While the UC Davis Arboretum and Public Garden has been a visitor destination for the community for decades, our documented plant collections—which have been curated for over 80 years—have also been used by UC Davis faculty and students for research. We would like to share with you three ongoing projects focusing primarily on habitat value and plant-pollinator interactions.

**Hummingbird Health in the Environmental GATEway**

In 2016, Dr. Lisa Tell, Professor and Researcher in the Department of Medicine and Epidemiology at the School of Veterinary Medicine, brought her expertise in hummingbird biology to collaborate with Emily Griswold, Director of GATEways Horticulture and Teaching Gardens, and Learning by Leading™ student Levy Hernandez to create the Hummingbird GATEway Garden, a demonstration garden located south of the new Veterinary Medicine Student Services and Admin Center. We developed the garden with Dr. Tell not only to demonstrate how others can create dedicated habitats to support hummingbirds, but to also shed light on the importance of the hummingbird population, its decline, and the work being done at UC Davis to support it.

To this end, Dr. Tell has set up hummingbird feeders at the Arboretum Teaching Nursery as one of her research sites to study the role urban feeders might play in the spread of disease in hummingbirds. “Hummingbird feeders attract birds to gather in areas where they normally wouldn’t congregate,” says Dr. Tell. “This is a human-made issue, so we’re looking at how that might change disease transmission and dynamics in populations.” Technology plays a key role in understanding hummingbird behavior. Dr. Tell and her team tag birds with passive integrated transponders, or PIT tags, that act as a unique identifier. At each of Dr. Tell’s feeder research sites, there are radio-frequency identification (RFID) transceivers that track hummingbird visitation and interactions. Dr. Tell’s study, conducted from September 2016 to March 2018, recorded about 65,500 visits to seven feeding stations across three California sites. Dr. Tell’s team tagged 39 Anna’s hummingbirds and one Black-chinned hummingbird in the Arboretum. Thirty-four of the 40 birds made their way back to the Arboretum Teaching Nursery, an 85% return rate.
Ongoing UC Davis Research in the Arboretum and Public Garden

From Page 1

We are excited to support this research and are currently working with Dr. Tell’s laboratory to train Learning by Leading™ students in maintenance of the feeders. We hope that this study can continue to inform us of the best ways to provide a healthy habitat for the wildlife in our gardens. Learn more about Dr. Tell’s research at hummingbirds.vetmed.ucdavis.edu.

California Fuchsia and Pollinator Research

Dr. Rachel Vannette, Assistant Professor in Entomology and Nematology, studies a wide variety of organisms that use plants for their survival. Using the Arboretum and Public Garden’s large collection of California fuchsia (Epilobium canum) varieties and cultivars, Dr. Vannette examines pollinator and microbial flower preferences. The research compares floral color, size, and length of floral tube. Her goal is to link floral traits, pollinator attraction, and microbial communities found in nectar. Each Fall Quarter, Dr. Vannette teaches an introductory Animal Biology lab where her class marks and tags Epilobium in the Arboretum to study. Students conduct data collection to support her main research goals, but are also able to ask their own questions by completing group projects. Past student research questions include: Do hummingbirds prefer flowers higher from the ground? Do shaded plants produce less nectar than plants in the sun? What is the relationship between floral color and nectar sweetness?

Dr. Vannette has summarized her work in an upcoming paper titled “Nectar microbiome structure and function changes over time and with dispersal vectors.” We look forward to working with Dr. Vannette on this ongoing project, which also provides opportunities for our Learning by Leading™ students to design and maintain garden plots that support her research. Learn more about Dr. Vannette’s research at vannettelab.faculty.ucdavis.edu.

Mapping Bee Habitat

Starting in 2017, Kim Chacon, a UC Davis doctoral candidate in Geography, has made the most of her walks through the Arboretum. Each week, she has surveyed bees and flowers throughout our gardens, documenting flower visitation and bee species interactions. Kim works on habitat connectivity for bees at a landscape scale. She says, “My work aims to learn more about what defines bee habitat fragmentation and also how to remedy it.” Kim layers data from other research on bee foraging preferences, bee genus seasons, bloom-time data from Calflora, and the Arboretum and Public Garden’s GIS (Geographic Information Systems) coordinates to create maps that will be able to potentially identify high-quality bee habitat areas and the gaps that lay between them. Once her data is fully compiled, she hopes to apply her research to a GIS urban pollinator analysis in San Francisco.

We are thankful that our gardens offer multi-dimensional resources to our campus community. Our diverse plant collections not only offer aesthetic tranquility and habitat havens, but legitimate opportunities for important and innovative scientific research across fields.
Ongoing UC Davis Research in the Arboretum and Public Garden

Bridge Construction and Detours

This spring, construction will begin on the La Rue Road Bridge replacement project. The new bridge will safely accommodate the increasing number of cars, bikes and pedestrians now traveling to and from the campus’s expanding Gateway District. This project – majority-funded by the Federal Highway Administration – replaces the current 32-foot-wide, almost 70-year-old bridge with a 52-foot-wide span that meets current seismic standards. Additionally, this project involves the relocation of critical utility lines and multiple improvements to the Arboretum.

Throughout construction, both lanes of traffic will remain open to cars and bikes. Pedestrians will not be able to cross the bridge during construction. See our website and follow signs for detour routes. The affected areas of the Arboretum below the bridge include portions of the California Foothill Collection, the Warren G. Roberts Redbud Collection and parts of the Conifer Collection. Detours will be in place here throughout construction, which may last upwards of 14 months.

The good news is that the project brings new landscape and hard-scape features to the Arboretum, upgraded irrigation, the construction of accessible pathways and the inclusion of bridge features designed specifically to delight Arboretum visitors. Also, note that our horticulturists will work closely with the contractor to ensure that the trees, plants and wildlife in this area receive proper care and protection.

To learn more about this project and see where the detours will be in place, visit arboretum.ucdavis.edu/la-rue-bridge

Rachel’s Top 3 Pollinator Plants

Rachel Davis, GATEways Horticulturist

The Arboretum Teaching Nursery is full of pollinator-friendly plants that will make your garden pop. After consulting Taylor Lewis, our Nursery Manager, I have selected three plants available at our upcoming Plant Sale fundraisers that have adapted to attract pollinators, specifically bees, hummingbirds, and butterflies.

Bee: Yarrow

Bees are the most efficient pollinators in the garden. They visit brightly colored flowers with blue and yellow hues since reds are not visible to them. Bees appreciate a nice landing platform and visit flowers like yarrow (pictured here Achillea ‘Coronation Gold’) and goldenrod (Solidago sp.) Bees often visit flowers that have low ultraviolet reflectance near the center of each petal. Ultraviolet is beyond the human visual spectrum, but this adaptation acts as a bull’s eye for bees to get quick access to nectar and is an efficient way for the flowers to get pollinated. Bees are also attracted to sweetly aromatic or minty fragrances.

Hummingbird: California Fuchsia

Hummingbirds are the high energy Olympians of the garden. Since their hearts pump 1,200 times per minute, they are in a constant flurry, darting around the garden to fuel their activity. A favorite native flower is California fuchsia (pictured here Epilobium canum), available in multiple varieties and cultivars. Hummingbirds are able to see reds, but enjoy any flower that has a high-nectar output that replenishes rapidly. They do have the advantage when it comes to tubular flowers, an adaptation that has favored these long-beaked birds. The petals are recurved at the floral tube opening, allowing their feathered faces to sweep up some pollen to exchange at the next flower stop.

Butterfly: Buckwheat

With their straw-like mouth parts called proboscises, butterflies can probe for hard-to-reach nectar in brightly colored (white, red, yellow and orange) flowers. They also appreciate sturdy landing platforms and often visit clusters of small flowers like buckwheat (pictured here Eriogonum parviflorum) and cow parsnip (Heracleum maximum). Buckwheats provide double-duty benefits for your butterfly garden since they are also a larval food plant for some butterfly species. Although butterflies have a weaker sense of smell compared to bees, some butterfly species produce floral scents to attract the opposite sex. This adaptation allows the butterflies to use an established attractive feature as an advantage for reproduction.
Katherine Brafford is a co-coordinator for the Sustainable Horticulture Learning by Leading™ internship. Katherine transferred to UC Davis and studies Plant Sciences and Religious Studies. The Sustainable Horticulture team designs and plants sustainable, low-water landscapes across the UC Davis Arboretum and Public Garden. Katherine, along with her staff mentor Ryan Deering, and fellow co-coordinator, leads hands-on training for her team that includes irrigation design and installation, planting design, plant selection and installation, and long-term maintenance.

Katherine likes having the opportunity to get her hands dirty, making the campus more beautiful, ecologically functional, user-friendly, and better adapted to Davis’s current and future climate. Last year, Katherine and her team transformed two sites on campus, one along La Rue Road across from Arboretum Headquarters and another along the Arboretum path west of the Southwest USA and Mexican Collection. The La Rue site now brightens the edge of campus with pollinator-friendly plantings and reduces runoff with a rain garden, all while avoiding plants or grading changes that could damage buried utility lines. This year, Katherine and her team are designing and planting two sustainable sites south of Shields Library, as well as the Sea of Cortez Memorial Garden. The Sustainable Horticulture team’s work is an essential element of our greater plan to transform UC Davis to a climate-ready campus.

Cory Quon, co-coordinator for the new Habitat Horticulture Learning by Leading™ team, is a transfer student who has worked her way through the Learning by Leading™ leadership ladder. She discovered a passion for horticulture when she joined our Sustainable Horticulture team her first year on campus, and switched her major to Sustainable Environmental Design with a minor in Landscape Restoration.

Cory proceeded to work as a landscape assistant to help maintain the Arboretum Waterway, gaining hands-on habitat restoration skills. This led her to intern for the Naturalized Lands and Habitat Restoration team. Cory has also interned with UC Davis doctoral candidate Kim Chacon, supporting Kim’s native bee mapping project (see page 2). As the Arboretum and Public Garden applies for UC Davis to join Bee Campus USA, Cory’s knowledge and experience will be a great asset. These opportunities prepared Cory to transition from an intern to a team leader for the new Habitat Horticulture team. Its work is centered in the habitat gardens of the Environmental GATEway located at the west end of the Arboretum and Public Garden.

Cory is beyond thrilled to create and enhance pollinator habitat on campus while also raising awareness about importance of pollinators in natural and agricultural environments. The Habitat Horticulture team will continue the momentum of creating sustainable landscapes and forging academic collaborations as UC Davis prepares to implement the Living Landscape Adaptation Plan, our 70-year plan focused on adapting the campus landscape to the likely impacts of climate change.

New Visitor Map Available

We are excited to share that we have a new visitor map for the Arboretum and Public Garden. Pick up a copy at Arboretum Headquarters or download it from our website (arboretum.ucdavis.edu/uc-davis-arboretum-visitor-map) to explore our three walking loops, each offering an in-depth look at the work we do to inspire human potential to help people and environments thrive. We hope this new resource will aid you as you wander the Arboretum through the seasons!
Spring 2019 GATEways Events

plant sales

Public Sales
9 am–1 pm
Saturdays – April 6, April 27, May 11
Shop our one-acre nursery for the area’s largest selection of attractive, low-water plants perfect for our region.

Members always save 10% on every purchase!
Not a member? Join online, at the door or call ahead!

All-ages programs

Rang De Davis – A Celebration of Holi
Sunday, April 7
12–4 pm, Arboretum Gazebo
Have a fun-filled time in this magnificent celebration of joy and love with colors, water, dance, music and Indian food. Co-sponsored by the Indian Graduate Student Association.

From Palm Fronds to Fish Fins
Sunday, April 7
2–4 pm, Environmental Horticulture 146
Jason Dewees, author of “Designing with Palms,” and Chris Dewees, author of “A Life Among Fishes,” will team up to talk about their respective passions that integrate nature with art.

Annual Picnic Day Celebration
Saturday, April 13
Parade 10 am–12 pm,
UC Davis campus and downtown
12–3 pm, Good Life Garden, Robert Mondavi Institute for Wine and Food Science
Find us at the ever-popular parade and in the UC Davis Good Life Garden!
picnicday.ucdavis.edu

Tea & Conversation
Sunday, April 14
11 am–1 pm, Wyatt Deck
Let’s bloom into spring and try five unique tea flavors: chrysanthemum, lavender, jasmine, rose, and daisy. Co-sponsored by the Global Tea Club.

The Gottlieb Native Garden: A California Love Story
Friday, April 26
7 pm, Putah Creek Lodge
Susan Gottlieb and Scott Logan describe how to restore natural habitat and protect biodiversity with simple, individual actions.

Guided tours

Wednesday Walks with Warren
April 10, May 8, June 12
noon, Arboretum Gazebo
Join Superintendent Emeritus Warren Roberts for an always-engaging, seasonally updated tour.

West End Discovery Tours
Sunday, May 5
10 am, Arboretum Gazebo
11 am, Good Life Garden
Saturday, June 1
11 am, Arboretum Gazebo
Join our Learning by Leading™ students and UC Master Gardeners of Yolo County for interactive tours of featured areas of the Arboretum including the Hummingbird GATEway Garden and our newly redesigned Good Life Garden (May 5 only).

East End Discovery Tours
Saturday, May 18
10 am and 11 am, Shovel Archway (Arboretum GATEway Garden)
Join our Learning by Leading™ students and UC Master Gardeners of Yolo County for interactive tours of featured areas of the Arboretum including the Arboretum Waterway and Arboretum GATEway Garden.

camp shakespeare

Campers will explore two productions from Davis Shakespeare Festival’s 2019 season: The Tenth Muse and The Comedy of Errors. Through theatre games, acting workshops, and a culminating show, campers will sharpen their performance skills while having a blast.

Session I (Ages 8-12): July 8 – July 19
Session II (Ages 8-12): July 22 – August 2
Both sessions will take place at the UC Davis Arboretum and camp will run Monday-Friday from 9 am–3 pm with options for early drop off and late pick up.

SIGN UP!
Visit shakespearedavis.org, email davis.shakespeare@gmail.com or call 530-802-0998.
Thank You Donors! November 2018 – January 2019

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STUDENT
Why are campus oaks important?

Oaks frame our campus’s most iconic locations including the Quad, Memorial Union, major thoroughfares, entryways and more, providing beauty, shade and vital habitat for wildlife. The UC Davis Arboretum is home to one of the largest and most diverse oak collections in the country, focusing on trees from the southwest U.S., Mexico, and the Mediterranean region. The oak collection includes about 100 species, varieties, and hybrids used for teaching and research. Massive heritage valley oaks (*Quercus lobata*) line the Arboretum Waterway, and over 300 evergreen and deciduous oak trees grow in the 10-acre Peter J. Shields Oak Grove, at the west end of the Arboretum.

With the growing threat of climate change, we are being proactive about conserving our precious campus oaks. Many other species of campus trees will not survive in the predicted warmer and more variable weather of the future, but oaks are particularly well-suited to survive and even thrive in these challenging conditions. By carefully managing our existing mature oak trees and planting well-adapted young oaks, we will guarantee a healthy and beautiful tree canopy across campus for generations to come.

**Campaign donations will help us:**

- Establish and train a new team of student leaders to support the health of trees in Shields Oak Grove and other parts of campus by assessing pruning needs and actively monitoring for pests and diseases.
- Improve nursery facilities and processes for propagating oaks that are well-adapted to future climate pressures while also supporting the students and volunteers doing the collecting and propagating.
- Plant new oak trees on campus and establish young oak tree care teams as part of our environmental stewardship Learning by Leading™ Program.
- Create student-led oak education events to share the riches of UC Davis Oaks with the public.

When is the UC Davis Oaks Forever! Campaign?

The UC Davis Oaks Forever! campaign is a chance for everyone in our community who loves the oaks on campus to help ensure their preservation for future generations. Campaign goal: Raise $80,000 in community donations.

- **Kicks-off** during UC Davis Give Day, April 12-13
- **Continues** during the regional Big Day of Giving, May 2
- **Concludes** during National Public Gardens Week, May 13-19

Thank you for considering a gift to this campaign. You can mail a check in the enclosed envelope or visit our website for giving links. Families and organizations have already pledged gifts that will match your donation! If you’d like to be a social media “Ambassador” to help us spread the word about this campaign, have other questions, or would like to offer a matching gift challenge, please contact Suzanne Ullensvang at suillensvang@ucdavis.edu.
Dear Friends,

Spring is here, and the Arboretum and Public Garden is buzzing with pollinators and researchers. We are working with a number of UC Davis faculty and students who are using our plant collections for academic research in a variety of departments. Read the cover story to learn about three ongoing pollinator-centric projects. As you get ready to join us for our Spring Plant Sales, learn what our horticulture team suggests to plant in your home garden to attract bees, butterflies, and hummingbirds (see page 3).

Another very important habitat plant is the oak tree. This year we are focusing our spring giving campaign on UC Davis Oaks (from UC Davis Give Day on April 12 to the conclusion of National Public Gardens Week on May 19). This fundraising campaign will help us protect existing oaks on campus and train student leaders to plant and care for new trees on campus and lead outreach events to educate the community about these iconic trees (see page 7). We thank everyone in advance for your support of this exciting campaign. We invite you to join us and our students in the Good Life Garden during Picnic Day to learn more (see calendar on page 5).

Our Learning by Leading™ students continue to innovate in our gardens, and they are key partners with us as we make changes to our campus landscape to prepare for future climate conditions (see page 4). Three wonderful education students have been recognized for their environmental education leadership and have been awarded the Pinkerton Prize for Outstanding Student Contributions (see page 2). We thank Bret Hewitt and his late wife, Deb Pinkerton, for setting up this special prize fund, and cannot wait to see how all of these students take the skills they have learned at the Arboretum and Public Garden into the world.

As always, we want to thank all our members and donors (see page 6), and we look forward to sharing our progress on the UC Davis Oaks Forever! campaign in future publications. Be sure to join us for our diverse, engaging events (see page 5), and enjoy the spring blooms as you explore our gardens and collections.

Kathleen

From the Director