# Obispoensis

Newsletter of the San Luis Obispo Chapter of the California Native Plant Society





February 2021

# (cover) Nipomo Lupine

### About the cover

Back in 1989 Bonnie and Dirk Walters published this article in *Crossosoma*, the journal for the Southern California Botanists, and we reprinted it as a cover story for *Obispoensis* in 2004. It is pertinent to the potential destruction of the plant's habitat by proposed expansion of off-road vehicle activities by California State Parks. This is discussed further within this newsletter. Here follows the original article.

This article was a report on our four year study of the population dynamics of an extremely localized plant. The plant is the Nipomo Lupine (*Lupinus nipomensis*). Its total known range is less than three square miles surrounding the petroleum refinery on the Nipomo Mesa. It grows in openings in areas covered with annual plants on the Nipomo dunes. In this type of vegetation, shrubs tend to be quite small and separated by more than 3 meters (ca. 10 feet). The species also does well in disturbed areas as long as the disturbance is not continuing. In areas where human disturbance was minimal, they seemed to prefer the cleared area around pocket gopher mounds. Pocket gophers were also their greatest enemy. During our many hours of field work we saw several plants pulled down from below by gophers, leaving only a hole where the center of the plant had been. During our monthly censuses we labeled and mapped every plant we found. Too often, we would return to the location of a marked plant only to find a hole precisely where the stem had been. Bonnie and I also hypothesized that pocket gophers could also be a major distributor of the seeds. When they pulled the plants under ground, we assumed they would eat most of, but not all of it. If the part they didn't eat included any of the succulent fruits, these would have retained enough water and nutrients to mature its seeds. The relationship between pocket gophers and Nipomo lupines has to be considered a mixed bag.

When we first started our study, we chose a beautiful plant to photograph throughout its life. We had first seen it as bump in the sand where its seed leaves (cotyledons) were just beginning to emerge above ground. In our naiveté, we thought we would be able to follow it throughout its life. It lived for only a few weeks, before succumbing. After four years of following lupines from emergence to death, we can now tell you why it was naïve to have expected to have chosen a single plant and expect to follow it throughout its life. In the best year, the highest survival or success rate we observed was a little less than 30%. We defined success as maturing a single fruit. In the other years successful plants were produced at an even lower rate. I.e. the probability of us choosing a successful plant would have been less than 3 of 10 even in the best of years.

I would like to mention one last item on survival of lupines. Nipomo lupine plants germinated after every significant rain through the fall and winter. The crop of plants that originated from a given rainy period we called a cohort. We therefore could ask, which cohorts (early or October) or (late or February) have greater success rates. February plants had the higher success rate by several times. But, this is not the whole story, because one can have various level of success. To determine this number, we counted open fruits. Early cohort plants survived at a rate of less than 5%, but if they survived they would produce huge plants that opened 500 or more fruits. And, since each fruit had on average four seeds in it, a single early cohort plant could expect to mature over 2,000 seeds. On the other hand, late cohort plant tended to survive at a higher rate, (closer to the 30% value) but they were only able to mature less than 20 fruits or less than 80 seeds. Life for a lupine is a big gamble.

How was the species able to control germination so that there were early and late cohorts? This is the bane of horticulturalists who which to grow CA natives commercially. Native plants tend to be very genetically diverse (heterozygous). Although we didn't actually do the studies, we saw no evidence to suggest that Nipomo lupines were not like other CA natives. The difference in germination time is related to the amount of germination inhibitor in the seed coat. Nipomo lupine seeds apparently varied from having little (early cohort germination) to a lot (late cohort germination after a lot of rain had fallen to leach out the inhibitor). This means if you want to grow natives, you can't expect to get a high percentage of seed to germinate without special treatment. And this means extra expense either for the treatment of garden space given to seed that can't germinate. **DIRK WALTERS** 

### Editor's Note

Never say that studying a tiny lupine is a hazard-free occupation. Dirk and Bonnie spent a lot of time with their faces close to the ground in the dusty sand just east of the entrance to the oil refinery. Dirk contacted a massive infection of valley fever from spore-infected dust, and it was touch-and-go for a while. Luckily he is still with us, and is probably one of the few remaining members of our chapter from its early years. For almost ever, Bonnie's line drawings filled the front cover of *Obispoensis*.

# Chapter 'Zoom' Meeting 7 pm February 4, 2021

# Getting by with a little help from friends: alpine cushion plant facilitation in Colorado and New Zealand

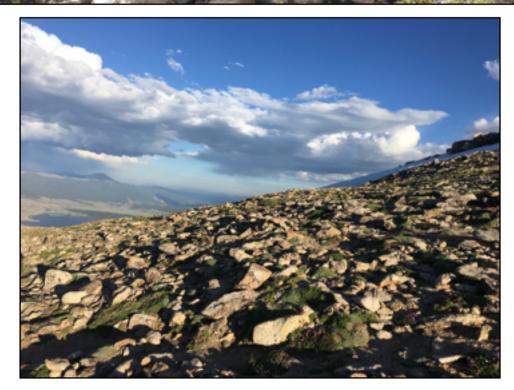
# **Register Here**

Please join us for our first presentation of the year, when Dr. Cath Kleier shares her work on alpine cushion plants from Colorado and New Zealand. Dr. Kleier is currently the Associate Dean of the College of Agriculture, Food, and Environmental Sciences at Cal Poly. She is going to bring us botanical wonders from around the world, from her studies in plant facilitation - a concept of plants helping other plants. Prior to joining the faculty at Cal Poly, Cath was a professor of Biology at Regis University in Denver, Colorado. She earned her B.A. in Ecology and Evolution from Colorado University at Boulder, her M.S. from Oregon State University, and her PhD in Ecology and Evolution from UCLA. In 2011, she was awarded a National Geographic Waitt Foundation grant to travel to northern Chile to explore populations of a rare, giant, alpine plant cushion (say that five times fast!), Azorella compacta. In 2013, she was a visiting Fulbright Scholar in the Botany Department at the University of Otago in Dunedin, New Zealand, where investigated facilitation in the alpine cushion plant genus Raoulia. In 2014, she was elected Faculty Lecturer of the Year at Regis University, and in 2015, she was awarded the Carnegie Foundation Colorado Professor of the Year. In 2017, she published *Plant* Science: An Introduction to Botany for The Great Courses<sup>©</sup>. And just this fall, 2020, she published her second production for The Great Courses©: The Botanist's Eye: Identifying the Plants Around You.









# Followup on our Books Issue





We asked if anyone had photos of Mary Coffeen, and Nancy Mann found this 1994 photo (left) taken with Allan Schoenherr, our banquet speaker. (right) Steve Schubert found this picture (below, right) of Mary and her dog leading a post-fire field trip on Cerro Alto. This was the August 1994 Highway 41 Fire, which burned 42 houses and covered 50,000 acres.

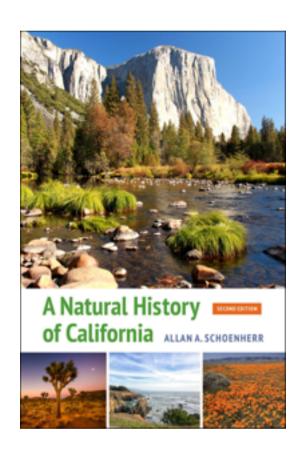


(right) Seeing Allan Schoenherr's picture, we were reminded of the comprehensive book of California's natural history. It should be in everyone's collection.

(left) Regan read the SLO book from cover to cover

It was great getting reader feedback, and I would love to hear from readers about what they liked. disliked, or want to suggest for future issues.

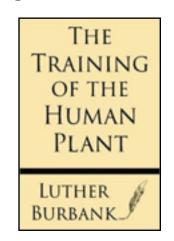
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# A Book whose Time has Past: Luther Burbank and Eugenics

If you can breed plants, why not people? But perhaps he means taking the best of ALL the'mingled' races?

"I have constantly been impressed with the similarity between the organization and development of plant and human life. ... I have come to find in the crossing of species and in selection, wisely directed, a great and powerful instrument for the transformation of the vegetable kingdom along lines that lead constantly upward. The crossing of species is to me paramount. Upon it, wisely directed and accompanied by a rigid selection of the best and as rigid an exclusion of the poorest, rests the hope of all progress. The mere crossing of species, unaccompanied by selection, wise supervision, intelligent care, and the utmost patience, is not likely to result in marked good, and may result in vast harm. ... let me lay emphasis on the opportunity now presented in the United States for observing and, if we are wise, aiding in what I think it fair to say is the grandest opportunity ever presented of developing the finest race the world has ever known out of the vast mingling of races brought here by immigration."



# SO FAR THIS YEAR, TOO DRY FOR MOST MUSHROOMS, BUT NOT FOR THE PESKY OAK-KILLING OAK ROOT-ROT FUNGUS



Photo: David Chipping

The following article was published on October 3, 2014 by **Brent McGhie**, **Butte County Master Gardener** in "The Real Dirt Blog of the UC Master Gardeners of Butte County.

### Oak Root Fungus - Armillaria mellea

The fungal disease "oak root rot" (*Armillaria mellea*) has evolved with California oaks and other native plants. It is parasitic on oaks and other plant species, but if these plants are growing in our environment of moist winters and dry summers, this fungus is normally kept in check. However, if summer irrigation is provided, *Armillaria* can become an aggressive, deadly pathogen. *Armillaria* is an opportunist that will also attack plants that are under stress either by damage to the roots or because of improper watering. Ironically water stress can be due to either drought or overwatering. In addition to oaks, woody plants that are susceptible to oak root rot include Escallonia, Butterfly Bush, Blue Blossom, Lilac, several types of Azaleas, and some Maples. Susceptible herbaceous perennials include begonias, carnations, daffodils, dahlias, geraniums, and peonies. Woody plants that are resistant to *Armillaria* include many species of Maple, Tree-of-Heaven, Madrone, Boxwood, Tree Anemone, Western Redbud, Holly, and many species of Pine. A more complete list of both resistant and susceptible plants can be found online at http://www.foogod.com/oakrootfungus/index.html.

Oak root fungus attacks the sapwood just beneath the bark of the lower trunk and roots of infected plants. This disrupts the flow of water and nutrients in the plant. When this occurs, the first above ground symptoms to be noticed are stunted shoots, discolored leaves and excessive leaf drop. There may also be cankers and gumming of the trunk just below or at ground level. When the bark of infected roots or the trunk beneath the soil line is peeled away, cream-colored fungal threads (mycelia) are present. These mycelia have a distinct mushroom-like odor. They may appear on the surface of herbaceous plants as well. Honey-colored *Armillaria* mushrooms typically emerge anytime between Thanksgiving and Valentine's Day and, when present, are always found in clusters around infected plants.

Armillaria is always associated with wood; it does not live independently in the soil. Armillaria spreads from plant to plant when a root from an uninfected plant grows into the fungal mycelium, or when specialized fungal structures called rhizomorphs bridge a short distance (less than one inch) between a diseased root and an adjacent healthy plant's root. Once Armillaria comes in contact with a living root, it dissolves the bark and decays the wood. Although the interaction of environmental factors is not completely understood, it appears that high soil moisture, high concentrations of Armillaria, and close plant spacing are key factors that favor the spread of oak root fungus.

There are no fungicides available that kill *Armillaria*. The only effective controls are planting resistant plant species and employing other appropriate cultural practices such as avoiding over-irrigation and avoiding moving infected root pieces to new uninfected locations. Drying *Armillaria* kills it. Reports state that oak root fungus growth has been slowed or stopped by removing the soil from around the base of an infected plant and allowing the area to dry completely. If an area is suspected of being infected with *Armillaria*, prepare the soil by removing roots and wood debris and air-drying the soil before planting. Then provide the new plants with adequate drainage and appropriate irrigation. Do not over-water.

# **Upcoming On-Line Plant Sale**

As we enter into a new year, we, as a chapter, decided to continue offering on-line plants for sale. *Saturday, March 20th, 2021* (the first day of Spring) from 9:00-11:00 is the time. The location/pick-up site is the same as our 2020 sales, at the end of Francis St. in San Luis Obispo. A plant list on our CNPS SLO chapter website will be available starting in late February. A variety of California native plants, seeds and books will be available for purchase. Thank you for supporting the CNPS. JOHN DOYLE

# Major Impacts Expected at Oso Flaco from State Parks Proposed Changes at Oceano Dunes SVRA

Several Rare Plants Threatened by State Parks New Plan for the Dunes

(Right Top) Google Earth Image of the west end of Oso Flaco Lake Road. showing the parking lot on the lower left, Little Oso Flaco Lake at the top, and the northeast corner of Oso Flaco Lake at the lower left corner.

Note that this is prime agricultural land, which is a protected asset under the SLO County Coastal Plan. This alone is a powerful argument against conversion to a campground, even if State parks owns the land



(Right Bottom) Massive camping planned on the extremely high quality agricultural land, together with trails along shores of Little Oso Flaco Lake and penetrating a so-called buffer that brings noise and disturbance into what is now undisturbed habitat. The entire Plan and EIR are at:

# https://www.oceanodunespwp.com/en/documents/draft-eir

and this map is found in Appendix A of Volume 1 where you can read the fine print that is hard to see in the scale of our photo. Note that there are no designated OHV roads leading from the campground.



# CNPS NOTIFIED STATE PARKS OF POTENTIAL IMPACTS TO RARE FLORA AT THE START OF THE PLANNING PROCESS

On March 3 CNPS informed State Parks of the presence of listed plants likely to be impacted by these plans. The information was assembled by John Chesnut, our Rare Plant Chair.

- (a) Federal Endangered *Arenaria paludicola* has extant populations (verified 9/2018) on the west and east shores of Oso Flaco Lake (northern half). Improvements in the causeway, and the riding area extension trail will destabilize the hydrology of the northern half which supports this population.
- (b) Nasturtium gambelii has populations immediately north and south of the causeway, and any "traffic capacity" improvement in the causeway would directly impact those locations.
- (c) Federal Endangered *Lupinus nipomensis* is found growing within the refinery waste pipe right-of-way, and using that ROW, as envisioned in the Concept 1 plan threatens this core population.
- (d) Cirsium scariosum var. loncholepis was recorded growing in damp swales south of the Refinery ROW in the OHV trail drawn in the Concept 1 plan.
- (e) The locally significant stand of *Leptosyne gigantea* (aka *Coreopsis*) is found on the west side of Osos Flaco lake, and within the redline OHV route shown in the Concept 2 plan.

In view of the long history of labor and resources that has taken place in the protection of these species, and of the integrity of the dune scrub ecosystems, we believe that a southern entrance to the SVRA should be removed from future development plans.

### Major Impacts Expected at Oso Flaco from State Parks Proposed Changes at Oceano Dunes SVRA



Google Earth Image of the dunes west of the oil refinery. Note that the only road into the vegetated dunes can be seen on the left side of the railroad tracks in the lower right of the photo. This is used to service a water pipeline from the refinery and has next-to-zero traffic.

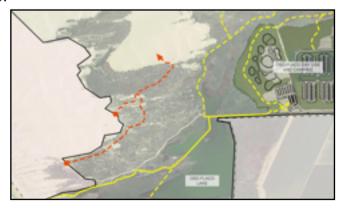


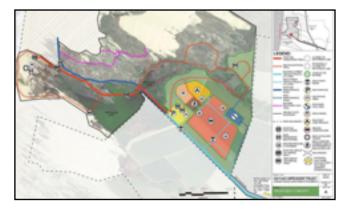
The proposed new road for motorized vehicles runs diagonally across the picture, and cuts through vegetated dunes. The purple color is part of a very large recreational playground for OHVs on the land currently highly disturbed by refinery operations which includes race tracks, concessions, a shooting range, OHV staging areas, parking, and (please don't laugh too loudly) an Environmental Education Center.

Are State Parks obfuscating on future OHV roads?

An examination of the plans for the Oso Flaco Lake campground only show foot trails (below, left yellow) linking to the open OHV dune areas, beach, and Refinery Area l. It is expected that nearly all campers would have OHVs, they would have to drive back down Oso Flaco Lake Road to find a way to the beach and dunes. This would vastly increase traffic on the narrow paved road.

However there is an existing service road that parallels the existing trail and boardwalk west of the lake. It terminates at a gate into the open dunes (left, thin white line, right, deep blue line) connecting with the proposed motorized trail (left, red line, right, magenta line). The north side of the gate is an area known as East Boneyard, which is currently closed to OHVs, but State Parks intends to open it up all-year. So it does not take much of a leap of speculation that State Parks will eventually allow OHV traffic along the existing service road. This would make the existing foot trail unbearably noisy. It is also an area of active, moving dunes, and so extra vehicle disturbance might accelerate drift of sand into Little Oso Flaco Lake.





The current Parks Plan (left) shows a new OHV road (red) that will destroy existing restoration lands to connect two riding areas in what is called the 40 acres. The Oso Flaco service road hardly shows. But the scoping document's map (right) clearly shows the service road (deep blue) connecting with the proposed OHV route (magenta).

## A Land Acknowledgement - from the President's desk

As we become more and more aware of the importance of diversity in our organization, I'd like to acknowledge the indigenous peoples of our Chapter, and acknowledge that many of us live on, explore and enjoy the traditional territory of the Chumash and the Salinan ("People of the Oaks") Nations. They are the first peoples of this land.

Sources suggest that the original name for this area was Tixilini, and within the Chumash Nation there were at least four subareas, or dialects, within our Chapter area: Obispeño (coastal Morro Bay and San Luis), Kuyam (interior – Carrizo and Caliente Mountains), Ámuwu (south coastal and VAFB), and Ineseño (Santa Ynez Valley). Within the Salinan Nation there appear to be two subareas, or dialects: Antoniaño and Migueleño.

The Chumash today are working toward protecting the central coast through designation of the Chumash Heritage National Marine Sanctuary, and we honor this work. In addition to ocean features, the sanctuary would protect land areas. The proposed Sanctuary is divided into different areas. Area 4 covers the ocean and dunes from Pt Sal to Arroyo Grande. The following is reprinted from the website of the Northern Chumash:

Onshore San Luis Bay are four major Chumash Sacred sites – three known to have been occupied for 9,000 years:

- \* The site for which the City of Pismo Beach is named
- \* The site where the Chumash people return to renew the Traditional Ritual Ceremony Cycle
- \* The old Chumash Capital in the area of Avila Beach, now partially covered by sea level rise
- \* The Chumash Sacred site at Diablo Cove along the coastline of the Pecho Coast

Continuing north are the Chumash Village Sacred site in Los Osos, hundreds of Chumash Sacred sites ringing Morro Bay, the Chumash village Sacred site of Cayucos (continuously occupied for 8,000 years), other large sites found in the area to a mile north of Pt. Estero, and two Chumash village Sacred sites in Cambria (continuously occupied for 10,000 years).

With a little more research, perhaps we can explore how we can assist the Salinan Nation in their current causes. CNPS SLO is committed to uplifting the names of these lands and the community members from these Nations who reside alongside us. If you are a member of these tribes, we invite you to join us. Please contact Melissa Mooney at mjmoon@charter.net.

For our members, here are some websites you might want to peruse: www.Salinantribe.com www.northernchumash.org www.chumashsanctuary.com. If you are interested in award-winning Children's books: https://ailanet.org/literature\_awards/2020-2/. To find your native land: www.native-land.ca

# THE GARDEN CORNER

Should I water? Or should I not? I have heard this question a lot lately. I am noticing a lot of dieback of oaks, manzanitas, ceanothus and sages with only 2.25 inches of rain this winter in Los Osos. Is this a normal occurrence? Or is there a big picture which we have only begun to touch? These questions have answers that are unknown; however, we can refer to the past and can see that once again we are experiencing a drought on the central coast of California.

Even though California native plants are considered drought resistant, all plants require water to exist. Just like humans without water plants will die. This can include new plantings along with well established trees and shrubs.

So to answer the question, should I water my oaks, manzanitas, ceanothus and sages now? The answer is yes. Apply at least three inches of water per month to your native plants now and through March if rains do not come. Do NOT apply fertilizer, only water. A Rain Bird impact sprinkler or an oscillating sprinkler is the best to mimic natural rainfall. So overhead watering is best, but a drip system is better than no watering.

I would make sure that you water all new plantings every two weeks to insure good establishment. With some luck we will get some rain, but just in case, you should know old oaks need more supplementation over January, February and March to survive. Other California native plants will be fine with one to two inches of water underneath their canopy.

These are just my recommendations and do not represent anything in regards to state CNPS policy, our local San Luis Obispo CNPS chapter or any governmental water regulations and/or restrictions.

For now we will hope for a more normal winter for both rainfall and temperatures. Until next month, happy gardening.

John Nowak

## Crop wild relatives of the United States require urgent conservation action

A very recent article published in PNAS-Open Access addressed the contributions of crop wild relatives to food security depend on their conservation and accessibility for use. To determine conservation priorities for these plants, the study developed a national inventory, compiled occurrence information, modeled potential distributions, and conducted threat assessments and conservation gap analyses for 600 native taxa. It found that 7.1% of the taxa may be critically endangered in their natural habitats, 50% may be endangered, and 28% may be vulnerable. We categorized 58.8% of the taxa as of urgent priority for further action, 37% as high priority, and 4.2% as medium priority.

The study used occurrence information combined with climatic and topographic data to model the potential distributions of 600 prioritized native wild taxa, including wild relatives of apples, barley, beans, blueberries and cranberries, chile peppers, cotton, currants, grapes, hops, onions, pecans, plums, potatoes pumpkins and zucchini, raspberries and blackberries, strawberries, sunflowers, sweet potatoes and other crops.

The value of crossing related species in order to select for certain characteristics has no better example than in the strawberry. The cultivated *Fragaria x ananassa* itself developed as an accidental cross between *Fragaria virginiana* and our local native *F. chiloensis* (beach strawberry) that took place in France. The latter is found in the Pacific fog belt of the Americas, and has developed several genotypes. It was noted that *F. chiloensis* seemed to be more resistant to disease, and when the California strawberry crop began to show serious disease and production problems, the beach strawberry was again re-crossed with the then commercial plants, which gave disease resistance and 'saved the day' for this massive industry.

New Yorker Magazine publihed an article in 2017 'How Driscoll's Reinvented the Strawberry' by Dana Goodyear, Near the end of the article, in visiting a Driscoll research lab, the author wrote "In one corner, Stewart was running hydroponic tests on a cross between a Driscoll's variety and Fragaria chiloensis, which was picked up on a beach in Santa Cruz. "The beach species is exceptionally tolerant of salt, because it evolved on sand dunes," Stewart said—a compelling quality, because drought and fertilizers cause salts to accumulate in soil."

However, Las Pilitas Nursery, in offering F chiloensis for sale, notes: "With regular water and part shade this strawberry will make a wonderful lawn replacement, as the clone we sell is so far fruitless, after 30 years. If you want fruit, try Fragaria vesca."

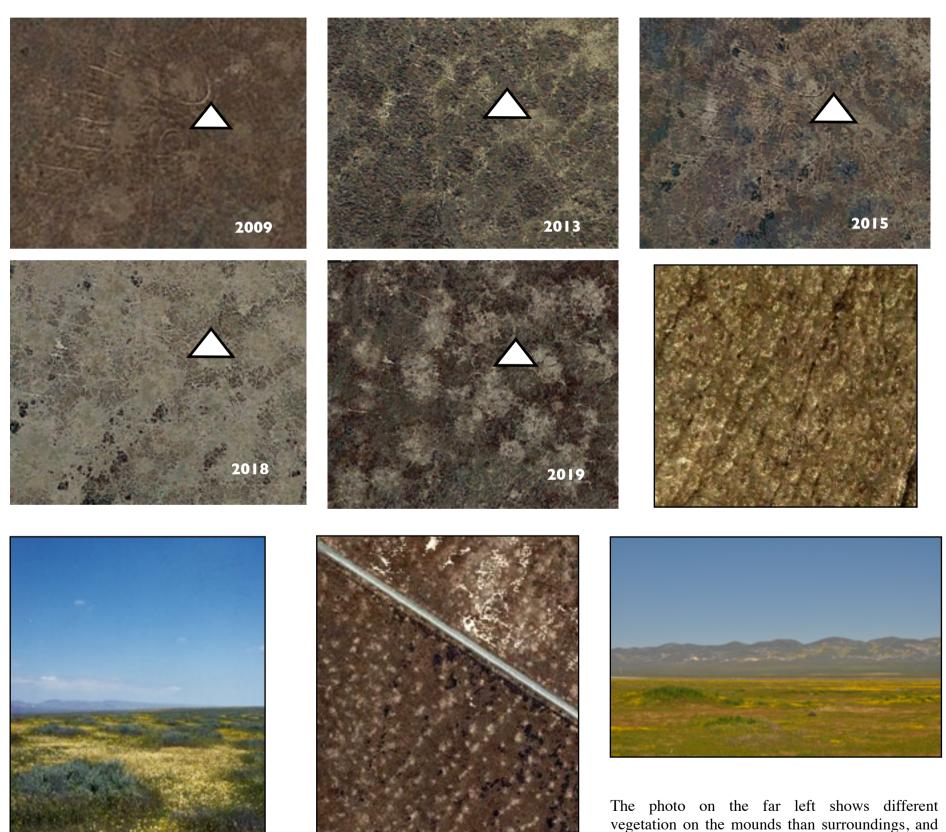
# Bajada lupine (Lupinus concinnus): Nipomo lupine's "almost" look-alike

If you have been on one of the many field trips led by Dirk Walters to Shell Creek, you will remember pulling over about a mile east of the Highway 229 junction and looking at this lupine. It is tiny, about the same size and coloration as Nipomo lupine, and growing in decomposed granite. The subtle differences are that this plant has flowers growing in the leaf axils all the way to the base of the plant, and the peduncle of the central inflorescence is usually upright rather than decumbent. In both plants the other inflorescences tend to be decumbent with upturned tips. As you can see, Lupinus concinnus can look a bit like Lupinus bicolor, although quite variable, has a densely ciliate upper margin to its keel petal, while that of both Lupinus nipomonensis and Lupinus concinnus is glabrous



## It's Taking So Long, But K-Rats Are Working On It

While some conservationists trumpet that the Carrizo Plain represents the last of an undisturbed grassland and shrubland that once carpeted the Central Valley, the truth is that grain farming pretty much ripped up the natural soil profile on the valley floor, and the plough scars are evident. Google Earth allows a person to look at past aerial/satellite views from 1994 up to 2019, all of which are decades after farming ended. The screen shots below are taken around the arrowed point 35.175907-119.831027 and show a point where the plough turned at the edge of a field. The pale patches are Giant kangaroo-rat precincts, which are dominated by raised mounds composed of dirt dug from their extensive burrow systems. The same patches often show plough lines that cross them, showing that they pre-existed farming, but after farming ceased many have been re-occupied and are gradually obliterating traces of the plough. However, as you can see, not very quickly. In parts of the Carrizo Plain the mounds are a dominant feature, and they are termed 'mima mounds'. They form a micro-topography where the mounds are better drained and aerated that their lower surroundings. This results in different vegetation on the mounds than between the mounds, and chains of mounds running down a slope, each mound being protected from runoff by the one above it. (photo bottom right from the north end of the Elkhorn Plain)



(center) a Google Earth pictures of the same area south of Soda Lake and Simmler Road. The photo (right) shows the green mound vegetation in the

vicinity of Washburn Ranch.

### THE GOOD PEOPLE WHO MAKE THE CHAPTER 'HAPPEN' AND HOW TO FIND THEM

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WE ALWAYS NEED PEOPLE TO HELP OUT. OUR MISSION IS VITAL AND OUR FLORA IS AT RISK CNPS SLO Chapter gratefully acknowledges French Hospital and the Copelands Health Education Pavilion for the use of their facilities for our Board meetings.

### Protecting California's Native Flora since 1965

The California Native Plant Society is a statewide non-profit organization of amateurs and professionals with a common interest in California's plants. The mission of the Society is to increase understanding and appreciation of California's native plants and to preserve them in their natural habitat through scientific activities, education and conservation. Membership is open to all. Membership includes the journal, *Fremontia*; the quarterly *Flora*, which gives statewide news and announcements of the activities and conservation issues, and the chapter newsletter, *Obispoensis*.



San Luis Obispo Chapter of the California Native Plant Society P.O. Box 784 San Luis Obispo, CA 93406



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