



GOLD FIELD NOTES

EL DORADO CHAPTER ☼ CALIFORNIA NATIVE PLANT SOCIETY ☼ JULY-AUGUST 2021

JULY 27 PROGRAM

THE ORIGINS OF CALIFORNIA'S FLORA THROUGH TIME AND SPACE

In this presentation Prof. Kristina Schierenbeck will place the great diversity of plants in California in the context of evolution, migration, and plate tectonics, a field known as phylogeography, with some emphasis on the Northern Sierra Nevada foothills. A scholar of California flora for over 35 years, Schierenbeck is a professor of botany at California State University, Chico and recently published a book entitled *Phylogeography of California*. Her research has focused on invasive plants species, evolution through hybridization, and the population genetics of rare plants.

This presentation is free of charge and open to all. To register for the meeting (required), go to <https://cnps-org.zoom.us/meeting/register/tJAtcOyqqDwpHtGeOaAo2AN-DMemu2S5Gq0J>. After registering, you will receive a confirmation email containing information about joining the meeting.



Editor's note: Prof. Schierenbeck has an article on the consequences of genetic hybridizations in the new issue of *Artemisia* (Volume 48:2, page 25).

Phylogeography of California examines the evolution of a variety of taxa—ancient and recent, native and migratory—to elucidate evolutionary events both major and minor that shaped the distribution, radiation, and speciation of the biota of California. The book also interprets evolutionary history in a geological context and reviews new and emerging phylogeographic patterns. Focusing on a region that is defined by physical and political boundaries, Kristina A. Schierenbeck provides a phylogeographic survey of California's diverse flora and fauna according to their major organismal groups. Life history and ecological characteristics, which play prominent roles in the various outcomes for respective clades, are also considered throughout the work. Supporting scholars and researchers who study evolutionary diversification, the book analyzes research that helps assess one of the major challenges in phylogeographic studies: understanding changes in population structures shaped by geological and geographical processes. California is one of only twenty-five acknowledged biological hotspots worldwide, and the phylogeographic history of the state can be extrapolated to study other regions in western North America. Further consideration is given to implications for conservation, recommendations concerning the biogeographic provinces that roughly define the state of California, and predictions related to climate change.

CALENDAR

July 24 (Saturday)

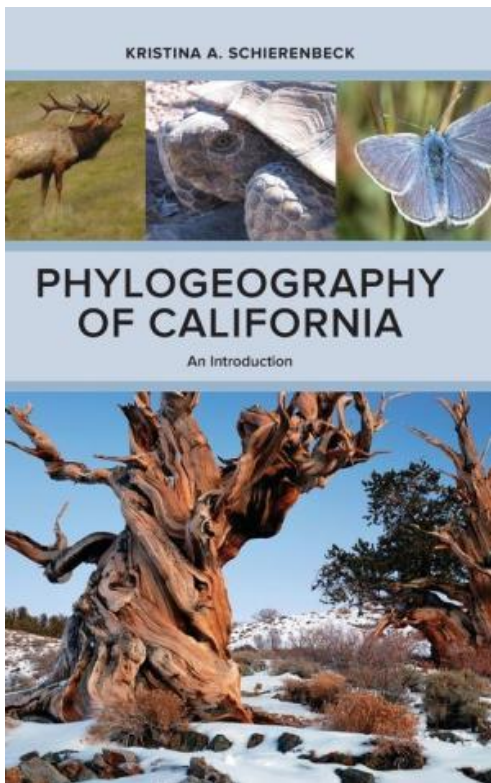
Plant walk.
Page (Paige) Meadows. See inside for details.

July 27 (Tuesday)

Chapter program
The Origins of California's Flora Through Time and Space. See article to right for details.

September 28 (Tuesday)

Chapter program.
A Landscape Primer. We are hoping to have this program in person at 7 pm. Stay tuned to website and next newsletter for details.



SEQUESTERING CARBON CASE STUDY II: VOLUNTEERS PROTECTING LEGACY PINES IN THE CA- PLES CREEK ECOLOGICAL RESTORATION PROJECT

Note: We are fortunate to have chapter members with a deep expertise in plants and who are willing to share their knowledge with us. This article is composed of excerpts and summaries from a white paper written by Lester Lubetkin, our chapter's Conservation Co-Chair (https://www.eldoradocnps.org/images/news-and-events/carbon-neutral/Case_Study_II_Lubetkin_2021-07-12_web.pdf). He, along with staff from Sierra Forest Legacy, organized chapter volunteers and others in 2019 to pre-treat (that is, to cut ladder fuels, to pile dead fall, and to rake pine needles and duff) within the planned prescribed burn in the Caples Creek drainage near Kirkwood, California. Lester also estimated the carbon sequestration of this volunteer effort. A link to the full white paper will be available of our chapter's website on the "Carbon Neutral Efforts" page.

Tal Blackburn

OUR CARBON NEUTRAL PLEDGE

In 2019, the El Dorado Chapter of the California Native Plant Society adopted a pledge to decarbonize its activities, meaning that the Chapter's activities will in net add no greenhouse gases to the atmosphere every year. This pledge encompasses travel for activities, meetings, events, etc. Based on member surveys and other information, the Chapter has determined that our carbon footprint is typically about 20 tons per year (CO₂ equivalent). Because of the various restrictions and social distancing during 2020, the Chapter's carbon footprint was estimated to be 7 tons per year (CO₂ equivalent). To put these 7 tons in perspective, the average annual carbon footprint per person in the U.S. is 15 tons.

To become carbon neutral, the first step is to reduce a carbon footprint as much as feasible. What remains of a carbon footprint can then be compensated for.

One way is with purchasing carbon credits. A second more direct and satisfying way is to directly take a hand in efforts that increase the carbon sequestration of the land around us. Some of the chapter's conservation projects are of this second way: they not only preserve and restore native plants areas, but also build up the land so that it can sequester more carbon. The difficulty in using a conservation project toward compensating for our carbon footprint is that there are few guides as to how much carbon we should take credit for – no one has tried to do the math.

The following analysis presents a calculation of the annual amount of carbon sequestered by protecting "legacy" conifers in advance of the Caples Creek Ecological Restoration planned prescribed burn. In a nutshell, every tree saved is a tree that can continue to pull carbon from the atmosphere and to lock the carbon into its biomass. The data indicates that if the area had burned as a wildfire, 23% of the large trees would have been killed in the fire, whereas none appeared to have yet died several months after the prescribed burn.

THE CAPLES CREEK PROJECT

During the summer of 2019, the El Dorado Chapter of CNPS took a lead role in facilitating the coordination of volunteers to protect large "legacy" conifers in advance of the Caples Creek Ecological Restoration Project's planned prescribed burning. The Caples Creek canyon is filled with a mixed conifer-oak forest interspersed with brush-fields, aspen groves and large subalpine meadows.

The mixed conifer-oak forests have adapted to thrive with fires every 10 to 15 years. With fires this frequent the duff and understory vegetation does not get so dense that the fires become too hot. Many of the tree species have bark that protect the trees from fire damage and oak trees have



Caples Creek Watershed. Photo: USFS

adapted to survive fires by sprouting new growth from their stumps.

With frequent fires, the large pines and cedars are naturally well spaced and are not competing with smaller trees for the limited water and nutrients in the dry summer. And frequent fires release needed nutrients back into the soil.

However, forest management for the last century has been to suppress wildfires. The result is that the forests have become denser with a more closed canopy and many small trees competing with the grand, mature trees. And even the mix of tree species started to change - whereas pines, cedars and oaks were the dominant species originally, white fir (a shade-tolerant tree) has started to become more prevalent. The amount of fuel accumulating on the forest floor has been increasing significantly and now there is what is called a "fuel ladder" allowing fire to spread from the forest floor, up the smaller trees and tangled branches into the canopy of the large, legacy trees.



Ground fuels and ladder fuels. Photo: Lester Lubetkin

continued on page 3

SEQUESTERING CARBON: CASE STUDY II

continued from page 2

The Eldorado Forest has developed a plan to reintroduce fire into the forest in the Caples Creek area. One of the requirements of the plan was to avoid killing the large “legacy” conifers when the area is subject to the understory burning of the dense vegetation and woody material that has accumulated. Past studies have shown that removing duff and litter around the bases of the legacy conifers helps to protect them from mortality.



Volunteers eliminating ground fuels.
Photo: Kathleen Barco

Volunteers worked during the summer of 2019 with Forest Service fire crews to cut down small trees next to the grand legacy Ponderosa and Jeffrey pines and to rake needles and duff away from the bases of these 400 to 700 year old giants,



Volunteers raking large legacy pine
Photo: Lester Lubetkin

some of whom were over 5 feet in diameter. Because fire had been suppressed for so many years in this area, an enormous accumulation of sloughed-off bark, fallen branches, needles and other organic material had collected right at the base of these pines. Had a fire come through this stand of trees, the fire burning so much duff at the base of these trees would have girdled the tree, killing it. Or, had the tree survived the fire, the shallow roots would have been “cooked”, prohibiting the tree from taking in the water and nutrients needed to survive and ward off insects. This secondary impact can be just as fatal to the trees.

Over 80 volunteers participated in 11 workdays and protected about 200 trees over an area of about 100 acres.

Finally, on September 30, 2019, some of the piles of branches and small trees were lit. There was snow on the ground in places and the weather was cool with some rain anticipated. Then, on October



Lighting piles. Photo: USFS

4th, the prescribed burning shifted to an “understory” burn, in which the fire is allowed to creep along the ground, consuming the duff and litter on the forest floor and killing some of the smaller trees.

The fuels were lit along the ridgeline on the north side of the canyon with the fire creeping downhill toward Caples Creek. The conditions at the time that the burning was started met the requirements for the prescribed burn, although a warming trend was expected and afternoon winds were forecasted for later in the week. Fire managers had projected that they would have been burning well into the latter part of October, weather permit-

ting. But, the weather pattern shifted with some afternoon winds driving the prescribed fire to the east. And then on October 10, very strong, shifting winds started blowing with burning embers flying beyond the area prepared for the understory burn. This led to spot fires starting up ahead of the fire front. At that time, the “prescribed fire” was de-



Firefighters igniting understory burn.
Photo: USFS

clared a wildfire. With that declaration, additional fire fighters were called in to help control and extinguish the fire. The wildfire was eventually contained by late October. Overall, a little over 1,000 acres were burned during the prescribed fire phase, and another 2,300 acres burned as a wildfire.

After the wildfire was extinguished, a Fire Behavior Study was completed to assess the benefits and impacts from the wildfire and prescribed burn. That study determined that the larger trees within the area of the prescribed burn survived the understory burning, whereas in the area that burned as a wildfire, 23% of the large trees were



After the fire. Photo: Ben Solvesky
killed by the fire.

continued on page 5

STINKWORT HAVING A TOUGH YEAR!

Some of us have noticed that our local stinkwort populations seem a bit sparser this year with smaller plants than in previous years (see photos below). It turns out, research from UC Davis showed, that dry springs, such as we just had, resulted in smaller plants that only achieved 30% of the growth of plants during a non-dry-spring year; these stunted plants did not grow much after May (Brownsley et al 2014 Growth and phenology of *Dittrichia graveolens*, a rapidly spreading invasive plant in California). All plants regardless of age, size, or year flowered in early- to mid-September, suggesting that photoperiod was the signal

for flowering. Further, the seeds did not have a dormancy period with most seeds (84-93%) germinating during the rainy months after seeds were shed in November.

What does this mean for stinkwort control? A smaller, less vigorous population will produce fewer seeds this year, especially if we search out and eliminate those sparse populations, meaning fewer weeds next year. Plants must be killed now and in the coming weeks before they flower in September and set seed. The general lack of seed dormancy means that once we get rid of it, it can stay gone. Is it fair to beat a weed when it's down? Oh, yes.



Stinkwort population, same location,: left early July 2020; right July 2021. Photos: D. Ayres

IN-PERSON PLANT WALKS THIS SUMMER

El Dorado Chapter field trips will continue this summer with mountain meadows our focus. We hosted the first trip on July 15 to Washoe Meadows, a California State Park gem, easily accessible from Highway 50 near South Lake Tahoe. There are lovely trails through the meadows, including boardwalks across more sensitive, wet portions and over

streams. This is a trip that one can take on their own. The terrain is flat and the trails doable by all. Find more info about Washoe Meadows State Park by visiting the park website at https://www.parks.ca.gov/?page_id=516.

https://www.calflora.org/app/ipl/idx?loc_id=gpi136, including a list of plants. Here there are alpine meadows and vernal pools to explore. If you would like to join this trip to the meadow, email Ginna Meyer at vcmeyster@mac.com to be signed up and get details including when and where to meet and what to bring.

On July 24, we plan a trip to Page (or Paige) Meadows, north of South Lake Tahoe, west of Highway 89, and south of Tahoe City. This site is one of Calflora's "Great Places", so you can learn more about this lovely spot at

We are working on plant walk sites for August, too, so keep checking our chapter website!



From left: Washoe Meadow (Ginna Meyer), *Comarum palustre* - marsh cinquefoil with flying insect (Lisa Couper) and last two images *Platanthera dilatata* var. *leucostachys* - Sierra bog orchid (Lisa Couper).

PINE HILL PLANTS AND FUEL REDUCTION

The Chapter is once again working with the California Department of Fish and Wildlife (CDFW) to help create and monitor a fuel modification perimeter around state property just off Salmon Falls Road.



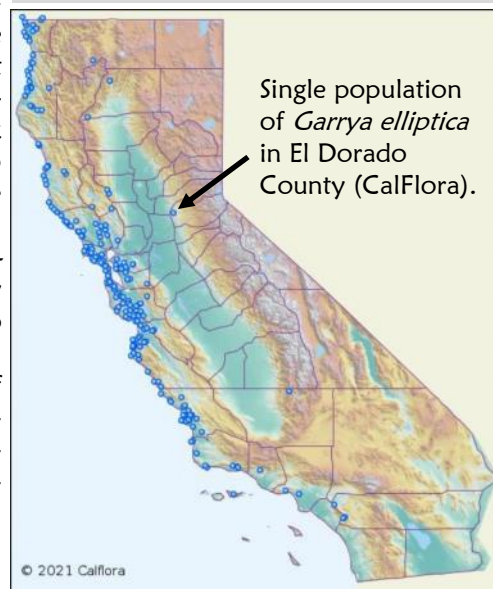
Above: Environmental scientist John Watkins of CDFW snapped this cross section of whiteleaf Manzanita (*Arctostaphylos viscida*) and carefully counted 70 rings. As this manzanita is killed by fire, this suggests the chaparral here is over 70 years old. Old fire scars show this plant obviously had a tough life!

After our preliminary plant survey along people-trails carved into the perimeter, a swath of dense chaparral was cut down with chainsaws, piling the brush for later burning. Ginna Meyer and Deb Ayres surveyed for rare and not-so-rare plants; the only species of concern was El Dorado Mule ears, which responds to fire by resprouting and flowering. We will be curious to see whether the heat of pile burning will promote the germination of Pine Hill Ceanothus and Stebbins' Morning Glory, two rare species noted to be in the area but not seen by us last month. We found a mini-forest of Leather Oak (*Quercus durata*), a shrub oak which characteristically grows on gabbro and serpentine soils, many of which we flagged to "leave alone" and several mature Silk Tassel bushes (*Garrya elliptica*), part of a population noted nearby in 2006 in Calflora, which we also flagged to "leave alone"; mostly coastal, this is the ONLY known population of this species in the northern Sierra foothills (see Calflora map)! When we survey again next spring we'll ask for volunteers.

SEPTEMBER 28 PROGRAM: A LANDSCAPE PRIMER

Chapter member Deb Ayres will talk about how to design and implement your home landscaping project. The meeting will begin at 7 pm.

We are hoping that this will be an **IN-PERSON** meeting. Stay tuned for details on location in next newsletter and on website.



SEQUESTERING CARBON: CASE STUDY II

continued from page 3

CALCULATING ANNUAL CARBON DIOXIDE EQUIVALENT SEQUESTERED

For purposes of calculating annual carbon sequestered due to the efforts of the volunteers, we want to calculate how much more carbon is being sequestered in the treated prescribed burn area compared to the untreated wildfire area. The following calculations were made:

1. Determine the volume and weight of annual growth of the trunk of an average legacy conifer: **110 lbs.**
2. Determine an adjustment for total biomass of an average legacy conifer. This adjustment accounts for branches and foliage not otherwise included in

the trunk calculation: **280 lbs.**

3. Convert from biomass to sequestered carbon for an average legacy conifer. Multiply by the total number of legacy trees in the area. Reduce the amount of annual carbon sequestered to 23% of the total, to account for the number of trees that lived that likely would have died if not pretreated in advance. Further, reduce the amount of annual carbon sequestered by 50% to account for the thinning and other fuel reduction work done by others in the project area: **1.5 tons.**
4. Convert carbon sequestered in the legacy conifers to carbon dioxide: **5.6 tons.**

It is estimated that the El Dorado Chapter CNPS volunteer efforts associated with raking around the legacy conifers and removing ladder fuels adjacent to these

trees would lead to an additional sequestering of **6 tons of CO₂ annually** as compared to the same legacy conifers facing a wildfire.

Lester Lubetkin has a Master's degree from Stanford in engineering geology. He is dedicated to the health and resilience of the Eldorado National Forest, where he retired 8 years ago as recreation program manager. He is happiest spending time with Alice in the woods, mountains, or any place outdoors.

There are more details and references in the [white paper posted on our website](#).

Lester says that there are more conservation projects planned for this year. If you are interested in being notified about them, let him know at web.eldroadocnps@gmail.com



El Dorado Chapter
California Native Plant Society
P.O. Box 1948
Placerville, CA 95667

July-August 2021

LATROBE FUND AWARDS

The Chapter was awarded two grants by the Latrobe Fund, a philanthropic agency in El Dorado County that funds local non-profit. We received \$3,700 to print our various brochures and distribute them free of charge to the public at in-person events and the libraries. We received \$8,000 to support the genetics research of Prof. Dan Potter and Dr. Shannon Still at UC Davis investigating Pine Hill flannelbush. This species is critically imperiled in California and globally; there is but a single population, centered on Pine Hill in Rescue, numbering fewer than 500 individuals. One catastrophic event could wipe out the entire species. Conservation genetics can answer questions posed in its Recovery Plan that could aid in its survival. In parallel with the genetic analyses, Ginna Meyer and Deb Ayres conducted a morphological study of the plants, leaves, and flowers of many plants and sampled them for genetic analysis to determine reliable visible traits. We offer a warm thank you to the Latrobe Fund for partnering with us to educate our community about native plants and to support genetic research that will inform conservation practice.



Fremontodendron decumbens (D. Ayres)

For Updates Visit Us on the Web
www.eldoradoCNPS.org and



eldoradoCNPS



CALIFORNIA
NATIVE PLANT SOCIETY

**DEDICATED TO THE
PRESERVATION OF
CALIFORNIA'S NATIVE FLORA**

The California Native Plant Society is a statewide nonprofit organization of amateurs and professionals with a common interest in California's native plants. The mission of the Society is to conserve California native plants and their natural habitats, and increase understanding, appreciation, and horticultural use of native plants. Membership is open to all.

Membership includes the journal *Artemisia*, quarterly magazine, *Flora*, which gives statewide news and announcements of Society activities and conservation issues, and the chapter newsletter *Gold Field Notes*. To join, call our main office in Sacramento, (916) 447-2677, or visit www.cnps.org to join online.

CHAPTER OFFICERS AND COMMITTEE CHAIRS

Contact Chapter Leadership at web.eldoradocnps@gmail.com

PRESIDENT
VICE PRESIDENT
SECRETARY
TREASURER
BOOKS & POSTERS
CONSERVATION CO-CHAIRS

CLARK YOUTH FUND
FIELD TRIPS
INVASIVE EXOTICS CO-CHAIRS

LIBRARY DEMO GARDEN CO-CHAIRS

MEMBERSHIP
PLANT SALE CHAIR
PROGRAMS
RARE PLANTS
VOLUNTEER COORDINATOR
FACEBOOK
COMMUNICATIONS
WEBMASTER
NEWSLETTER

Alice Cantelow
Debra Ayres
Kathleen Barco
Ola Jane Gow
Christie Johnson
Lester Lubetkin
Sue Britting
Chelsea Morgan
Ginna Meyer
Debra Ayres
Virginia Meyer
Cindy Podsiadlo
Madeline Franke
Cindy Podsiadlo
Kit Veerkamp
Debra Ayres
Steve Serkanic
Vacant
Annie Walker
Kathleen Barco
Deborah Nicolls
Sue Britting