Spring Awakening
A new era for California biodiversity
Last summer, my husband and I moved within walking distance of the CNPS headquarters in midtown Sacramento. Since then, I’ve enjoyed the luxury of walking to work. In those 30 quiet minutes a day, I’ve been able to observe the seasons and the urban natural environment in a slow, experiential way. From the amber, smoke-filled skies of fall and the darkest of winter days to the native wildflowers now forcing their way through cracked sidewalks, I’m reminded daily of the dynamic, quietly powerful forces that govern our natural world.

This year more than most, I’m especially grateful for spring, one that is gloriously green thanks to months of much-needed rain. With vast wildflower blooms across the state, I can’t think of a better time to celebrate California Native Plant Week (April 13-21), Earth Day (April 22), and now a new International Day for Biodiversity (May 22). This issue of Flora is a tribute to these special occasions. Look to the back of the magazine for a listing of the dozens of events our 35 chapters and partner organizations have planned. Wherever you live, you’ll find opportunities to tour native gardens, attend field trips, hear expert speakers, or learn about wildflowers. In the spirit of the superbloom, you’ll also find a guide to this year’s wildflower season with tips from one of our most passionate wildflower experts, CNPS Southern California Conservation Analyst Nick Jensen.

As we celebrate the beauty of spring, let us also be grateful to each other for the hard work of protecting the places and plants we enjoy. On page 6, we feature a striking photo essay, documenting the incredible progress of the California Plant Rescue (CaPR) collaborative. Thanks to volunteers, students, and scientists working together, CaPR already has collected and stored the seeds of more than 50 percent of California’s rare and endangered 1B plants! Seed collection is one of many actions identified in California’s new Biodiversity Initiative, an exciting new conservation framework that recognizes the importance of our state’s remarkable native plant diversity. For more on this effort, turn to page 16 for a special message from CNPS Executive Director Dan Gluesenkamp about the initiative’s great potential.

Last, I hope you’ll enjoy our featured interview with iNaturalist creator Ken-ichi Ueda. If you haven’t used the iNat smartphone app, give it a try from one of your outdoor excursions this spring – and may there be many. As the late nature writer Edward Abbey once said, “It is not enough to fight for the land; it is even more important to enjoy it.”

Happy spring!

Liv O’Keeffe
Senior Director, Communications and Engagement
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ON THE COVER: On location at the Antelope Valley Poppy Preserve, where the California poppy (Eschscholzia californica) blooms as far as the eye can see. Photo: Saxon Holt

ABOVE: A lone valley oak (Quercus lobata) on Tejon Ranch rests amid a diverse mix of California wildflowers, including rusty popcornflower (Plagiobothrys nothofulvus), California poppy (Eschscholzia californica), spider lupine (Lupinus benthamii), and purple owl’s clover (Castilleja exserta). Photo: Nick Jensen
California Fire Recovery Guide

An updated version of the CNPS Fire Recovery Guide will soon be available, thanks to CNPS Mount Lassen chapter donors, Butte County Fire Safe Council, and a private foundation. The update covers the entire state with new information on defensible space and erosion, along with considerations for the 12 California habitats most impacted by fire. To download the latest version or order print copies, visit cnps.org/fire-recovery.

“CNPS wishes to thank the many experts who contributed their time and knowledge to bring the latest fire recovery science to California.”

NEW CNPS FELLOWS AWARDED

In recognition of exceptional contributions to California’s native plants, CNPS has named Celia Kutcher and Julie Evens its newest CNPS Fellows. Fellow recognition is the highest honor CNPS awards its members. Kutcher is a long-standing leader of the CNPS Orange County Chapter, recognized for her decades of work in Southern California native plant conservation. Evens is the CNPS Vegetation Program Director and co-author of *A Manual of California Vegetation*, with John Sawyer and Todd Keeler-Wolf. Under her leadership, CNPS has participated in the fine-scale mapping of 50 percent of California’s undeveloped lands.

Please go to cnps.org/fellows and watch for the fall 2019 issue of *Fremontia* to read our full coverage of the newest CNPS fellows.

Left: Celia Kutcher with CNPS Board President Steve Hartman. Above: Julie Evens.
CENTENNIAL DEVELOPMENT

Faces New Scrutiny

In February, CNPS and the Center for Biological Diversity (the Center) submitted a comment letter calling on Los Angeles County to delay a final vote on the Centennial development, pending further analysis of the county’s new Wildfire Analysis Motion.

The Tejon Ranch project proposes a new city of 55,000 in the far northwestern corner of Los Angeles County. The development would destroy more than 5,000 acres of native grassland and wildflower habitat and is sited within a high wildfire hazard severity zone as designated by Cal Fire. In December, the county supervisors voted on their intent to approve the development, but a week later adopted a Wildfire Analysis Motion directing the county to review existing prevention regulations and address lessons learned.

“Supervisors can’t OK the county’s biggest-ever development in a wildfire area and then quietly admit that such projects endanger residents and firefighters,” say J.P. Rose, a Center staff attorney in a joint news release by the Center and CNPS.

The California Environmental Quality Act requires a thorough review and analysis of any new information relevant to proposed development projects, and new information requires an additional round of public comments. CNPS and the Center await a response from the county.

Go to cnps.org/centennial to follow the project and take action.

RE-OAK CALIFORNIA on the Move!

The acorns gathered in the aftermath of the 2017 Wine Country fires are now thousands of healthy young trees. In February, CNPS Re-Oak Coordinator Seth Kauppinen worked with community groups and partners to distribute 3,972 seedlings, primarily to Sonoma and Napa counties, the areas most impacted by the 2017 fires. More than 3,000 additional seedlings will arrive in the following areas this spring: Marin, Petaluma, Santa Cruz, Santa Rosa, Napa, and the greater Sacramento area. Interested in planting oaks in one of these locations?

Sign up at cnps.org/reoak.

ADOPT A BABY OAK!

...and help restore California’s native landscape.

acorns@cnps.org

This van contains super-cute baby trees who need a home. All they demand is water, light and love. And they’re FREE.
As wildflowers explode at the southern border of Joshua Tree National Park, Riverside County is considering whether to pave over nearly 2,000 acres of that land for 8,490 new homes. Located about 15 miles east of Indio, the proposed site of the Paradise Valley Specific Plan serves as an important habitat corridor between the national park and conservation lands in the Orocopia Mountains and Mecca Hills to the south. CNPS has submitted comments on the Paradise Valley project’s environmental impact report and plans to testify against the project at the upcoming Riverside County Planning Commission hearing on May 15. Staff and volunteers will be present to stand against destructive sprawl and demand appropriately-sited infill development. Stay tuned to CNPS social media for opportunities to get involved.

Cindy Podsiadlo, pictured here with Christie Johnson, inspired El Dorado Chapter volunteers to renovate the Placerville Public Library’s demonstration garden, transforming it from xeriscape to a native habitat garden. (Watch for our feature on this garden in an upcoming issue of Flora.)

This spring’s blooms on display along the southern border of Joshua Tree National Park. Photo: Michelle Cloud-Hughes

CNPS CHAPTER MILESTONE in El Dorado County

The CNPS El Dorado Chapter is celebrating its 25th anniversary. The chapter, which covers the west slope of the Sierra Nevada between the Sacramento Valley foothills and Echo Summit, is active in the ongoing protection of Pine Hill Preserve, the subject of a recent study on native bee foraging. Long-time chapter members Annie Walker-Barron and Shellie and Steve Perry also lead efforts to identify and protect rare plants on Lava Caps, an often overlooked and rare native plant habitat. Visit www.eldoradocnps.org to learn more.

VOLUNTEERS Make the Difference

Each year, thousands of CNPS volunteers are working to protect and celebrate native plants across California. The quarterly CNPS Volunteer Recognition Awards honor those who’ve contributed in significant ways to CNPS programs. A special thanks to our recent recipients: Elsah Cort, Alta Peak Chapter; Marty Foltyn, San Diego Chapter; and Mila and Adrian Stroganoff, Yerba Buena Chapter. Please visit cnps.org/volunteer-recognition to learn more about their years of dedication and service.

Have a volunteer you’d like to nominate? Contact Charlie Blair at blairce@sbceo.org.

Paving Paradise IN THE DESERT

As wildflowers explode at the southern border of Joshua Tree National Park, Riverside County is considering whether to pave over nearly 2,000 acres of that land for 8,490 new homes. Located about 15 miles east of Indio, the proposed site of the Paradise Valley Specific Plan serves as an important habitat corridor between the national park and conservation lands in the Orocopia Mountains and Mecca Hills to the south. CNPS has submitted comments on the Paradise Valley project’s environmental impact report and plans to testify against the project at the upcoming Riverside County Planning Commission hearing on May 15. Staff and volunteers will be present to stand against destructive sprawl and demand appropriately-sited infill development. Stay tuned to CNPS social media for opportunities to get involved.
FIESTA FLOWER (*Pholistoma auritum*)
This widespread coastal annual herb has a prickly stem that winds as it grows. Hairs and bristles cover the deeply lobed leaves, which cling to a lapel very nicely, perfect to wear to a fiesta! All three species of the genus bloom March through May.

JOSHUA TREE (*Yucca brevifolia*)
This woody succulent is an easily recognizable character of the Mojave Desert. The trunk branches to spiky clusters of leaves. The yucca moth is the only pollinator to transfer pollen between the waxy, white flowers blooming in April and May.

SNOW PLANT (*Sarcodes sanguinea*)
When the Sierra and Transverse ranges warm, a waxy, brilliant red stalk with bell-shaped flowers emerges in colonies May through July. Without chlorophyll, the plant does not photosynthesize. Instead, this “mycotrophic” gets nutrition from fungi below the soil.

MAIDENHAIR FERN (*Adiantum jordanii*)
Shaded hillsides and moist woodlands provide widespread habitat for this delicate species. A thin dark stalk, used in traditional basketry, connects to many green fan-shaped segments of the frond.

CALIFORNIA PEONY (*Paeonia californica*)
Endemic to (found only in) California’s coastal scrub and chaparral communities, this peony’s hanging red flower blooms January through May. It needs dry summer dormancy, making it uncommon in home gardens.
Extinction is on the rise worldwide, but California is pushing back. Out of more than 6,000 native plant taxa, only 22 are presumed extinct – and California’s botanical institutions are determined to prevent any further extinction of the state’s native plants.

In 2014, California’s native plant leaders came together to form the California Plant Rescue (CaPR) under the auspices of the Center for Plant Conservation, a national organization providing guidelines and support for native plant species survival. The goal: collect and conserve the seeds of 75 percent of plants ranked rare, threatened, or endangered (CNPS Rare Plant Rank 1B) in the California Floristic Province by 2020. The 75 percent by 2020 target is one of 16 plant conservation targets set by the United Nations Convention on Biological Diversity.

Thanks to the work of professionals and citizen scientists, the group is well on its way toward reaching its target, with more than 50 percent of 1B species now in collections. These collections preserve high levels of genetic diversity in botanic gardens and seed banks to safeguard populations against extinction. As progress advances, so too does support. California’s new Biodiversity Initiative, the statewide directive to preserve and protect biodiversity in the face of climate change, calls for increased funding to support the very efforts CaPR has well underway. (To read more about the initiative, see page 16).
Efforts in action

The CaPR collaborating institutions partner with land managers, funders, and other organizations to complete their collections. They also gather data about wild populations, providing baseline information for future generations. The collected seeds become the focal point of integrated plant conservation strategies, connecting collections, horticultural practices, and species-specific research for plant conservation.

CaPR members collect and store seeds as an irreplaceable insurance policy against loss in the wild, ensuring our plants never go extinct. The seeds we collect provide the raw materials for population enhancement, restoration, and recovery, as well as opportunities for research.

A seed has power. As ethnobotanist Gary Paul Nabhan has said, “It contains a life spark that allows the regenerative process to happen. We need seeds because they are the physical manifestation of that concept that we call hope.”

CaPR’s collaborative spirit has allowed the group to set ambitious goals, involving hundreds of people across the state. This photo essay documents the day-to-day life of CaPR over the past three years, through the different stages of seed collection, processing, and conservation work. From monitoring populations to preparing seeds to add to our seed banks, these activities feature some of California’s most beautiful plants and places.

In 2018, San Diego Zoo Global launched a new program to collect seeds of California rare plants south of the US-Mexican border. The efforts are focused on plants that are rare in both countries, including dehesa beargrass (Nolina interrata), known from a single population in Baja California, and a handful of occurrences in San Diego County. The binational team includes representatives from the CNPS Baja California Chapter, the Center for Scientific Research and Higher Learning of Ensenada (CICESE), and San Diego Zoo Global’s Plant Conservation team. Photo: Sula Vanderplank

CaPR members often work with partners in various tasks. Here California Department of Fish and Wildlife vegetation crew members Catherine Curley and Todd Keeler-Wolf discuss the nature of an isolated wetland stand in the Modoc Plateau region. Photo: Brett Hall

To learn more about CaPR and see a list of all CaPR participating organizations, please visit https://www.caplantrescue.org/about-us.html.

Christa Horn and Evan Meyer are members of the CaPR team. Christa is a Plant Conservation Program Specialist for the San Diego Zoo Institute for Conservation Research. Evan is Assistant Director of the Mildred E. Mathias Botanical Garden at the University of California Los Angeles.
Above: Rancho Santa Ana Botanical Garden’s senior field botanist, Duncan Bell, hikes to the top of southern California’s highest peak, Mount San Gorgonio, to make a seed collection of the newly described Krantz’s catchfly (*Silene kranztii*). Photo: Cheryl Birker

Left: Lindsey Hamilton pursues a mountain hemlock stand (*Tsuga mertensiana*) on Lincoln Ridge near Yuba Pass to measure snow accumulation, which provides summer irrigation for hemlocks and other montane forest species. Photo: Brett Hall

Below: Beach layia (*Layia camosa*) is a state and federally endangered annual wildflower threatened by coastal development, invasive plants, and foot and vehicle traffic. In 2017, the Santa Barbara Botanic Garden partnered with ManTech SRS Technologies, Inc. to survey and map beach layia at Vandenberg Air Force Base. This effort resulted in updated sub-meter accuracy maps for the extent and abundance of beach layia across the base, as well as the procurement of conservation seed collections. Photo: Heather Schneider
Above: In 2017 staff from UCLA and Rancho Santa Ana Botanic Garden made an expedition to the top of the Kingston Mountains with a volunteer tree climber (Brendan McCarthy of Skyline Landscapes) to collect seeds from the rare Mojave desert populations of white fir (Abies concolor). These unique populations, found only in highest peaks of a few isolated Mojave Desert mountains ranges, may be especially vulnerable to climate change. Photo: Duncan Bell

Left and Above: California Department of Fish and Wildlife botanist Merissa Hanisko reaches for the sky as she collects seeds of Castle Crags ivesia (Ivesia longibracteata), pictured here, a plant only known from the rock crevices of Castle Crags in Shasta County. Merissa and two additional volunteers joined a CNPS staff botanist to collect the seeds of this species along with Castle Crags harebell (Campanula shetleri), another rare species known only from the vicinity of the Crags. Photos: Aaron E. Sims

San Diego Zoo Global’s Joe Davitt worked with the Chaparral Lands Conservancy to collect seed of short-leaved live-forever (Dudleya brevifolia) and grow the seed out for a population enhancement of this narrow endemic. Photo: Christa Horn
Top left: Botanist Merissa Hanisko with the California Department of Fish and Wildlife collected the diminutive seeds of Castle Crags harebell (*Campanula shetleri*) as a CNPS volunteer. Left: Castle Crags harebell clings to rock crevices of cliff faces and rugged outcrops, making seed collection time-consuming and challenging for this rare California endemic. Photos: Aaron E. Sims

Left: Common species are also an important element of CaPR’s mission. Here Stacy Anderson collects California poppy (*Eschscholzia californica*) seed from plants tucked into a sea of invasive grasses in a protected area. Photo: Katie Heineman

A giant mountain dandelion (*Agoseris grandiflora*) with seeds fit to collect, found in the Santa Cruz Mountains. Photo: Brett Hall
HOPE FOR THE FUTURE

Left: The binational team collects seeds of the barberry-leaf goldenbush (*Hazardia berberidis*) on the dunes of Reserva Natural Punta Mazo in San Quintín, Baja California, Mexico. Photo: Sula Vanderplank

Above: Joe Davitt gently removes seed from the dried remnants of spreading navarretia (*Navarretia fossalis*), a threatened vernal pool species. Photo: Stacy Anderson

Below: Mexican collaborators collect seeds of multiple rare plants in one of the largest vernal pools in the California Floristic Province, in Baja California (Mexico). Photo: Sula Vanderplank

Left: The Santa Barbara Botanic Garden is a regional hub for seeds collected on the Channel Islands, like this soft-leaved indian paintbrush (*Castilleja mollis*), which is also listed as federally endangered. Photo: Christine Pang

Above: In summer 2018, a group of conservation corps members working with BLM assisted the UC Santa Cruz Arboretum to collect several rare species for long-term seed banking, including Pine Hill ceanothus (*Ceanothus roderickii*), Stebbins’ false bindweed (*Calystegia stebbinsii*), Red Hills soap plant (*Chlorogalum grandiflorum*), El Dorado County mule’s ears (*Wyethia reticulata*), and Layne’s ragwort (*Packera layneae*). Photo by Brett Hall

Left: CaPR’s rare plant seed collections are curated along guidelines established by the Center for Plant Conservation, including dividing the seed put into long-term storage between multiple banks for safety. After carefully cleaning the seed of the rare San Diego button celery (*Eryngium aristulatum* var. *parishii*), Tobin Weatherson divides the seed from each mother plant in two for long-term storage at San Diego Zoo Global’s seed bank and a backup with the National Laboratory for Genetic Resource Preservation in Fort Collins, Colorado. Photo: Joyce Maschinski
The citizen science tool iNaturalist (iNat) is arguably one of the world’s most powerful digital platforms for crowd-sourced biodiversity data, but co-founder Ken-ichi Ueda isn’t so sure it’s a success – at least not by his standards.

A lifelong naturalist and professional software engineer, Ueda first imagined iNat to be a sort of “super blog,” combining the functions of mapping, photo sharing, and observations. This was 2003, long before smartphone apps and social media hit the mainstream. Ueda, a Connecticut native, had just moved to the Bay Area and noticed the ways he and other nature lovers were using digital cameras, Flickr, and blogs to record observations. He wanted a tool that could do it all, so he enrolled in UC Berkeley’s School of Information, where he joined fellow students Nate Agrin and Jessica Kline to build what would become iNaturalist.

“My initial vision was that this would create a land ethic,” says Ueda, “that people would learn to care. But if I take a hard look at my own work, it’s a failure of the original vision. iNat does create that sense of connection and joy and wonder for the kinds of people who already care about those weird, wonderful things, but I don’t think it’s currently creating a lot of converts or new naturalists.”

The numbers seem to tell another story, however. A tool that had a few hundred users in 2008 now hosts 30,000 daily active users, 438,000 observers, and 64,000 volunteer
There’s a tension between utility and the sense of fun that drives the site. It’s a very real thing in citizen science that, often, useful information is hard to collect, not fun to collect, and not fun to analyze or even look at.

“identifiers” worldwide. If iNat hasn’t developed a cohort of new naturalists, it’s certainly brought the world’s existing ones together. In 2014, iNat became an initiative of the California Academy of Sciences, and in 2017, a joint initiative with the National Geographic Society.

Ueda credits much of that success to his iNat co-founder Scott Loarie, a former research fellow in the Global Ecology Dept. at the Carnegie Institute for Science and a lecturer in the Department of Geography at UC Berkeley. When the two met in 2011 Loarie was developing climate change statistical models and quickly saw iNat’s potential to provide missing biodiversity data.

“Scott was tapped into the conservation world and could see the real ways iNat could have an impact,” Ueda says. “If I built the house, he brought the party.”

Today, iNat is used worldwide by amateurs and scientists alike. (See sidebar on page 38.)

Recently, we chatted with Ueda about the tool’s utility and his desire that more people fall in love with the natural world. Following are excerpts of that conversation.

Ken-ichi, given iNat’s tremendous popularity, why do you feel it falls short of your original vision? From the outside, it looks like a huge success. It all depends on your goal. My definition of success is based on making a difference in people’s lives. My standard is: Did you really learn a name or did you just look at the screen? Did it stick with you?

Five to 10 percent of users are creating 90 percent of the content. I see a huge percentage of people that have one observation and never come back. I don’t know what happened after that. Did it change the way they view nature?

iNat users have contributed 16 million observations. That amount of data is a victory in itself, don’t you think?

That’s why I’m so glad to have Scott. Scott really gets the applied side of things. Scott used to end his talks saying he had all the climate data he could ever need but had zero biodiversity data. On iNat, we’re now collecting those kind of data about where and when organisms occur. That’s hugely motivating for people and potentially beneficial and useful.

I’m more about the warm fuzzies you get when someone says how awesome a bug is, or someone who studies a millipede but has never seen it before finally sees a picture, or someone in Hong Kong identifies a moth in your backyard. That’s what makes me happy.
I think that global community is part of the iNat magic. Is that something your team is deliberately cultivating, or has it just happened on its own?

We have organized partnerships in several different countries: Mexico, New Zealand, Canada, Columbia (iNat network). In these places, institutions pay us for a white label version of the site, and we’re providing technical infrastructure. By far, Mexico is the most active country. Our CONABIO [Comisión Nacional para el Conocimiento y Uso de la Biodiversidad] partners are awesome. They do all kinds of stuff — run TV ads, workshops, all kinds of outreach to bring people into the site.

In other parts of the world, it’s happened more organically. In Italy, we have a huge concentration of people who’ve found the site and told their friends. We’ve also got a lot of users in Hong Kong, Korea, Taiwan, and Singapore. In Australia we’re seeing huge growth mostly nucleated by this guy who’s super into fish and started a Fish of Australia project. The most recent hotspot is Russia, which is pretty cool. We’ve done nothing there and don’t know the story, but we do know they’ve been really active in translating the site. That’s a huge precondition for growth around the world.

Taxonomy is somewhat contrived and thus always fodder for dispute. If you think getting people on the same page in California is difficult, try doing it for the whole planet.
What do you think causes some projects to take off while others get little engagement?
The most important ingredient is an individual who is super motivated and actually uses iNaturalist themselves and thus understands what it can and can’t do. However, when potential project leaders lead by talking about what they’re going to do with the data, that never works out. If they start with, ‘Cool, I’m going to get this on my site and reach out to my mailing list and teach people how I use iNat,’ that’s going to work.

What are some of your favorite iNat success stories?
Well, one of our users submitted a photograph of a snail from Vietnam that was described by a naturalist who sailed with Captain Cook, and had hardly been seen since. Similarly, a tourist took a picture of a dart frog at an eco-lodge in Colombia, and a herpetologist in DC who had never seen it was able to identify it as a new species.

Here in the South Bay, volunteers used iNat to try to document and put a stop to extensive roadkill of newts on a particular road. Suddenly, there were hundreds of photos of smooshed newts. Six hundred photos of dead newts aren’t fun and are hard to look at, but they might be useful. This could actually do some good in the world.

Definitely not the nature glamour shots of Instagram.
Right. There’s a tension between utility and the sense of fun that drives the site. It’s a very real thing in citizen science that, often, useful information is hard to collect, not fun to collect, and not fun to analyze or even look at. Sometimes, people don’t want to record the kind of data you need.

So, how can the CNPS community and native plant lovers be of greatest help?
We really need people to add identifications on iNat. People take a lot of photos of plants because they’re easy to photograph, but they’re not always easy to identify. People are posting a lot of observations from their yards, from gardens, and other areas where the plants are exclusively cultivated. CNPS folks would do a lot of good by both identifying and marking plants as cultivated, so we can separate those two kinds of data. That would help these new users, who are almost all potential naturalists. You could be helping them out just by naming it.

I think that’s really important to note. Sometimes people who participate in our Facebook group get frustrated when newcomers post photos of common garden plants or non-natives asking for an ID. In fact, these are all teaching moments. How does the iNat team manage the people aspect of the platform?
First, I think it’s important that everyone understands iNat is a totally open community. It’s not for kids. It’s a community of strangers; it’s worth monitoring even your teenagers. A lot of personal info is being shared and it’s good to be aware of that.

iNat is largely a moderated space. We have staff that moderate and many, many volunteers who selflessly donate their time. iNat would be an immeasurably worse place without their help to resolve the tense situations that happen in every social space.

I would also ask that people would be a little forgiving of how we handle taxonomy on iNat. Taxonomy is somewhat contrived and thus always fodder for dispute. If you think getting people on the same page in California is difficult, try doing it for the whole planet [laughing].

> cont. on page 38
Human impact on our planet is incontrovertible, and the survival of our species depends on preserving Earth’s biodiversity.
Fifty years ago, a single photo forever changed the way we think about the Earth. Intrigued by rumors of secret NASA photos showing our planet from space, Stewart Brand agitated for their publication. In 1967, a photo of our incredible “blue marble” was released and then featured on the cover of Brand’s *Whole Earth Catalog*. This, along with Rachel Carson’s *Silent Spring* and other science communications, fundamentally transformed the way we view our world.

Americans listened to the science, spoke up, and got to work saving our planet. We closed burning garbage dumps on the shores of our lakes and bays, and enacted a succession of new laws: the Wilderness Act, National Environmental Policy Act, Clean Water Act, and Endangered Species Act. Together, we came to understand that there was no Planet B, and together we took bold action to protect our fragile and only home.

Today we are entering another moment of cultural awakening, similar to that of 50 years ago, in which new scientific information informs new personal understanding. We’re witnessing dramatic climate change, the “new normal” of wildfire, epochal tree die-offs, and apocalyptic declines in pollinators and insects. We are still collecting data, and it will be the continuing work of a new generation to fully understand what it all means, but one truth is becoming increasingly clear: As E.O. Wilson cautioned decades ago, human impact on our planet is incontrovertible, and the survival of our species depends on preserving Earth’s biodiversity.
The B Word

Public relations professionals have long advised environmental groups to avoid using the word “biodiversity.” In the ‘80s and ‘90s, their polling research showed that people associated the term with finger-wagging and divisive politics. Environmental advocates erred on the side of caution, instead using recommended phrases like “clean air” and “clean water.”

Here at CNPS, we think times have changed. We see people seeking a word that captures the science we see and the love we feel, and that word is biodiversity. Our language needs to expand to meet an emerging public recognition of the interconnectedness and value of different species, and of the individual differences that make each living thing special.

Growing numbers of people recognize the beauty that is the diversity of living things; they celebrate it. Today, urban hipsters are becoming mycophiles and Blue Planet is streaming on Netflix. The citizen science tool iNatura list has 16 million observations, created by people all over the world, obsessed with finding as many different types of life as they possibly can. Hashtags like #superbloom trend mightily on Instagram, and water cooler conversations gush over wildflower travel plans; upon returning from those pilgrimages, people share their worry that there weren’t as many bugs squished on the windshield as there were just a few years back. In a time of division, of bad news and ugly pictures, biodiversity is something that unites us, excites us, and reminds us of how wonderfully healing this living world truly is. We have fallen back in love with biodiversity, and that love deserves to be expressed.

The California Biodiversity Initiative

Even as public perception has undergone a little-noticed transformation in recent years, environmental protection and conservation frameworks in California have also evolved. For example, we are in an era of renewed regional conservation planning. These ambitious efforts apply the best available science to rationally identify areas most suitable for development, infrastructure, agriculture, and conservation, often over very large scales. The Desert Renewable Energy Conservation Plan (DRECP) is a 30-year plan that covers 26 million acres, a quarter of our state! Today, much of California is engaged in some form of regional conservation planning effort, providing a tremendous opportunity for securing long term protection of California’s biodiversity and rich natural resources.

The California Biodiversity Initiative is an exciting new approach to making the most of this rare convergence of opportunity, and CNPS is proud to contribute leadership toward ensuring its success. The Biodiversity Initiative began in 2017, when the governor’s office convened two dozen leading California biodiversity scientists with political appointees and leadership staff representing California agencies: Calif. Department of Fish and Wildlife, Calif. Department of Food and Agriculture, Department of Conservation, and the Governor’s Office of Planning and Research. Working together the group identified major opportunities and themes, and selected a small team to draft a statement of principle on behalf of California’s diverse community of biodiversity scientists. I was privileged to help lead the effort to draft this “Charter to Secure the Future of California’s Native Biodiversity,” thrilled to see it officially released in September 2018, and overwhelmingly gratified that it has since been signed by more than 450 California scientists who share our vision!
The biodiversity charter is an important document, a magna carta of shared values that we hope will inspire and unite Californians long into the future. It is already having an impact. Gov. Brown was inspired: In the closing days of his administration he issued several executive orders focused on biodiversity and native plants, and brought the charter to the Global Climate Action Summit so he could share it with the world. Finally, he directed his staff to work with our team of scientists to develop the California Biodiversity Initiative: a Roadmap for Protecting the State’s Natural Heritage.

You will probably recognize some of the work that is put forth in the Biodiversity Initiative’s seven-part roadmap. They are familiar projects that CNPS and partners have shown can successfully make a difference. Now, we are excited at the possibility of doing even more, addressing our priorities at a much larger scale, accomplishing them at a much-accelerated pace. Projects promoted in the governor’s roadmap include:

- Map all California’s native plants and vegetation, to best understand how to save them;
- Seed bank California’s rare plants, to create a hedge against extinction;
- Identify California’s Important Plant Areas, to ensure they are saved;
- Engage and educate, via gardening and rare plant treasure hunts, to involve all Californians in celebration and protection of our diverse native plants.

Much of the work we are doing at CNPS fits into this new framework. As our conservation team works with agency leaders to reform forestry management and fire protection, the Biodiversity Initiative provides a powerful framework for communicating current science and explaining win-win approaches. As our outreach and horticulture team partners with water districts to replace lawns with natives, the initiative makes the case for planting the local plants that support specialized pollinators and beautify our communities. Going forward, we will build stronger partnerships and find greater understanding as we invest in growing support for these proven approaches through a single focus — biodiversity.
21st century action

CNPS staff are now meeting with agency leaders and legislators, and also working to build the broad community of nonprofit and university partners that together will advance this paradigm-changing initiative. The list of signatory scientists continues to grow, and soon we will introduce a “citizen sign-on” so Californians everywhere can add their voices in support of our shared commitment to biodiversity. These actions will support our new Gov. Gavin Newsom as he moves forward with the ambitious steps laid out in the roadmap.

Our very near term work is guided by the important biodiversity goals specified by the United Nations in the Global Convention on Biological Diversity (CBD). Currently, many countries are making minimal progress toward the 2020 goals, and experts are concerned that when the world meets in China for the 2020 conference, members will soften their targets. While the US is not a signatory to the CBD, California will be an active subnational participant at the upcoming convention. We hope to demonstrate strong success toward the 2020 goals, so we can exhort others to follow our lead. This is what California did with regard to the Paris climate change accords, further establishing California as a global model for what’s possible.

For this reason, efforts in coming months will include a focus on plants. While the overall Biodiversity Initiative includes all taxa, the UN goals for plants are especially well developed with clear numeric targets specified in the Global Conservation Strategy for Plants. Moreover, we have made strong progress toward achieving the 2020 goals. For example, 75 percent of rare plants are to be seed-banked by 2020; thanks to the work featured on page 6 of this issue, California is currently at more than 50 percent. California is one of 34 global biodiversity hotspots, and this approach will enable us to focus efforts and demonstrate progress toward demonstrating our ability to saving globally significant biodiversity.

Toward this end, California is moving rapidly on a number of key projects. The Calif. Department of Fish and Wildlife and the Calif. Department of Food and Agriculture are the roadmap’s state agency leads and have already started securing funding for their biodiversity initiative work. Thus far, the initiative has brought funding for a new biodiversity coordinator, for invasive species efforts, and $1 million to map vegetation of the Southern Sierra Nevada Foothills — the portion of the state at greatest risk of catastrophic habitat development in coming years. Now, we are hoping to see another $4.2 million in funding for eight agency biodiversity positions and to map soil carbon, and $2 million to fully complete seed banking all of California’s 1B-ranked rare plants!

We are also beginning development of a detailed implementation plan, which will bring together dozens of organizations and scientific partners to contribute ideas that will guide our actions in the coming years. This effort is being led by Brent Mishler of UC/Jepson Herbaria representing the university stakeholder group, and CNPS representing nonprofit stakeholders. The plan will include actions that can be accomplished in the near term, but also those that will require more sustained efforts to yield more enduring benefits.

> cont. on page 39

By 2020, seeds will be collected and stored for 75 percent of rare plants in the California Floristic Province, which includes areas like Mesa Colonet in Baja California, Mexico. Photo: Jim Riley
Two years ago, you could see California’s epic blooms from space. The good news is that most of us have a chance to see them up close, and this year is already a special one. California offers diverse and beautiful places to view spring wildflowers, from the Mojave Desert to coastal dunes. These shows of beauty are a great excuse to get outdoors and discover the natural wonders of the state.

1. Carrizo Plain National Monument
   **Location:** San Luis Obispo County
   **When:** Mid March-early May
   **Highlights:** One of the premier locations for wildflowers in California, the Temblor range features massive displays of common monolopia (Monolopia lanceolata), phacelia (Phacelia spp.), and California poppies (Eschscholzia californica). Watch for rare plants like California jewelflower (Caulanthus californicus) and Munz’s tidtytips (Layia munzii).

2. Santa Monica Mountains
   **Location:** Los Angeles County
   **When:** April-June
   **Highlights:** Most of this mountain range burned in 2018 making this a great place to view fire-following annuals in the coming years.

3. Anza Borrego Desert State Park
   **Location:** San Diego County
   **When:** February-May
   **Highlights:** Unbeatable in a year with good precipitation. Visitors can enjoy the sight of ocotillo (Fouquieria splendens) towering over an expanse of desert dandelion (Malacothrix glabrata).

4. Table Mountain
   **Location:** Butte County
   **When:** March-May
   **Highlights:** One of the more reliable locations for displays of lupines (Lupinus spp.) and purple owl’s clover (Castilleja exserta). Look out for the rare, endemic, yellow-flowered Jokerst’s clover (Trifolium jokerstii).

5. Jepson Prairie
   **Location:** Solano County
   **When:** March-May
   **Highlights:** A great place to learn about vernal pool habitats and see what the Central Valley would have looked like before development and agriculture. The Solano Land Trust hosts excellent docent-led tours.

6. Joshua Tree National Park
   **Location:** Riverside County
   **When:** March-May
   **Highlights:** It is hard to beat the majestic, boulder strewn landscape of Joshua Tree, studded with poppies, phacelia, and desert dandelion. The Joshua trees (Yucca brevifolia) themselves are a treat.

7. Bear Valley
   **Location:** Colusa and Lake counties
   **When:** March-May
   **Highlights:** Stunning displays of California poppies, lupines, and purple owl’s clover decorate this inner coast range valley. Be on the lookout for the rare, fragrant adobe lily (Fritillaria pluriflora) in March.

8. North Coast Dunes
   **Location:** Humboldt County
   **When:** April-June
   **Highlights:** Home to some of California’s finest sand dune habitat, Lanphere-Christensen Dunes in Humboldt County is accessible via guided tours only. Look for gems like sand verbena (Abronia spp.) and beach morning glory (Calystegia soldanella).

9. Red Hills
   **Location:** Tuolumne, Sierra Nevada
   **When:** March-April
   **Highlights:** This is one of the finest places in California to appreciate serpentine habitats. Serpentine, our state rock, host a unique array of plants endemic to California and this soil type. Look for rare plants like Rawhide Hill onion (Allium tuolumnense) and carpets of goldfields (Lasthenia gracilis).

10. Punta Mazo Nature Reserve
    **Location:** Baja
    **When:** October to March
    **Highlights:** For the true adventurer, this hotspot is about a 5-hour drive south of San Diego near San Quintin, Mexico. The incredible landscape boasts volcanoes home to rock daisy (Perityle emoryi) and the rare, Anthony’s live-forever (Dudleya anthonyi).

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Some of our favorite wildflower hotspots

Photo: Nick Jensen

BY NICK JENSEN AND KATHY MORRISON
Most Common California Wildflower Families

**Asteraceae**
*Common name:* Sunflower  
*Representative species:* Goldfields (*Lasthenia gracilis*); common monolopia (*Monolopia lanceolata*)  
*ID know-how:* Sunflowers can be recognized easily by their composite inflorescences (aka heads), tight clusters of many small flowers with a series of bracts below. With more than 1,000 taxa, the sunflower family is the most diverse plant family in California.

**Boraginaceae**  
*Common name:* Borage  
*Representative species:* Rusty popcorn flower (*Plagiobothrys nothofulvus*); common fiddle-neck (*Amsinckia intermedia*)  
*ID know-how:* The borage family is closely related to the waterleaf family. Borages typically have fruits with four nutlets. Look for popcorn flowers (*Cryptantha* spp. and *Plagiobothrys* spp.) with white flowers, and fiddlenecks (*Amsinckia* spp.) with yellow flowers.

**Papaveraceae**  
*Common name:* Poppy  
*Representative species:* California poppy (*Eschscholzia californica*); cream cups (*Platystemon californicus*)  
*ID know-how:* This family includes our state flower, the California poppy, which creates some of the most spectacular displays in the state. Species in this family usually have large showy petals and many stamens.

**Hydrophyllaceae**  
*Common name:* Waterleaf  
*Representative species:* Tansy-leafed phacelia (*Phacelia tanacetifolia*); baby blue eyes (*Nemophila menziesii*)  
*ID know-how:* Species in the waterleaf family are identified easily by their coiled inflorescences, called scorpionid cymes. Flowers are often purple or blue (especially in *Phacelia*). Fruits are many-seeded capsules.

**Fabaceae**  
*Common name:* Pea  
*Representative species:* Sky lupine (*Lupinus nanus*); tomcat clover (*Trifolium willdenovii*)  
*ID know-how:* With 500 taxa, the pea family is one of California's most diverse. The most obvious feature of the pea family is, well, fruits that look like pea pods. Many members of the family have a characteristic “pea flower.” The leaves are either divided and feather-like (pinnate), or hand-shaped (palmate).

**Polemoniaceae**  
*Common name:* Phlox  
*Representative species:* Birds-eye gilia (*Gilia tricolor*); evening snow (*Linanthus dichotomous*)  
*ID know-how:* Plants in this family can be recognized by their five fused petals at the base and three-part stigma. While this family is not particularly diverse from a worldwide perspective, more than 250 taxa occur in California.
Orobanchaceae
Common name: Broomrape
Representative species: Purple owl's clover (Castilleja exserta); butter and eggs (Triphysaria eriantha)
ID know-how: The broomrape family includes paintbrushes (Castilleja spp.) with relatively inconspicuous individual flowers, but colorful leaflike bracts below each flower. All plants in this family tap into the roots of host plants for nutrients.

Liliaceae
Common name: Lily
Representative species: White fairy-lantern (Calochortus albus); butterfly mariposa lily (Calochortus venustus)
ID know-how: In California, this showy family includes about 100 species. Look for large flowers with parts arranged in groups of three or six (e.g., Calochortus have three sepals and three petals that are often very similar in appearance).

Lamiaceae
Common name: Mint
Representative species: Thistle sage (Salvia carduacea); chia (Salvia columbariae)
ID know-how: Many species in the mint family are perennials or shrubs, but in a good rain year chia (Salvia columbariae) makes a showy display. Distinctive characteristics include square stems, opposite leaves, and bilaterally symmetrical flowers arranged in clusters along the stem. Look for the gem, thistle sage (Salvia carduacea), in Southern California.

Polygonaceae
Common name: Buckwheat
Representative species: Rose buckwheat (Eriogonum roseum); pink spinflower (Chorizanthe membranacea)
ID know-how: Buckwheats often create spectacular displays of color in the summer and fall, long after the blooms of spring flowers have faded. The numerous small flowers of wild buckwheats (Eriogonum spp.) and close relatives are borne together above cuplike structures called involucres.
Do the right thing

Remember that wildflowers are for all visitors to enjoy. Be respectful of others while reveling in one of California’s finest natural treasures.

Do:
- Follow signs, trail closures, and recommendations of land managers.
- Drive safely while traveling to and viewing wildflowers (don’t block roads).
- Be prepared. Plan accordingly, and make sure you are prepared with food, water, and safety gear during road trips and hikes.
- Join CNPS! Being a member is the best way to support California’s wildflowers.

Don’t:
- Walk off trails or step on flowers.
- Drive off roads unless you are in an area where this is specifically permitted.
- Crush or lay down on wildflowers while posing for or taking pictures.
- Pick or collect plants unless you have the proper permits and permission from the landowner.

Activities for Wildflower Visitors

Photography Capture California’s splendid wildflower shows and share your photos with #CNPSsuperbloom.

Plant identification Discover which wildflowers you’re seeing using the resources listed below.

Hiking A great way to experience the bloom up close.

Scenic drives Many large parks and nature preserves lend themselves to long, eye-popping drives.

Citizen science Document what you see using iNaturalist or join a CNPS Rare Plant Treasure Hunt.

Art Sketching or painting is a great way to observe flowers and landscapes in a new way.

Get involved and make a difference Connect with local CNPS chapters to pull invasive plants competing with wildflowers.

Flower ID Resources

CNPS Public Facebook Group (https://www.facebook.com/groups/38417209275/) This savvy group can help you ID almost any wildflower you find.

Calflora (https://www.calflora.org/) A comprehensive plant ID resource, including “What grows here?” where users can search for plants using an online map.

iNaturalist (https://www.inaturalist.org/) Post observations from the field with your smartphone. The online community will identify unknowns and verify your IDs.

Calphotos (https://calphotos.berkeley.edu/) An enormous, searchable photo database of California’s flora and fauna.

CNPS webstore (https://store.cnps.org/) Your go-to for botanical books and guides.
definitely home

Originally published in
Fire and Rain: Ecopoetry of California

Riparian
willow and mule fat congregations —
noon’s withering glance, rebuked
in the cathedral of sycamore arches
yellowthroat choirs join in, jubilant

Slope effect
how green follows north folds —
no fence-line created this contrast —
half-hills quilted with laurel sumac
quail embroidering the curvaceous air

Drought deciduous
in dry times leaves retreat
not skeletons, but patient dancers
who wait for winter’s sweet beating
rain drums – who can hold on till then

Vernal pools
ephemeral home of fairy shrimp –
no fish survive summer’s dust
just round rainbows of wildflowers
doomed to recede, recede, reseed

Chaparral
look out: California’s wild identity
the opposite of disneyfication
old-growth elfin forests – licked
like frosting by tongues of wildfire

BY THEA GAVIN

Thea Gavin is a member of the CNPS Orange County Chapter. She organized and led the CNPS 2018 Conservation Conference poetry event, Native People, Plants, Poetry: A Celebration.

Fire and Rain: Ecopoetry of California (Scarlet Tanager Press, 2018) contains 250 poems by 149 authors in a showcase of deep connection to California’s natural landscapes.

Miner’s lettuce (Claytonia perfoliata). Photo: Dylan Neubauer
After years away, Carl and his wife moved back to California in January 2015, settling in Riverside. The region has the driest climate Carl has lived in, and arriving in the midst of a major drought was quite a shock, he says. Nonetheless, native plants were still growing in the local parks. Amazed and inspired by this, Carl asked his landlords for permission to replace the lawn with a native garden. Thankfully, they agreed!

A home for pollinators

Watching the plants grow and bloom the following season, Carl grew interested in the variety of pollinators drawn to the native plants. He learned that California has 1,600 species of bees, the majority of which are native (the honey bee being a notable exception). These bees come in many shapes, sizes, and colors (including iridescent green and blue) and coevolved with native plants. In fact, many will collect pollen only from particular types of plants. Carl decided to create a year-round food supply for these bees and other pollinators like butterflies, moths, and bats.

Today, Carl enjoys watching birds visit the birdbath and feed on seeds and insects in the garden. He loves the smell of the garden and how it changes with the seasons. After winter and spring rains, the yard has the moist, refreshing scent of sages and sagebrush. The heat of late summer brings out the aroma of sunflower (Helianthus sp.), tarplant (Deinanadra paniculata), brickell bush (Brickellia californica), and thickleaf yerba santa (Eriodictyon crassifolium).

Carl is excited to help his neighbors and community see and recognize the seasonal beauty and rhythms of our native flora. In schools, students learn about the seasons of northern Europe or the Northeast. Yet in Riverside,
Carl believes that it will be easier to protect and promote native plants if people understand that those brown shrubs are very much alive, just like bare trees in winter.

many of the shrubs go dormant over summer, and people perceive the brown hills to be dead. Carl believes that it will be easier to protect and promote native plants if people understand that those brown shrubs are very much alive, just like bare trees in winter.

Through his native garden, Carl hopes that he has inspired others in the neighborhood to include some native plants in their yards. He finds it especially rewarding when a stranger walking or driving by stops to ask about the plants and say how much they enjoy passing by his garden.

> cont. on page 28

**Carl’s favorite California native plants**

- **California buckwheat** (*Eriogonum fasciculatum*) - Produces a profusion of flowers from spring to fall without any care or extra water.

- **Coast live oak** (*Quercus agrifolia*) - Reminds him of home (the Bay Area).

- **Phacelia** (*Phacelia* spp.) - Beautiful flowers that attract a wide range of interesting pollinators.
About the garden...

BY CARL MAUTNER

Garden location: Front yard
Garden size: Approximately 2,800 square feet
Year planted: Fall 2015
Lawn removal method
By hand. I've been slowly making my way across the yard, trying to get rid of a bit more grass each year.

Style inspiration
I drew inspiration from walks in our local open spaces, and from other native gardens, particularly the Land Use Learning Center garden run by the Riverside-Corona Resource Conservation District. I designed the garden to be based mostly on coastal sage scrub with a few hints of chaparral and desert, and sowed patches of annual seeds in the bare soil between the shrubs.

I have also tried to make use of existing features of the property. For example, the roof of the house does not have gutters, so the drip line of the house gets much more rainwater than the rest of the yard. I have found that I can plant things there like California goldenrod (*Solidago velutina* ssp. *californica*) and blue-eyed grass (*Sisyrinchium bellum*) that would need additional water if I planted them elsewhere.

Go-to native plant nurseries
Theodore Payne Foundation, Rancho Santa Ana Botanic Garden, and the local CNPS chapter plant sale.

Irrigation
I hand-water to get plants started, then supplement the rain in the winter and spring if we have unusually dry spells. With a few exceptions, like hummingbird sage (*Salvia spathacea*) and the non-native shade trees, I don't water the established plants between June and October.

Maintenance
During the winter I weed as often as I have time at least weekly. In the spring after the most of the annuals have gone to seed, I clear them out and collect some of the seeds to share with friends.

Wildlife spotted
Lots! Western bluebirds, goldfinches, yellow-rumped warblers, cedar waxwings, bushtits, scrub jays, California towhees, and dark-eyed juncos are just a few of the birds that visit.

Favorite element
It is impossible to choose one, but I’ll say buckbrush (*Ceanothus cuneatus* var. *cuneatus*). I am amazed at its heat resilience.

Biggest challenge
Weeds, Argentine ants, and spending too much time in the yard!

Advice
Many of the plants popular at plant sales have spectacular blooms in the spring. However, there are also late-blooming native plants (particularly asters) that are super important for pollinators. Consider planting ones that are native to your area to keep your garden blooming into the fall.
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Photo by Jeb Bjerke
Q: I’ve been reading about the insect apocalypse and declining monarch butterfly populations. Why are native insects important, and how can I support them in my garden?

A: Native plants serve as food and shelter for many species of native insects. Whether in the wild or in the garden, they exhibit a variety of fascinating interactions. We can boil them down to either one- or two-sided interactions.

One-sided interactions benefit the individual insects that feed on the plant, such as on sap, leaves, buds, and/or other parts. Since most herbivorous insects are host-specific — they feed only on one or a few related plant species — just having these native plants in the garden promotes survival of their dependent native insects.

- Larvae of the achemon sphinx moth, *Eumorpha achemon*, feed on leaves of native grapes, both *Vitis girdiana* and *V. californica*. Every year, the plants in my yard are inhabited by these caterpillars, which are surprisingly difficult to locate.

- When manzanitas (*Arctostaphylos* ssp.), bloom in winter-spring, they are host to numerous species of native butterflies, flies, and bees, such as the red admiral butterfly (*Vanessa atalanta*). Every garden needs at least a handful of manzanitas.

Two-sided or mutually beneficial interactions are activities that provide benefit to both insect and plant. Certainly the most widely discussed two-way interaction is pollination. As the insect gathers nectar and/or pollen, pollen sticks to its body, sometimes powdered all over like snow. Even the most careful insects inadvertently drop some of the pollen they so assiduously collect. Pollen that lands on a receptive stigma, either within the same plant/flower or between the flowers of different individual plants, successfully becomes an agent of pollination. Pollination, when successful, leads to fertilization, seed production, fruit growth, and seedling production.

If insects were 100 percent successful at gathering and retaining the pollen they encounter, there would be no pollination and therefore no reproduction of insect-pollinated plants. As Charles R. Darwin said, “Natural selection will not produce absolute perfection.” (*On the Origin of Species*, Chapter VI.) Fortunately for plants, he was correct; pollinating insects are sloppy.
“

A garden full of locally native plants provides food and shelter for native insects.

Adult insects use the pollen and nectar they collect to feed themselves and/or feed their young. Thus, pollen-collecting and successful pollination are both mutually beneficial interactions. Insect-pollinated native plants require insects for their own reproduction.

How can I support native insects in my garden?

We can support these native insects by using locally native plants, eliminating pesticides, reducing garden disturbance, controlling our use of mulch, and changing human notions about native insects.

• A garden full of locally native plants provides food and shelter for native insects.

• A hard look at pesticides reveals that nearly all are used against non-native insects that feed on non-native garden plants. A native garden, then, has no need for pesticides. The insects that show up to feed on those native plants belong there.

• Soil cover (mulch) is often overused. Sure, it helps keep weeds down, but it also covers the bare soil required for nesting by many species of native bees, egg-laying by grasshoppers, and soil pupation by many species of moths and beetles. Try to keep at least some areas of undisturbed bare soil to allow these insects to survive.

We must change the all-too-common human perception that having insects on our plants is a bad thing – it’s not. Enjoy the insects!

Robert L. “Bob” or “BugBob” Allen has studied insects and plants since early childhood in San Juan Capistrano, Calif. He is now an adjunct professor of biology at Santiago Canyon College and Orange Coast College, a research associate in entomology at the Natural History Museum of Los Angeles County, a research associate at the Rancho Santa Ana Botanic Garden, a horticultural consultant, and author of Wildflowers of Orange County and the Santa Ana Mountains.
Wild for **Wildflowers**

BY ELIZABETH KUBEY

Spring is here, and it’s time to get outside and enjoy the wildflowers. Your native plant “homework” this season is to plan a hike with your family or visit a nearby garden. Need ideas? Go to your local CNPS chapter’s website (cnps.org/chapters/map) to find recommended hikes and native garden tours. Once you’re at your destination, try these activities to observe the variety of shapes and colors in flowers that help attract insects to pollinate them.

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**Zoom In, Zoom Out**

✓ **Best for ages 8+**  ✓ **30 minutes**  ✓ **Notebook**  ✓ **Drawing supplies**

Let’s observe a flower from three scales: life-size, magnified, and from a distance. Notice how features move in and out of focus at each point. We can easily miss important characteristics by getting stuck at one level of focus in our observations and drawings. **First, a little exercise:**

- Stand far enough away from the flower so you can see it in its habitat. What do you notice?
- Next, walk up close to the flower. What do you notice close up? Did your observations change at different distances?

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**Journal your observations through writing and drawing.** Draw a life-size view of your flower. If the plant is bigger than your paper, draw your favorite part. Then choose an interesting detail to show zoomed in. At the side of the paper, draw a magnified view showing features that are too small to be shown in the life-size image. Finally, take a few steps back from the plant and make a final sketch, this time zoomed out to take in the whole plant, and some of its environment. Remember, you can observe all plants from these three levels of focus!
Plant Timeline

✔ Best for ages 8+  ✔ 30 minutes  ✔ Notebook  ✔ Drawing supplies

Now that you can notice differences in flowers at three scales, use those skills to document one flower species at different stages of growth. Try to find an area with lots of flowers of the same species.

• Identify one flower that you think is at the peak of its bloom.

• Make a careful diagram or sketch of that flower in the middle of your page.

• Next, find a flower that is a little further developed or older than the one you sketched. Draw it to the right of your first flower.

• Then find one that is a little less open and draw it to the left of your flower.

Continue like this, adding flowers on either side and see if you can find ones that are still in bud or perhaps even producing a fruit. See if you can find the youngest and oldest stages. If you have access to see the flower over weeks, you can make a timeline for that individual.

Can you find the oldest and youngest flowers in these photos?

Left: California poppies (Eschscholzia californica). Right: Seaside daisies (Erigeron glaucus) Photos: Elizabeth Kubey

Special Thanks to John Muir Laws

These beautiful illustrations and activities are adapted from Opening the World through Nature Journaling: Integrating Art, Science, and Language Arts by John Muir Laws, Emilie Lygren, Emily Breunig, and Celeste Lopez. To purchase a copy, please go to store.cnps.org. Visit johnmuirlaws.com to learn more about John Muir Laws and his work.
Please join us in thanking these **Legacy Circle members** for including the California Native Plant Society in their estate plans.

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*If you have included CNPS in your estate plan and are not listed here, please accept our apologies and let us know!*
To inquire about giving to CNPS through your will or trust, contact Christine Pieper, Development Director

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Irwin and Mary Frances Vogel

“California’s plant diversity is astounding to me, and I want to see it protected for centuries to come.”

— Susan Cochrane Levitsky

“We’ve got to do everything we can to save what’s left of our natural ecosystems.”

— Jake Sigg

“If you love plants, CNPS is a really great cause.”

— Glen Holstein

Photos: Nick Jensen
Julie Clark De Blasio

A CNPS member since 2006, Julie Clark De Blasio is the conservation chair of the Los Angeles/Santa Monica Mountains Chapter and recently served on the CNPS state board of directors. In her volunteer roles, Julie works closely with community groups, governance, academia, environmental organizations, and other CNPS chapters. Professionally, Julie works as a community education specialist for the University of California Cooperative Extension, where she works for natural resources and urban forest protections. She has a personal focus on the role of carbon capture and retention in native plants, habitat, soils, and naturally occurring water bodies.

What spurred you to join CNPS?

A CNPS member looked me in the face, told me she intuitively felt I needed something more in my life, and believed that an organization with which she was active might be a perfect fit. The suggestion was spot on!

I relocated to the Los Angeles area from the Central Coast in 2001 and often intersected with longtime CNPS fellow and member Betsey Landis at public meetings. These exchanges were conservation projects associated with my work as an environmental scientist for the State of California, National Park Service, and a local land trust. At these meetings, CNPS advised on sustainability and protections of existing native plant communities, public access to education and outreach regarding the benefits of native plant communities in watersheds, and the roles of natural vegetation in the fire regime.

My involvement in CNPS happened organically. In retrospect, it became a personal missing link of community based conservation that created continuity and balance [for me] between intellect, heart, spirit, and body.

Do you have a favorite CNPS program?

At the risk of reading non-committal, I can honestly state I enjoy and have learned from the various CNPS programs. There is a personal proclivity toward conservation, climate change, biodiversity, vegetation, and rare plants due to my background. The horticulture program has taught me skills to be more hands on with native plant landscaping and restoration.
My involvement in CNPS happened organically. In retrospect, it became a personal missing link of community based conservation that created continuity and balance [for me] between intellect, heart, spirit, and body.”

— Julie Clark De Blasio

### Why have you decided to make a provision for CNPS in your estate plans?

CNPS to me is a sound investment. It is a stable, forward-thinking, science-based organization. The leadership, staff, members, and partners are integral to its success. Legacy contributions to CNPS afford the sustainability of the organization over generations.

### What compels you to continue supporting CNPS today?

CNPS is committed to being a partner and voice for native plants and habitat that I support without hesitation. The balance of conservation and plant science backed by research, land use planning, and policy make CNPS a respected organization throughout the state.

### Are You Future-Minded?

Find out how to become a CNPS Legacy Circle member today. Email us at legacy@cnps.org.

### Become a Certified California Consulting Botanist

Professional certification for field and consulting botanists is good for the profession and the environment. Certification formally recognizes botanists who:

- Incorporate scientifically sound botanical principles in decision-making
- Meet a minimum set of standards in knowledge and experience
- Adhere to high ethical standards

To learn more about the program, including who is eligible, the application process, and how to prepare for the exam, visit:

www.cnps.org/bot-cert

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Indeed! Given the public nature of iNat, people also are rightfully concerned about sharing data that could make sensitive species vulnerable to poachers or even just too many visitors. How do you address this concern?

For taxa or species that we know to be threatened, like CNPS-ranked rare plants, we will automatically obscure the coordinates of that species. The true coordinates are only displayed to the person making the observation. For the public, we display a randomly chosen location within a 0.2 degree cell that contains the true coordinates. That makes it really hard then to know where something is. In fact, it’s annoying enough that many scientists approach us because they can’t get the data unless it’s part of a project. It’s a tightrope. People really like their maps.

For each individual observation, you can also manually obscure the coordinates or hide them completely. But these kinds of obscuration methodologies are not absolute. If someone is intent on breaking down your door, they will.

Bottom line, if you’re really concerned, don’t upload.

I’m sure you hear from a lot of folks with ideas for the platform. What is the best way to submit suggestions?

We have a new forum, https://forum.inaturalist.org/, that is replacing our aged Google Group. It’s a lot easier to use and it should help us be more responsive to people’s needs.

Tools like iNaturalist can be culturally game-changing. There’s something transformative about being able to know something and name it. How do you think about that as a naturalist?

Anyone who has traveled or gone to a different kind of grocery store should understand this. Think about when you’re in a foreign place and don’t know what to eat. Taxonomy and ontology are the first steps to knowledge. What are these things? How do I communicate about them if I don’t have a name? If you don’t know the names, nature tends to look like a green and brown blur. A forest in California is the same thing as a forest in South Africa. You and I know that is radically untrue, but to a lot of people a tree is a tree. For some reason it’s not obvious that there are thousands of different kinds of trees, and each has value. When you know these things, the world is much richer and more complex than you might have imagined. Sometimes that can be really overwhelming but also a source of real joy.
We need to use a common language, follow the same map, and continue to build on the momentum California’s leaders put in motion.

We have a special opportunity

California’s Biodiversity Initiative holds tremendous promise, but groups like CNPS must take swift and resolute action. We need to use a common language, follow the same map, and continue to build on the momentum California’s leaders put in motion.

All too often, the environmental movement has fragmented at moments of critical opportunity. Recently, in the pages of *Flora* magazine, seasoned legislative experts have advised us to find shared priorities and work together in common cause. This approach is long overdue, and it’s what the California Biodiversity Initiative offers.

Our moment has come. We are experiencing a convergence of new scientific information, political opportunity, and cultural zeitgeist similar to that which changed the world 50 years ago. Back then, improved understanding of natural systems changed public sentiment, creating a window of opportunity for action. We updated our conservation toolbox based on what was then cutting edge science. Those tools worked exceptionally well, and today our water and air are cleaner, our wetlands protected, and we have secured as public land an astounding 50 percent of our state. That said, it is time for an update. In 50 years, our scientific understanding has advanced tremendously. We now have tools that give us unimaginable ability to count trees from space, read the fundamental code of life written in each cell, engage every citizen in biodiversity science, and make all of those new data available in maps and models all Californians can use. It is time to update conservation accordingly.

We must seize this opportunity. We will strive to complete an ambitious survey of all California’s biodiversity, so we have the data required to map a win-win future. We will work for an end to extinction, and accelerate the healing of natural landscapes and human communities. Working together, we will demonstrate to the rest of the world how an enlightened civilization, applying sound data and shared commitment, lives in a diverse and productive land.

Dan Gluesenkamp is executive director of the California Native Plant Society.

**Want to know more about the California Biodiversity Initiative? Start here:**

Site for general information, plus scientist and citizen sign-ons: [http://californiabiodiversityinitiative.org/](http://californiabiodiversityinitiative.org/)


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1600 species of native bees live in California’s rich ecosystems.
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http://ucanr.edu/ca-bees
Upcoming Events | APR 11 – JUNE 26

California Native Plant Week is April 13 – 21! CNPS chapters have a full schedule of garden tours, wildflower shows, plant sales, and field trips to make this spring our best yet. Go to cnps.org/events or your local chapter’s website to see them all.

CNPS Chapter Plant Sales and Wildflower Shows

<table>
<thead>
<tr>
<th>Date</th>
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<tbody>
<tr>
<td>Apr 13</td>
<td>Marin Chapter Plant Sale</td>
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<tr>
<td>Apr 13</td>
<td>Napa Valley Chapter Wildflower Show and Plant Sale</td>
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<tr>
<td>Apr 13</td>
<td>Los Angeles/Santa Monica Mtns. Chapter Symposium, Wildflower Show, and Plant Sale</td>
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<tr>
<td>Apr 13</td>
<td>San Luis Obispo Chapter Wildflower Show</td>
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<tr>
<td>Apr 13</td>
<td>Santa Cruz County Chapter Plant Sale</td>
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<tr>
<td>Apr 14</td>
<td>Mount Lassen Chapter Wildflower Show and Plant Sale</td>
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<tr>
<td>Apr 19-21</td>
<td>Monterey Bay Chapter 58th Annual Wildflower Show</td>
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<tr>
<td>Apr 27</td>
<td>Kern Chapter Spring Plant Sale at Garden Fest</td>
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<tr>
<td>May 3-5</td>
<td>North Coast Chapter Wildflower Show and Plant Sale</td>
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<tr>
<td>May 4</td>
<td>Milo Baker Chapter Plant Sale</td>
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<tr>
<td>May 4</td>
<td>Willis L Jepson Chapter Plant Sale</td>
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<tr>
<td>May 25-25</td>
<td>Dorothy King Young Chapter Wildflower Show</td>
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Native Plant Garden Tours

*Inspiring tours hosted by CNPS chapters and partners*

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<tr>
<th>Date</th>
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<tbody>
<tr>
<td>Apr 13</td>
<td>Orange County Chapter Garden Tour</td>
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<td>Apr 13-14</td>
<td>San Diego Chapter Garden Tour</td>
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<td>Apr 27</td>
<td>Sacramento Valley Chapter Garden Tour</td>
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<td>May 4</td>
<td>Marin and Milo Baker Chapters at Sonoma-Marin Eco-Friendly Garden Tour</td>
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<tr>
<td>May 4-5</td>
<td>Santa Clara Valley Chapter Going Native Garden Tour</td>
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<tr>
<td>May 5</td>
<td>Alameda and Contra Costa County Bringing Back the Natives Garden Tour</td>
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<tr>
<td>May 5</td>
<td>Mount Lassen Chapter Garden Tour</td>
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</tbody>
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UPCOMING EVENTS

APRIL

APR - JUN 1
Beauty and the Beast: California Wildflowers and Climate Change
Marin Chapter
Award-winning photographers Rob Badger and Nita Winter have spent 20 years capturing California's vanishing wildflowers, bringing awareness to their beauty as well as to the dangers facing our natural habitats from climate change.

APR 1
Wildflower hike in Springville
Alta Peak Chapter
See regrowth of a recently burned area on this 4.5 mile hike.

APR 13
Mendocino Coast Botanical Gardens BioBlitz
Dorothy King Young Chapter
Join local experts and use iNaturalist to identify as many species as possible.

APR 11 AND MAY 9
Plant ID Workshops
Yerba Buena Chapter
Learn plant family ID features, distribution, and history.

APR 14
Botanizing at Big Tujunga Wash Rare Plant Treasure Hunt
Los Angeles/Santa Monica Mountains Chapter
Join Cynthia Powell and Keir Morse on a Rare Plant Treasure Hunt

APR 16
Wild Yards Project
LA/Santa Monica Mtns. Chapter
David Newsom shares highlights from the storytelling collaborative inspiring people across the country to transform their yards into native plant habitat.

APR 18
Happy Hour for Young Angelinos in Land Care
San Gabriel Mountains Chapter
A networking opportunity to chat with like-minded young gardeners, landscapers, and plant lovers over a beer at Angel City Brewery.

APR 19
Bag Lunch and Poetry Reading among the Flowers
San Gabriel Mountains Chapter
Enjoy your lunch break at Eaton Canyon Nature Center's patio or picnic area and bring your favorite poem.

APR 20
Native Plant Extravaganza and Garden Art Fundraiser
East Bay Wild, Oakland and Watershed Nursery, Richmond
Shop for native plants, garden art, and nature-themed note cards in support of the May 5 Bringing Back the Natives Garden Tour.

Irvine Ranch Water District is a proud sponsor of the California Native Plant Society.

View our plant selection guide at rightscaperesources.com
UPCOMING EVENTS

APR 20
San Bruno Mountain: Summit Trail Hike
Yerba Buena Chapter
Doug Allhouse will lead a three-mile loop hike on the species-rich summit trail.

APR 20
Caliente Ridge, Carrizo Plain Natl. Monument Hike
San Luis Obispo Chapter
Drive through the Monument towards Camp Selby on to the top of Caliente Ridge.

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PLEASE DONATE AT TAX TIME - LINE 403 - CALIFORNIA RETURN

Funds directly support efforts to prevent the extinction of imperiled plant species
Please spread the word - www.wildlife.ca.gov/conservation/plants
upcoming events

APR 27
Vernal Pools Walk
El Dorado Chapter
Visit vernal pools at Nimbus Overlook, Phoenix Park, and Mather Regional Park.

MAY

MAY 4
GardenFest
Bristlecone Chapter
Family-friendly event with native plants and delicious food for purchase, a free beer tasting, live music, children’s games, and more.

MAY 9
Firewise Landscaping: Can Native Plants Help Save Our Homes From Fire?
Marin Chapter
Greg Rubin explores the factors that encourage fire resistance in native landscapes.

MAY 22
Restoring Plants, Soil, and Water: Nature Wants to Help
Marin Chapter
Presentation and talk by environmental journalist Judith Schwartz; book signing to follow.

MAY 25
Johnston Ranch Wildflower Hike
San Luis Obispo Chapter
Cal Poly Botany Professors Jenn Yost and Matt Ritter will help ID flowers and answer questions.

MAY 26
Lava Bluffs Trail Hike, Calaveras Big Trees State Park
El Dorado Chapter
A moderately difficult trail will take hikers across a volcanic formation and through a diverse forest environment with wildflowers.

JUNE

JUNE 6
Mosses are from Mars, Vascular Plants are from Venus
Yerba Buena Chapter
Brent Mishler, PhD, Director of the University and Jepson Herbaria at UC Berkeley, will speak on bryophytes.

JUNE 26
Insect and Plant Life-Cycle Disruption from Climate Change and Other Factors
Redbud Chapter
Presented by Art Shapiro, UC Davis Professor Emeritus, and Matt Forister, University of Nevada, Reno Professor.

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Plant Science Training Workshops

2019

Mar 6-7
Rare Plant Survey Protocols
Imperial Beach, CA | Taught by Heath Bartosh & Aaron Sims

Mar 19-21
Vegetation Mapping
Kentfield, CA | Taught by Julie Evens, Todd Keeler-Wolf, & John Menke

Apr 24-26
Measuring & Monitoring Plant Populations
San Luis Obispo, CA | Taught by Charley Knight

Jun 4-6
Intro to Plant Identification
Oxnard, CA | Taught by Nick Jensen & Sandy Namoff

Jul 23-25
Vegetation Rapid Assessment/Relevé
Truckee, CA | Taught by Jennifer Buck-Diaz & Jaime Ratchford

Aug 12-15
Pygmy Forest Flora & Ecology
Fort Bragg, CA | Taught by Teresa Sholars

Oct 1-3
CEQA Impact Assessment
Berkeley, CA | Taught by David Magney

Oct 22-24
Mitigation Measures & Monitoring
Sacramento, CA | Taught by David Magney

Details & registration at CNPS.ORG/WORKSHOPS

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Photo: Dennis Mudd