

RAE SELLING BERRY SEED BANK & PLANT CONSERVATION PROGRAM



Spring 2019 Newsletter

From the Director



Acting Director Kris Freitag

In this issue of the newsletter, Dr. Ed Guerrant touches on a topic I have also been giving special thought to: Our program is one of many voices that speak for the plants--a tapestry of organizations that seek to protect highly vulnerable organisms from great dangers. Our own role is uniquely rooted in the past, with much organizational knowledge to contribute to the effort. We are a known and secure repository for vanishing genetic resources. Yes, we are a cog in a conservation mechanism, and the work is not always sexy. But PSU knows our value; we play a part in the life of this valuable institution. The University keeps our lights on and surrounds us with

a network of support staff that keeps our computers updated and our utilities operating. That is a lot, but without funds to pay for staff, interns and equipment, the doors close and the Seed Bank becomes nothing but a freezer full of plant material. Your support is deeply appreciated. (Please see the sidebar for a specific equipment need our program has. Thank you!)

The growing season is upon us--the time we enjoy most. Our field season was officially launched on April 14, with the first Citizen's Rare Plant Watch volunteer training event of 2019. Within the next five months, we will visit about 20 sites, collecting plant population data that would not otherwise be available to support conservation efforts. Also, under an agreement with the Center for Plant Conservation (CPC), we will be participating in a special seed collection effort funded by Kew Foundation America to build up the CPC's National Collection of imperiled native plants. Christa von Behren is heading up the effort to collect population data and seeds from *Sullivantia oregana* (Oregon coolwort). The "global" rank of this species is G2; it is narrowly endemic to northwest Oregon and Skamania County in Washington.

Dr. Guerrant is continuing much of the work he was doing before retiring, including writing articles and



Oregon coolwort habitat

MAKING A DIFFERENCE

THANK YOU, NEW SEASONS MARKET

New Seasons very generously gave us a donation that easily covered our refreshment needs at our Citizen's Rare Plant Watch training a week ago. Thank you to our favorite market!

UPCOMING CRPW TRAINING

Join us in monitoring rare plant populations in Oregon! Currently, most Citizen's Rare Plant Watch sites are within 2-3 hours drive of Portland, in a variety of habitats. We are working to extend activities throughout the state. Small groups will be led by an experienced leader, but we will have much to teach each other. Independent assignments are also possible. Our next training of the season is in Corvallis on Saturday, June 1, with an optional site visit on Sunday, June 2. Call or email for details!

Please call Kris at (503) 725-2468 or email kfreitag@pdx.edu if you would like to attend the training, support our program, provide a valuable service and have some plant-geeky fun.

taking his seasonal trips to monitor reintroduced Western lily populations. I am especially grateful for his dedication to bringing the new database to full functionality. Although he will receive some pay under specific government contracts, such as for the Western lily work, he is racking up a huge number of volunteer hours on behalf of Berry. He also will be donating his expert efforts in fulfillment of a Recovery Challenge Grant in partnership with the Yreka US Fish and Wildlife office, to develop a flexible strategy for recovery of the Yreka phlox (*Phlox hirsuta*) that can incorporate additional information as time goes on.



Ari Sindel searching for *Rorippa columbiae*

Ari Sindel, whose Master's project was detailed in the last newsletter, is now finishing up his collection/monitoring prioritization tool and preparing to begin a Conservation and Land Management internship in Albuquerque (!) as a team leader. He will be leaving in July, which is a month when I am most glad to be working in the cool Northwest. We wish him the best and are very grateful for the months' worth of volunteer time he's put in for our program; we will miss him. We are especially grateful that he recruited a number of volunteers to help him with one labor-intensive part of his project. Some of these individuals are now supporting our seed processing efforts in the lab as well!

Please let me know if you have any questions about the work we do, or if you would like to participate in any way.

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We Live in Wild and Woolly Times

Ed Guerrant



Santa Ana River woolly star

These are turbulent times. A seemingly endless stream of tales of doom, gloom and catastrophe are raining down on us. A truly alarming global loss of biodiversity due to habitat degradation and invasive species has long been part of our common understanding. And that was before human caused climate change became the critical issue we now know it to be. There are very good reasons to think we are in the early stages of the sixth great mass extinction in the last half billion years of the history of life on earth.

It's hard to know what to think about many specific claims, however, and there is a danger of crying wolf unnecessarily. As well, what is a catastrophe for one group of organisms may not be so bad, or even be essential for the survival of another. Recently, a well-respected peer-reviewed journal [published a piece](#) that assessed 73 entomological studies and concluded "dramatic rates of decline that may lead to the extinction of 40% of the world's insect species over the next few decades."

But part of the beauty and one of the great strengths



OUR GERMINATION CHAMBERS NEED UPDATING! -- Click on the GIVE button and specify "Germ Chambers" in the "Comments" field.

GIVE ►

We use this special equipment to test the continuing viability of seeds in our vault and to collect data about different species' requirements. Your targeted gift would help defray the cost (up to \$600) of updating the software and making the chambers operational again. Thank you!



Stay up-to-date with the Seed Bank on our Facebook page!

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of science, as a way of knowing, is that it is self-correcting. It didn't take long for a critical reply to appear in another peer-reviewed journal entitled "Alarmist by bad design: Strongly popularized unsubstantiated claims undermine credibility of conservation science." As scientific news and commentary site, ScienceDaily.com (SD) noted, the Finnish researchers who published their critical response to the scientific review censured the sensationalizing of insect declines. They decried the use of words such as "shocking, drastic, dreadful, [and] devastating" as unacceptable in a peer-reviewed scientific paper. And although they admitted that overall insect populations are in decline, they cited a number of study methods that biased the results, leading to an especially dramatic conclusion. SD quotes the responding article as saying "we are concerned that such development is eroding the importance of the biodiversity crisis, making the work of conservationists harder, and undermining the credibility of conservation science," Although I believe some things merit very forceful language, I feel that this larger point is on solid ground.



Beetle on Gorman's aster

In the case of flooding, strong words are justifiable. It is very important, however, to take a look at the bigger picture. Another piece in SD is entitled "Woolly star plants need catastrophes to live." The title of the source article in the journal *Ecosphere* is more subdued: "A dam in the drylands: Soil geomorphic treatments facilitate recruitment of the endangered Santa Ana River woolly star."

What is a catastrophe for one group of organisms may not be so bad, or even be essential for the survival of another.

In a long term experimental study, the authors found that the endangered Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum*) needs the effects of intense flooding to grow and survive in the flood plain where it lives. Like much of the Los Angeles basin and surrounding areas, the habitat in question is subject to episodic floods and debris

flows, which can destroy pretty much anything in their path. The debris flows that swept through the Santa Barbara suburb of Montecito last year are an example of a rather small one. The pattern is engagingly described in the chapter "Los Angeles Against the Mountains" of John McPhee's book *The Control of Nature*. The big ones, so to speak, are often presaged by large fires and triggered by intense rain falling on ground that had not had a chance for soil or vegetation to recover. The Santa Ana River woolly star needs this sort of drastic disturbance once in a while to maintain suitable habitat.

In terms of sheer over-the-top rhetoric, it may be hard to outdo a statement like "It's like finding the Holy Grail clutched in the bony fingers of Jimmy Hoffa, sitting on top of the Lost Ark." The quote is attributed to paleontologist Robert DePalma, referring to his recent discovery in a piece entitled, "The Day the Dinosaurs Died" in the April 8, 2019 issue of *The New Yorker*. The title of the article refers to the fifth great mass extinction, caused by the asteroid that struck the Yucatan Peninsula 66 million years ago, killing something like 75% of the species alive at the time. (Now that's a catastrophe!)

Extraordinary claims must be supported by extraordinary evidence. An original research paper in the *Proceedings of the National Academy of Sciences* drily entitled "A seismically induced onshore surge deposit at the KPg boundary, North Dakota" makes some pretty extraordinary claims. *The New Yorker* article sums up what they found, or at least the

Wide World of Seed Banking

OTHER LINKS

[Seed-Based Restoration of Damaged Mediterranean Coastal Habitats: The Sardinia Case](#)

[Portland \[Maine\] nonprofit promotes planting native seeds to encourage biodiversity](#)

[Seeds inherit memories from their mother](#)

[People are essential to conserving pollinators](#)

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paleontological record of that day. The authors claim to have found a site so well preserved that it enables researchers to accurately interpret what happened there in the minutes to hours after the asteroid struck the earth.

If true, it may turn out to be the one of the most astonishing scientific discoveries, well, ever. Not surprisingly, there is already push back, at least in the lay press, in [a dyspeptic piece](#) in the online magazine Slate.com. Time will tell if the interpretation of the underlying data holds up, but it sure seems pretty compelling at this early stage.

The first question, is the rock outcrop they studied really from the time of the impact? Fortunately, there is a geochemical indicator all around the world in the form of a thin layer rich in the element iridium, which "time stamps" the asteroid strike. Iridium is rare on earth, but abundant in asteroids. The site in question lies immediately underneath a thin layer of iridium, which, along with other evidence, indicates the site is from the right time. Below the iridium are layers of glass-bead-like tektites, which are small nearest the surface, growing larger at increasing depth. The tektites had largely changed chemically over time, but some were found to have been trapped in amber from logs found at the site and were protected from degradation. Those tektites proved to be almost identical to those known to be deposited at three other sites when the asteroid struck.



*Glass bead-like tektite
(Image: Dante Alighieri)*

Tektites are the solidified remnants of rocks struck by the asteroid, melted, and ejected into the atmosphere, where the liquid droplets solidified and later fell from the sky. Those two pieces of evidence seem to nail down the time not only to the day the so-called "Age of Reptiles" came to an end, but to the minutes and hours after the event.

The site also contains a rich but curious mix of fossil fresh and saltwater fish, tree trunks, and all sorts of things jumbled together as if they had been swept up in a tsunami. The fossils are preserved in exquisite detail and are fully 3-dimensional, not squashed flat. Problematic at first for the researchers was that the events they seemed to be documenting would have happened minutes after the asteroid hit, which is nowhere near enough time for a tsunami to arrive.



Fossil fish (Image: Geozerken)

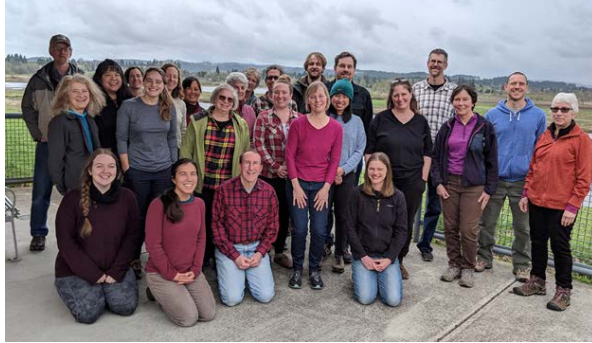
It turns out that the asteroid impact likely caused a global earthquake, and the distance between the Yucatan and North Dakota would be just right for shock waves passing through the ground to reach the site when the tektites rained down. During the great earthquake of 1906 that led to the destruction of San Francisco, the shaking essentially liquefied much of the softer ground near the Bay. Something like that appears to have happened at the fossil site: in a river above a shallow sea, the shaking set up a situation

where the animals were swept one way, then the other, trapped in a quicksand like slurry, then quickly buried by the glass globules falling from the sky. A particularly poignant finding is that all the fish had their mouths open, as if they were suffocating, and many of the tektites can be found in their gills.

The end of the "Age of Reptiles" gave way to the current "Age of Mammals," in which we live. I offer this as perhaps the best example of a true catastrophe for one group of organisms, dinosaurs, that was beneficial--or even essential--for the survival of another: mammals, and us.

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2019 Treasure Hunts



Our **Citizen's Rare Plant Watch** (CRPW) training on April 14 was full, and it went so well! Jason Clinch, former coordinator of CRPW and my volunteer co-trainer, and I conducted the workshop between us. We introduced the participants to the Seed Bank, the history and partnerships of CRPW, population data collection and size estimation, among a host of other details. Our outdoor "systematic sampling" practicum, in all its complexity, went very smoothly, if I do say so myself. I credit my weather luck with the perfectly timed break in the rain.

The following is a selection of our target species for this season. Our next training will be June 1 & 2 in Corvallis. Let me know if you are interested in participating or would like more information.



Delphinium pavonaceum (peacock larkspur), is endemic to the Willamette Valley. A number of populations occur in the greater Corvallis area, and this beautiful plant will be the target species for our June training. (Image: Jerry Murray)

Found in many warmer areas, *Hydrocotyle verticillata* (whorled marshpennywort) is notable in Oregon for being at one of its highest latitudes. (Image: I, Kenpei)



Reminiscent of the somewhat weedy but charming jewelweed of wet areas we're familiar with, *Impatiens ecorruta* (spurless touch-me-not) is much less widespread, narrowly limited to moist and shady wooded areas. (Image: Matt Lavin)

We'll be documenting a newer population of an uncommon form of Columbia lewisia, *Lewisia columbiana* var. *columbiana*. It may be a cliffside population we can only count using binoculars! (Image: Walter Siegmund)



A population of *Cicendia quadrangularis* (Oregon timwort) was first recorded in the early 2000's; we've been asked to more fully document and collect a specimen of this tiny beauty by the Forest Service. (Image: Steve Matson)

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CPC

Ed Guerrant



Calochortus umpquaensis,
Umpqua mariposa lily

Plant conservation is a "team sport." The Berry Botanic Garden was a founding member of the Center for Plant Conservation (CPC), and our participation has been a boon for our work ever since. I like to think we have contributed to the practice of using ex situ seed storage as part of an integrated conservation strategy that necessarily includes land managers and others who work to protect habitat.

Among the greatest benefits is the professional scientific community CPC provides. Having a peer group of conservation practitioners from around the country provides a forum within which to discuss common challenges and the group experience and expertise to work out solutions.

This didn't happen by accident. It began early on when the CPC central office staff set out to provide practical conservation guidelines, scientifically supported. They knew what they wanted to do, but were humble enough to know they weren't the experts. Their solution was to organize an international symposium of the best scientists and practitioners they could find to address issues they would need to consider critically for any "final" guidelines. The CPC published a book of the symposium proceedings (*Genetics and Conservation of Rare Plants*); the appendix, titled "Genetic Sampling Guidelines for Conservation Collections of Endangered Plants," was the ultimate goal.



Seeds of Packard's blazingstar
Mentzelia packardiae

They took this model for developing practical guidelines--determine what underlying scientific issues need to be understood to inform such guidelines, organize an international conference with the leading experts on those issues, have them write in-depth papers on their topics, and then use what was learned to develop scientifically sound, practical guidelines. The second issue the CPC addressed this way was the reintroduction of endangered plants. The guidelines thus created came out in the second CPC book, *Restoring Diversity: Strategies for the Reintroduction of Endangered Plants*.

The third book in the series followed, *Ex Situ Plant Conservation: Supporting Species Survival in the Wild*. New sets of guidelines were created: "Guidelines for Seed Storage" and "Guidelines for Ex Situ Conservation Collection Management." Enough had been learned in the decade following the original sampling guidelines that the book also contained "Revised Genetic Sampling Guidelines Conservation Collections of Endangered Plants."

The fourth and most recent CPC book, *Plant Reintroduction in a Changing Climate: Promises and Perils*, provided a broad review of what the conservation community had learned about reintroduction in the decade since *Restoring Diversity* was published. The information gained was used to



update the "Center for Plant Conservation Best Reintroduction Practice."

While these books and guidelines have been very influential globally, the information is in book form, and may not be as widely available as we would like. To remedy that situation, and to allow for more timely updates and additional recommendations, the CPC has quietly for the last couple of years been

updating all of the guidelines and recently posted online a downloadable pdf document, "[CPC Best Plant Conservation Practices to Support Species Survival in the Wild](#)." For the first time we have consolidated our guidelines to cover plant conservation practice from soup to nuts.

It is my hope that these guidelines will become the de facto standard practice, and that, as they are web based, the CPC can use feedback from practitioners to modify and update and otherwise improve them accordingly.

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Berry Volunteers Connect



Farewell to long time Garden member and volunteer **Audrey Moser** (shown here with our spiffed up library!), who is moving to Boise to be with family. Audrey stepped in when we first moved to PSU and offered to help us to bring order to the small portion of the Garden's library we'd brought with us. Audrey replaced ancient labels and entered the books into the EndNote bibliography database. And THEN she started on periodicals and journal publications! Altogether, she gave the Seed Bank 569 hours of her time. We will miss you sorely, Audrey, and we hope you have a great time in Idaho!

We are grateful for seed processing volunteer **Mary Lee**, who says this: "I'm a junior at Portland State University studying psychology and computer science. During winter term, I took a class called Urban Environmental Issues to satisfy a requirement, and it ended up being one of my favorite classes. For one project in the class, we were encouraged to volunteer in our communities. For my project, I helped with planting native plants along a creek, and it made me very interested in learning more about



native species. I searched for information about native plants on PSU's website and came across the site for the Rae Selling Berry Seed Bank. I decided that I wanted to volunteer at the Seed Bank to do my part in protecting native plants. It has been a very valuable and fun experience, and it makes me feel that even if I don't decide to work in the field I can still make a difference."

Seed processing volunteer **Kelsey Finnegan** came to us through the efforts of grad student Ari Sindel, who recruited several students to help with a particularly labor-intensive part of his population prioritization project. Kelsey has this to say: "This past January I volunteered to help with a graduate student project involving the Seed Bank and have been captivated ever since. I will be graduating this spring with a Bachelor of Science in environmental studies (geography minor), after transferring to PSU from Loyola University New Orleans two years ago. In an age of extinction, my passion for botany has left me curious as to the workings of seed banks and their conservation efforts. I always anticipated having to travel to Norway, for example, or England to satisfy my curiosity--not the basement of the SRTC building right here on campus! I plan to attend graduate school in the near future, but my interests are numerous, encompassing melittology (study of bees), entomology, paleobotany and biosystematics. The Seed Bank has provided me the opportunity to further develop skills and to home in on a specific interest, while also contributing to the conservation of our region's rare and endangered plant species."



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Making a Difference - Private Support



A special thanks to all who donated in response to our 2018 Annual Appeal: Rachel Witmer, Janet & Stephen Webster, Sylvia Giustina, Carol & Kurt Putnam, Cate & Jeff Soulages, Dave & Norma Freitag, Sharron Gargosky, Jane Hartline, Gerard & Rita Van Deene, Stephen Wille, Emma Puckett, Audrey Moser,

Dean Runyan & Liz Evans, Katherine & Roger Lintault, Cheryl McCaffrey, David & Kay Pollack, Jean & Ralph Quinsey, Michael Dawson, Ron Klump, Patricia Stenaros, Laurie Meigs, Jerry & Stephany Anderson, John Bondurant, Frank & Sarah Chaplen, Elisabeth Dally, Beverly Koch, Janet & William McLennan, Raj Sarda, Courtney & Anthony Vengarick, Donald & Priscilla Zobel, Janet Dorow, Keith Karoly, Meenakshi Rao & Bennett Battaile, Catherine Dalziel, Lorali & Patrick Reynolds, Elizabeth J. Lilley, Reid Ozaki, Judith &

Charles Roberts, Martin Skinner, Elizabeth Stanek, Kenneth Jay Walters, Burton Lazar, Pamela Johnston, Susan & John Schilke, Janice Dodd, Joan Horstkotte, Candy Puterbaugh, Marna Tallman, Gay Greger & Jim Sjulín, Barbara Manildi, Yvonne Hajda.

Our germination chambers need updating! Please see the sidebar for more information about supporting our program in a crucial area.

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

Native Plant Month PDX 2019

Events Sponsored by the Portland Chapter of the Native Plant Society of Oregon, Friends, and Partners

May 1 - 31

Portland Metro area and beyond

Don't miss out--mark your calendars for Native Plant Month! This year, the Portland chapter of the **Native Plant Society of Oregon (NPSO)** will be promoting a month-long celebration of native plants throughout May 2018. Native Plant Month (NPM) draws inspiration from the NPSO's statewide Native Plant Appreciation Week, and is packed with fun-filled and educational events coordinated by NPSO-Portland, partnering organizations, and friends. All of the featured events share a theme of supporting greater appreciation and knowledge of our local native plants, and highlight the importance of protecting and preserving these valuable species.



Our beloved pup in balsamroot and paintbrush

Highlights of Native Plant Month include:

- May 4: Exploring the Plants of Tryon Creek
- May 7: NPSO After Work Field Trip: Camassia Nature Preserve
- May 21: **Rae Selling Berry Seed Bank Open House**
- May 26: Hoyt Arboretum--Pacific Northwest Ethnobotany
- May 30: Elk Rock Island Paddle & Plant Walk

[More details>>](#)

Rae Selling Berry Exhibit at the Oregon Jewish Museum

Date TBD

Oregon Jewish Museum and
Center for Holocaust Education
724 NW Davis Street, Portland

The daughter of prominent Jewish philanthropist and politician Ben Selling, Rae Selling Berry made a name for herself as an expert plantswoman. After she died, the Berry name continued on at the eponymous garden.



Rae Selling Berry in the Willows

Eventually, we took her whole name as part of our plant conservation program, in honor of her great passion for and activity in the realm of special native plants.

The Oregon Jewish Museum is creating an exhibit to honor Mrs. Berry, as well as her horticultural and botanical legacy.

[More details>>](#)

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Urban Ecosystem Research Consortium Lunch & Learn

Lunch & Learn Series - First Fridays:

Next one is Friday, May 3, 2019

12:15 - 1:15 p.m.

Metro, 600 NE Grand Ave, Portland, Room 370

Free and open to the public



Streetside bioswale

May Lunch & Learn: "Designing Hydro-logical Community Resilience." Ms. Luna's architectural design perspective will offer an innovative opportunity to expose the interconnectedness of infrastructure, ecology, and architecture within the Lents and Powellhurst-Gilbert neighborhoods. She'll examine where current efforts are falling short in providing a holistic solution for floodwater risk, health, displacement, and economic prosperity within a historically disadvantaged community.

Speaker: **Sabrina Ortiz Luna**, Master's student, University of Oregon

[More details>>](#)

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Citizen's Rare Plant Watch Volunteer Training

Saturday, June 1, 9:00 a.m. - 4:00 p.m.

and Sunday, June 2, 8:30 a.m. - 1:00 p.m.

Oregon State University campus, Corvallis

Join us in monitoring rare plant populations in Oregon! Citizen's Rare Plant Watch sites are in a variety of habitats throughout the state. Small groups will be led by an experienced leader, but we will have much to teach each other. We strongly recommend this training session. If you



Systematic sampling training

wish to take on independent assignments, training is required.

[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: Mojave Desert Seed Bank

Mojave Desert Land Trust (MDLT) has conserved more than 70,000 acres of prime desert habitat, forever weaving together National Parks, wilderness areas, and wildlife linkage corridors. The organization works closely with a broad range of desert community members and visitors, as well as with local, state, and federal agencies. MDLT offers hands-on learning and volunteer opportunities to residents and visitors of the desert. It collaborates closely with, and is supported by, a diverse range of partner organizations, agencies, neighbors, and visitors who treasure the desert's unique qualities.



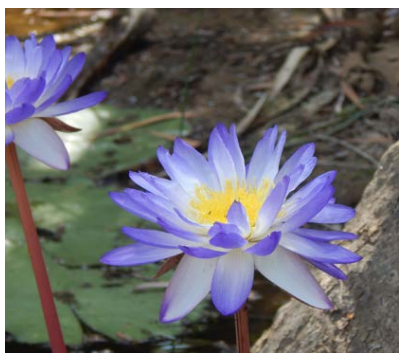
Desert endemic, Nitrophila mohavensis, Amargosa niterwort (Image: Stan Shebs)

The Mojave Desert Seed Bank is a repository of seeds and spores of native flora from throughout the Mojave Desert ecoregion. The seed bank serves as an ex-situ conservation tool for use in restoration, education, and research in the Mojave Desert region.

[Continue reading at the Mojave Desert Land Trust site>>](#)

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In the World: Kimberley Community Seedbank of Northwest Australia



Kimberley waterlily, Nymphaea violacea (Image: MissMegido)

The Kimberley Community Seedbank is a not-for-profit community enterprise that promotes good revegetation practices, supports conservation and management activities and provides an avenue for community groups to make an economic return. It is also a resource hub.

The Seedbank works with community groups including ranger teams to collect local seed and preserve the flora of the Kimberley. It was set up in

2015 by Environs Kimberley because Kimberley seed is under-represented in national seedbanks and provenance seed is in limited supply for revegetation projects across our region.

The project assists communities and local groups with support and training in, and information about, collecting, storing, cleaning and propagating viable native seed. The Seedbank works with many Aboriginal groups and combines Indigenous ecological knowledge with Western science. The Bardi Jawi Oorany (BJO), Nyul Nyul and Karajarri Rangers have been collecting seed from rare, endangered and culturally significant plants in order to rehabilitate degraded areas of their country. As well as using the Seedbank for the longer-term protection of plant species, the BJO women rangers are growing plants in their own nursery.

[Continue reading about the Kimberley Community Seedbank>>](#)

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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