Welcome to the spring 2023 issue of *The Matilija*. This winter-into-spring of remarkable precipitation is beginning to clearly be one of those “where were you when...” moments. It is shaping up to be a weather event of historic proportions. The southern Sierra has already exceeded the highest ever recorded snow pack (measured as snow water equivalent) for this date, and the central and northern Sierra are doing exceedingly well too. You will be interested to know that the previous “highest ever” winter was exactly 40 years ago (winter of 1982-1983). We are saddened by the destruction in communities across California that has been wrought by the storms. Here at CalBG, we’ve had erosion and minor flooding but our Garden is green and lush. I imagine that our redwoods have loved every cool, humid, dripping day. Our grapevines - harvested in mid-March by our volunteers for their annual wreath-making extravaganza - were plump and pliable. And everyone everywhere is talking about a wildflower “superbloom,” both in the Garden and throughout California.

“Where were you during the 2022-23 rains?” is indeed an apt question!

A number of our wonderful docents - whom we call ‘Garden Guides’ - will answer that question by saying that they were at the Garden frequently over the course of this winter: field trips are back! Our Garden Guides are wonderfully devoted teachers of the children who visit the Garden for tours that impart curriculum consistent lessons. The sight of our stuffed coyote riding by on a cart as it is taken out to a particular station for a lesson always brings a smile to my face! One of the things that I greatly admire about our Garden Guides is that they are willing to let kids be kids and enjoy their outing even if their attention is entirely diverted for a bit from plants to the squirrels and lizards. It is, afterall, the total experience that is memorable. We work very hard to fund our program of school tours so that small grants can be provided to cover bus or materials fees when these costs would otherwise stand in the way of a field trip for the children.

I am also thrilled that, in this issue, we share with you the amazing work of our restoration team. If you do not already know the story of our path blazing, phytosanitary, and pathogen-free nursery, you have no idea what you are missing! Ever the optimists, colleagues who work in this area of the Conservation team take on projects that very actively seek to restore landscapes and plant species. Importantly, any plant that we send out into the wild has been grown in a nursery that prioritizes sanitary practices with the goal of not sending pathogens into the wild. I am excited that we are growing the remarkable Big Cone Spruce (*Pseudotsuga macrocarpa*) to ensure its longevity in the Transverse Ranges. I am equally excited about our work to improve habitat around the Salton Sea by growing and delivering plants that are native to that area and that can help to stabilize that challenging ecosystem. Please join me in admiring the dedication and hard work of our Restoration team!

I hope that you will enjoy this issue of *The Matilija* and consider getting more involved with CalBG - from upgrading your membership, to attending classes and events, to volunteering, there are so many ways to contribute to our mission. Please take special note of our upcoming spring gala, *Forever California*. I do hope that many of you will participate. Together we are building an ever stronger and more impactful California Botanic Garden!
CONTENTS

4 All About Garden Guides
From school tours to Festivals, these core volunteers are on the front lines of community education at CalBG.

7 New Roles, New Faces in the Library and Archives

7 The Wallace Fund

10 Cultivating Resilience Through Restoration Work
Restoring native plant habitats is a core part of CalBG’s mission.

12 Step-by-step: Join our Restoration Crews at Work in the Field

15 Coming Soon at CalBG

On the cover:
Allen’s Hummingbird
Photograph by Jason Flaugh

On this page:
Photos by Carrie Rosema

Spring 2023
Imagine that you’re walking through the Garden early on a weekday morning and you come upon a friendly person unloading a barn owl taxidermy from the back of a golf cart. Maybe there’s a raccoon in there too. And a gray squirrel. And a California towhee.

An hour later you run into an enthusiastic Garden Guide leading a troop of giggling 4th graders to those stations throughout the Garden. Together, they are exploring California’s diverse habitats and all the living creatures who are bonded together there in the web of life. Happy students are prompted to play games, make comparisons, smell the sage, hunt for animals, and get to know some of the Garden’s most iconic trees.

Now it’s the afternoon, and while some volunteers are undoing the set up from the morning’s school group visit, another guide is taking a local gardening club on an exploration of the Cultivar Garden. The group is excitedly discussing different species of plants, and the locations and conditions favorable to growing them. They listen to the guide and then talk amongst themselves. Listen and discuss. Listen, ask questions, and discuss.

At the same time, another visiting group may be far in the back of the California Plant Communities section of the Garden, looking for the first time at the dramatic boojum tree. They are there at the halfway point of their tram tour. Next stop, the tram driver says, is a grove of Torrey pines, the rarest pine tree in the United States.

All of these experiences are led by the incredible volunteer educators who are part of CalBG’s Garden Guide program. Together, they serve children, college students, adults, and seniors who visit the Garden for tours, as well as support...
the Garden’s interactive programs and activities and the development of new educational programming. But what’s it really like to be a Garden Guide? We asked some of them to tell us in their own words. Their answers have been edited for length and clarity.

PAUL CLARKE (GARDEN GUIDE SINCE 2023)

**What inspired you to become a garden guide?**
I’ve been to the garden many times since I came to Claremont almost thirty years ago, mostly for bird watching and to get ideas for my garden. When I retired I decided to volunteer at the Garden. The new volunteer tour of the garden made me realize there was so much more to the garden than just showing off plants. Working with the horticulture crew expanded my knowledge of the Garden and when the chance came to do a guide class it was a chance to learn more and also a chance to share the Garden with others.

**What have you learned or noticed about the garden since you started training that you hadn’t noticed before?**
Since taking the class I have learned a lot about the habitats that make California so special. What makes each habitat unique and which plants and animals take advantage of each habitat. I have also learned that there is a lot more to learn.

ANN MORGAN (GARDEN GUIDE SINCE 2016)

**What curriculum development projects have you worked on and what were your goals?**
Over the last several years the Visitor Education Committee (a Garden volunteer group) has revised most of our school tours to conform to California’s Next Generation Science Standards (NGSS). In addition to enhancing learning, aligning our tour content with the standards helps the visiting teachers get permission and funding for the tours.

**How do you encourage engagement with nature for guests of all ages?**
We want all tour participants, children and adults, to enjoy their time in the garden so it’s important to project our own enthusiasm and interest – which is not difficult to do. I also encourage everyone to ask questions and to alert the group when they see something interesting. With the school groups I try to get students to think about what they’re seeing by asking them questions, or when they ask questions I might first ask them to come up with a possible answer. I’m also open to going with the flow - we might run across some particularly active squirrels or lizards which is much more interesting to the students than anything I have to say. If something is interesting to them they’ll be more engaged.

Adult tours are less structured so it’s more of a conversation with the group. I start by asking if they’ve been here before, where they’re from, what they might expect to see and go from there.

CONTINUED ON PAGE 6

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*Long-time Garden Guide and GNN volunteer Steve Bryant giving a tour to members of the Claremont Chamber of Commerce.*
It is not an exaggeration to say that our Garden Guides change lives, young and old! And we know that many of our guides find a strong sense of purpose in the work that they do connecting guests with the natural world around them. CalBG enthusiastically welcomes new Garden Guides to the team. Fun and in depth training is provided.

Interested in learning more about the Garden Guide program? Contact Jennifer Scerra at jscerra@calbg.org or 909-625-8767 x 206.
New Roles, New Faces
in the CalBG Library and Archives

By Ken Otto and Vanessa Ashworth

Following the retirement of Irene Holiman, a new team is now serving the CalBG Library and Archives: Ken Otto and Vanessa Ashworth. Ken comes to the Library with many years of experience in academic libraries and archives, most recently at Azusa Pacific University. Ken will be partnering with Vanessa, the long-time editor of the Garden’s scientific journal Aliso and alumna of the botany program.

Since transitioning into our new roles, we have been spending time learning about and exploring the diverse and exciting library and archival collections of California Botanic Garden. After our preparatory work is behind us, we will be poised to continue the fine work done by Irene and her predecessors in the past, and we hope to place the Library and Archives in a good posture for the many changes that are happening in libraries and archives for the future. Some of the areas we will be focusing on include developing relationships inside and outside of the Garden; devising a plan to keep the Library current in book and journal acquisitions, cataloging, and processing; prioritizing the processing of archival materials; developing a priority, plan, and strategy for digitizing materials; reviewing Library and Archives policies and updating any as needed; identifying projects to utilize volunteers; touring visitors through the Library facility; giving any necessary library and research instruction to students and others; and providing reference services to Library and Archives patrons.

Several interesting tasks and projects have already come our way and are currently in progress, including the accessioning of newly acquired books and journal issues, developing a new workflow to print book-plates and spine-labels from the cataloging software, and collaborating with the Honnold Library’s Special Collections to display one of the Garden’s grand folio edition volumes of Flora de Filipinas in association with a presentation by an outside scholar from the University of California, Santa Cruz. Exciting plans and activities are on the horizon, and we’re looking forward to serving the needs of the CalBG Library and Archives. Stop by and say hello or feel free to contact us by mail, email (kotto@calbg.org or vashworth@calbg.org), or phone (909-625-8767 X210 or X236).

THE WALLACE FUND

Ken Otto’s position at CalBG has been made possible by The Wallace Fund: a newly endowed fund that will provide long-term core support for the Garden’s important library and archives.

The Wallace Fund is made possible by a generous gift from Marianne Wallace, whose husband, the late Gary Wallace, was a Garden trustee and alumnus of the CalBG graduate program. Gary loved the library, knew it extremely well, and supported it often.

CalBG’s library stems from the important collection made by our founder, Susanna Bixby Bryant. She knew early on that her Garden would have a research quality library to support the scientific activities that she intended the Garden to encompass. Marianne Wallace’s founding gift to establish the Wallace Fund was quickly joined by several other contributors, and we welcome additional donations. Funding this vital position via an endowed fund ensures quality leadership for the library into the future. For more information about contributing to The Wallace Fund, contact the Advancement Office at advancement@calbg.org or 909-625-8767 x 258.
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Esri is proud to support California Botanic Garden in protecting biodiversity for future generations.
Celebrating the critical work of California Botanic Garden’s wonderful staff, students, and volunteers in protecting, understanding, and preserving California’s native plants!

–Ann and Dick Walker
CULTIVATING RESILIENCE THROUGH RESTORATION WORK

By Naomi Fraga, Director of Conservation Programs
And Billy Sale, Restoration Project Manager

The work to restore California native plant communities is central to California Botanic Garden’s mission. The Garden was born with a vision “to preserve our native California flora,” and to “try to replenish the depleted supply of some of our rarest plants.” Today, the staff of CalBG are experts on the flora of California; we work to conserve and restore plant diversity through inventory, monitoring, seed banking, and restoration. Restoration is becoming increasingly important in California shrubland ecosystems which have historically been thought of as so highly resilient that they don’t need our help.

In southern California, we live in a landscape dominated by semi-arid shrublands. We call these habitats coastal sage scrub and chaparral, and they are among the plant communities that most characterize California. Together these shrublands cover an estimated 14,000 square miles, including natural areas around Claremont and neighboring communities. These shrublands are dominated by plants such as buckwheat (*Eriogonum*), California lilac (*Ceanothus*), chamise (*Adenostoma*), manzanita (*Arctostaphylos*), sage (*Salvia*), and sagebrush (*Artemisia*). Coastal sage scrub is known for its abundance of fragrant plants. In contrast, chaparral is known for being so dense and woody that you are lucky to travel 50 ft in an hour if you are making your way through it without the benefit of a trail.

These shrublands have evolved with fire and are adapted to burn periodically. In fact, following fire, and provided there is sufficient precipitation, we are treated to a bounty of color from herbaceous “fire followers.” These plants may only be seen after fire, when they fill in gaps in the formerly dense canopy of shrubs. It is a cycle that is vital to our regional ecosystems; it is the chance to replenish and renew the soil seed bank, and it allows the fire followers to carry out their life cycles.
In recent decades, southern California shrubland communities have suffered, especially following catastrophic wildfire events. Climate change, increased fire frequency and intensity, and human disturbance at the wildland-urban interface have intensified the impact of wildfires. Coastal sage scrub and chaparral plant communities are now more vulnerable to invasion by non-native plant species with the result that shrublands formerly dominated by native plants may be converted to fields dominated by non-native mustards and grasses. This is unfortunately the case in many foothill community areas across southern California.

“Type conversion,” the change from plant communities dominated by native plants to those dominated by non-native plants, can have devastating consequences for regional biodiversity. Our native plant communities are vital to the health and well-being of watersheds, wildlife, and human communities. They provide clean air and water, and the nurturing solace of nature. Native plants are the very foundation on which habitats are built. Plant restoration in areas now dominated by non-native species is essential for recovery and management of healthy ecosystems.

Since 2010, the California Botanic Garden has been working in partnership with a variety of organizations to restore fire affected landscapes across several burn areas, starting with the Station Fire (2009), the largest wildfire in Los Angeles County history (160,577 acres). This work includes invasive plant removal, collecting local native seed, plant propagation, out-planting and seeding at restoration sites, and planting thousands of native plants including sages and oaks. As a research-oriented Garden, we are especially excited by the fact that we are implementing experiments to identify the best methods for restoration. All of our work follows strict best management practices in order to reduce the introduction of non-native pathogens into the wildlands.

Most recently, our restoration and invasive plant management teams have been working in partnership with the Angeles National Forest, National Fish and Wildlife Foundation, and Southern California Edison among others. This work has aimed to restore plant communities in numerous burn areas including Copper (2002; 23,407 acres), Sayre (2008; 11,200 acres), Powerhouse (2013; 30,274 acres), Bobcat (2020; 115,796 acres), and Lake (2020; 31,089 acres) to name a few. Each year, we treat hundreds of acres for weeds, collect thousands of seeds from a variety of plant species, propagate thousands of phytosanitary plants for restoration, and implement numerous studies to inform best methods for conducting future restoration. This work is further advanced by annual monitoring and surveys to ensure that our methods are successful now and into the future.

In addition to the chaparral restoration work that is occurring on the Angeles National Forest, our restoration nursery produces thousands of plants each year for habitat restoration projects that are overseen by partnering organizations across southern California. Our work supports a diversity of habitats from coastal dunes to desert, and includes both common and rare plant species. As a part of this work, we often conduct propagation research to increase horticultural knowledge for future restoration efforts.

The work of our restoration and invasive plant management teams is ongoing. We intend to continue to expand it in the future, especially as needs arise. Building climate adaptation and resilience into our native plant communities will be a cornerstone of plant conservation into the future. Restoration allows us to care for land and life that has seen increasing damage from numerous disturbances. The work of restoration also provides hope that we will see the return of diverse and thriving native plant landscapes into the future, as we work to make nature a centerpiece in our human-dominated environment.
CalBG’s Restoration and Invasive Weed Management crews have worked in partnership with Forest Service staff to restore hundreds of acres in the Angeles National Forest over the past ten years. One of our projects involved the out-planting of 6,000 container plants composed of 40 native oak and chaparral species in the Copper Fire Burn area.

Conducting a restoration out-planting involves more than just putting plants in the ground. First we start with collecting seed and/or vegetative material that is local to the restoration site, then growing phytosanitary plants in the restoration nursery. This is all done while also identifying appropriate restoration sites and a reference site. Many recently-burned sites do not meet the criteria for restoration because they have the capacity to naturally recover. The restoration site is a location that has been disturbed to a high degree and frequently undergone type-conversion to non-native and invasive species (Figure 1). We also choose an undisturbed reference site that provides us with guidance that helps us towards our end goal by providing the foundation for our species list and composition.

Once our sites are chosen, assessments are made to determine proper clearing techniques to remove invasive species (Figure 2).

A cleared site will then have to be marked for planting with plants appropriately spaced based on the reference site (Figure 3). Holes are dug both manually and mechanically (Figure 4) and given pre-water to moisten the soil prior to planting (Figure 5).

**Figure 1.** Chaparral type-converted site filled with invasive mustard and grasses, by Billy Sale.

**Figure 2.** Site cleared using a combination of mechanical, chemical, and hand removal, by Alexandra Soto.

**Figure 3.** Container plants placed at the restoration site based on species composition of the reference site, by Alexandra Soto.

**Figure 4.** Holes being dug using an auger for easier digging of compact soil, by Alexandra Soto.

**Figure 5.** Pre-dug holes are given a pre-water in order to provide moisture to the hole prior to planting, by Alexandra Soto.
Plants are carefully put into the ground (Figure 6), given additional water and mulch pads for moisture retention in order to complete the planting phase of the project (Figure 7).

Continued maintenance of a site is vital and includes supplemental watering and continued invasive weed removal for a more successful planting (Figure 8). Following maintenance care and establishment, the goal is for our site to become self-sustaining and resilient to future invasions and disturbance (Figure 9).
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- And much more!

Keep up to date on what’s going on in our twice-monthly e-mail newsletter, on the Events page at www.calbg.org, and by following California Botanic Garden on Instagram and Facebook.

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