California Plant Phylogeny Working Group Established

CNPS citizen scientists needed to collect target plants

By Brent Mishler

Understanding patterns of biodiversity on the landscape is important for conservation planning, given the urgent need to prioritize efforts in the face of rapid habitat loss and human-induced climate change. Biodiversity is usually measured by counting the number of species in a location and examining the extent of their distribution, to identify areas of particularly high species diversity and endemism. However, investigation of species distribution alone misses the full richness of analyses that can result from taking a phylogenetic approach. Biodiversity is the whole tree of life, not just the twigs (species).

Phylogeny is a complex subject that can be difficult to understand at first, but is like a human genealogy: a tree showing how closely that related modern species are to each other in evolutionary history, i.e., how long ago was common ancestry. These days DNA sequences are emphasized rather than externally visible characteristics.

New phylogenetic methods incorporate knowledge about the relationships of species to provide deeper insights into the distribution of biodiversity. They can tell us how well currently protected lands cover the phylogenetic tree, and identify high-priority unprotected areas containing unique evolutionary histories in need of conservation.

Phylogenetic diversity (PD) is different than species diversity. This is a hypothetical phylogenetic tree of 42 total species, the vertical lines representing the amount of genetic difference since the last common ancestor. The same number of species sampled in different locations (represented by the blue circles) can have a very different PD (the sum of the red branches on the subtree connecting them) depending on how closely they are related. Conservation efforts should focus on preserving PD rather than on the number of species, as this will maximize preservation of genetic diversity and other traits such as chemistry and morphology.

Get Ready for the CNPS Conservation Conference

The CNPS 2015 Conservation Conference is coming up this January 13–17 at the DoubleTree by Hilton San Jose. Kicking off the 50th anniversary of CNPS, this special event will be larger and more exciting than ever before.

The Conference begins with 21 pre-conference workshops and five field trips to botanical hotspots on January 13 and 14. The main conference will launch into full gear on January 15 with opening plenary speaker Michael Soulé, the “father of conservation biology.” Then the exhibit hall will open and concurrent sessions will begin, continuing through January 17.

We have added several new sessions this year, and two new session formats: energizing five-minute “Lightning Talks,” and “Progress and Promise Talks,” providing 40-minute time slots for key speakers. We are anticipating over 300 oral and poster presentations in 25 sessions by plant scientists, conservationists, and horticulturists.

Have some fun after the first day of sessions. See the Botanical Art Exhibition, vote for the best entries in the Photography Contest, and connect with like-minded people during the Opening Reception. The “Reaching High: Poets and Writers” event will be followed by Songfest and a music jam in the seventies-style disco bar.

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Phylogeny Working Group

Bruce Baldwin, David Ackerly, and I of the University and Jepson Herbaria at UC Berkeley, have received a three-year National Science Foundation grant to apply a novel suite of phylogenetic tools to the exceptionally rich flora of California. In our research, we are making use of the Consortium of California Herbaria database, the online Jepson eFlora for California, and the wealth of published phylogenetic studies.

We are focusing on two key concepts: phylogenetic diversity (the portion of the overall phylogeny that is present in a local place), and phylogenetic endemism (the geographic rarity of that portion of the phylogeny). Our research team is developing a comprehensive phylogeny for California plants using existing data from Genbank (an international databank of DNA information) as well as fresh material for taxa whose DNA has not yet been sequenced.

This is where CNPS comes in. The grant includes financial support for an innovative collaboration with CNPS citizen scientists with knowledge and interest in California native plants and their phylogenetic history. Educational workshops will be held and financial and logistical support provided for fieldwork to collect target plants. This fieldwork will be coordinated with other CNPS activities including the Rare Plant Treasure Hunt.

The California Plant Phylogeny Working Group will hold a “kick-off” meeting during the CNPS Conservation Conference in January 2015. To learn more about the project, contact Staci Markos in the Jepson Herbarium: smarkos@berkeley.edu. If you are interested in attending or getting involved in the project’s workshops and field trips, contact Danny Slakey at: dslakey@CNPS.org.

Brent Mishler, Director
University and Jepson Herbaria

Conservation Conference

The next morning will open with another new addition to the schedule, “Visions for California Protected Lands,” in which a plenary panel drawn from major state and federal agencies will discuss their ideas and perspectives on the future of California conservation. Sessions will then continue, followed by the Silent Auction. Then relax and enjoy a delicious dinner to wrap up the day at the Friday Banquet, which will include keynote speaker Jared Farmer, historian and geohumanist.

The Conference will conclude Saturday with Progress and Promise Talks. While in San Jose, don’t forget to explore the vibrant Bay Area from the conference’s ideal central location. There are wonderful attractions nearby, including many parks and natural areas. The DoubleTree is conveniently located, and it’s easily accessible whether you arrive by plane, train, bus, or car. With special discounts for conference attendees, it’s the perfect place to stay—and you never have to leave the party!

The 2015 Conference will have something for everyone with an interest in native plants and conservation. Whether you’re a consultant discovering the latest technology and trends, a student or researcher presenting your work, an agency employee seeking to learn best practices for land management, or a backyard botanist looking for tips to improve your native garden—you won’t be disappointed. Sponsor, exhibitor, and volunteer opportunities are available, and we especially encourage students and CNPS members to attend and take advantage of discounted rates.

We hope you will join this celebration of the past 50 years of progress, and be a part of the discussion about what the next 50 years will hold for California’s native plants. Full details and registration are available online at cnps.org/2015. See you in San Jose!

Becky Reilly
CNPS Events Coordinator

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