
**Fall 2018 Newsletter**

## From the Director

*Painting of the Berry Garden patio, by retiring director, Dr. Ed Guerrant*

It has been my great privilege to contribute to the effort to reduce the toll extinction is taking on our native flora. I was fortunate to work at a time when the science of ex situ, or off site plant conservation made tremendous strides, and to contribute something of my own and in partnership with others.

It is remarkable that I happened on an opportunity to work at a seed bank for rare and endangered plants and do something meaningful in my field of interest and training in botany, ecology, and evolutionary biology. More remarkable is that the Berry Botanic Garden Seed Bank for Rare and Endangered Plants, established in 1983 and housed in a 6-acre postage stamp of an estate garden, was the first seed bank in the USA--and probably the world--dedicated exclusively to rare and endangered plants.

*First Seed Bank director, Julie Kierstead (Img: Linda McMahan)*

In 1989, I became the Conservation Director of The Berry Botanic Garden, after the founding director, Julie Kierstead (Nelson), left to work for the USFS. She established two foundational pillars we have sought to employ ever since: use the best science available, and work cooperatively with land management agencies and other stakeholders interested in preserving our natural heritage of native plants. I have been with the Berry Seed Bank for almost thirty years, in a career dedicated to helping conserve rare plants here in the Pacific Northwest, the USA and less directly the world. I am now officially retiring, but there is still much I feel a need to finish before I fully leave. The database I've been working on for many years is at the top of that list, and we are in the final stages of beta testing the "query" functions now, which like the whole thing, is much more complicated than I had originally imagined. Nevertheless, the database should prove to be an essential and vital tool, enabling us to work more effectively.

As exciting as it was to land a job in plant conservation, I was initially uneasy whether taking seeds out of their natural habitats in order to save populations in the wild was a sound strategy. It seemed like it could lead to a Typhoid Mary type of situation, where

## GIVING TUESDAY, NOVEMBER 27, 2018


**The Rae Selling Berry Seed Bank will be participating in the PSU Day of Giving on November 27th. Join us by sharing our link or supporting our program!**

**Check back closer to the 27th at the Day of Giving site for more details. #Give2PSU**

**Also, call Kris anytime at (503) 725-2468 or email kfreitag@pdx.edu if you would like to volunteer with our program.**

### MAKE A GIFT TODAY

GIVE

*Have you included or considered including the Rae Selling Berry Seed Bank in your estate plans? If so, or if you would like to learn more, please contact Kathleen Hampton, Major Gifts Officer, at (503) 725-3526 or hamptonk@psuf.org.*

Stay up-to-date with the Seed Bank on our

acting on a desire to help might have the opposite effect. The resolution of this apparent paradox is that banking seeds is not an end in itself, but a means to an end. To succeed in its aim, ex situ efforts are necessarily a part of a whole that involves a wide range of partners from public land management agencies to private organizations to individuals.

One of the things that enabled us to be so effective was that The Berry Botanic Garden became one of the dozen or so founding members of a national consortium of botanic gardens, the Center for Plant Conservation (CPC), which now boasts over 40 participating institutions around the country.

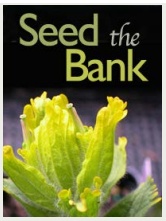
*Western lily* (Lilium occidentale) *blooming at reintroduction site*

The CPC has been at the center of the developing science of ex situ plant conservation in practice and in publications. The CPC and people at participating institutions provided a vital professional community for me and our young conservation program. This community has produced four books that have been at the forefront of seed banking techniques, including reintroduction and related methods to prevent extinction of rare and endangered plants. Indeed, the third CPC book, *Ex Situ Plant Conservation: Supporting Species Survival in the Wild*, is in part a product of my initial uneasiness with the approach of taking seeds out of nature to enhance species' prospects in nature. Storing seeds of rare and endangered species is an insurance policy of sorts against extinction in the wild, and a source of founders to reintroduce them to the wild as needed. It has proved a useful and effective tool, but in the light of already apparent effects of global climate change, I think we are well advised to expand the scope of Seed Bank holdings beyond rare species. Bulk collections of common species could serve as a source for larger scale ecological restoration efforts in this region.

As with any organization, Seed Bank accomplishments have not been mine alone—many others have been involved. It began with an insight by a remarkable plantswoman, Molly McGuire Grothaus, an early supporter and longtime board member of The Berry Botanic Garden. Given that the non-profit status of the Garden was based on its being a "sanctuary" for rare plants, because Rae Selling Berry had been growing a number of them, great effort was put into figuring out how a small garden organization, firmly tucked into an exclusive neighborhood in Portland, could do something truly meaningful in that regard.

*Early BBG supporter, Molly Grothaus*

Molly wondered, since seed banks worked to store seeds for agricultural species, might not the same technique work with rare and endangered species? Indeed, seed banking has become an essential tool in humanity's efforts to pass on to our descendants the largest possible measure of the biodiversity we inherited from our ancestors. When Julie Kierstead was hired, even though the garden was small and unknown, she reached out




Facebook page!

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### OTHER LINKS

"Lawn to Wildflowers" Project

New edition of *Flora of the Pacific Northwest* now available!

Variation within species is critical aspect of biodiversity

Extreme Botany: The Precarious Science of Endangered Rare Plants

*A Growing Passion* episode--"Plants: The Endangered Species"

### CONTACT US

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to the seed bank at the Royal Botanic Gardens, Kew. As I was later to find out when looking through old correspondence, Kew's Simon Linington not only advised her extensively on how to go about setting up a proper seed bank, he also sent a number of hard to find publications to see that the Berry Seed Bank established a solid foundation on which to build.

*Past BBG director, Linda McMahan*

There are others who contributed significantly to our efforts, but I will mention just two individuals of the many who contributed to plant conservation at the Garden. Dr. Linda McMahan, the Director of The Berry Botanic Garden during the 1990s, was instrumental in helping to solidify, grow and better focus the Garden's conservation efforts. Essential, too, was Andrea Raven's (now Kelsey) contribution, who was with the Seed Bank for 17 years. We have been fortunate to have had many interns, ranging from high school and college students to college graduates. For 19 years we had from one to three high school interns as part of the Saturday Academy's Apprenticeships in Science and Engineering program. Finally, the small army of volunteers has been and continues to be vitally important to our work, and their assistance is much appreciated.

As I have mentioned in previous newsletters, financial support of the Seed Bank has always been precarious, given that it is essentially self-supporting here at PSU. Many of our historical funding sources have either significantly dried up (e.g. federal funding for the last two years), or are much less available than they were before when we were at the Garden (e.g. many regional foundations). Thus, I ask all those who have supported our work to please continue, and to those who are philosophically supportive, please be generous when it comes to assisting us financially, so the work can continue to go forward.

That being said, the Seed Bank's long-term future is, I think, reasonably secure, though the form it will take in future years at PSU is not clear. I am thrilled to be able to pass the baton to Kris Freitag, currently the acting director, with whom I've worked for almost for almost twenty years. I will continue to offer my support to Kris and the Seed Bank in any way I can.

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I am grateful to Dr Ed Guerrant for his continuing heartfelt support of the Berry Seed Bank and myself. He has always demonstrated a deep commitment to the mission and vision of this conservation program. Coming to the Seed Bank a short six years after its inception, Ed had enormous influence on its development, becoming the professional and personable face of the program. Yet he has always known how to value and to show his appreciation for the many staff, volunteers and interns who have been essential to creation of a robust and effective entity.

We do not know how long I will be acting director

*Acting Director Kris Freitag*

of the Berry Seed Bank. The university intends to fill the position with an environmental restoration professional eventually. A vision is unfolding that may unite the efforts of the Seed Bank and the PSU Herbarium and that may warrant a common director. However that may be, I intend to continue the mission of the Rae Selling Berry Seed Bank, to conserve the genetic resources of Oregon's native plants for current and future generations, to the best of my ability. I intend also to support the vision of the Seed Bank and its future as it has been conveyed to me during the past eight years, passionately and intelligently, by Ed Guerrant.

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## Adventures with Citizen's Rare Plant Watch: Gorman's Aster (*Eucephalus gormanii*)

*Jason Clinch*

***Note: Although Citizen's Rare Plant Watch has been on hiatus this past field season, it will resume in early spring, so watch your inbox for details!***

*Ari, Jason and Brenda on the trail*

Some excellent adventures start off rather poorly. Our July monitoring trip began with the discovery of two nails in my truck tire. Two nails, side by side, through the tire tread. So deep that when I pried at one, I could hear the hiss of air escaping. Not a good start to the day since my rig was to be transport for four of us—Ari, Brenda, Kris and myself—to our destination in the Willamette National Forest, which we knew entailed traveling rough gravel roads.

Roughly two hours later and a trip to Les Schwab, my tire wasn't fixed as there was too little tread, but at least my spare was in good shape. Fingers were crossed that we didn't get an actual flat tire on the trip, and off we went up the North Santiam Highway toward Detroit. Our destination was French Creek Ridge, a roughly east-west ridge that separates the Little North Fork Santiam River drainage from the North Fork Santiam River drainage. This rocky remnant of the Old Cascades forms, in part, the southerly boundary of the Opal Creek Wilderness. It is noted for large columnar basalt formations, outcrops of platy andesite, large scree fields, and magnificent views into the Opal Creek watershed and central Cascades from Olallie Butte to the Three Sisters. It is also known for having a population of our target species, Gorman's aster (*Eucephalus gormanii*).

Gorman's aster is a rhizomatous, upright perennial that stands up to 12" in height. The leafy stems are generally crowded with elliptic-oblong, sessile, glandular leaves. Inflorescences are mostly solitary but occasionally 2-4 in number. Heads are mostly 0.7-1" in diameter, with yellow disc flowers and 8-13 white-to-pinkish ray flowers. The 0.25-0.5" high involucre is composed of overlapping, glabrous, lance-ovate shaped bracts that are broad and sharp-pointed

*An unusually lonely bloom of* Eucephalus gormanii

with green tips and prominent mid-veins. The edges of these bracts are scarious- to hyaline-margined and shortly fringed-ciliate. The pappus on the achenes is double with the outer consisting of short bristles.

Gorman's aster primarily inhabits open-exposed, mid-elevation (4,000-6,200 feet), dry, rocky slopes and cliffs as well as gravelly scree and talus slopes. This habitat generally degrades at its lower margins into dry, rocky, meadows with deeper soils and greater vegetation cover and eventually into partially shaded to shaded forest edge communities with even greater shrub (and tree) cover. These latter habitats also harbor this species, but to a lesser extent.

Once at the trailhead, our little sojourn along French Creek Ridge was very pleasant as we passed through a forest of mountain hemlock, Alaska yellow-cedar, and noble and silver fir, with rhododendron, beargrass, and huckleberry in the understory. We noted that most of the draws and drainages were pretty dry due to the drought, but saw thimbleberry, goat's beard, and a few common monkeyflowers. We passed through several scree and talus slopes that gave us views of the ruggedly steep Marten Buttes and their impressive columnar basalt formations, before arriving at where our first population of Gorman's aster should be. Finally!

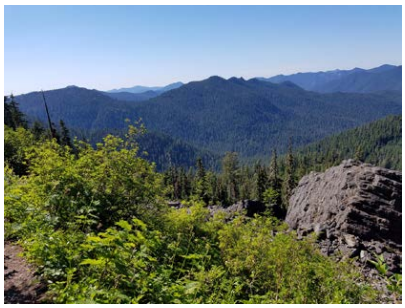
*Precarious, sloping habitat*

The location map we had showed the population off trail and up a slope. A very steep slope. A very steep slope with loose talus and cliffs. We ditched our packs and spread out for safety and began our upward push through the vine maple and open talus looking for our target habitat, where the slopes were just slightly more stabilized and some level of soil had accumulated in the gravelly substrate. Up through some cliff bands and to a narrow sloping shelf we climbed. I heard a "Found it!" from across the slope only to look up and see a nice clump of our species at eye-level! Success!

Out came the GPS and we began mapping the perimeter of this sub-population and counting plants. The rhizomatous nature of Gorman's aster lends it to growing in relatively tight, multi-stemmed clusters that make up an individual plant. We scanned the periphery of this sub-population for other individuals before moving further up the slope. We discovered another sub-population at the top of the rocky butte but a momentary sense of vertigo overcame me and I had to sit for a moment. I wasn't scared but rather thrilled! As I gazed over part of Detroit Lake in

the distance, I could see several boats on the water. Those people had no idea the four of us were scrambling around up here having such a unique adventure!

Given how common this Oregon endemic can be in the narrow range it occupies, the available time is generally the limiting factor that ends our field trips. Had we continued, we would probably have found one after another open rocky meadows with clumps of this charismatic plant. As it was, we halted after revisiting three subpopulations last surveyed no more recently than 1991. We found the plant in two of these; the third appeared to have given way to maturing forest trees.



*It was worth it!*

In other words, the factors that make for a deeply satisfying monitoring trip were all present: like-minded companions, good weather, adventurous bushwhacking, and most of all, discovering our target in reasonable health! We were able to return solid data to the Forest Service and Oregon Biodiversity Information Center that they would not otherwise have acquired. All told (including no flat tires), it was a good day.

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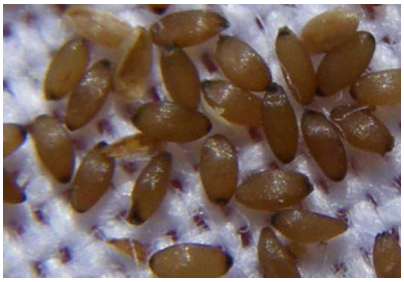
## The Challenge and Beauty of *Campanula shetleri*

*Kris Freitag*



Campanula *seeds (Image: BLM CO932, Seeds of Success)*

Recently, Mona Robison of the California Native Plant Society (CNPS) asked the Rae Selling Berry Seed Bank & Plant Conservation Program to clean and store seeds of *Campanula shetleri*, a rare California endemic. Named for one of its few known locations, it is commonly called the Castle Crags bellflower. Based on a picture of the plant and its exciting habitat, I'm already formulating plans to look for *C. shetleri* at Castle Crags State Park next summer during its bloom time. My personal collection, however, consists of lovely images of plant species I have visited, rather than seeds.

This seeds of this sweet mat-forming plant must have been very difficult to collect. It's a testament to the courage of the CNPS seed collectors that they managed to collect from more than 120 plants, in their steep, rocky habitat. It is even more of a testament to their restraint that they adhered to the rule to limit their collection targets to less than 20% of the plants at each site. It must have been obvious that the tiny fruits would not be yielding up a large quantity of mature seed.

Indeed, wrestling (with extreme delicacy) the somewhat sticky seeds into neat, chaff-free piles was a time- and patience-consuming task. Although there may have been a great number of unfilled seeds, healthy looking full seeds were

*Castle Crags bellflower,* Campanula shetleri

much fewer. And at about 1 mm in length, they were eye-boggling to push around under a stereo microscope, carefully separating the apparently robust from the empty.

The unfilled seed coats look like the bent, dried petals of some straw-colored flower, and they make the tiny seeds look husky by comparison. The seeds are usually rod-shaped, with rounded, darker ends. They range from light golden, like a droplet of vegetable oil, to light brown. Maturity appears to determine their color. While manipulating the seeds with our preferred tool, the pointed end of a micro spatula, I and our volunteers learned to frequently examine both planes of the tool for the inevitable seed stuck to the surface, either from static or its own stickiness. We learned to hold our breath while counting seeds into piles, separating the piles and sliding them off into wax paper envelopes for storage. It wasn't easy to tell whether all the seeds had gone where they were supposed to go.

*Castle Crags (Image: Bob Walker)*

After packaging the seeds in waxed envelopes, we packaged these envelopes in plasticized foil packets for sealing against moisture and filing in the freezer vault. We also sent half of all apparently good seeds to the National Laboratory for Genetic Resource Preservation in Ft. Collins, Colorado, as we do for all plants considered "sensitive." This provides at least some additional protection for a species that is threatened simply by low numbers at least, in this era of rapid change.

As always, it was a challenge to get to know the plant--which is the seed, which is a good seed, how can we separate them as quickly as possible from chaff and each other? It was enjoyable to be somehow part of the ecology of the species, getting a whiff of the high elevation ridges it inhabits just by crumbling its dried capsules and examining its seeds. Looking at its image on the CNPS web site awoke the hunger--in me, anyway!--to see it in person, taking a summer trip in the beautiful California mountains.

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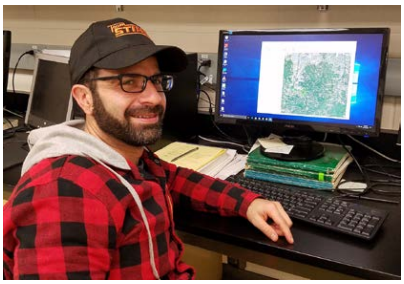
## Berry Volunteers

**Thank you to all our volunteers! Even with our citizen science program, Citizen's Rare Plant Watch, on hiatus, our volunteers gave us close to 800 hours, or about one-third of a full time employee. We couldn't do it without you! Here are three individuals who have been especially generous this year:**

**Ari Sindel, Masters Student**



After volunteering with Citizen's Rare Plant Watch by monitoring for rare plants from the mountains to the coast, I wanted to volunteer with the Seed Bank in the office as well. My wintertime project was to enhance the collections database by using GIS coordinates to determine ecoregion, soil, and geological characteristics for seed collection sites. As part of my Master of Environmental Management program, I am now waist-deep in a graduate project for the Seed Bank—creating a tool that will streamline selecting populations for seed collection and monitoring. This project builds upon processes already in use at the Seed Bank, incorporating new criteria to help increase the effectiveness of staff and volunteers during the field season.

Until now, in order to determine monitoring targets, we have been laboriously examining records for factors such as driving distance, relative rarity of species, and length of time since a population was last visited. The new computer tool takes into consideration multiple criteria and generates a prioritization score for each of the: 1) Oregon rare plant populations tracked in Seed Bank records; 2) population records deposited with the Oregon Biodiversity Information Center (ORBIC), and 3) for some of the criteria, all native plant taxa known in Oregon (using Oregon Flora Project's plant list). This last was included because the Seed Bank is interested in including in its collection common native plants as well as rare ones.

Adding criteria adds to the considerable labor to input data. For example, I've been combing through records in order to add the criterion "threat to habitat" across the state. I've also matched scientific names in our records to those of partner organizations (ORBIC, Oregon Flora Project), where the names for the same plant taxon are recorded differently (because of differing sources, or naming updates that occurred after our record was created).

Finally, another volunteer and I have made our first comprehensive effort to compare locations of collection sites in our records and in ORBIC's tracked populations. Weâ€™ll be able to determine with greater accuracy how our collections juxtapose with the records of rare plant populations across the state, which of ours may not yet exist in the state heritage database, and which populations have not contributed to seed collections. I'm hoping to present the project to my graduate committee this coming spring, and I look forward to sharing my results and having this tool enhance plant conservation efforts. Please feel free to reach out to me if you would like to know more! sindelj@pdx.edu

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**Christa von Behren, Program Development Coordinator**

I first got involved with the seed bank as an intern at The Berry Botanic Garden in 2007. I fell in love with the work and was able to participate for two additional summer seasons as a seed

collector for the Seeds of Success program. In the fall of 2010 I started a PhD program in Environmental Science and Management (ESM) at PSU. It was my good fortune that the Seed Bank moved into the department as well. I studied seed dispersal in urban riparian forests, and during the last few years of my dissertation Ed and Kris were kind enough to let me pretty much move into the lab to process my samples.

I finished my degree in June of this year, and this fall I am teaching as an adjunct instructor in the ESM department. I have also taken on a volunteer role with the Seed Bank as the Program Development Coordinator. While the Seed Bank continues to do the same excellent work it has always done, I will be pursuing new partnership and grant opportunities. The Seed Bank is an invaluable resource, and I hope to expand on existing connections with a broad range of conservation and restoration organizations by developing new relationships and partnerships. I am excited to be pursuing new opportunities with the Rae Selling Berry Seed Bank!

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**Phyllis Bittinger, Writing Intern**

I have been volunteering for the Rae Selling Berry Seed Bank periodically since 2014, while also studying to earn a Bachelor of Science Degree in Arts and Letters, with a Writing minor. I needed two more credits to complete my minor, and it seemed natural to reach out to Ed Guerrant, Director of the Rae Selling Berry Seed Bank & Plant Conservation Program (RSBSB), to explore summer internship opportunities. He suggested that I write a user's manual for the new RSBSB relational database, which had been under development with a programmer at the Chicago Botanic Garden for the past five years. The database was finally ready to document, and the internship project turned out to be a mutually beneficial situation for everyone involved.

Ed and I discussed the intended purpose, scope, and format of a user's manual that would be both useful and doable in the time available. Before I could begin composing the manual itself, it was necessary for me to become familiar with the database, and be able to use it remotely. Given the scope of the task, we understood that my commitment would be to flesh out the structure and main narrative, rather than to complete the manual. I contributed more time on the project after the internship ended, but I needed to devote my attention to studies with the return of Fall Term. The manual is an evolving document, and I leave its future expansion in good hands.

Working on the development of the relational database user's manual gave me the opportunity to apply learned writing skills while helping me acquire new techniques for collaborative writing project development and management. It has been my honor to work with everyone at the Rae Selling Berry Seed Bank over the past several years.

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## Making a Difference - Private Support

*Gilbert and Laurie Meigs*

Our dear friend **Gilbert Meigs** passed away this year. He and his wife Laurie established the Gilbert and Laurie Meigs Conservation Education Endowed Scholarship, which has enabled us to support several students in recent years, each precious hour of work nudging our database closer to functionality. Gilbert himself was the most precious gift to us, however. His dry humor, generosity and fascination with the world and its wonders and joys have touched all who had the pleasure of being his friend. He gave Kris one of his lathe-turned wooden bowls, a hobby learned in recent years, product of his ever active mind and body. We miss him and mourn him, but we will always treasure his legacies in our lives and work.

**PSU's Day of Giving** is coming up! The Rae Selling Berry Seed Bank will be participating in the PSU Day of Giving on November 27th. Join us by sharing our link or supporting our program. Check back closer to the 27th at the Day of Giving site for more details. #Give2PSU


**Private gifts and grants** make all the difference in the life of our program. You can go directly to our giving page, or for more information on ways to make a gift, please contact Kathleen Hampton, Major Gifts Officer, at (503) 725-3526 or hamptonk@psuf.org.

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## Upcoming Events

### PSU's Environmental Science & Management Dept - Friday Science Seminar

Friday, November 30, 2018
1:30 - 2:30 p.m.
SRTC Bldg, Rm B1-82 (next to the Seed Bank)
Free and open to the public; light refreshments will be provided.

**What**: Environmental Science & Management and the Association of Environmental Science

Trillium ovatum
*(Image: Andrea Raven)*

Students host a weekly Friday Science Seminar aimed at providing a casual platform for the presentation of current research and new ideas.

**Who**: Eric Butler, an ESM graduate student, will present, "Gardening with Pacific Northwest Native Plants: An Ecological Approach."

More details>>

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## Urban Ecosystem Research Consortium Lunch & Learn *and* Urban Ecology and Conservation Symposium 2019

**Lunch & Learn Series:**
Friday, December 7, 2018
12:15 - 1:00 p.m.
Metro, 600 NE Grand Ave, Portland, Room 370
Free and open to the public

*Invasive Japanese knotweed,*
Fallopia japonica *(Image MdE)*

**December Lunch & Learn**: "So many weeds, so little time: Prioritizing use of limited resources"

Speaker: **Elaine Stewart**, Metro - Conservation Program

Hear about the use of computer modeling to assess habitat enhancement results under the pressures of increased water temperatures and other changes.

**17th Annual Urban Ecology and Conservation Symposium**

Monday, February 11, 2019, 8:00 a.m. - 6:00 p.m.
PSU, Smith Center Ballroom
Keynote speakers: Robert Michael Pyle and Celeste Searles Mazzacano
**Early registration**: $45; Student: $15; Volunteer: $10

More details>>

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## The Wide World of Seed Banking

Saving seeds for future use is as old as human civilization and as timely as today's headlines. Our focus has been on rare and endangered species, but the world of seed banking is far more expansive. It probably began with storing seed for next year's

crop, and agricultural plants are likely still the most common focus of seed banks around the world. But recent decades have seen an explosion of seed banking of a much wider array of plants for many different purposes. In this section, we seek to provide a glimpse of the wide and wonderful world of seed banks.

## In Our Country: Missouri Botanical Garden Seed Bank

*Endangered Missouri native,* Platanthera praeclara, *Western prairie fringed orchid*

Seed banking is a valuable conservation tool that enables the long-term storage of genetic diversity of a large number of plant species. It involves collecting, cleaning, drying, recording, and storing seeds at low temperatures for future conservation and restoration uses.

To supplement its on-site plant conservation locally and globally, the Garden in 2013 established a Seed Bank at the Shaw Nature Reserve. As of the end of 2017 the facility contains 3,863 dormant seed accessions which include 761 different taxa. Some of these seeds were collected by Garden horticulturists and researchers on visits to Japan, China, and the Republic of Georgia. Additionally, we have collections from over 25% of Missouri's 2,000+ native plants stored in the Seed Bank, including 64 Species of Conservation Concern.

Continue reading at the Missouri Botanical Garden Seed Bank site>>

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*Ethiopian endemic,* Kniphofia foliosa *(Image: Bernard Gagnon)*

## In the World: Ethiopian Biodiversity Institute

A Plant Genetic Resources Center, Ethiopia (PGRC/E) was initially established in May 1976 through a bilateral technical cooperation agreement between the governments of Ethiopia and Germany. The main objective was to rescue the country's plant genetic resources from adverse impacts of various human activities and natural calamities and thereby support crop improvement programs. In 1998, it was re-established as the Institute of Biodiversity Conservation and Research, broadening its mandate and duties to implement Ethiopia's obligation to the Convention of Biological Diversity. In 2013 the institute achieved the current structure and was renamed as Ethiopian Biodiversity Institute (EBI).

Ethiopia has set clear national policy directives on conservation of biological resources. In the past, conservation efforts focused on plant genetic resources and priority was given to field crops. Since 1998, the Institute was given a wider mandate of conservation and sustainable utilization of all forms of biological resources including plants, animals and microbial genetic resources as well as associated indigenous knowledge. Ecosystem management is also recognized as one of the areas to be given priority.

Continue reading at the Ethiopian Biodiversity Institute site>>

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Stay informed on upcoming events and news by regularly visiting the Rae Selling Berry Seed Bank web site.

*This e-newsletter is a publication of the Rae Selling Berry Seed Bank & Plant Conservation Program at Portland State University*

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