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NEWSLETTER OF THE CALIFORNIA BOTANIC GARDEN VOLUNTEERS

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## FROM THE PRESIDENT Lynn Miller, Volunteer President

**Hello everyone,**

If it's true that our recent rains added up to nine inches, this is something to celebrate. I am grateful for what we now have, but I wouldn't mind more. Today I noticed flower buds on the Ceanothus in my backyard, so I can only imagine what is getting ready to bloom in the Garden. When you do visit the Garden, be sure to visit the inventive and evolving sculpture show, *(Re)place*. The rain brought some designed changes in the unfired and seeded creations, so the next question is, what will grow in their place?

Thank you to all volunteers who helped with Luminaria Nights. You set up and took down, lit candles and lights, checked guests in, tended bar, and guided people on their way. All four evenings were successful, and our guests enjoyed a beautiful night out. Thank you Susan Starr and Marla White for organizing our Cider and Cookie sales. We also sold merchandise, so thank you to our craftswomen: ceramist, Katy Douglass and Zen rock designer, Wanda Ewing. Barbara Nakaoka donated the Matilija Poppy quilt for our Opportunity drawing, and Native Designs provided wreaths. Our visitors were able to shop while they enjoyed their warm cider and cookies. Receipts are still coming in, but we raised a significant amount of money towards our year-end donation to the Garden. All great news and thanks for your support!

It's hard to believe that a month ago we freely enjoyed Luminaria Nights, and now Omicron has limited volunteer activity. If you have questions, check with your staff leader. Currently, it's difficult to plan our favorite events, but the Staff is looking for monthly themes to keep our visitors and members engaged. Wisely, the annual Grapevine Harvest has been moved to March 17th, giving the vines more time to soak up a good drink. Covid is a challenge, but it is no match for the creative thinking of our Garden Staff and Volunteers!

Once again, patience is a key word in our lives. In the meantime, I wish you good health, and when you feel the need, the Garden is just the place for a break.

Be well,

—Lynn

The deadline for articles to be submitted for the March 2022 issue of OAK NOTES is **Tuesday, February 15**. Thank you for your prompt submission!

**Volgistics reminder:** Please submit your monthly volunteer hours to Volgistics. Every volunteer minute counts.



## FROM THE DIRECTOR

**Lucinda McDade,  
CalBG Executive Director**

### **Hello faithful volunteers!**

I feel like we are pushing restart yet again and I am tired of it! Of course, I am speaking of the pestilential virus that is disrupting our lives yet again. Things were not exactly calm back in late 2021 with the Delta variety, but we thought that, with masks and mostly operating outdoors, it was manageable. This newer Omicron form clearly operates at a completely different level in terms of contagion. Numbers of cases all across the US are nothing short of astonishing. Although I keep hearing of people who are pretty darned sick from it, I am willing to believe that it is less virulent than earlier versions and I am grateful for that!

In any case, we find ourselves at the Garden with, now, stricter protocols than ever before, including a vaccine mandate, as we try to support everyone in staying healthy. In light of Omicron, I have had to ask that volunteer activities be limited for now and I thank you for honoring that request and for being extra careful. We will take baby steps back to operations once it is clear that the storm is passing.

Luminaria Nights was wonderful! The nights were just right: cold enough to be wintery but not so cold as to be really uncomfortable. I hope that you enjoyed seeing the So Cal Gardens pathway out to the Forest Pavilion lit up for the first time ever! The beautiful new, smooth pathway was adorned with luminaria! Both of the musicians who played in the Forest Pavilion absolutely loved the space—as did our guests. Thanks for all that you volunteers did to support the event. I am very glad that your drink and bake sale event did well as I know that you have been somewhat thwarted in your normal fundraising means (no) thanks to COVID. To those of you would help support the new pathway and do not yet see your commemorative brick: not to worry! it is

coming. Basically, the opportunity to get the paving done came before we had the bricks prepared. Once the engraved bricks are prepared, the contractor will prise up appropriate bricks to be replaced with yours.

Speaking of the Forest Pavilion: it is essentially done in terms of the contractor's responsibilities and we now turn to what is in our court to do. This includes the landscaping: an irrigation system has been installed and Peter and the hort staff are contemplating planting. We have somewhat revised the plan for the demonstration garden areas to reflect the site as it is emerging from construction, with very positive results. I cannot wait to see the Sally & Skip Prusia Sun Garden and the Marilee Scaff Arroyo Garden. These names will, of course, remind us for the very long run of the importance of our volunteer corps here at California Botanic Garden.

Other capital projects are marching along, large and small. Toward the large end of the spectrum, the solar power system for the Seed Bank is almost done. Toward the small but important: many of you will be happy to know that we will be fixing that dangerous patch of uplifted concrete around the palo verde tree in the Outdoor Gallery in the third week of January.

I hope for volunteer involvement in another project, which is to revise the Garden map that guests are given. There are both positive reasons to revise it (e.g., to add the Forest Pavilion and the restroom facility there) and less positive, by which I mean problems with the current map. Those problems include the fact that the plant communities area is not drawn to scale and that the trail system is mostly pretty schematic. Jennifer Scerra has already done a draft 'redo' of the map that staff are working with. I intend to schedule at least one session with volunteers to get your feedback and input on the map before we finalize it. If you are especially interested in the map, feel free to be in touch so that we can be sure that you are part of that group.

And onward into 2022! Thanks, volunteers, for all that you do. We will get there!

# ARTISTS WITH AN EYE ON NATURE: KATY DOUGLASS, WANDA EWING, AND GABRIELA CHAVARRIA

by Lynn Miller

During the recent Plant Sale and the Luminaria Nights, volunteers sold artwork created by two of our Volunteer Board members, Katy Douglass and Wanda Ewing, and quiltmaker Gabriella Chavarria. We asked them to talk about their source of inspiration and how they create their works.



Katy said the inspiration for her Garden medallions came about when past Volunteer President, Marla White, asked her to create a unique logo-inspired gift to thank Board members when her tenure ended.

The medallions are made from porcelain-based clay with the Garden logo stamped on it. The glaze colors include a soft green, brushed-on background, and orange, yellow, white, and dark green applied with an applicator bottle to create the Matilija poppy. These colors were chosen to reflect the natural beauty of the poppy and make the medallion stand out in any garden space. Metal stakes back each medallion for easy placement in the soil. Katy’s medallions create interest and brighten any garden.



While the Matilija poppy medallions add focus to a garden, Wanda Ewing’s meticulously crafted Zen rocks are suited for a quiet place in the home. She describes the intricate process as contemplative.

This is apparent as she talks about gathering rocks “that call to her” from areas like the Forest Pavilion excavation site, on mountain hikes, along dry streambeds, and even in local stone yards. At home, she examines each rock, deciding which embellishment will enhance its

unique shape and color. Wrapping the rocks with cane or leather cord incorporates Japanese basketry and knot tying techniques. Occasionally, Wanda adds driftwood, twigs, and dove feathers to her designs. Working with materials from the earth is meditative for her, creating a sense of peace and a connection to the natural world.



Gabriela Chavarria designed a beautiful Matilija-poppy-inspired quilt that was donated to the fundraising effort by her friend, Barbara Nakaoka. Barbara knew that Gaby made quilts for other organizations and

had asked if she could make this one for the Garden. Gaby immediately started researching the topic and visited places where the poppy was in bloom. She then designed a pattern and selected colors for the quilt. She loves quilting because it lets her experiment with different types of quilting and explore new methods. The process both relaxes and fulfills Gaby, while the recipient experiences the joy of nature.

We deeply appreciate all three artisans—Katy, Wanda, and Gabriela—who created these original designs



## A Very Happy February Birthday to:

Dorcia Bradley	Julie Scheuermann
Richard Davis	Barbara Shelley
Farheen Dustagheer	John Turner III
Sofia Flores	Amanda Vliestra
Phoebe Frankeberger	Emy Lu Weller
Carol Hopping	Sandy Wilson
Ann LeVangie	Betsy Zimmerman
Donna Nicholson	

that enrich the home. We also acknowledge Barbara Nakaoka's generosity in helping the Volunteer Organization's fundraising effort.

## MOONLIGHT GARDEN WINS by Linda Prendergast (Native Designs) and Jennifer Scerra

The California Native Plant Society held their second annual Wreath Masters competition in early December 2021. The friendly contest was open to anyone who wanted to create a wreath, but it had to be composed of at least 51% California native plant material and the elements used sustainably collected. There were six categories: Most whimsical, Most "I want to hang this on my door," Most naturalistic, Most avant-garden, a Kid's category, and Best in show.



Two of the Garden's Native Designs volunteers submitted wreaths. Out of more than 100 entries, we are delighted to announce that **Judy Moffet-Whale** won the Most whimsical category with her entry entitled *Moonlight Garden*. We are so proud of Judy

and her tremendous talent as a designer. Judy's wreath was made from California juniper (*Juniperus californica*), white sage (*Salvia apiana*), manzanita (*Arctostaphylos* sp.), woolly blue curls (*Trichostema* sp.), and palo verde (*Cercidium floridum*).

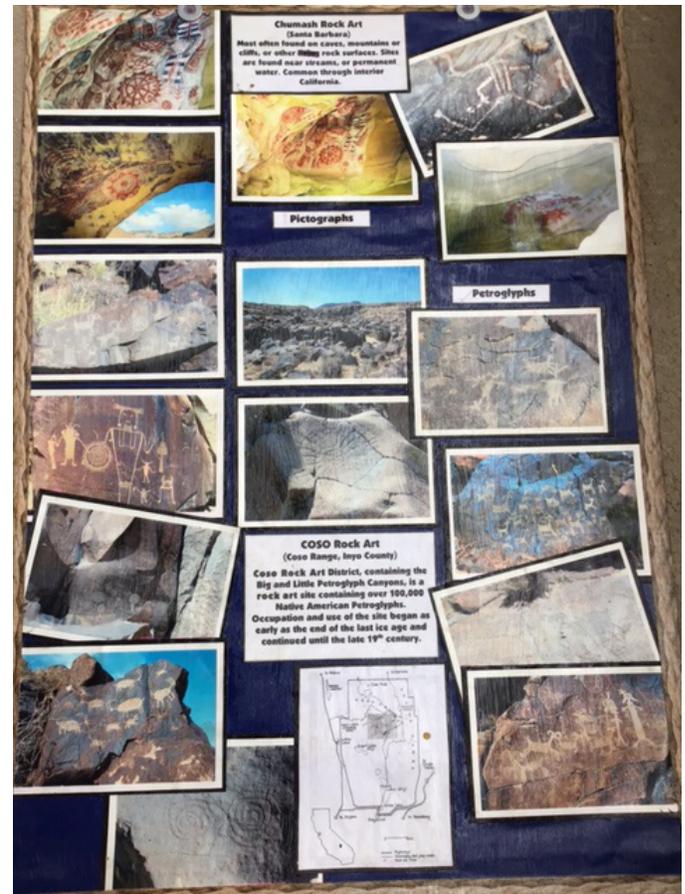


**Carol Petty's** wreath was a finalist in the Most naturalistic category. Carol's wreath, *Planted Wild*, was made from white sage (*Salvia apiana*), manzanita (*Arctostaphylos* sp.), Catalina ironwood (*Lyonothamnus floribundus*), and purple sage (*Salvia leucophylla*).

The results were announced during a fun-filled Zoom webinar, with celebrity judges, that you can watch on YouTube. On the California Native Plant Society webpage for Wreath Masters <https://www.cnps.org/wreathmasters>, there is a link to the video and photos of the many wreath submissions. It is pretty inspiring to see all the amazing wreaths made from California native plant material.

Congratulations again to our designers for their well-deserved accolades!

## CALIFORNIA INDIAN ROCK ART by Shaunna Gygli



California Indians made three kinds of rock art: petroglyphs, pictographs, and geoglyphs or intaglios. Pictographs were painted shapes on rock surfaces and in caves. Archaeologists think many were painted to tell myths and story origins and probably done in religious ceremonies. Paint was made by grinding materials like cinnabar (red), kaolin or chalk (white), ochre (yellow), and charcoal (black) into a powder

and mixing it with animal fat or bird eggs. The paint was applied with sticks, fingers, or brushes made from fibrous plants like yucca. Some important sites in the Santa Barbara area are being protected.

Petroglyphs were made by removing a portion of the rock surface in a pattern, design, or shape. They struck the surface, mainly of large boulders and rock faces, with a sharp rock to make the art. Often the rock surfaces were dark because of desert varnish or a patina caused by microscopic bacteria that leave a manganese residue. Some petroglyph images are believed to have deep cultural and religious significance, asking for good health, good hunting, or good fortune. The Coso Petroglyph National Historic Park on the Naval Weapons Air Station China Lake, has over 100,000 Native Californian petroglyphs. The Maturango Museum in Ridgecrest sponsors tours in the spring and fall.



Geoglyphs, or intaglios, are massive figures carved out of the desert floor. They were created by scraping away layers of dark rocks or soil to reveal the lighter soil beneath. The Blythe Intaglios in

the Colorado desert are the best-known, with over 200 figures. The figures and labyrinths, probably ceremonial, were most likely created by the Mohave and Quechan Indians 450 to 2,000 years ago. The largest is 171 feet long. These figures are so immense that they weren't discovered by non-Indians until an airplane flew over them in the 1930s. The Blythe Intaglios are protected by fences, but are open to the public.

Today we are in danger of losing these treasures from the past. Nature is wearing them away. Vandals are destroying them with graffiti and using them for target practice. ATVs run over the geoglyphs and, of course, human encroachment destroys many.



## MALVACEAE AND NYCTAGINACEAE

by Steve Bryant

Below are seven Malvaceae and three Nyctaginaceae with large and/or colorful flowers.

*Malva assurgentiflora* (Island Mallow). Shrub to 4 m tall, 3 m wide. Flowers pink to purple with darker stripes, to 7 cm across. Fast-growing, fairly short-lived. Cultivars available.

*Malacothamnus fasciculatus* (Chaparral Mallow). About 3 m tall, not as wide. Pinkish flowers 2 to 3 cm across.



*Sphaeralcea ambigua* (Globemallow). To 2 m tall and wide. Flowers generally orange, but lavender form (var. *rosacea*) are common

around Palm Desert. Crosses between these two forms may produce offspring in any shade of white through pink to red. Flowers 2 to 3 cm across. Profuse bloomer. Cultivars available.



*Hibiscus denudatus* (Rock Hibiscus). To 1 m tall and wide. Flowers pale pink. Similar to *Sphaeralcea*.



*Eremalche rotundifolia*. (Desert Five-spot). Height 0.1 to 1 m, narrow. Bristly, reddish and/or greenish foliage. I think this annual has the prettiest (though not the showiest) flower of all California natives: an open pink globe

with a maroon spot at the base of each of its five petals. Start from seed in November to January.

*Abutilon palmeri* (Palmer's Abutilon). Shrub to 2 m tall, sometimes wider. Leaves densely velvet. Deep yellow flowers 3 to 4 cm across during much of year.

*Fremontodendron* (Flannel Bush) Large shrub to 7 m tall and/or wide. Waxy, deep yellow flowers to 8 cm across. Irritating hairs, especially on fruit. Three species and cultivars available.

*Boerhavia coccinea* (Scarlet Spiderling). Thin, wandering stems of about 2 m may resemble a spider web. Clusters of very small, dark red flowers.



*Abronia villosa* (Sand Verbena). Sprawling, sticky-leaved annual that may perennate. Clusters of vivid pink flowers much of the year. Can turn the lower desert pink in a good rain year.



*Mirabilis multiflora* (Colorado Four-O'clock). Low, bushy shrub about 1 m wide, 0.3 m tall; dies back in the cool season. Bright pink flowers may cover most of the plant.

Cultivation and acquisition: Most are fairly easy to grow, but don't like much, if any, summer water. Most volunteer—*Abutilon* and *Boerhavia* too freely. *Fremontodendron*, *Abutilon*, and *Sphaeralcea* are common in specialist nurseries; others are not as easy to find.

## INTO THE PLANT ANATOMY LAB

**J. Travis Columbus, Senior Research Scientist; Professor of Botany, Claremont Graduate University**

The CalBG plant anatomy lab occupies two large, well-equipped rooms beneath the library. What happens in the anatomy lab? Here botanists study the morphology (form) and anatomy (structure) of plants. Samples come from live plants or (with permission) herbarium specimens.

Whole-plant morphology is often studied using herbarium specimens, but sometimes these studies are taken into the lab. In particular, we study the fine details (micromorphology) of plant surfaces using an amazing (and fun to operate!) instrument called a scanning electron microscope, which can image surfaces (e.g., of pollen) at magnifications greater than 10,000X, well beyond the limit of a light microscope (around 1,000X).

Preparing a sample for anatomical study is involved, ultimately resulting in permanent microscope slides that are viewed with a light microscope. Each slide contains thin sections of a plant part (e.g., cross section of a leaf) sandwiched between two pieces of glass. But first the samples are infiltrated and embedded in wax for support, sectioned using a rotary microtome, and stained with various solutions to accentuate certain tissues, cell types, and cell contents. The sections are very thin, typically 10  $\mu\text{m}$ , which is only 0.0004 inches thick!

Why do we study plant morphology and anatomy? Reasons vary by project, but often we are searching for variation among samples representing different lineages or species. We then evaluate differences we find in context of the evolutionary relationships

among the lineages/species (determined separately from analysis of molecular data) to learn about the origin of a morphological or anatomical trait. These traits can guide classification (e.g., all species in a genus share a particular kind of pollen or leaf structure), or we may be more focused on the evolution or function of the trait itself. For instance, Ph.D. alumnus Victor Steinmann asked the question, “How many times has stem succulence (fleshiness) evolved in New World euphorbs (Euphorbiaceae)?” Based on evolutionary relationships among the species, he learned that stem succulence evolved independently multiple times, and, based on comparative anatomy, he learned that the stems achieved succulence in different ways.

This note is part of an ongoing series preceded by notes on botanical fieldwork (October 2021) and the herbarium (December 2021).

## SUPER BLOOM by Fred Brooks

What are the chances of a local super bloom in 2022? Will the December rains of 2021 be enough to germinate dormant wildflower seeds in the soil? Some sources say probably not, others say it is possible. Several events are needed to produce a super bloom and their timing is important.



Photo: Poppies at one month



Fig. 1. CalBG’s Hitachi scanning electron microscope showing a pollen grain (magnification nearly 2,000X) of a species in family Acanthaceae. Photo credit: Nina House, M.S. student.



Fig. 2. 2017 Summer Research Institute in Plant Systematics student Elia Meza sectioning a plant sample using a rotary microtome in the anatomy lab. Photo credit: Travis Columbus.

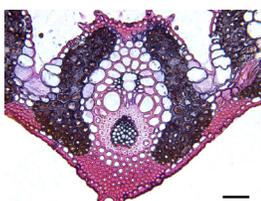


Fig. 3. Cross section of the midvein of a leaf blade from the grass *Aristida longifolia*. Scale bar 25  $\mu$ m. Photo credit: Rosa Cerros-Tlatilpa, Ph.D. alumna.

The first criterion is a dry spring and summer that inhibits invasive weeds. These plants can outcompete the annual wildflowers for water and sunlight. Next, rains of at least a half inch in September–October are needed to remove chemical inhibitors or soften hard seed coats and stimulate germination. Heat or smoke from wildfires can also trigger this process.

Once seedlings emerge, some cloud cover is needed to protect them from the drying sun and strong winds. Well-spaced winter and spring rains then encourage growth, flowering, and seed development.

Following emergence, the new seedlings seem to stop growing. During this time, they are developing a strong root structure. Warming soil in the spring then accelerates aboveground growth and flowering. Common southland wildflowers include California poppies (*Eschscholzia californica*), lupins (*Lupinus* spp.), tidy tips (*Layia platyglossa*), and bluebells (*Phacelia campanularia*).



There have been two striking blooms in the southland recently, in 2017 and 2019. Super blooms only occur once a decade on average, however, and our dry fall in the southland places one in doubt for 2022. The rains in late

December of 2021 stimulated an explosion of poppy and lupine seedlings on our property. Will this happen in our deserts and burn scars, or will a lack of continuing rainfall and spring warmth prevail?

## COURTNEY MATZKE, CALBG GRADUATE STUDENT

I was born and raised in Florida, but felt the need to explore other parts of the country as soon as I was able. I relocated to Seattle, WA and attended the University of Washington to study plant biology. At UW, I conducted research on the rare hemiparasite, *Castilleja levisecta*, through a large-scale greenhouse experiment investigating the competition and photosynthetic effects of this hemiparasite on its host plants. I also worked on a project investigating the reproductive development and underlying genetics of the fern, *Ceratopteris richardii*. I wanted to learn more about plant biology, so decided to continue my studies. I was accepted to graduate school at Washington State University and focused on plant

molecular genetics. My master's thesis investigated two different topics: the genes underlying distyly in the tropical species *Turnera subulata*, and the molecular involvement of alpha-amylase in genetic defects of agricultural wheat.

Through this work, I honed my skills in the concepts of plant biology and molecular laboratory techniques. While gaining skills in molecular genetics during my master's program, I also wanted more direct experience conducting field work with endemic and threatened native species. I was elated by my acceptance to the Claremont Graduate University and California Botanic Garden for a second master's in botany.

I recently selected a thesis project documenting the vascular flora of the Piute Mountain Range located in the southern Sierra Nevada.

The Piutes are a transition range leading to the Tehachapi Mountains and Transverse Ranges. This makes it important as a potential North–South plant migration corridor from the Sierra Nevada into the Transverse Ranges. The study site encompasses coniferous forest, chaparral, Joshua tree woodland, and desert transition zones. The site also contains a wide variety of geologic features and substrates. These habitats and substrates are expected to harbor a diverse flora, including rare and endemic plants. This area has not been fully explored and documented botanically, so there is a high possibility of finding unrecorded rare plants, new county or state records, or even undescribed taxa. This research will produce a complete specimen-based inventory of the range, providing valuable baseline data for countless future



Photos from the Piute Mountain Range in the southern Sierra Nevada.

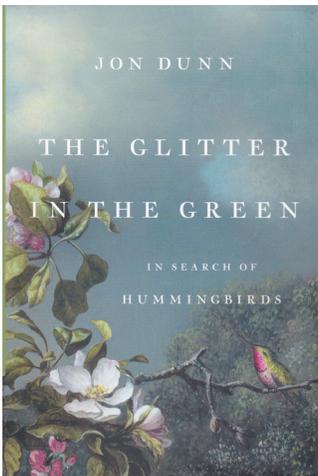


Left to Right: Snow Lakes, Frenchmans Coulee, and Hood River, all in Washington state.

studies. I am extremely excited for the opportunity to embark upon this new adventure!

## BOOK OF THE MONTH

**Joan Sweeney, Volunteer  
Library Committee**



*The Glitter in the Green:  
In Search of Hummingbirds*  
by Jon Dunn. Basic Books.  
Hachette Book Group.  
New York. 2021, 327 pp

Jon Dunn, a British nature writer, photographer and environmentalist, was a child when he saw preserved hummingbirds displayed in London’s Museum of Natural History. Their feathers glittered. They were “dipped in rainbows with plumage that sparkled and shone.” He was fascinated by them. Dunn was in his mid-thirties when he first saw a living hummingbird while hiking in Arizona. Inspired by this encounter, he decided to seek out and write about hummingbirds. He wanted to see as many hummingbirds as possible in their habitats, and also wanted to share his concern about the effects of development and climate change on their survival.

There are more than 350 species of hummingbirds, but they are found only in North and South America and nowhere else on Earth. Their common name comes from the humming noise their wings make as they beat at least 50 times a second. To fuel their warm-blooded metabolism, they consume about 4,000 calories an hour. At night or when food isn’t available, hummingbirds enter a deep sleep state known as torpor to prevent their energy levels from falling critically low. Their main food source is flower nectar. Over 20 million years, flowering plants and hummingbirds evolved together.

Jon Dunn began his travels in Alaska, the breeding site of some Rufous hummingbirds. These amazing birds migrate more than 2,000 miles to and from Mexico. His final stop was at the southern tip of Argentina.

He spent most of his time in Central and South America, where he took the eight pages of photos included in this book. Along with descriptions of landscapes and bird sightings, Dunn also writes vividly about references to hummingbirds in art and literature.

While the book has an index, it lacks citations for the author’s primary sources. I felt tighter editing would have eliminated repetitive passages, but readers who want to know more about hummingbirds will enjoy *The Glitter in the Green*.

# QUARTERLY LUNCHEON

Photos by Marla White

