Queen of the Andes

“Century Plant” is a moniker that normally refers to Agave americana, a familiar garden plant in our area. In reality, it usually blooms in a much shorter time span, typically living for only 20-30 years. We have many agave blooms in the Garden every year. Perhaps this common name should have been reserved for Puya raimondii, a much rarer plant in the collection, which is known as the “Queen of the Andes.” In the wild, it takes 80-100 years to bloom, much closer to the century mark.

Although not entirely different in general form to some agaves, Puya is not very closely related. Rather it belongs to the bromeliad family, a large group that occurs primarily from Mexico through South America. Bromeliads are commonly known from the tropical epiphytes frequently used as house plants; many are displayed in our Tropical House. Another genus, Tillandsia, is commonly known as an ‘air plant’ or ‘Spanish moss’ that hangs in open air, while the pineapple is the most economically significant and the
A prominent group of terrestrial bromeliads in South America is the genus *Puya*. They generally have spiny greyish to green leaves that form rosettes. Leaves are typically long, thin and spiny—I can personally attest to their treacherous nature. The Garden has 28 accessions representing 16 different taxa of *Puya*. Several display some of the most spectacular flowers seen in the Garden. Typically numerous along a tall stalk, blossoms may be large and waxy, with unusual brilliant colors (e.g., indigo, lime green or teal) and filled with loads of sweet nectar. The puyas vary in size but by far the largest of all as well as the hardiest is *P. raimondii*, the largest of any bromeliad. Considered an endangered species, it is limited to small populations in the high Andes (up to almost 4,300 m or 14,000 ft) of Bolivia and Peru. This plant originated from seed collected in Bolivia at about 4110 m (13,500 ft). In fact, we received about a dozen seeds which were planted in the nursery on November 16, 1990. Germination was excellent and in 1994, a number were planted out in our South American collection, near the north end of the Garden of Old Roses. Today, four plants remain, but only one bloomed.

There was no expectation of a bloom, but while leading a bird walk on Saturday, May 3, 2014, Associate Director of Horticulture and Collections Chris Carmichael noticed something unusual forming atop one of the 3 m (10-11 ft) rosettes of leaves. Within days, we knew this was the start of a bloom, and there was certainly no doubt when the thick stalk (peduncle) began to grow, reaching nearly 7 m (22 ft) in July when the flowers started to open. Individual flowers are very attractive—relatively large,
about 7.5 cm (3 in) long, slightly tubular with white petals and orange anthers—but almost too high to appreciate without binoculars. The flowers do not open all at once but rather in waves from the bottom up, clustering around the bases of protruding short horn-shaped branches. Estimates indicate that 10,000 or more flowers may be produced, each capable of forming many seeds. While impressive, the flowers may not be as colorful as in some of the other species we have. However, it is the overall ‘presentation’, a massive stalk that is over a foot in diameter and towering 3.6 m (12 ft) high above the plant that is really impressive. Our bloom, perhaps because of the plant’s youth, is actually shorter than expected. In nature the inflorescence may reach 9 m (30 ft) (our 1986 bloom reached about 8.5 m (28 ft). There is some resemblance to the more common agaves, and we have received frequent messages from people who say they have a puya blooming in their yard or neighborhood. When you see the ‘Queen’ in life, however, there is no mistaking them.

Recent studies have shown that this species contains a large supply of very rich nectar. They are normally pollinated by hummingbirds, especially the giant Patagonian hummer. But here in the Garden, we have been impressed by the swarms of bees and only occasionally seen visits by our local hummingbirds, Anna’s and Allen’s, which are very abundant and active in the area.

Sadly, this species (like most agaves) is monocarpic—they only bloom once and then die—so by its 24th birthday last fall, the plant will be nearing the end of its life. However, we harvested several flowers and leaves to make permanent herbarium vouchers of the plant. It will remain an impressive sight worthy of visits for many more months. It produced millions of seeds, some of which were harvested for propagation. We plan to have plants to offer to the public, and we hope the three remaining ‘siblings’ will continue to grow and that the Garden community will soon enjoy additional opportunities to see this spectacular bloom.

— Paul Licht
Plants from the South American continent and associated islands are represented in twenty-five beds on nearly two acres. This collection is designed to take advantage of a steep slope below the Mediterranean Area and surrounding the Garden of Old Roses. Full sun exposure, and drainage facilitated by the slope, make it a good site for mediterranean-climate plants from Chile. Much of the collection developed as a result of the basic research interests of Garden directors, though they were also influenced by the promise of many ornamental species.

Garden Director T. Harper Goodspeed’s expeditions to the Andes mountains (1935-1958) were a great source many plants in the collection, and especially for the initial plantings of tobacco (*Nicotiana* spp.). Two of these accessions remain: tobacco cimarron (36.0020 *Nicotiana tomentosa* var. *leguiana*) and *Nicotiana glauca* (37.0012). Both were collected by James West. These tobacco species are a favorite of the Anna’s and Allen’s hummingbirds. In 2014, the birds also visited the adjacent Queen of the Andes (*Puya raimondii*).
Dr. Robert Ornduff, director from 1974 – 1991, traveled to South America for various research projects. In 1989 he was able to bring several species of plants from the Chilean paramo habitat to the Garden, which were displayed in Bed 650. The Andean paramo occurs from southern Central America into northern South America, and represents plant communities (especially those with tussock grasses) that occur above continuous tree line but below the permanent snow line.

Development of the matorral plant community (beds 609-612) was facilitated by Dr. Ornduff’s work in Mediterranean areas of Chile in the early 1980s. The South American matorral is comparable to the chaparral of California and the maquis vegetation of the Mediterranean basin, all characterized by drought-tolerant shrubs with small leathery leaves. Classes, especially in ecology, have compared the plants in these three communities to learn about convergent evolution.

All the monkey-puzzle trees (Araucaria araucana) in Beds 657 and 658 are from seeds Dr. Ornduff collected in 1983 from the northernmost population, in the Cordillera de la Costa, near Angol, Chile. Monkey-puzzle trees are restricted to a relatively small area of Chile and Argentina, and the species is listed as endangered by the International Union for the Conservation of Nature. These plants have been setting seeds for several years, and seedlings from them were offered through Pacific Horticulture magazine’s Pacific Plant Promotions program in 2011.

Horticulturist Peter Klement has developed and taken care of the South American Collection since 1983. It’s not too unusual for Garden staff to stay with a collection for this many years. He planted the young Puya raimondii plants and helped them grow for all of their 24 years to date. Peter traveled to Chile in late 1992 with a small group from the Garden (then curatorial assistant Holly Forbes, then horticulturist Martin Grantham, current docent Nancy Swarengen, retired volunteer propagators Jack Dohlinow and Sarah Wikander, and the now late volunteer June Falkner). The purpose of the trip was to scout out a possible Garden-led educational tour. The commercial tour was too difficult to organize at the time, but the scouting trip was valuable for Peter, Holly and Martin to see plants in various habitats and how they might be displayed here.

More recent acquisitions have been through exchange with other institutions, and from a few commercial sources in the region. We require that the plant materials are of documented wild origin, which limits what is commercially available. Researchers still play a role in specimen acquisition. Graduate student Evan Wolf from UC Davis recently donated young plants of Puya raimondii to the Garden. He grew them from seed collected at one of his study sites in Peru. This is a great help in that we now have plants from two distinct populations of this rare species.

― Holly Forbes
This past spring and summer seemed absolutely hectic, but I think I've said that before. Actually, three major events marked 2014: the arrival and completion of a spectacular, historical Julia Morgan building, the completion of the first phase of our irrigation replacement project, and the blooming, also historic, of the giant Puya raimondii, not that lots of other things haven't been ongoing.

I am especially pleased to report that Associate Director of Collections and Horticulture Chris Carmichael received the Professional Citation from the American Public Gardens Association in June. See the details in Garden Notes of this newsletter.

I've highlighted the Puya ‘Queen of the Andes’ elsewhere in this newsletter, but I want to emphasize here that it is important not only for its botanical attributes, but also because special plant events like this tend to bring a new audience into the Garden. I've had the opportunity to speak with lots of these visitors, and I believe we've made some new ‘friends’, even members.

Speaking of membership, it has continued to increase, with the new Family Plus level being the most popular; I encourage you to give it some thought. Memberships also make great gifts. The shop has taken on a wonderful new look with a focus on special logo items. We are adding a new mug to our collection for this season which I am sure you will want (think one of the most precious members of our fauna).

I'm sure you've gotten used to hearing about the constant problems we face with the aged and deteriorating irrigation system. This issue has taken on even greater significance with the long-running drought, demanding ever greater vigilance about water usage; you may notice our lawn getting brown. The good news is that the completion of the first phase of the new system (part of the Asian Collection) has already proven its value with efficiency of water-savings on the order of 40%—as well as staff effort. Campus funding is in place for a second phase to address an even larger part of the remaining Asian Collection, and we continue to seek additional funding to make more progress.

The Julia Morgan Hall warrants a story in itself and will be treated in greater detail elsewhere. For now, I want to say that we are fully aware of the disruption it caused in the Garden. The construction limited road access, especially in the California Collection, and intermittent utility shutdowns affected water and bathrooms. I cannot begin to tell you how much time I've spent overseeing this project with the goal of making it as attractive and functional as possible as a multiple use facility. You can look forward to attending events in this new facility and enjoy it for yourself.

Another exciting project just completed was the extensive renovation of the redwood amphitheater which also included resurfacing of over 200 m (700 ft) of pathway in the grove. Several, perhaps less dramatic, but still important projects completed include renovation of the Ornduff Room in the Conference Center with new roof and lighting and acquisition of new planter boxes for the front of the Tropical House. Programs were also popular this past summer, with almost all of the Thursday concerts in the Redwood Grove being sold out.

— Paul Licht
Julia Morgan’s Natural Environment

Julia Morgan (1872-1957), the famous architect of the former Senior Women’s Hall that was recently relocated to the UC Botanical Garden, always designed with the natural environment in mind and now the Botanical Garden can show off her talents. She was a San Francisco Bay Area native who spent her life vacationing at resorts in Los Gatos, Pacific Grove, Santa Cruz and the Santa Cruz Mountains, Humboldt, Napa, and Sonoma Counties. When her family ventured south, they stayed on Catalina Island, and when she was in her sixties, Morgan bought a weekend bungalow high in the hills above Monterey. She carefully cultivated a wild garden of bushes, flowers, and fruit trees at the Monterey cottage, and when the city paved a corner of her property, Morgan quickly demanded that the offensive asphalt be dug up and the corner returned to its natural and dusty, untidy state. This love and respect for nature’s beauty infused much of Morgan’s architectural oeuvre.

The architectural style that urbanist and cultural critic Lewis Mumford dubbed the “Bay Tradition” dominated the early building designs of Morgan’s career (a far cry from her later famous Hearst Castle in San Simeon). Like the Senior Women’s Hall, these buildings featured unpainted exteriors with little or no applied decoration, and interiors marked by extensive use of unpainted wood, built-in seating and cabinets, and exposed ceiling structures. The buildings were designed to blend into the surrounding environment, to be a natural outcropping of the land with sleeping porches and sunrooms that fostered healthy living. Hence, even when...
it was first built in Strawberry Canyon, the Senior Women’s Hall looked as though it settled into the landscape and stood in harmony with the surrounding hills, brush, and oak trees. It was moved to a nearby location in the mid-40s and when it eventually became a neighbor with new buildings, most recently the Haas Business School, its’ natural blending into the environment became more difficult. The move to the Botanical Garden has now returned it to a broader naturalist setting in keeping with its origins.

Morgan’s consideration of nature and the environment in her designs derived significantly from architectural training she gained at the École des Beaux-Arts at the turn of the century, a desire to create buildings that last, fashion, sentimental passion for her native landscape and climate, and available technologies. She did not particularly engage with modern notions of sustainability or environmental efficiency. Nonetheless, architects in recent years have come to see in

Morgan’s buildings lessons for achieving such goals. As Berkeley-based architect Sandhya Sood, writes, Morgan “sought to moderate climate to improve comfort by use and location of thick walls, openings, shading devices, building form and orientation to sun and wind, among other passive strategies. Although environmental control in its new setting will be aided by air conditioning, it is hoped that the main atmosphere will continue to reflect Ms. Morgan’s goals. By incorporating passive design, Morgan created sustainable spaces that benefit human lives through wellness, good indoor environmental quality and adaptability to changes in use.” And thus the Senior Women’s Hall is adapting to a new home and new use at the UC Botanical Garden.

— Karen McNeill, PhD.
Join the University of California Botanical Garden at Berkeley in 2015 for a year of celebration. We will be ringing in our 125th anniversary with an entire year of programs, events, special offers and more. The Garden will soon be sharing our plans for the big 1-2-5. If you are not already signed up for our email list head over to botanicalgarden.berkeley.edu to stay connected. Thank you for your support and see you at the Garden!

**Garden Party Celebration**  
**Sunday, June 28th, 1 - 4 pm**

The Garden will host a special 125th Anniversary Celebration. Please join us for cupcakes, gelato and lemonade in the Garden. There will be music and interactive exhibits to entertain young and old alike!

*Adults $12.50, Children aged 5-12 $5, and under 5 free.*

*Not a member? Special ‘Member for a Day’ tickets are $25 for adults, Children aged 5-12 $5, and under 5 free.*
The Garden has a strong history of programs for youth aged five and older, with kindergartners often taking the “Awaken Your Senses” tour. This tour is an introduction to plants and the Garden environment using all six senses. Occasionally, a preschool or homeschool group with children as young as four would request a tour and the Garden would make attempts to assemble a special group of docents who felt comfortable leading and interpreting to children this age and interpreting the Garden to them. The Garden is now pleased to be formally developing programs designed for children in the four to five age range.

Several docents have been advocating for a preschool tour for some time, while others have been wary of the challenges of communicating plant science concepts to such young children, as well as navigating them through the Garden’s uneven terrain. A number of elements finally aligned for the Docent/Education program to delve into programming for these little plant explorers.

As a first step in working with this age range, a team of docents from the Outreach group formed a Preschool Project. Docents Jennifer Osborne and Doris Graesser took on the challenge of presenting a trial in-classroom program at the request of a local Montessori preschool in the spring. The presentation focused on edible roots, fruits and seeds. It was very successful and well received. Some design improvements are planned and the program will be tested at schools again in the 2014-15 school year.

Preschool teacher Marykaren Mrowka, who came to the Garden as part of her graduate Museum Studies program, provided expertise to the project through a summer internship. Her work with Grace Weltner is further described in this newsletter. She researched the opinions of local preschool staff to inform feasibility and potential topics for a Garden program both off- and on-site. She participated in planning the docent in-class presentation and drafted a potential Garden tour outline. In August she presented a lecture to docents on the cognitive and developmental milestones of children in this age range and suggested techniques for working with them in the Garden.

Funding from the Alba Witkin Charitable Foundation is underwriting education staff to work with docents on the next steps of the preschool program development. We will be developing tour outline ideas and developing with docents a Garden tour that can be tried out with groups of four year-olds in this school year. Once completed, there will be training workshops to launch the new tour to the full docent body, and we will formally add it to our docent-led tour offerings in 2015.

— Christine Manoux
UPDATE ON THE GARDEN “WISH LIST”

In our last newsletter we reached out to our readers and supporters for underwriting to replace four badly deteriorating wood planters anchoring the area between the Tropical House and the Conference Center. Our wish was granted by two generous families, the Novaks (Laura, Mark and Max) and the Ritters (Bob and Pat).

Next time you visit, please check out the new planters and their contents. I am sure you will agree that these additions have greatly improved the aesthetics of this small area of the Garden.

Thank you to both the Novak and Ritter families for rising to the occasion!

THE GARDEN ADVISORY BOARD WELCOMES NEW MEMBER, AND FORMER GARDEN DIRECTOR OF DEVELOPMENT, VANESSA CREWS.

Vanessa served the Garden as Associate Director for Development for five years, building the Advisory Board, a strong membership base of nearly 3,500, and successfully engaging donors through the Garden’s Annual Fund, Legacy Giving, and Major Donor programs. For those of you who may not know Vanessa well, here is a short bio of her many achievements.

Vanessa Crews lives in Orinda with her husband (and high school sweetheart) of nearly forty-one years, Jesse. They are the parents of four adult children and grandparents to three little ones. Vanessa served as a volunteer for local schools for over twenty years including nine years as a member of California’s top-rated Acalanes Union High School District Governing Board, serving two terms as board president. Vanessa particularly enjoyed running school finance campaigns where she had the opportunity to work with marketing professionals and hone her fundraising skills. These efforts garnered Vanessa many awards and accolades from the community and schools, including Orinda Citizen of the Year. She is looking forward to a retirement filled with flowers, travel, genealogy pursuits, grandchildren and botanical gardens! Jesse and Vanessa visit public gardens on all their travels. Vanessa is especially passionate about the Garden, and we are delighted to have her back in the fold!

MATCHING GIFTS

Just a reminder of the opportunity to leverage your donation to the UC Botanical Garden with a matching gift from your employer. It is as simple as including your employer’s matching gift form with your donation. We take it from there. Don’t forget, your Membership dues are considered a donation and are fully tax deductible. Many thanks to the donors who used their firm’s match program to double their gift to the UC Botanical Garden during the past year.
PROFILE OF SUMMER INTERN:
Marykaren Mrowka

This summer, Marykaren Mrowka, a graduate student in Museum Studies at the University of San Francisco, joined the Visitor Experience and Education Departments as intern extraordinaire. Mary grew up in upstate New York and moved to the Bay Area eight years ago. In addition to her graduate studies, she is a preschool teacher. She has also spent time studying ASL, Deaf history, and early childhood education. Mary’s focus at USF is environmental practice and design within institutions.

Like all Garden staff, Mary wore many hats. She worked with docents and the Volunteer & Tour Coordinator to hone existing and in-class outreach materials and develop a new tour program for preschool aged children. To compliment this, Mary developed a training module for docents focusing on working with preschool aged children. Mary also worked on a phone and image based tour for seniors unable to leave their homes and on the collation of national education standards. Mary excelled in everything that she did at the Garden and made great strides in these exciting new focus areas for our staff and docents!

CONGRATULATIONS TO THE 2014 SERVICE PIN RECIPIENTS

Thank you for your dedication to the Garden! These were celebrated at our annual Volunteer Appreciation Luncheon in December.

5 Year Service Pin Awards

Jody Berke  Propagator, former Garden Shop
Lew Feldman  Board Member, Faculty Advisory Board
Robert Ferber  Board Member
Tim Gregory  Board Member, Propagator
Pam Grossman  Board Member
Curtis Hoffman  Board Member
Sarah Holt  Propagator
Suanne Inman  Board Member, Docent
Cynthia Lloyd  Horticulture
Warwick May  Board Member
Gayle McQueen  Propagator, former Garden Shop
Patricia Morrison  Propagator
Phila Rogers  Events/Bird Walks
John Scharffenberger  Board Member
Alison Stewart  Sick Plant Clinic
Camille Wanat  Docent, Curation
Carolyn Webber  Curation

10 Year Service Pin Awards

Monica Clyde  Docent
Steve Geahry  Docent
Patti Itano  Propagator
Carolyn Kasprik  Docent
John Taylor  Faculty Advisory Board
Debra Valov  Curation
Kuniko Weltin-Wu  Propagator
### VOLUNTEER

#### 15 Year Service Pin Awards
- Ronni Brega  Docent
- Francoise Costa  Propagator
- Ruth Ann Pearsons  Garden Ambassador, former Docent

#### 20 Year Service Pin Awards
- Linda Govan  Docent
- Elizabeth Medwadowski  Docent
- Mary McCarthy  Docent
- Eleanor Stark  Docent
- Pennie Warren  Docent

#### 25 Year Service Pin Awards
- Elizabeth Waterman  Garden Shop, Sick Plant Clinic

#### 30 Year Service Pin Awards
- Pete Shell  Docent
- Nancy Swearengen  Docent

- **Volunteer Kahtleen Smallfield** at a fundraising event.
- **Advisory Board art committee at the Garden’s Natural Discourse Exhibition opening. Pat Rudebusch and Jim & Linda Landau.**
- **Garden docent Bill Garcia giving a free tour at the Garden.**
- **Propagator Marilyn Pekasky advising shoppers at the Spring Plant Sale.**
PUBLIC PROGRAMS
New Programs are constantly added. Check our website for updates and registration info.

**Sick Plant Clinic**
First Saturday of Each Month, 9 am -12 pm
Join the Garden for our monthly Sick Plant Clinic and find out which diseases ail your plants. Entomologists are also available to identify pests! *Please cover plants and disease samples in containers or bags before entering the Garden.* Free

**Unselt Birding Breakfast**
Saturday May 2, 8 am - 10:30 am
Join the flock of bird enthusiasts and enjoy the Garden’s bird life with Chris Carmichael, Associate Director of Collections and Horticulture. Event includes light breakfast. Free; Members Only; registration required

**Morris Dancers for May Day**
Sunday May 3, 2 pm - 2:30 pm
Come enjoy our annual visit by the Berkeley Morris Dancers to celebrate May Day. Their lively performance will be in the Garden entrance. Free with Garden Admission

**Mother’s Day Tea in the Garden**
Sunday May 10, 10 am - 12 pm
Invite mom for a lovely tea-style breakfast followed by a botanical crafting session where you’ll use Tillandsia air plants to create gorgeous displays for your home. Held in our new Julia Morgan Hall. $65, $55 members

**2015 Unselt Lecture: Julia Morgan, Her Life and Legacy**
Thursday May 14, 10 am - 11:30 am
Julia Morgan scholar Dr. Karen McNeil will speak on Julia Morgan’s life, UC Berkeley and the women’s movement, and the history of the Garden’s newest building. Free with Garden Admission

**Botanical Latin**
Saturday June 6, 9:30 am - 1 pm
Join us for an introduction to botanical Latin. We’ll look at common Latin and Greek roots for plant names and botanical terms, and use simple rules of thumb to pronounce plant names with confidence. Al Luongo developed this course for the New York Botanical Garden and is now bringing it to Berkeley. $50, $40 members

**Summer Solstice Shrubs & Spirits**
SAVE THE DATE! Sunday June 21; early evening hours
Mark your calendar for lovely evening hours in the Garden on the Summer Solstice. The Cocktail Whisperer Warren Bobrow will tell us tales of the newest celebrity in the artisanal cocktail world - the shrub! St. George’s Spirits will be sponsoring the event with delicious libations. Details on our website

**Botanical Art: Roses with Catherine Watters**
Thursday August 20, 10 am - 4 pm
Come learn how to capture these distinctive and beloved flowers with botanical artist Catherine Watters in this day long botanical illustration course. $90, $85 members

**National Pollinator Week**
Monday June 15 - Sunday June 21
Film in the Grove: The Pollinators by Sarah Rara
Friday June 5, 6pm - 7:30pm
$10, Children 12 and under are Free

Pollinator Tour of the Garden
Tuesday, June 16, 10am - 11am
Free with Garden Admission

Butterfly Bonanza on the Tour Deck
Friday, June 19, 10am - 1pm
Free with Garden Admission; no registration required
Check website for more details.
Drought Effects in the Garden and in the Field

The on-going drought has been one of California’s most challenging environmental situations. We are addressing water use throughout the Garden to reduce waste and runoff, reduce actual water usage, and even cease irrigating (the lawn).

The Garden’s antiquated irrigation system is our most challenging infrastructure priority and has been for some time. Fortunately, we have received substantial support from campus to improve the situation. The first of several phases to replace the often breaking, often leaking, decrepit galvanized pipe system was completed last summer in the higher elevations of the Asian Area.

To preserve the collection, all new irrigation within planted beds is surface installed. Feeder lines that were
installed in pathways are undergrounded. Surface installation eliminates almost any disturbance to delicate root systems in an established collection.

The new design was created by Russell Mitchell Associates of Walnut Creek, and installation was done by Shooter & Butts. Funding was generously provided by the campus’ Capital Renewal Committee. The second phase, also in the Asian Area, will be installed in early winter. Timing is important – we want to take advantage of natural rainfall during installation to reduce chances of the irrigation system being out of service for any length of time. Old systems must be shut off when testing the new, and there are always fine-tuning tweaks to make during testing.

In addition to the gradual replacement of the deteriorating ancient irrigation systems throughout the Garden, we have been replacing sprinkler heads in the old systems with modern, innovative, improvements that assist by spreading water more carefully and losing less to evaporation. Some of these improvements were described in our last newsletter, such as Netafim, which eliminates surface evaporation, surface runoff, and atomized losses to the wind.

The Garden collections provide an irreplaceable research resource. We must provide enough water to keep the plants healthy. The plants cannot be easily replaced, and some are extinct in habitat. Since much of the collection is from other mediterranean-climate areas of the world, their need for supplemental irrigation is not as great as it is for collections from wetter climates.

One of the areas of the Garden that doesn’t serve a research purpose is the lawn. We elected to stop watering the lawn as a valuable water-saving step. It will likely not turn brown immediately due to subsurface water draining from the collections upslope. As East Bay Municipal Utilities District says, “brown is the new green.” We can do that with the lawn, but not with the research collections.

In the field, the drought has had varied effects on California wildflowers. Much of the state lost its’ greenish cast of grasses quickly, other areas along the coast were not as dry. Yellow larkspur (Delphinium luteum) grows very close to the coast near Bodega in Sonoma County. We counted 63 plants this year, more than any year previously. Baker’s larkspur (Delphinium bakeri) grows only in western Marin County in shaded sites. They did not seem badly affected by the drought and were not as preyed upon by banana slugs as in wetter years.

The pattern of very little rain during the fall months, followed by sparse, but regularly spaced out showers in the spring, has shown benefit in the past to some of our wildflowers. These include large-flowered fiddleneck (Amsinckia grandiflora). We believe this is due in part to the lack of growth by non-native grasses, its’ biggest competitor for habitat. The reduced growth of non-native grasses may also have been a factor in the fabulous wildflower displays in limited areas of the state. Bear Valley in Colusa County displayed acres of cream cups (Platystemon californicus), California poppies (Eschscholzia californica) and daisies (especially Layia gaillardioides).

— Holly Forbes
Garden staff are working on some of the most endangered plant species in the world. Several of these species are now limited to one natural population, which in two instances mean just one individual, and the next most dire is down to only four flowering size individuals.

The on-going drought limited options in 2014 for helping the large-flowered fiddleneck (Amsinckia grandiflora). We intended to help create several new populations. This meant retaining hundreds of seedlings that were meant for planting in the field, growing them on for seed production, and cleaning the seeds from the plants as they dried out. Annual species are sometimes easier to deal with than perennials, because we don't have to work around stems that the plant wouldn't normally shed. However, these stems have prickly hairs, which make them a little less easy to handle. Garden volunteers processed 200 cloth bags of plants with seeds of this species. We were then ready to sow another 2900 seeds into individual containers for a late fall/early 2015 winter planting of seedlings at ten sites in habitat. The lone self-sustaining population received a huge assist in January 2014 from the Contra Costa Water District when they installed a fence around the site to protect the plants from trampling by cattle. The population grew from about 1200 plants in 2013 to over 6500 plants in 2014, in spite of the drought. Jake Schweitzer of Vollmar Natural Lands Consulting in Berkeley is the lead on this project.

While cattle and other wildlife can have negative impacts in habitat, other wildlife can wreak havoc with plans for seed production in the nursery. The plants must be accessible to insect pollinators or seed set will be non-existent to very poor. This must be balanced with protection from seed eating predators, such as the Lesser Goldfinch. This bird species is abundant in the Garden and seems to have learned that the Garden nursery is the best source of food in the area. They even, on a daily basis, penetrated the bird netting installed to stop them from eating the large-flowered fiddleneck seeds. We can't personally attest to the tastiness of these seeds, but we'll take the bird's behavior as testament for it.

Less problematic are the annual plants of San Mateo thornmint (Acanthomintha duttonii). Several hundred plants were combined in 140 pots for another year of seed production. Perhaps the 'thorns' of the thornmint are enough to discourage seed predators. These seeds are also much smaller and therefore don't offer the same food value as do the large-flowered fiddleneck.

A small crop of Tiburon paintbrush grew well in the Lath House in preparation for outplanting in January. Plants were grown with common yarrow (Achillea millefolium) and purple needle grass (Stipa pulchra) as host plants. In habitat, plants are threatened by grazing animals (both cattle and rabbits) as well as other habitat disturbance/loss. The lead for this project is Creekside Center for Earth Observation in Menlo Park. Both the paintbrush project and the large-flowered fiddleneck project are funded by the Bureau of Reclamation.

Garden staff and colleagues in the US Fish & Wildlife Service identified a potentially suitable site for reintroduction of yellow larkspur (Delphinium luteum) in the vicinity of Jenner, Sonoma County, close to the coast. If all goes well with the conservancy land owner, we will try to establish flowering sized plants there.

— Holly Forbes
The Garden supports a wide variety of research projects, from sampling caterpillars for the study of wing development in adult butterflies, to biofuels research in exotic species, to the more usual study of plant evolution.

In June, 2014 Prof. Tingshuang Yi of the Kunming Institute of Botany in Kunming, China, visited the Garden with his colleague Dr. Shudong Zhang to collect samples for their research into the evolutionary history of the rose family. In addition to a full day of collecting in the Garden, they spent a week driving all over the state looking for and collecting samples of endemic species (growing nowhere else). They returned to China to analyze the samples for genetic and morphological data.

Prof. Yi reported back that “most samples collected from your garden are in very good condition, and we already got some whole plastid genome from some of them, and we are analyzing more.” I accompanied them during their full day in the Garden, making collections from 13 families, 43 genera, and 54 species, among which there are 25 genera and 33 species of the rose family (Rosaceae). These species are from North America (including Mexico), South America, Asia and Africa. Some places in these regions are very difficult to access in the field.

During his week of field work in California with guide Jim Shevock (a research associate of the Jepson Herbarium on campus and also of the California Academy of Sciences), they collected from five families, 25 genera and 40 species, among which there are 21 genera and 30 species of Rosaceae, and these species are only from California.

Prof. Yi appreciated being able to make collections in the Garden because, in addition to the tremendous variety available, he could keep the material cool enough for genetic work. The hot days in the field around the state led to degradation of some of those samples, such that he was not able to obtain plastid genome information.

— Holly Forbes
Associate Director for Collections and Horticulture Dr. Chris Carmichael was presented with the Professional Citation of the American Public Gardens Association at its annual meeting in June, 2014. In issuing the award, the association noted Chris’ work with the American Public Gardens Association (APGA) and the North American Plant Collections Consortium (NAPCC), a joint program of the APGA and the U.S. Department of Agriculture that works in North American gardens to preserve plant germplasm and to acknowledge excellence in curatorial practices. Germplasm is held in living botanical collections and also in seed banks. The Garden holds four NAPCC collections: cycads, magnolias, oaks and ferns.

In his nomination for the award, Carmichael was praised by Ray Mims of the U.S. Botanic Garden (and an APGA director-at-large), for implementing the Garden’s development of organic and sustainable practices, stewarding the work of UC Berkeley’s living collections, and being a leader on public gardens and public horticulture.

**Associate Director for Development Nadean Lindberg** joined the staff in February 2014. Nadean comes to us from a fund raising position at Planned Parenthood and, previously, the Oregon Health Science Center. She is working closely with staff and the Garden Advisory Board to further develop resources to support the Garden.

Lutsko Associates, the landscape design firm of Ron Lutsko, Jr., worked pro-bono with Garden staff to design a home demonstration garden of California native plants around Julia Morgan Hall. Installation was completed in February.

Thanks to the San Francisco Orchid Society, the Garden received $2,200 from the February 2014 Pacific Orchid Exposition held at Fort Mason, San Francisco. In addition, Acura Motors donated another $1000 to the Garden in support of the orchid collection. Garden staff provided quite a few tropical plants for the display and staffed an information table about the Garden at the event. These funds will be used to purchase supplies and equipment to improve growing conditions for the orchid collection.

We were fortunate to have two graduate students making research vouchers throughout the collection during summer 2014. Adam Schneider and Grace Benson-Martin, both of the UCB Department of Integrative Biology, worked half-time gathering hundreds of specimens. These are deposited in the UC Herbarium on campus.

**Horticulturist Brandi Eide** resigned in July to follow her partner and his great job opportunity out of state. Marketing & Design Manager Muinat Kemi Amin resigned in December to take a position at UC San Francisco.

— Holly Forbes
PLAN YOUR VISIT

Check for the latest news and events on our web site: http://botanicalgarden.berkeley.edu

Join a tour: Free without reservation every Thursday, Saturday and Sunday at 1:30 pm. Join a docent near The Garden Shop for an hour or so and learn about special plants.

Bring a group for a tour: Contact our Tour Coordinator at 510-643-7265 or gardentours@berkeley.edu before the 15th of the month prior to your tour date. Various kinds of tours are described in our tour brochure and on our web site: botanicalgarden.berkeley.edu then go to TOUR TYPES > ADULT TOURS

Pack a lunch: Enjoy your lunch on one of the many Garden benches or tables located throughout the Garden.

Bring a camera or binoculars to see the dozens of birds that call the Garden home, even if only briefly.

Take a class or workshop, meet fellow enthusiasts.

Attend the plant sales, everyday and on special occasions, next up Spring Plant Sale 2015

If you haven't already, become a member and enjoy free admission all year.

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Garden contact information is available on our website. Call 510-643-2755 for more information.
E-mail garden@berkeley.edu
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Public Tours are offered at 1:30 pm each Thursday, Saturday and Sunday. Call (510) 643-2755

GARDEN HOURS: The Garden is open from 9 am - 5 pm year round. Closed first Tuesday of each month.

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2015 spring plant sale

Members’ Sale & Reception
Friday, April 24 | 5 - 7:30 pm

Public Sale
Saturday, April 25 | 10 am - 2 pm

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