
Nemophila

THE CALIFORNIA BOTANICAL SOCIETY NEWSLETTER

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Madroño feature:

Restoring California ecosystems for plants and people

By: Lorena Villanueva-Almanza, Ph.D.
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This article highlights the recent *Madroño* article: “Germination of multi-year collections of California grassland and scrub seeds” by Madison T. Ginn, Timothy M. Brown, Rick Flores, and Karen D. Holl. *Madroño* Vol. 67. No. 2.

<https://bioone.org/journals/madro%C3%B1o/volume-67/issue-2>

Efforts to restore the sage scrub and grassland ecosystems at Pinnacles National Park and the Younger Lagoon Preserve, part of the California Natural Reserve System, have been going on for years. Although park rangers had been planting species to bring back the functionality of these ecosystems, they were not sure about the viability of the seeds they were using. Researchers confirmed seed age is among the most important factors to consider when putting seeds in the soil and recommend testing seeds stored before using them

in restoration projects that increase native biodiversity.

A group of researchers from the University of California Santa Cruz wanted to know how long seeds of 34 native species of grasses, forbs, and shrubs can be stored and remain viable. Seeds were collected from 50 locations in the Preserve and the Park, dried, and stored for a period of 6 to 12 months before they were sown into pots with mycorrhizae soil in a greenhouse. Mycorrhizae are beneficial fungi

that help plants absorb water and nutrients. After caring and tracking the seeds for 11 weeks they found that, for three quarters of the species, at least 25% were on track to grow into adulthood. Seed performance was dependent on storage time: seeds that were stored for longer were less likely to sprout.



Castilleja exserta grown at the UCSC greenhouses to bulk up the seed count. This was one of the annual species reseeded in the field at Pinnacles. Figure provided by Rick Flores.

The novel aspect of the project is the inclusion of annual species explained Rick Flores, director of horticulture at the UC Santa Cruz Arboretum and Botanic Garden and co-author of the publication.

Karen Holl, professor at the University of California Santa Cruz and last author of the paper, said this research was motivated by management questions. “Will the seeds germinate under ideal conditions? (Because) if they are not germinating in the greenhouse they will not germinate in the field,” she said.

The results of the research could help inform future seed collection in both sites.

After not being able to collect fresh seeds one

year, staff at Pinnacles National Park had to use some from an older stock, which led to decreased germination rates, explained Amelia Ryan, vegetation ecologist at Pinnacles National Park, who was not directly involved with the research.

Researchers also found that germination depended on whether seeds were exposed to germination triggers like low temperature, seed quality, collecting and storing practices.

“How you're storing these seeds is also really important to the viability of seeds for restoration projects,” said Flores.

One of the caveats of the study was that, since researchers mixed seeds from both locations, they were unable to identify populations that produced better seeds.

The scientists recommend testing seeds stored to make sure they are viable. This would save time and resources. They also suggest collecting seeds from different populations and on different years to increase genetic diversity.

But restoration is not only important for these ecosystems; it also brings back some resources that indigenous groups have used throughout time.



Field germination site at Pinnacles. Wildflowers seen are *Lasthenia gracilis* and *Castilleja exserta*. Photo by Rick Flores.

Flores explained this study is part of a bigger restoration project that builds upon what others have been working on, including the Amah Mutsun, a local tribe in the area. The tribe helped select some of the species that scientists studied for their seed experiment.



Clarkia unguiculata. Also grown at the UCSC Greenhouses to bulk up the seed count for the field. This species was used in the field at Pinnacles. Figure provided by Rick Flores.

“When we work with the tribe on other restoration projects, we now have this baseline of knowledge about how to restore annuals within those grasslands, that are still historically important to native peoples,” Flores explained.



Upcoming Events

Despite the continued need to be socially distant, we have quite a few events on the way! Our 28th Graduate Student Symposium will be held virtually (via Zoom) on April 30th and May 1st. Our Keynote speaker will be Dr. N. Ivalú Cacho from the Department of Botany, Institute of Biology, Universidad Nacional Autónoma de Mexico (UNAM). **Abstracts are due March 12th**. We look forward to seeing you there!

We have the opportunity to visit and learn together each month at our Botany Speaker Series, held every 2nd Thursday of the month from 7 – 8 pm PT. The next talk will be on March 11th, with Justin Luong, presenting on coastal grassland restoration. His talk is entitled: “What happens to restored coastal California grasslands years after planting and seeding efforts?”

Our next grant cycle is coming up, with the Paul Silva Student Research Award application deadline on May 15th. This grant is open to undergraduates and graduate students.

We are also working to continue our Botany Ambassador program, educational grants, and K-12 science fair awards programs. We hope you will join us in participating and contributing to these events and programs.

More information about these events can be found on our website: calbotsoc.org.

Botany Speaker Series

Our virtual speaker series is off to a great start! We have enjoyed talks by Dr. Lorena Villanueva-Almanza and Adriana Hernández. To catch up on past talks the recordings are on our website at calbotsoc.org/previous-speakers/.

On March 11th from 7-8 pm PT, Justin Luong will give a presentation on “What happens to restored coastal California grasslands years after planting and seeding efforts?”



March Botany Speaker Justin Luong keying out coastal grassland species. Photo provided by Justin Luong.

Upcoming talks:

- 11-Mar** Justin Luong
- 8-Apr** Natalie Love
- 13-May** Suzanne Pierre
- 10-Jun** Jenna Ekwealor
- 8-Jul** Maria Jesus
- 12-Aug** Rachael Olliff-Yang

The zoom link will remain the same for all speaking events this year and can be found at: www.calbotsoc.org/events.

We are hoping to showcase and promote the work of early career botanists. If you are an early career botanist interested in giving a talk of general interest to our members, please email us at membership@calbotsoc.org.

Virtual Student Symposium

April 30th- May 1st 2021

We are pleased to announce that we will be hosting a virtual conference for our biennial student symposium, to take place on April 30th and May 1st 2021. Our Keynote speaker is Dr. N. Ivalú Cacho, from the Department of Botany in the Institute of Biology, Universidad Nacional Autónoma de Mexico. Dr. Cacho will be giving a talk on “Evolutionary ecology of Californian Jewelflowers, an integrative approach.”



Dr. N. Ivalú Cacho (UNAM), next to fruiting jewelflower *Caulanthus inflatus*. Dr. Cacho’s keynote lecture will cover the “Evolutionary ecology of Californian Jewelflowers, an integrative approach.” Photo provided by Dr. Cacho.

If you are a student at any level, we look forward to seeing your abstract submission! Presentation types include: Talks (15 minutes), Lightning Talks (5 min), and posters.

Abstract submission deadline is March 12th. Submit at: bit.ly/calbotsoc_abstract

We hope you will join us!

Paul Silva Student Research Grant

Applications Due May 15th, 2021

The Paul Silva Student Research Grant is named after Paul Silva (1922-2014), a phycologist and Curator of Algae at the University Herbarium, UC Berkeley, whose bequest to the Society has made this award possible. Awards are made to qualified undergraduate and graduate student members of the Society working on projects that will help achieve the Society's goal of advancing Western American botany. Students from any accredited university doing botanical research within western North America and who are members of the Society are eligible for this award.

The next application deadline is May 15, 2021. Proposals will be reviewed by a panel of experts, and winners will be announced within two months of the application deadline. We anticipate awarding funds for both undergraduate and graduate projects, and application groups will be judged separately. More details and application forms are available at calbotsoc.org/grants

Those interested in supporting this grant can donate at: <https://calbotsoc.org/membership/>. Donations allow us to increase the number of awards given each year.

Open Positions – Join our board!

As part of the cycle of leadership for The California Botanical Society there are three open board positions on our Council: Outreach Coordinator, Corresponding Secretary, and Membership Chair. We are seeking enthusiastic candidates with vision to step into these roles. Below are descriptions of each position. All are volunteer positions that support and advance the mission of

our not-for-profit society. Please email us at membership@calbotsoc.org to find out more or nominate yourself for one of these positions.

Outreach Coordinator

This position involves coordinating and recruiting participants to the Botany Ambassador program. Responsibilities include promoting the Botany Ambassador program, creating and connecting members with opportunities to share and communicate botany, and attending monthly council meetings during the academic year.

The Outreach Coordinator directly supports and cultivates the Botany Ambassador program. Current branches of the Botany Ambassador program include botany presentations for K-12 students and lay summaries of academic papers published in *Madroño*. If you are passionate about science communication and would like to create opportunities and support others in communicating science, this is the position for you!

Corresponding Secretary

This essential role aids in processing bills and reimbursements and sending out annual mailings and fliers (e.g., President's letter and banquet announcements). Responsibilities include assisting our administrator and treasurer in filing paperwork each year for the running of *Madroño*, managing the corresponding secretary email account, and attending monthly council meetings during the academic year. This position is well-suited to someone interested in gaining business administration experience, or who wants to learn more about the workings of nonprofit organizations and the publishing process.

Membership Chair

This position manages our membership email and writes and distributes messages directly to our members. This role includes creating the monthly mailing insert in the *Madroño* issues, submitting print orders for *Madroño*, organizing the mixer at the Northern California Botanists Symposium, and other publicity and outreach events to engage and increase membership. There is a lot of flexibility to start new programs that will support and benefit our members. This role is perfect for a creative individual interested in interacting with other members and expanding their network!

Volunteer and Make a Difference: Inspire Young Botanists

The Society awards prizes to outstanding botany projects presented by budding K-12 scientists at recognized California science fairs. Anyone interested in judging or in helping in their county's science fair should contact Justen Whittall at jwhittall@scu.edu, who can help connect you with your local science fair, and coordinate judging and awards. Most California counties have science fairs and the Society is currently sponsoring fairs only in Santa Clara and Santa Cruz counties. With your help, we hope to reach science fairs across California.

Contribute to *Nemophila*

Nemophila is a digital newsletter compiling and disseminating information and announcements for the members of the California Botanical Society, as well as highlighting and sharing member news and stories. We are seeking short articles, letters to the editor, photos, and other items of interest to the members of the California Botanical Society concerning the Western North America region. Please email your submissions to our editor, Rachael L. Olliff Yang at: membership@calbotsoc.org.

