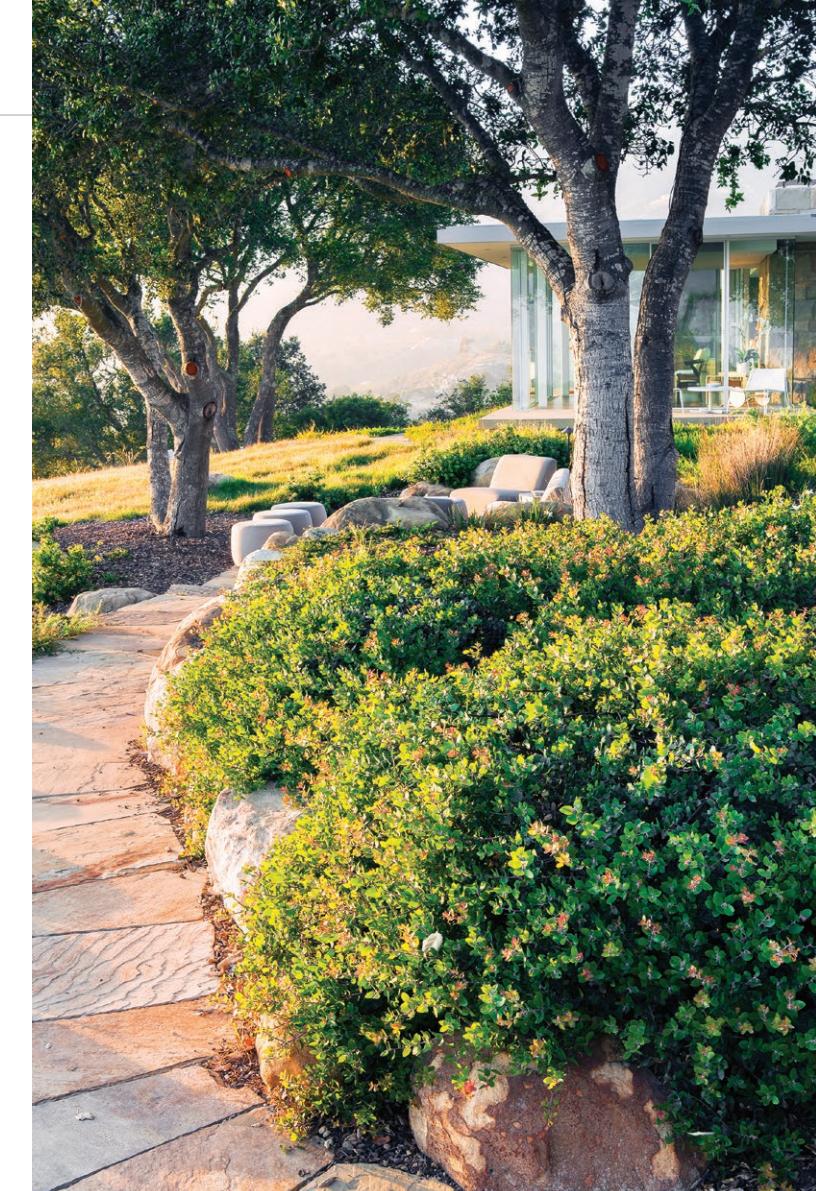
Planted areas can be a mix of organic mulches or gravel broken up by bare soil, gravel, hardscaping, or irrigated groundcover. Spring wildflowers, geophytes, and grasses (*Bouteloua*, *Elymus*, *Deschampsia*, *Festuca*, *Melica*, *Muhlenbergia*, *Stipa*, etc.) can give bursts of color in manicured landscapes, then be raked away before fire season. Sedges (*Carex*) and rushes (*Juncus* etc.) are useful for seasonally moist areas, are drought tolerant, and can be ignition-resistant if kept free of dead debris. Subshrubs (*Diplacus*, *Eriophyllum*, and some *Artemisia*, *Lupinus*, etc.), like larger woody plants, can be pruned to reduce fuel loads.

If you live in chaparral habitat, many species can be sculpted to be more fire resistant (*Arctostaphylos*, *Artemisia*, *Ceanothus*, *Cercocarpus*, *Dendromecon*, *Encelia*, *Eriogonum*, *Fremontodendron*, *Garrya*, *Malosma*, *Philadelphus*, *Prunus*, *Salvia*, etc.). Numerous chaparral and sagebrush shrubs can be quite ignitable when dry, but resistant to ignition when hydrated and patchy across the landscape. Your choice of native plants should reflect your ecoregion and your management capabilities. With a more open canopy, be sure to remove non-native annuals that connect plant fuels horizontally.

In forested areas, think proactively about ladder fuels. *The Encyclopedia of Wildfires and Wildland-Urban Interface* (WUI) areas describes a ladder fuel as live or dead vegetation or a combination of both that provides vertical and horizontal continuity for fire. Mature trees in woodlands can be more fire resistant and resilient if fuel loads beneath trees are reduced during fire season and trees are pruned up at least six feet. Leave some leaves beneath native trees and shrubs to support invertebrates and a healthy soil microbiome. To minimize excess fuels beneath plants, you could create a leaf bioswale—a depression in which you pile leaves to decompose and support wildlife.

Conifers dominate at higher elevations, and the resins they produce (like most chaparral shrubs) can make them more ignitable, although many have fire-resistant

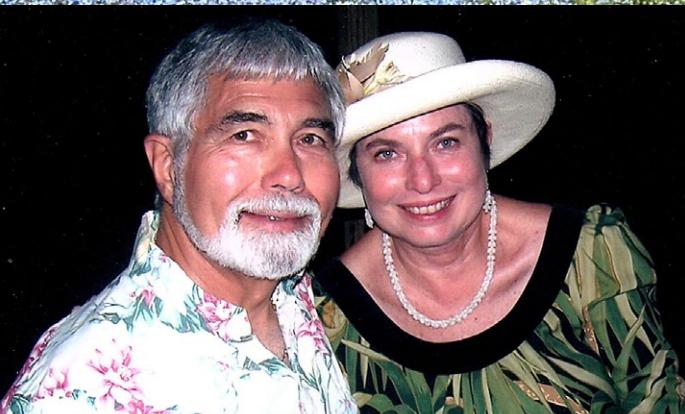
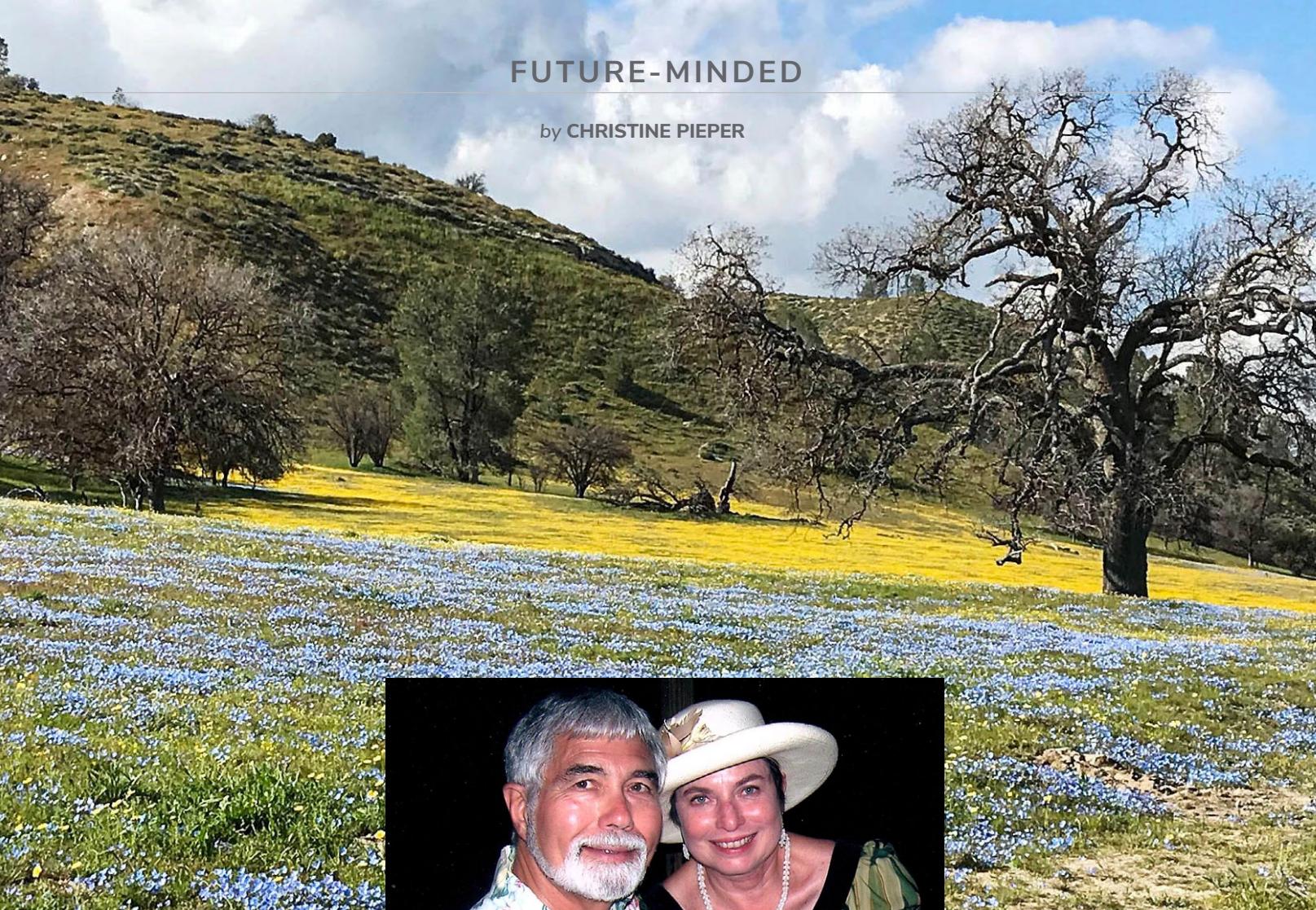
## ASK AN EXPERT



Manzanita cultivar and oaks frame the walkway to an outdoor seating area alongside a beautiful home. Photo: Mark Robinson

bark. To the extent possible, smaller conifers should be towards the outer edge of the Lean, Clean, and Green Zone, although mature, limbed-up trees with thick bark will not ignite in well-timed, low intensity fires. Islands of vegetation broken up by noncombustible areas can help keep flames low. (*The CNPS Fire Recovery Guide* found at [cnps.org/fire-recovery](http://cnps.org/fire-recovery) can help you learn more about the fire regimes of wildlands near your home.)

No home or landscape is fireproof, and your priority is to stay safe. But we can firescape to support the staggering native biodiversity of California by monitoring winds and weather, building or retrofitting fire-resistant structures and communities, and welcoming native plants strategically into our fire resilient landscapes. ■



## Nancy Farrell-Rose & Ron Rose

Nancy Farrell-Rose and Ron Rose enjoy life in Paso Robles, and they appreciate the oak woodlands that gave the town its name. Having worked in the field of archeology, the couple has explored many less-traveled sites in California, Hawaii, and the greater Pacific. Closer to home, Nancy and Ron love the beautiful blooms of Carrizo Plain and a local gem—Shell Creek. Read on to learn why they support native plants as Perennial (monthly) donors, and why they made a commitment in their estate plan.

Chamise  
(*Adenostoma fasciculatum*).  
Photo: John Rusk



“This year, the chamise is blooming as never before, with whole hillsides of pale yellow against the dark green leaves.



**CP:** Nancy and Ron, how were you first introduced to native plants?

**Nancy:** I was born in California, and as a kid I loved dirt. Climbing trees was my thing. I went to UCLA and majored in anthropology so I could justify studying everything. I became interested in ethnobotany and took a class by Mildred Mathias, and then joined her ecology field trip to Costa Rica. As a result of the contacts I made, after graduation I worked in the UCLA Herbarium for two years. I went through all the specimens, made repairs, and created new labels when species were renamed. I had lunch outside, in the garden (now known as the Mildred E. Mathias Botanical Garden) every day and met all the visiting botanists. That was when I first heard about native plants.

**Ron:** I grew up in California, in Hanford in an area that was bordered by farms. So, my interest in plants had an agricultural focus. When we married, I got more into native plants through osmosis. Then I sold my banking and finance companies, and I went to work with Nancy.

**CP:** How are native plants part of your lives now?

**Nancy:** I have an archaeology consulting business. I get to see a lot of places I'd never see otherwise. Many years ago, when I worked for the Bureau of Land Management, I was all over the desert from the Mexico border to northern Death Valley. While looking for archeology sites, I'd also do an ecological inventory. I saw a lot of plants that were quite rare, and I always brought back plants I didn't recognize to the BLM biologists. I found way more plants than archeology sites! I still include a paragraph on plants and birds in all my surveys, to help record what is there.

One of the things that makes me happy is when I drive through oak woodland and chaparral, and I see all the shades of green, and in late winter the smudges of lilac when the Ceanothus is in bloom.

This year, the chamise (*Adenostoma fasciculatum*) is blooming as never before, with whole hillsides of pale yellow against the dark green leaves.

**Ron:** We like to visit Shell Creek, which is about 30 miles east of Paso Robles. There's an incredibly diverse collection of wildflowers there, on pastureland that is managed with flowers in mind.

**Nancy:** The San Luis Obispo Chapter always does a field trip to Shell Creek. The late Malcolm McLeod wrote several guidebooks on the area. There is a big oak tree named after him where people have lunch. I have a watercolor of that tree in my kitchen! It's a beautiful drive to get out to Shell Creek, it looks like an impressionist painting.

**Ron:** (Laughing) Except it's real!

**CP:** You are protecting special places like Shell Creek with your support for CNPS today, and in your estate plan. Why is that important to you?

**Ron:** I have three kids, eight grandchildren, and three great-grandchildren. They've been very successful and have all the stuff they need. So, each year I contribute to CNPS in their names.

**Nancy:** It's a good thing for this whole family from California to support what is all around us. I am happy to indoctrinate them into the ways of native plants! In our work, we see a lot of places that will probably be paved. CNPS is finding places to conserve rare plants and protect open space. It's important not just for the health of the planet, but for the people, too. The more I go outside and talk to trees, the happier and healthier I am. ■

Announcing



# PLANT PALS CONTEST WINNERS

**CONGRATULATIONS** to the CNPS youth writing contest winners, Cain Fahety, Ryder Pittman, Melisa Clarke, and Aashay Mody! Last spring, CNPS announced its first youth writing contest, inviting writers ages 6 to 18 to share their native plant stories through essays, comics, flash fiction, or poetry. Please take a moment to enjoy the winning entries from our 13-18 age-group.

## Tiny Birds On Green Stalks: Padre's Shooting Star

by Melisa Clarke

In a forest glade little birds are diving.  
The Verdant ground below never arriving.  
Black beaks angled down.  
Yellow faces wear white crowns.  
Magenta wings striving.

I wish to photograph these beautiful birds,  
yet my frustration I can't express in words.  
Not one example of their kind  
I have been able to find,  
while everywhere is covered in  
black mustards.

Every weekly excursion  
with wildflower immersion  
as I explore nearby parks  
and go on family larks  
provides plentiful diversion.

Yet as my pursuit  
reveals no fruit,  
I continue to persevere  
though I have come to fear  
no birds are en route

Still I hold tightly onto my one and only hope  
that if I wait for spring to bring its  
warmer weather  
and use iNaturalist posts to find the bird's scope:  
my family and I will witness this avian  
beauty together  
and we can treasure the memory forever.

After many a hike and many a week  
on a south facing rise  
I finally found the wildflower I seek.  
My avian wonder lies  
within that location,  
rather than clustered in one mass,  
it is scattered about the grass  
in a loose formation.

However certain clues revealed  
that their places in the field  
may have connections  
as they grew in sections  
where invasive grasses did not invade  
and away from the flower the grasses stayed.

While I have no answer to that mystery,  
this search shall not become history.  
My hikes and hunts are not done.  
I shall surely begin another one.  
For while the photos of this flower  
I will forever treasure,  
the time I spent finding it has no measure.

Family, flowers, and fun  
can only be found under the sun.  
Thus my endeavors will not stop  
and I will explore every hilltop,  
and everything else below.  
There is so much more I want to know.

## WINNING ENTRY | ages 13 to 18

### WINNING ENTRY | ages 13 to 18



## Emergence of Life from Death

by Aashay Mody

Almost every day would the wren fly past this area. The brown stain among concrete structures that had taken the place of wild habitats. Dry winds swept up dirt from the cracks scattered across its surface, and it leeched the life from any who entered its poisonous grasp. A desolate wasteland.

Until one fateful day, when everything changed.

As the wren flew over on her daily journey, she noticed a group of humans daring to venture into the area. They brought with them tools and water and plants. The wren found it especially surprising that most of the humans present were, in fact, children. But she had witnessed too much destruction caused by humans and thought that they were surely there to do more. So she paid them no heed.

However, the humans were not there to cause more harm to the planet. They wanted to help it recover. A local high schooler was leading a habitat restoration to reintroduce native plants into a heavily urbanized and degraded area in Southern California.

Over the next few weeks, when the wren made her routine crossings, she felt a change. The humans had been hard at work, keeping invasives at bay and consistently caring for their newly propagated plants.

At daybreak, one spring morning, when the dawn chorus could, for once, be heard over obtrusive human noises, the wren decided to stay nearby and see if life truly had been returned.

Artwork: AI generated image by Ian Vorster

A piercing cry broke the early air, coming from a young hawk flying above. He looked down at the gray, seeing building after building, until a speck of green broke free of the shadows, enchanting him. Angling his wings downward, the hawk swooped toward it. Upon his approach, he extended his feet and beat his wings back to perch upon a dull lamppost that overlooked this hidden oasis.

The first golden ray of sun brushed a slowly unfurling leaf as dark gave way to day. From within a sealed bud, fiery orange colors emerged into the crisp air, looking up at wispy clouds floating amongst the vast ocean of air above. Warmth slowly built up in the flower as it took in the morning light alongside many others. It was but one in a field of its kind.

Soon the bees came, with a gentle buzzing that dissipated in the air as their descent began. Beneath the moist soil, springtails sensed their new visitors, while another rested among the leafy flower stalks where morning dew gathered in crystal droplets; a spider, waiting, watching for a meal.

Eventually, the sun rose to its peak, marked by the arrival of bluebirds who sent gentle gusts of wind over the flowers' silky petals. They flitted about, ruffling their feathers and preening. Enjoying the company of each other.

So concentrated was life in this small sanctum, vibrant and diverse, that once only signified death. The wren joined her avian companions in hopping among the vegetation, amazed by the transformative power this native flora could have. ■

**CNPS currently collaborates with the Green Biome Institute at CSU East Bay to DNA sequence and genetically profile 300 of California's most endangered plants by 2026. CSU also partners with the CNPS in the Klamath Mountains Vegetation Mapping Partnership at Cal State Polytechnic University, Humboldt, to inventory and map plant communities. Please share a few other highlights that speak to the benefits for endangered landscapes and threatened biodiversity thanks to similar CSU-nonprofit collaboration.**

**GR:** Recently, 18 CSU campuses were awarded grants by the State of California for climate action and climate adaptation. The awards were broadly sorted into ecosystem resilience; environmental sustainability; education, collaboration, and workforce training; and human resilience. Included in these were drought, resilient grassland restoration, water system resilience, sustainable land initiatives, and soil carbon accrual.

And teachers are supported with justice centered pedagogy: There is fire stewardship, and the human health effects of climate change. In the Los Angeles

area for example we have rural heat islands, which are little areas separated by small distances, but which experience huge temperature differences. These pockets often contain some of the most vulnerable communities. There are also opportunities for respiratory protection for firefighters, and the health and safety of migrant workers.

Many of our campuses also work with Native Nations as community partners on climate and fire resilience. And we have a faculty member at CSU San Diego who is working on a concept called Connected Landscapes. It would enable

animals to migrate from warmer areas to cooler areas.

**What gives you hope for the future?**

**GR:** It's a great time to be in higher education and to create opportunities for the leaders of the future. Our young people will lead the charge. And while there are no limits to human creativity and innovation, we still have to be mindful of social, ethical, and environmental factors. We have a responsibility for stewardship of our much-loved landscapes and resources, and their perpetuity so that future generations can live healthy lives. ■

Michele Vongsa, a staff intern from Cal Poly Humboldt, watches over the shoulder of Sam Swatling-Holcomb, the CNPS field lead on the Klamath Mountains project in the foreground. In the background, Cal Poly Humboldt graduate student CJ Copper collects survey data. The party is working in a mixed chaparral stand of manzanita (including *Arctostaphylos manzanita*, *A. canescens*, and *A. patula*) at the southern end of the Klamath Mountains.

Photo by Michael Kauffmann.



## NATIVE GARDEN NEWS FROM CALIFORNIA COMMUNITIES

by IAN VORSTER

### Garden tour season is just around the corner

By growing native plants, we have the power to support wildlife and save precious natural resources—all while creating beautiful landscapes that celebrate the real California. This spring, grab a friend and visit real-life native gardens. CNPS chapters and partners like the Los Angeles-based Theodore Payne Foundation are working with gardeners across the state to bring you the best of the best.

**Check the CNPS online Calendar of Events through May to see updates on the latest tours near you.** Here's a preview of what to expect from the CNPS San Diego Chapter's tour.

### San Diego Native Plant Garden Tour

Explore the beauty and diversity of San Diego's native gardens on April 6 and 7 to celebrate the CNPS San Diego Chapter Native Garden's 10th anniversary. Meander your way through the inspiring gardens of Calscape founders Dennis and Pamela Mudd in Poway, and Jim Smith in Del Mar. Their landscape designs reflect Calscape's mission to guide Californians as they restore nature, one garden at a time.

This year's theme is Planting Animals. It explores the connection between native plants and animals as part of the web of life. Let the beauty of San Diego's native plant gardens inspire you to embrace native plants and build a better future for all living things. **Tickets can be purchased at [cnpssd.org](http://cnpssd.org)**



CNPS online Calendar of Events

[cnps.org/events](http://cnps.org/events)

## GROW NATIVE PLANTS

### Education of children starts in a native habitat garden

With their keen eyes and low centers of gravity, young children find acorns to be of endless fascination. As part of an inspiring new program at the Martha Walker Native Habitat Garden, curious groups of children aged 1 to 7 tow their parents along as they visit the garden. Together they learn of the many insects, birds, and mammals that rely on the acorns through song, story, and a scavenger hunt.

The garden is home to many oak trees that are center stage for the subtle seasonal cycles that grace the California landscape. Heralded by shortened days and cooler nights every fall, acorns drop to the earth to provide hearty meals for a wide array of creatures. The same crop then ensures the birth of new oaks in the coming spring.

The curiosity and joy awakened in a young child so often blossoms into a lifelong appreciation for the natural world. "We pride ourselves on the fact that the education of many children begins in this native habitat garden," says Christine Washowiak, a CNPS Napa Chapter volunteer and teacher-guide.

### Love Oakdale event celebrates with native plant garden

As part of the Love Oakdale event, early last summer the CNPS North San Joaquin Valley Chapter partnered with the Oakdale Boy Scout Troop, and Oakdale Garden Club to plant a native garden at the Oakdale Post Office.



Parents and their children dug holes and got soil beneath their fingernails as they bedded down ten native plant species, including desert marigold and foothill penstemon. Blossom Hill Natives provided the garden design and plants. Susan

Byars of the Oakdale Garden Club, Cynthia Typaldos of CNPS North San Joaquin Valley Chapter, and Carl Hill of Blossom Hill Natives led the project, which resulted in a water-friendly display that has engaged both pollinators and post office patrons. ■

Oakdale Boy Scout Troop and Oakdale Garden Club members plant a native garden outside the Oakdale Post Office. Photo: Cynthia Typaldos



Children visiting the garden love the tactile sensation of an acorn in the hand.

## REGIONAL PARKS



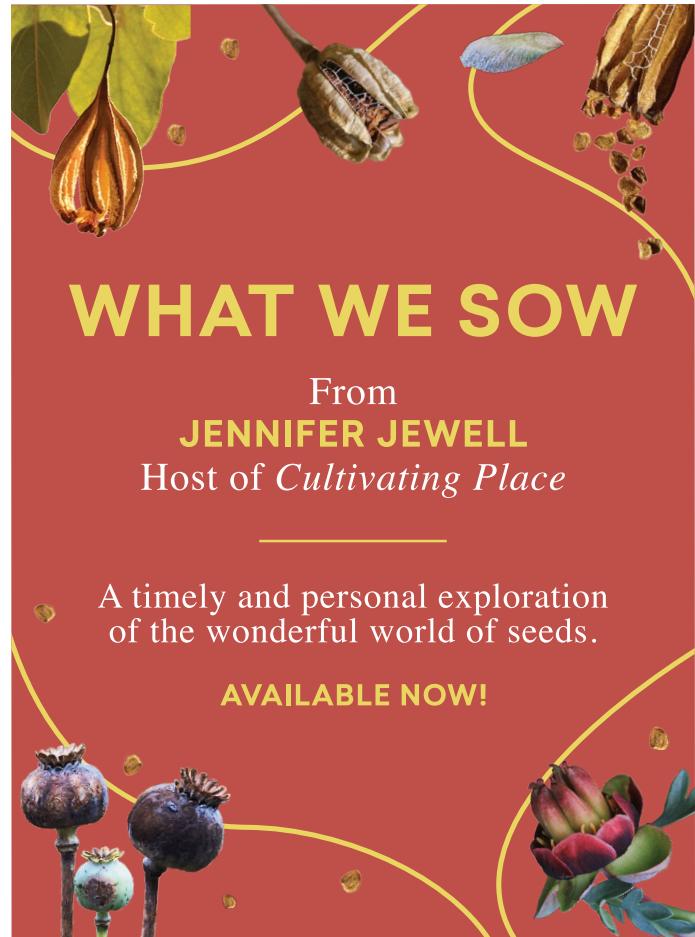
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