CALIFORNIA NATIVE PLANT SOCIETY
San Diego Chapter Newsletter

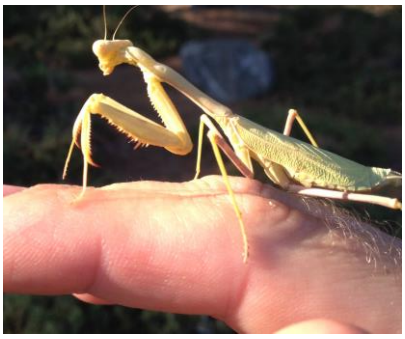
CHAPTER MEETING

Casa del Prado Room 101
Balboa Park

February 20, 2018
Wildlife Friendly Landscapes

by Christopher McDonald Ph.D.

California is home to a wide variety of plant and animal species, with Southern California being particularly diverse. Southern California has a unique climate pattern, and topographic and geologic diversity that all contribute to create a wonderful place to call home. Native plants form the base of the food web in our wildlands and are essential to many species of wildlife, yet our traditional suburban landscapes are dominated by non-native plants that offer little benefit to wildlife. When land managers and homeowners learn some of the causes of species diversity they can view the world through the eyes of a native pollinator, or a bird, and adapt their landscapes to increase the amount of native wildlife that visit their yard. Through the increased use of a variety of native plants, and by providing food, water and shelter, we can create backyard habitats for small species of wildlife that can enrich our yards and our lives.



Dr. McDonald is the Natural Resources Advisor at UC Cooperative Extension, San Bernardino, San Diego, Riverside and Imperial Counties. Dr. McDonald has been working on vegetation management research for over 15 years. His research focuses on reducing and managing invasive plants, including highly invasive and novel species, as well as restoring native plants after weed removal among other wide-ranging interests.

6:30-7:00 pm – Natives for Novices

My Favorite Native Plant:

- California fuchsia - **Diana Stockdale**
- Baja fairy duster - **Judie Lincer**
- Tree mallow - **Susan Lewitt**

7:00 pm – refreshments, browsing, & socializing.

7:30 pm – presentation by Dr. McDonald.

Chapter meetings are free and open to the public.

February 20 Meeting Presentation:

Hartmut Wisch, retired naturalist-guide, will give an illustrated talk exploring the great diversity of bees that have co-evolved with California's native flora. Approximately 1,600 bee species are known to be native to California. Some bees are generalists pollinating a variety of flowers from different plant families, others are more specialized. This informative talk featuring beautiful images of our native bees will cover the six recognized families of bees (Anthophila) extant in California.

FIELD TRIPS

Hollenbeck Canyon
Sunday, February 4
10:00 a.m. to 1:00 p.m.

Length: 4.5 miles round trip
Difficulty: Easy to moderate

Assuming our February isn't bogged down with rain storms (not a bad thing), Hollenbeck Canyon beckons. For anyone who hasn't been to this location, it is a great walk through grasslands, oak riparian woodland, San Diego County sunflower (*Bahiopsis laciniata*)-dominated coastal sage scrub, and along a cliff face bristling with chalky dudleya (*Dudleya pulverulenta*) and chaparral yucca (*Hesperoyucca*

whipplei). The creek will still have a bit of water and yerba mansa (*Anemopsis californica*) grows amongst the willows (*Salix* spp.).

Hollenbeck Canyon is a 3,200 acre preserve managed by CDFW for the care of rare and common species of plants and wildlife. A few of the rarer species along the trail are San Diego sagewort (*Artemisia palmeri*), San Diego County sunflower, round leaved filaree (*California macrophylla*) and delicate clarkia (*Clarkia delicata*). Look back to the September 2017 Newsletter for CNPS for Tom Oberbauer's excellent description of the Jamul Mtns. With any luck we'll come across some San Diego horned lizard (*Phrynosoma blainvillei*) as their main forage (native ants) is abundant along the trail.

From the trailhead, we'll take Hollenbeck Canyon up over the trail to the Daley Ranch Truck Trail and head up to a ridge trail that brings us back. Bring plenty of water and suitable hiking gear. There is a lovely spot to stop for snacks beneath old coast live oaks (*Quercus agrifolia*) near the stream.

Location/directions: Hollenbeck Canyon, 1820 Honey Springs Rd., 91935, Jamul, CA. Take SR 94 east past Jamul for about 3.5 miles east of the casino. Turn north on Honey Springs Rd.

Carpooling: From Fashion Valley Mall Transit Center in Mission Valley near Fashion Valley Rd. 9 am to 9:15 am. Park near the road so we can find each other easily.

Upcoming Field Trips

Check https://www.meetup.com/San-Diego-County-Native-Plant-Discoverers-Meetup/ or contact Justin Daniel (fieldtrips@cnpssd.org) for more info as it becomes available about the following field trips:

February 18: Fallbrook - Santa Margarita River Trail. LEAD: **Justin Daniel**.
February 25: Anza Borrego - The Mojave Pocket, Pictograph Trail or other. LEAD: **Jon Rebman** or **Larry Hendrickson**.
March 4: Otay Mtn Truck Trail. LEAD: **Justin Daniel** + Other.
March 9: Friday - Hellhole Canyon & alluvial fan about Research Center. LEAD: **Jon Rebman** &/or **Larry Hendrickson.**
March 17: OPEN to other LEAD. Iron Mtn or Blue Sky Preserve (RECON or Tree of Life Nursery Tour possible instead).
March 25: - Torrey Pines Extension, Del Mar. LEAD: **Justin Daniel**.
April 1: Silverwood Wildlife Sanctuary. LEAD: Phil Lambert (open to another lead).
April 8: Santa Rosa Plateau, Wildomar. LEAD: Ranger as assigned.
April 15: Guatay Mtn. LEAD: Forest Service Botanist **Jenny Moore**.
April 22: Algodones Dunes, Imperial County. LEAD: **Larry Hendrickson.**
April 29: Del Mar Mesa, Encinitas. LEAD: **Frank Landis.**
May 6: Miramar vernal pools (late season)
May 13: Elsinore Peak, Santa Ana Mtns. LEAD: Forest Service Botanist **Jenny Moore** or **Kirsten Winter**.
May 20: Mt. Laguna Calochortus Trip. LEAD: **Fred Roberts**, CNPSSD Rare Plant Botanist.
May 27: Mt. Palomar Doane Valley along the Creek. LEAD: **Justin Daniel** & **Kay Stewart** (maybe).

JUNE

- Cuyamaca Peak from Milk Ranch Road for *Calochortus albus*.
- Baja California Trip with **Sula Vanderplank** & **Josue Campos**.
- Silver Strand State Beach.
- Mission Trails Dam to Fortuna Peak.

JULY

- Garner Valley & Thomas Mtn - San Jacinto Mtns.
- Calavera Preserve, Carlsbad.
- Trabuco Canyon, Orange County.
- Marian Bear / Rose Canyon, San Diego.

AUGUST (short or heavily shaded hikes)

- Border Field / Tijuana Estuary.
- Tecolote Canyon.
- Rancho Penasquitos Canyon.
- Elfin Forest to Olivenhain.

~ **Justin Daniel**, Field Trip Chair

BOARD MEETING

Wednesday, February 7, 6:30 – 9:00 p.m. 4010 Morena Blvd, Suite 100, San Diego (Thomas Guide 1248 C4). CNPS-SD Executive Board meetings are always the first Wednesday of the month, except when the 1st Wednesday

falls on a holiday. Members are welcome to attend as observers. To add an issue to the agenda, please email president@cnpssd.org.

At the January 3 Board Meeting the Board elected the following Board members as officers for 2018:

President: Tom Oberbauer
Vice President: Frank Landis
Treasurer: Connie di Girolamo
Secretary: Mike Evans

WELCOME NEW MEMBERS

Ian Abramson
Katherine Bell
Jean Booth
Libby Brydolf
William Bulger
Laurel Dean
Michael Diamond
Tamia Dowlatabadi
Lynn Hillman
Sorina Igneti
Dave James
Charlotte Kenison
Scott Kilian
Cathy Long
Patricia Mcghee
I.J.A.E. McNeil
Brian McNeil
Dana Myers
David Peery
Steve Seaburg
Mary Wirges

GARDENING WITH NATIVES

Native Gardening Winter Demonstration Workshop

Saturday, February 10, 2018
9 am-3:15 pm
SOLD OUT

SAVE THE DATE!

Native Garden Tour

April 14 & 15, 2018

and

Spring Plant Sale

Saturday, April 28, 2018

Native Gardening Committee Meeting

February 14. The Chapter's Native Gardening Committee meets the 2nd Wednesday of each month at various locations. Contact gardening@cnpssd.org for location and time.

Native Plant Landscape in Old Town State Historic Park

Volunteers Invited to give TLC to the Old Town Native Plant Landscape

February 10, Saturday. 9:30 a.m. to noon

Wildflower seeds planted over the past two years that were donated by the Chapter Seed Committee will be coming up, we hope. The Old Town Landscape gets irrigated twice every month, so whether or not rains have fallen in January, by February the longer days should be encouraging seedlings to grow. Come help us thin out unwanted weeds and see how many native wildflowers look when they are babies, and enjoy the company of fellow native plant lovers.

The landscape is the far west end of Old Town State Historic Park, at the corner of Congress and Taylor Street across from the train/trolley/bus depot. Park for free in the lot off Taylor and Calhoun Streets. Bring your favorite weeding tools and gloves, and sun protection usually is a good idea.

Extra Weeding Party

February 24, Saturday. 9:30 a.m. to noon

Weeds are growing again. At this second February work party we will focus volunteers on digging out exotic grasses. The rabbits that live in the NPL can't keep up with the demand! We also may see some seedling wildflowers, so we will want to be especially careful in the areas where seedbanks of native annuals lie in the soil.

Park in the lot off Calhoun and Taylor Streets, and meet us under the Sycamores. Bring water or your favorite hydration beverage and sun protection. If you don't want to bring your favorite weeding tools and gloves, share ours. Questions? Contact OldTownLandscape@cnpssd.org .

~ Kay Stewart

CONSERVATION

Conservation Committee

February 6. Usually the first Tuesday evening of each month. Contact **Frank Landis** at conservation@cnpssd.org for details.

Nick Jensen
SoCal Conservation Analyst

The Southern California Conservation Analyst (SCCA) is a new position that CNPS has created, and it builds on a similar role held previously by both Jan Skow and Ileene Anderson. The SCCA serves a huge area, leading regional-scale conservation efforts and supporting the volunteer conservation activists who are at the heart of so many of our successes. It's a big job!

Nick started his full-time position this week, and is already digging into the myriad issues, initiatives, and projects that he will be working on closely with CNPS Chapters and conservation partners in the Southland.

You may already know Nick since he's been a part of CNPS for many years. After graduating from UC-Davis, Nick worked in the CNPS Vegetation Program. He transitioned to our Rare Plant Program where for several years he was the CNPS Rare Plant Botanist, and then Rare Plant Program Director before leaving to pursue graduate studies in California's native flora, with a focus on the incomparable Tejon Ranch. Last month, Nick completed his PhD program at the Claremont Graduate University and today, takes over as CNPS Conservation Program's lead staff person in Southern California. Over the next several months, I will be working closely with Nick to help him transition into the role and come up to speed on issues, and to introduce him to our conservation partners with whom he'll be working.

This significant increase in conservation is possible due to a generous grant from the Robert & Patricia Switzer Foundation, on-going contributions from CNPS Chapters, and because Elizabeth Schwartz named CNPS in her will. Ms. Schwartz's lasting gift matches donations made by CNPS supporters -- if you are able to make a gift then it is much needed!

Thanks to the support of everyone who values Southern California's wild landscapes, CNPS is able to dramatically expand our ability to fight on behalf of rare plants and special places.

Scaling Mt. VTP Again

This month I wanted to go over my experience of the Board of Forestry's (BoF) Vegetation Treatment Program (VTP) Programmatic Environmental Impact Report (PEIR). It's the fourth time this PEIR has been sent out since 2013, the third time I've written and submitted a letter for CNPSSD.

Working on this document is always an exercise in repression, because it is impossible to read through it without becoming furious at something. For the third go-round in 2016, about half of us commenting on that version found from commiserating that we could only work on it for a few hours a day, due to either heartburn or stomachaches from holding it in.

But why? That's what I wanted to go through here. Some basic facts are not in dispute, but the fury-inducing question of Why! is something those of us who work on it continue to speculate on.

What's not in dispute: the main body of the VTP is 751 pages long. With appendices it is just over 1,200 pages long. This too-short document is supposed to cover a project over 23,000,000 acres of BoF's 31,000,000-acre State Responsibility Area (SRA) where they have jurisdiction to respond to fires (For comparison, the state of California is about 104,765,440 acres). Since the 1980s, BoF has had a Vegetation Management Program (VMP) that allowed them to do most of the things that they want to do in VTP. The goal of the VMP was to treat 120,000 acres of land each year, but it has not met that goal for many years, treating as few as 5,000 acres in 2013/2014. "Treat," in this case, means some combination of prescribed fires, herbicides, mechanical and hand removal of vegetation, and grazing. All of this supposedly should make fires less dangerous and also convert chaparral-covered hills to grasslands to "improve forage," which seems to mean making ranches grassier to support herbivores (Deer? Cattle?). BoF blames the shortcomings of the VMP on the full CEQA process that each VMP project goes through. In the case of prescribed burns, the VMP permit is only good for three years, and sometimes that is not long enough to get the right conditions. The VTP solution is to increase the amount of land that could be treated from 10 million to 23 million acres and to short-circuit the CEQA review process, so that projects get approved faster that way, they'll be able to treat 60,000 acres per year. What "treat" also means is that a big part of what BoF does is to take money from government funding sources and pay for treatments on

private land. These treatments average 260 acres each, and people apply for funds from the program.

One big problem with this version of the VTP was the maps. Although the text says that the VTP only covers state lands, the maps propose fuel breaks on everywhere from MCAS Miramar to Cabrillo National Monument, even the floor of Death Valley(!). It isn't just federal lands—most of the local Indian Reservations had VTP activities mapped on them. So did the Safari Park, for that matter. The mappers didn't bother to make sure that the VTP only treated state lands, and the contradiction between text and maps led us which, if either, was correct. There's a legal issue there, because activities on federal lands are regulated under NEPA, not CEQA, and require an EIS, not an EIR. Incidentally, would you trust these people to plan a prescribed burn? During a drought?

Sadly, it gets worse from there. A link to a purported CEQA-style checklist in the appendices (one that was present in version 3) now links to a checklist for planning prescribed burns, not avoiding sensitive plants. Then there's climate change. The VTP purportedly would have no significant greenhouse gas emissions. Their logic was that they would treat 60,000 acres per year. Since those acres would burn each year anyway, and the VTP only burns half of its acres (the other half would be masticated, herbicided, cleared and/or grazed), the VTP has less greenhouse gas emissions than the fires it replaces, 260 acres at a time. This sounds great, until you ask whether anybody can so accurately predict where the fires will burn each year that they can preemptively clear the area. If they could, why didn't they do that for the Tubbs and Thomas Fires this year? Actually, there's research suggesting that there's something far less than a 1% chance of a fire hitting a fire break that was cleared the same year, so basically the VTP's 60,000-acre treatment is in addition to the fires that burn each year, rather than in place of them, with rare exceptions that we can only hope will matter.

That's the level of analysis throughout the document, and part of my frustration is reading this over and over and over again, Groundhog Day-style. What has happened in the past is that the BoF takes all our comments, does a trivial rewrite, discards our old comments and issues the VTP all over again, perhaps hoping that this time we won't respond. This year we submitted all our old comment letters along with the new ones, so if they repeat this maneuver on the fifth edition, they just get a bigger record to respond to.

From here speculations enter tinfoil hat territory, diving into the mess of the VTP and trying to figure out what it really does and why. As with so much in politics in the last year, this devolves into speculation. Rather than tell one story, here I will tell two, both consistent with the evidence.

The kind guess for VTP motivations is that the people pushing it believe it will be good for the state. Their view happens to be contrary to what the fire ecology research now says, but it's easy to believe a story that getting rid of fuel will make for fewer fires. The reason it doesn't is that you have to ask what happens next. If you replace chaparral with grass, you reduce fuel but increase ignitability. If you rush the review process and light more prescribed fires during the depths of a severe drought (as in 2013/2014), you get more out-of-control conflagrations.

Still, this guess portrays the VTP authors as good people in over their heads. Their problem is that they're working on a PEIR. Programmatic EIRs are supposed analyze predictable, repetitive impacts for programs (such as large developments or the MSCP) so that project EIRs can "tier off" the PEIR, referring to the analysis in the PEIR rather than repeating it themselves. The problem with a statewide PEIR is that it would take tens of thousands (if not millions) of pages to do all the analyses necessary for the VTP. The published PEIR tries to push all that analysis down to the individual projects, and that's incorrect. Hence the current mess.

That's one interpretation. The less kind interpretation assumes that the PEIR is a scam. Perhaps the individual projects tiering off the VTP PEIR won't have any analysis. Instead, they'll claim that the analysis was done in that 1200-page PEIR. It wasn't of course, but if the project is declared to have no significant impacts (a main theme of the VTP), it doesn't need to go out for public comment, so it can just go into effect with a signature or two. One could even go so far as to see this as a Trumpian way to use CEQA (via the PEIR) to create a system that ignores CEQA, avoids oversight from those pesky urban democrats, bypasses all those anti-business California environmental laws, all the while transferring huge amounts of taxpayer money to private contractors.

This falls into the narrative of the "Fire-Industrial Complex," the idea that we fight fires in part because it makes contractors rich, rather than treating big fires as natural disasters and saving lives. We do spend billions each year fighting fires, and a lot of the money goes to equipment rental, contractors, and firefighter services. Is the whole complex really that out of control? Hard to

tell from here.

These speculations only matter if the VTP gets approved, survives the inevitable lawsuit, and we see it in action. That's not likely to happen, not this time. This year more CNPS chapters than ever before submitted their own comments. In addition to our own letter, CNPSSD donated $1,500 from our legal fund to help Endangered Habitats League hire a lawyer and fire ecologists to provide expert comment. Given the depth and breadth of the negative responses, I don't think the VTP will go into effect, so long as we can muster a response. Since I'm a pessimist though, I do wonder when the next edition will come out..

~ **Frank Landis**, SD Conservation Chair

RARE PLANTS

Round-Leaved Filaree Loses Status

Round-leaved filaree (*California macrophylla*) is a California Rare Plant Rank (CRPR) 1B species no more. In December 2017, it was officially demoted to a CBR (Considered but rejected) status.

For southern Californians familiar with the plant, it is a pill that is a little hard to swallow. It is quite rare in southern California south of the Transverse Ranges. It can only be reliably seen at three locations in San Diego County and perhaps 10 sites between Los Angeles and Riverside County so a rank of 1B seems more then appropriate.

Round-leaved filaree, a white-flowered annual member of the Geranium family (Geraniaceae), is typically associated with clay soils and found mostly in grassland. Its foliage is a soft silver green, and as you may have guessed, it gets its name from its rounded leaf shape. The plant can be surprisingly cryptic and difficult to survey for. It can also be a challenge to photograph as the petals often fall off by mid- morning.

Statewide, the rarity has always been somewhat problematic. It is found from as far north as Mendocino and Tehama Counties and even extends into northwestern Baja California, Mexico. It is very wide-ranging for a typical rare plant. However, at least in 2006 when it was elevated to rank 1B, of the 70+ occurrences known at the time, the status of many sites was uncertain, in decline, or likely extirpated. Not long after 2006, new reports started pouring in, most from surveys of the vast 270,000-acre Tejon Ranch where the plant is far more abundant than anywhere else in the state. Today, the CNDDB tracks over 200 occurrences.

So clearly this plant is more common than we thought after all. Or maybe not. Yes, it is doing very well at Tejon Ranch and a few other sites but there is still a large number of sites where not only don't we know the status of the occurrence, we don't even really know where the plants were found within a couple miles. This was a central theme of discussions about the rank of the plant on the Forum in 2015, which basically left things where they had been but highlighted a need to learn more about the large number of sites with uncertain status.

This fall, the status of round-leaved filaree once again appeared as a Rare Plant Forum discussion. The arguments for deleting the plant had expanded, and certainly the moderators thought, more robust. The main controversies were unchanged. The plant is still exceedingly rare in some areas of the state, but locally common in other parts of the state. There are still a lot of occurrences with uncertain status (and several contributors were not convinced CNPS had supported its conclusions). About 70 percent of the occurrences are found in just three counties, Kern, San Luis Obispo, and Colusa County. Los Angeles Co. also added a set of important new records but these are north of the Transverse Ranges and nearly all associated with the massive Centenniel project in the southern portion of Tejon Ranch. Dean Taylor had the most novel suggestion, giving the plant a duel rank, CRPR 4 north of the Transverse Ranges and CRPR 1B south of the Transverse Range. To no avail, despite a rich discussion, with nearly 85 percent of the Rare Plant Forum participants arguing against deletion, the plant was deleted from the Inventory anyway. The Rare Plant Program Committee (RPPC), the final arbitrator on Inventory actions, made the call. Stay tuned, you may not have heard the last of this plant.

~ **Fred Roberts**, Rare Plant Botanist

Botany

Botany in San Diego County before European Contact

It is fascinating to contemplate the appearance and distribution of biological natural resources in San Diego County at the time of the first European contact. Because San Diego County is now one of the more populous counties in the U.S., it is sometimes difficult to imagine what it looked like a mere 500 years ago. All the land that is now covered by urbanization and agriculture was originally natural and inhabited by a wide array of plants and animals and what is more interesting is that our ever present Mediterranean

weeds were not here. Just imagine land without *Avena fatua* (wild oats) and brome grasses (*Bromus madritensis*, *B. hordeadeus* and *B. diandrus*) and the ever present Red-stem filaree (*Erodium cicutarium*). Their absence means that other species already existed in the areas that they now inhabit. When considering the combination of land that is converted to urban and agricultural lands and the land that is inhabited by non-native weeds, a very large area of San Diego has very different land cover than what originally occurred here.

A number of sources exist that will provide a glimpse into the past at the time of the first exploration of San Diego County by Europeans. The first documents were reports of the findings of Juan Rodriguez Cabrillo in 1542 and Sebastián Vizcaíno in 1602. However, one of the primary sources of information is from the writings and journals of Padre Juan Crespi, who passed through San Diego on foot in 1769. This was already 200 years after the first European visitors.

In addition, a moderately large and stable population of native people lived here, harvesting wildlife, managing the landscape through occasionally burning and using plant resources for survival. Based on recent findings of the San Diego Natural History Museum, people have been here for at least 120,000 years. Their presence already had an influence on the natural history landscape in this region, but they existed in a time of natural balance. There are estimates that there were tens of thousands of people in the area at the time of contact (Indian Country Diaries 2006, Killea 1975). The landscape reflected the activity of the local people.

This discussion will be in four parts, beginning at the coast, foothills and valleys, mountains, and, lastly, the deserts. The coastal area has probably undergone the greatest change of any of the region since contact. However, at the time of contact, the coast, as well as the rest of the County, would have been a naturalist's and wildlife lover's paradise. Along the coast are remnants of native vegetation located on Point Loma, parts of Mount Soledad, and of course, Torrey Pines State Reserve.

It is well known that even in the first generation of the 20th century, wildflowers were prevalent along coastal areas. Carroll DeWilton Scott (1955) had black and white photos of fields of *Layia platyglossa* (Tidy tips) in the coastal areas near what is now Mission Bay as late as the 1920s. The shrubby vegetation would have been present, including the existing coastal sage scrub and chaparral on the upper slopes, but instead of grasses between the shrubs, the openings would have been covered with wildflowers. There are also a few photos around of the Ocean Beach area covered with Tidy tips. The Tidy tips would have been augmented by a smaller-flowered coastal form of *Eschscholzia californica* (California poppy), and extensive patches of *Camissoniopsis* spp. (Sun cups) of more than one species; probably at least on the coastal sandy areas Beach evening primrose (*Camissoniopsis cheiranthfolia*), California sun cup (*Camissoniopsis bistora*) and small-flowered evening primrose (*Camissoniopsis micrantha*).

San Diego Bay was a breeding area for California gray whales, so their spouts, breaches, and spy hops would have been visible throughout the deeper parts of the bay during the winter months. San Diego County was well known for the presence of Grizzly bears late in the time of final occupation. Cave Johnson Coutes (1849) remarked about the numbers of Grizzly bears encountered on a trip he took through the mountains near Julian down to Fort Yuma. The Grizzlies here were also larger with massive bears being killed near Valley Center and on what is now Camp Pendleton (Valley Center Historical Society, Tremor et al. 2017). Grizzlies would have been found in the major river valleys, the San Diego, San Luis Rey, Sweetwater, and Otay, which would have been feast areas with access to a variety of plants and animals. It is not just that there were a few Grizzlies around, but based on historic accounts and references, they were numerous.

The coastal beaches and coves such as La Jolla Cove would have supported numbers of Harbor seals, Elephant seals, California sea lions, Sea otters and potentially Guadalupe fur seals. As mentioned, Gray whales collected and bred in San Diego Bay at the time. All these groupings of wildlife suffered occasional mortality that would have drawn numbers of Grizzly bears. California condors would have also been numerous in the County, feasting along with the Grizzly bears on the mortality of the pinnepeds and whales. The pinnepeds also drew native people who occasionally harvested them (Antonelis and Fiscus 1980). Imagine the La Playa area of Point Loma covered with wildflowers down near the shore, Tidy tips and California poppies, while Grizzlies and packs of Coyotes feasted on some dead Elephant seals and a Gray whale that washed up on shore as a number of Condors swoop down on the remnants.

Another plant that would have been very widespread and that even seems to thrive with disturbance was *Dichelostemma capitatum* (Wild hyacinth) that has blue flowers on the end of tall stalks. *Dichelostemma* is a geophyte that supports a corm (a bulb-like structure) that doesn't have layers like onions but does have a central starchy center. These were harvested by the local people for a meager food source and they could have been also important food for Grizzly bears, which were known for eating anything that is edible, even grass.

The landscape effect of Grizzly bears on the vegetation overall may have been subtle, but they, like coyotes, may have also eaten berries from shrubs including *Arctostaphlos* spp. (Manzanita) in addition to other bulbous geophytes like *Allium haematochiton* (Red-skinned onion), *Muilla maritima* (Sea muilla) and *Bloomeria crocea* (Golden stars) and maybe even *Bloomeria clevelandii* (Cleveland golden stars), which is found only in San Diego County and part way down the Baja California peninsula. In some cases, digging up bulbs of geophytes has a result of stimulating their growth.

The native people were known to use fire to enhance different food plants like the geophytes as well as some seed-bearing plants like *Salvia columbariae* (Chia). Early explorers

mentioned smoke in the fall in Southern California from the intentional burning that occurred. This would have also opened up the vegetation in the burned areas with a mosaic of lands that had not burned for a while and those that had, creating an equilibrium consisting of a mix of young and old vegetation in a changing surface pattern. Some areas, due to their geographic terrain and moisture regime, would have not burned as frequently; the Torrey Pines area for example, and probably Point Loma.

The original vegetation of Point Loma is an interesting subject of its own. The tryworks (furnaces), where killed whales from San Diego Bay were cut up and cooked to obtain oil from the blubber, were located at Fort Guijarros on the Bay side of Point Loma. Wood for fuel would have likely been harvested from the nearby locations to avoid having to transport it, which would mean that any trees or large shrubs that were within reach would have been utilized for fuel and maybe along with the use of some of the blubber itself for fuel. One can imagine the canyons of Point Loma with dense thickets of *Quercus berberidifolia* (Inland scrub oak) and *Quercus dumosa* (Nuttall's scrub oak) around the point and there is a potential that Torrey pine (*Pinus torreyana*) may have grown there as well. Torrey pines that were planted some time ago are now present without irrigation and doing well, indicating that the conditions that could support them exist on Point Loma. However, it is not as probable that *Quercus agrifolia* (Coast live oak) was growing there at that time because of soil and climate conditions that are not as favorable for it. The chaparral that still exists in parts of coastal San Diego County, dominated by *Adenostoma fasciculata* (Chamise), *Ceanothus verrucosus* (Wart-stemmed ceanothus), *Arctostaphylos glandulosa* ssp. *crassifiolia* (Del Mar manzanita), would have occurred in the areas of Maritime Chaparral that grew on sandstones on Point Loma and other coastal areas. Large *Rhus integrifolia* (Lemonadeberry) was probably also harvested for wood on Point Loma. So, on the coastal ridges, chaparral would have been present as it is today.

The vegetation of downtown San Diego and the lower slopes around San Diego Bay, the mouth of the San Diego River, and the south-facing slopes, which include the canyons, and river valleys, would have all been covered with Coastal sage scrub. South of Chollas Creek and east of what is now Balboa Park and down across the mesas southward, Coastal sage scrub was most of the vegetation. However, north and west of these locations, including the upper mesas and what is now San Diego State University and Linda Vista on the northern mesas, the vegetation was chaparral on the upper parts, mostly Chamise-dominated but with mixed species on the north slopes. In the northern part of the County, Coastal sage scrub would have covered the south-facing slopes and the major drainages, San Diego Bay to the slopes around the lagoons and the slopes on the coastal mesas of modern Camp Pendleton with the exception of areas with fine soils. The fine soils, clays and fine silts, would have supported natural grasslands of *Nassela* species, probably *Nassella pulchella* (Purple needlegrass), *Nessella lepida* (Foothill needlegrass) and a large number of wildflowers, such as *Sidalcea malvaeflora* (Checker mallow), *Dichelostemma*, *Viola pedunculata* (Johnny jump-up), *Amsinkia intermedia* (fiddlenecks), *Sisyrinchium bellum* (blue-eyed grass) and swaths of *Layia platyglossa* and mixings of *Eschscholzia californica*. A clay soil inhabiting shrub, the *Adolphia california* (California adolphia), would have been scattered around the fringes of the grasslands on the coastal terraces north of the San Luis Rey River and San Mateo Creek to San Onofre Creek, and patches in a variety of locations.

Another large mammal with a strong presence in coastal San Diego County was the Pronghorn. The early explorers observed numerous bands of them across the mesas and terraces. They are known browsers and while in modern times they are found in parts of the west where *Artemisia tridentata* (Great basin sagebrush) grows, in coastal San Diego County, they fed on Coastal sage scrub, probably including *Artemisia californica* (California sage brush), which is a relative of the *Artemisia tridentata*. Their presence in good numbers would have also enhanced the openness of the vegetation in some places. The mix of browsers and periodic fires in a vegetative mosaic would have helped maintain a variety of levels of shrub density. Where the shrubs were older and more dense, they would have supported the now endangered California gnatcatchers. Where shrubs were less dense, they would have supported Rufous-crowned sparrows. Again, the lack of weedy grasses at that time means that their place in the ecosystem was represented by other species that would have included some native grasses but also areas composed mostly of native wildflowers.

A large part of the flat mesas was covered with depressions and mounds. The mounds were covered with shrubs but, just as today, not the depressions. This is because standing water drowned the roots of the shrubs in the deeper basins that fill with winter rainfall. Vernal pools with their array of flowers and reproducing toad and frog larvae may have been food for Grizzly bears who could have harvested the larvae and adult animals and extracted the *Brodiaea orcuttia* (Orcutt's brodiaea) that grows in profusion in pool bottoms. *Eryngium aristulatum* var. *parishii* (San Diego button celery) could have also been a food sources and the geophytic root bases would have been prolific in the pool bottoms along with *Pogogyne abramsii* (San Diego Mesa mint) and *P. nudiuscula* (Otay Mesa mint). While conditions right along the coast would have supported *Eschscholzia californica* mixed with other species, such as *Linanthus dianthiflorus* (Fringed ground pink), which I have seen covering whole hillsides, one cannot overstate the importance of *Eschscholzia*. Explorers moving northward in ships along the California coast are reported to have thought that the hills were on fire because they were covered with orange California poppies. Other important species include *Leptosyne maritima* (Sea dahlia), which itself forms dense patches of bright yellow, but would have had a greater opportunity in canyons and *Encelia californica* (California encelia) and *Bahiopsis lacinitata* (San Diego sunflower) would have painted south-facing slopes yellow, particularly

immediately along the coast and inland to the foothills following good rainfall seasons.

Riparian river valleys were undoubtedly wetter than they are now because wells did not draw down the water tables at that time and dams did not collect rainfall runoff. On the other hand, there are now locations near the coast where the water table may be slightly higher than the pre-contact levels due to the collective levels of runoff from urban irrigated landscaping. Dense forests of riparian vegetation would have existed in the major stream and river courses extending to the coast. They would have also had some variation in age and density of vegetation due to the periodic flooding that would have occurred, scouring out trees and shrubs that would then establish anew. We still have many of the major riparian areas but with reduced area, particularly in the valleys and interior regions.

Coastal San Diego County was a wildlife wonderland with Grizzly bears, Jaguars, and Pronghorns along with Southern mule deer, Coyotes, Bobcats, California condors, Swainson hawks, Golden eagles, Bald eagles, Peregrine Falcons and other wildlife species we still have. The views across the landscape following a good rainfall season must have been spectacular with multi-hued patches of orange, yellow and blue in the foreground over the terraces and valleys mixed with shrubs and hillsides of dark chaparral covered blue and white in the spring due to *Ceanothus tomentosus* (woolly-leaf ceanothus) and *Ceanothus verrucosus* (Wart-stemmed ceanothus), with Black Mountain, San Miguel Mountain and Mount Soledad as the backdrop.

Foothills and valleys

East of the coastal zone, the modern impact on vegetation may not have been quite as extreme as that along the coast, but Escondido, Ramona, El Cajon and Alpine have replaced large areas of native vegetation with urbanization and rural development and, in some areas such as around Fallbrook and southward, agriculture has replaced vast areas of natural habitats.

Proceeding east from the coast, competing forces of greater seasonal precipitation and higher seasonal temperatures take place. Overall, rainfall increases on average due to rising elevation but some pockets in the valleys suffer from the rain shadow effect that combined with the higher temperatures creates more xeric conditions. The pattern of vegetation may be quite complex with chaparral on north-facing slopes and coastal sage scrub on south-facing slopes. Where erosion and rock features create topographic variation, the pattern of vegetation will have been and still are in locations where the distinction between vegetation patches is very abrupt.

The adverse effect of weeds is overall present in the foothills and valleys. Again, the effect of fire, both occurring as the result of natural weather phenomenon and the effect of the manipulation of the land by the native people, will have been the generation of much more diverse age classes of vegetation.

In the absence of weeds and the presence of more open vegetation before contact, there is no reason that wildflowers would not be prevalent almost every spring season. There has been documentation about the flowers of the Los Angeles Basin (Minnich 2008). Even when rainfall is well below seasonal averages, after fires, wildflowers can exhibit nice displays due to the initial lack of weed growth. Prior to weed invasions, flowers like *Eschscholzia californica* and *Linanthus dianthiflorus*, as well as *Dichelostemma capitatum*, would have been the ground cover. It is notable that even though the *Eschscholzia californica* along the coast is more of a pale yellow, the flowers on interior plants are larger and a more richly colored orange. In the Del Dios area and east of Poway in the spring of 2008, a slightly below normal rainfall season following the massive fires of October 2007, created spectacular color where the deep orange poppies covered the hillsides. Imagine nearly every spring large patches of orange on hillsides where it existed in open areas and mixed among openings between the shrubs.

The chaparral vegetation would have grown with a mixed pattern. Some areas would have been younger patches with strong, succulent new growth while others would have been older growth vegetation. It is likely that due to topography, slope and wind conditions, some areas would have burned less frequently because of wind pattern idiosyncrasies due to the slope of the terrain and direction of air flow. Otay Mountain and Tecate Peak would have supported healthy, robust *Hesperocyparis forbesii* (Tecate Cypress) forest, that grew to large sizes before being consumed by fire with a frequency of roughly once every one-half to a full century. Large trees existed as recently as the mid-1970's but multiple fires recently have left only younger, smaller trees. Major fires would have likely been more associated with summer rather than fall since there would have been fewer ignition sources. The native people who lived in the environment would have understood the effects of wind and low humidity during the Santa Ana conditions, which are the most common fire periods of modern times. Mistakes with fire during these periods could have been catastrophic for local inhabitants. The fact that the Tecate cypress on Otay Mountain and Tecate Peak was so robust in the last 50 to 75 years is an indication of conditions in which they were somewhat protected by wind patterns and air flow from too frequent fire that would have eliminated them.

The valleys like El Cajon, Escondido, Poway and even Ramona would have had Coastal sage scrub habitat on the floor. It was probably dominated by *Eriogonum fasciculatum* (California buckwheat) since it seems to grow best in these sorts of conditions. However, parts of Ramona could have supported natural grasslands of *Nassella* species as well as clay soil inhabitants including *Acanthomintha ilicifolia* (San Diego thornmint) and *Convolvulus simulans* (Small-flower bindweed). Vernal pools were also widespread in the valley bottom with *Downingia cuspidata* (Toothed downingia) patches and *Calandrinia menziesii* (Red maids) flowers nearby. Pronghorn would have been part of the fauna in

these areas as well, with bands of them roaming about on the open valley landscape, pruning down the shrubs. One can visualize them across the northern portion of Ramona with the northern hills in the background.

In the foothills and interior valleys, riparian woodland would be growing well since no groundwater extraction resulting from deeply drilled water wells would have affected the water table. Even during dry years, the underground reservoir formed from the rocky crevices and sandy valley sediments would have held water for far longer into the dry season than they do now. Oak woodlands which now grow on the some north facing slopes and hillsides such as at Singing Hills and Alpine would have been even more prevalent in the valleys such as Viejas Valley. *Quercus engelmannii* (Engelmann oak) would have been even more common than it is now. The foothills and valleys would also have been one of the favored homes of the Grizzly bear, especially in the riparian areas. Chamise chaparral and chaparral mixed with a variety of species including *Xylococcus bicolor* (Mission manzanita), several species of Ceanothus including *C. tomentosus*, *C. leucodermis* (Chaparral whitethorn) and *C. crassifilolia* (Thick-leaf lilac), as well as *Arctostaphylos glauca* (Big-berry manzanita) and *A. glandulosa* (Eastwood Manzanita) in some areas, would have been the dominants as they are today and more resistant from fires. If for some reason a fire occurred in an area in close succession so that the shrubs were displaced, wildflowers would have filled in the void left by the shrubs.

The foothills are where the effects of gabbro and metavolcanic soils are most prevalent. McGinty Mountain, Viejas, Poser, Barber, San Marcos Mountains, and mountains near Rainbow are composed of gabbro. San Miguel Mountain and the Jamul Mountains in addition to Otay Mountain are composed of metamorphic volcanic rock. Iron Mountain is composed of metamorphosed sedimentary rock. Each of these rock types produce soil that is somewhat limiting for plants due to low nutrients or high concentrations of magnesium and iron. The plants that grow on these soils are able to overcome the apparent limitations of the soil mineral composition so a number of them are rare and different or at least interesting. These mountains composed of gabbro and metavolcanic rock have some similar components of vegetation associates. These may include the fern-like leaved *Chamaebatia australis* (Mountain misery), *Tetracoccus dioicus* (Parry's tetracoccus), *Packera ganderi* (Gander's butterweed) and *Nolina interata* (Dehesa nolina) and *N. cismontana* (Chaparral nolina) on some of the gabbro soils and *Lepechinia ganderi* (Gander's pitcher sage) and *Clinopodium chandleri* (San Miguel Savory) in addition to *Chamaebatia australis* on the metavolcanic and metasedimentary mountains. Tecate cypress also occurred and still occurs on both sets of gabbro and metavolcanic rock types. As mentioned earlier the cypress was probably a bit larger in area than it is now, especially near Tecate Peak. The other species would have ebbed and flowed depending on the cycle of burning.

There is a question regarding whether or not Bighorn sheep occurred on the west side of the mountains in the past. There were unsubstantiated rumors in the 1970's that Bighorn sheep occurred on Otay Mountain. They could have occurred on the west side of the mountains outside of the desert and mountain realm.

It is difficult to tell if there have been changes in coverage between Coastal sage scrub and Chaparral other than the areas where they have been removed by urban and agricultural development. Before Europeans arrived, animal browsing and fires may have kept the vegetation open. However, during the late 1800's and early 1900's cattle grazing was heavy. A set of 1927 aerial photographs provide an indication of just how affected the vegetation was with slopes and large areas with little shrub vegetation of any kind tha later recovered with Coastal sage scrub in some places and forms of Chaparral in a few locations. Therefore, in addition to the major losses of vegetation by modern development, the boundary between Chaparral and Coastal sage scrub vegetation may have been affected, but how much is hard to say. Since the distribution of Coastal sage scrub and Chaparral seems ultimately to be driven by precipitation and whether a slope is north or south facing, it may be that the boundaries between Chaparral and Coastal sage scrub have not changed significantly. However, repeated fires of the past quarter to half century have in some locations provided an avenue for non-native weedy species to take over the Coastal sage scrub locations. In other locations, such as the area below the Alpine View Point on I-8, repeated fires in Chaparral, even when burned several times in a dozen years, have not changed the chaparral and it has recovered. It may be that Chaparral has recovered more readily than Coastal sage scrub due to Chaparral species being able to resprout, which may provide an advantage over the now prevalent invasive non-native annual plants that grow in this region.

At the time of European contact, Rancho Jamul, Viejas Valley, the valleys formed by the middle and upper San Luis Rey and the valleys filled by El Capitan, San Vicente, Otay, and Barrett reservoirs were also full of Coastal sage scrub habitat except the valley bottom where the stream courses passed through which would have supported Riparian woodland. So, overall, in the foothills and valleys, the patterns may not have been that much different than there in modern times except for the displacement of vegetation by the foothill towns and agricultural development. The situation has been mainly a displacement rather than a conversion of the type of vegetation growing in an area with the exception that the non-native weeds have impacted some areas of Coastal sage scrub, especially in the past two decades.

One sad state of affairs is the human caused invasion of gold spotted oak borer and shot hole borer beetles. They are impacting more forest, both oak in the case of the oak borer, and riparian in the case of the shot hole borer, than any other activities of the past half century and maybe longer. Their lasting effects will be fewer trees naturally growing in San Diego County.

Mountains

For the mountains, the effect of European settlement on vegetation is a mix of some areas that are very similar to pre-contact coverage but other areas that are different. The wildlife species have changed as well.

First, the Coniferous forest areas were larger than they are now, particularly since the fires of 2002, 2003, and 2007 which have killed off coniferous forest lands. Under natural conditions, periodic fires more frequent than in the lowlands would have burned off the understory and kept the forest more open (Van der Water and Safford 2011; Sugihara, Wagtendonk and Shaffer 2006). When a fire burned through the coniferous forests of Laguna, Cuyamaca, Palomar, Volcan and Hot Springs Mountains, very little mortality of the adult trees occurred because the trees were spread far enough apart that crown fires would not have commonly occurred. Huge old trees were relatively common, trees that survived many fires over the centuries. A few of these same trees are still alive though there were more prior to 2003. Trees 180 feet tall and five feet plus in trunk diameter grew on the upper parts of the Cuyamaca Peak prior to some of the older fires in the early 1950s (Cuyamaca Rancho State Park information) and at least 166 feet and one 9-foot diameter tree on Middle Peak prior to the 2003 fire. This enormous tree may have already been several hundred years old at the time of European contact (Oberbauer 1975; personal observation).

Grizzly bears were relatively common as were deer. There are records about the high number and, as mentioned, the size of the bears that occurred in this region. There were so many that they were market hunted for their meat and it was shipped to the San Francisco Bay area. However, one other animal that is not mentioned much and which would also have occurred here was the Jaguar (*Felis onca*). Jaguars are thought to have occurred as far north as Monterey, with the last one in Southern California in 1860 in Palm Springs where it was shot while apparently stalking someone dressed in a deerskin camouflage outfit. They didn't just occur in the mountains and forest but also down into the desert. One was killed in Baja California in the southern tip of the Sierra de San Pedro Mártir in 1955 (Sundquist and Sundquist 2017). Their predominant food was likely Mule deer or Bighorn sheep. Bighorn sheep were also numerous, probably occurring in the mountains as well as in the desert as they do in the San Gabriel Mountains. With this somewhat different mix of large animals present, there were likely subtle differences in the vegetation caused by different browsers and grazers and potentially the digging capabilities of the bears.

Mention of valleys in the mountains suggests meadows with extensive wildlflowers nearly every spring. *Layia platyglossa* formed expanses around the boggy area that is now Cuyamaca Lake. *Castilleja densiflora* (Dense owl's clover) mixed with *Lasthenia gracilis* (Goldfields) and *Platystemon californica* (Cream cups) and *Sidalcea malvaeflora* (Checker mallow) grew in profusion in main part of the meadows and valley areas such as Laguna meadow, the very wet area that is now Cuyamaca Lake, and Doane, Will and Dyche valleys on Palomar Mountain. The vast Valle de San Jose and its associated tributary valleys near Morrettis Junction and near Mataguay Boy Scout Camp contained yet another type of *Eschscholzia californica*. These poppies generate flowers that may be nearly 3 inches across and of deep orange color. In some places, they may be mixed with *Malacothrix glabrata* (Desert dandelion) and *Linanthus dianthiflorus*, *Lasthenia gracilis* and *Lupinus bicolor* (Miniature annual lupine) flowering in a vast cover of orange and blue. Occasionally small remnants of this are found today following good rainfall seasons. Roving bands of Pronghorn occurred in these areas as well, trampling the flowers in some locations as they moved across the vast landscape with a backdrop of the San Ysidro Mountains, including Hot Springs Mountain and Palomar Mountain.

After contact, logging did occur in the mountains. Logging of local forests would have generated timber for the construction of the Stonewall Jackson gold mine that generated many millions of dollars in gold. Forest areas around Cuyamaca Lake and Julian were cut and sawed or burned. In the 100 years that have passed since logging, forest grew again in some of the areas as illustrated by the trees in the area where the Stonewall Jackson mine once occurred south of Cuyamaca Lake. There may have been permanent changes in the overall extent of the forest compared to what was present before the development of Julian and before the mines were constructed.

Palomar Mountain was important in a similar way where some forest was cut, but the extent is not known. Only two *Pinus lambertiana* (Sugar Pine) trees have been found on Palomar Mountain and one wonders why more don't occur there. Sugar pine wood is highly prized and could have been cut selectively, but a question would be if people would have gone to so much trouble to concentrate on them rather than the abundant *Pinus jeffreyi* (Jeffrey pine), *Abies concolor* (White fir) and *Calocedrus decurrans* (Incense cedar).

Hesperocyparis stephensonii (Cuyamaca cypress) grew in a limited area on the west slopes of Cuyamaca Peak. Cuyamaca Peak is composed of gabbro, which as mentioned earlier, supports unique vegetation due to the presence of high concentrations of magnesium and iron. Was *Hesperocyparis stephensonii* more widespread before repeated fires beginning in the 1950s?

A massive fire in the Cuyamaca Mountains during the early 1950's was one of the initial forces for destroying old growth forest, killing off *Pinus lambertiana* on Cuyamaca Peak that were reported to be 180 feet tall. Five-foot diameter stumps existed on Middle Peak in the 1970's.

While still part of the mountain area but in a more desert trending zone, the area around Jacumba was reported to have suffered a large fire in the early part of the 20th century. Pinon pine forest that was widespread in that region was reported to have been burned and did not regrow. Pinyon

pines (*Pinus monophylla*) are currently absent in most of the Jacumba area though there are a few in the vicinity of In-Ko-Pah County Park, not far away, and significant groves occur among granitic rock formations in the Jacumba Mountains to the east.

Some of the greatest impacts in the mountain areas since European people arrived occurred in the past few decades. Prolonged drought in the late 1980's and early 2000's killed off large areas of *Pinus coulteri* (Coulter pine) in the southern part of Palomar Mountain and *Pinus jeffreyi* in the hills around Julian, in addition to forests in the Cuyamaca and Laguna Mountains.

When these areas burned in the Palomar Mountain fire of 1999, the Pines Fire, Cedar Fire, Poomacha Fire, Volcan Mountain fire and Hot Springs Mountain fire over the last 20 years, huge losses in forest vegetation occurred. The Cedar Fire alone destroyed at least 20,000 acres of Coniferous forest. In the absence of any adult trees, since all conifers were killed in massive crown fires in much of these areas, reproduction or natural regeneration of these forests is not occurring without assistance. A more natural stand density may have allowed fewer standing dead trees since fewer trees competed for the lower rainfall, and with a more open forest of lower density, more trees might have been spared by the fires. Chaparral has been the winner in these burn areas since 2003. Ten-foot tall pure stands of *Ceanothus palmeri* (Palmer ceanothus) replaced the trees in much of the 20,000 acres mentioned earlier. Except for the spread of chaparral into what was formerly forest lands, the major change in the forest areas since European settlement in San Diego County is one of loss.

Pine Mountain on top of Rancho Guejito is a case in point. Prior to 2003, it supported a significant stand of *Pinus coulteri* on the highest locations. The fire killed large areas of trees and their trunks appear like bleached match sticks on Google Earth aerial photos. Few of the pines are growing back now as is also evidenced on Google Earth.

However, the effect of centuries of cattle grazing should not be understated. Oak woodland reproduction has halted in areas where cattle graze heavily and old trees eventually die without reproducing. This has happened in the Valle de San Jose east of Lake Henshaw. Riparian forests of *Populus fremontii* (Fremont Cottonwood) and *Salix* species (willows) with *Quercus agrifolia* (coast live oak) would have been extensive in these areas. They have been gradually eliminated by heavy grazing with remnants near Morretis Junction and east along the Highway S-2.

Desert

One might think that the desert portion of San Diego County may not have had many changes since the area was occupied by Europeans. However, again, the absence of weeds provided for enhanced wildflower growth. The predominant weeds *Brassica tornifortii* (Sahara mustard) and *Bromus tectorum* (Cheatgrass) at the higher elevations, and *Schismus barbatas* (Common Mediterranean grass) along with *Erodium cicutarium* have become a major complication of the vegetation growth especially the *Brassica,* which seems to have had its greatest effect in the past couple of dozen years. In some parts of Borrego Valley, displays that are reminiscent of what would have been more common occasionally occur following good rainfall seasons. With the absence of weeds, *Abronia villosa* (Sand verbena), *Oenothera deltoides* (Birdcage evening primrose), *Geraea canescens* (Desert sunflower) and *Malacothrix glabrata* (Desert dandelion) would have filled every void between the *Larrea tridentata* (Creosote bush) and the *Fouquieria splendens* (Ocotillo) more frequently than they do now.

Another area where the deserts have suffered is in groundwater draw down. The groundwater table of Borrego Springs has been gradually lowering for decades as water is pumped out. Even *Prosopis glandulosa* (Honey mesquite) and the non-native *Prosopis velutina* (Velvet mesquite), which is notorious for being deep rooted, are eventually adversely affected. The Mesquite Bosque in Borrego has been declining as water that fell as rain hundreds and thousands of years ago is drawn out for irrigation of land around Borrego Springs.

An interesting set of birds that inhabit the bosque include Lucy's warbler, Crissal thrasher, and Gambel quail. Mesquite Bosque has covered a combined area of approximately 3,868 acres in the desert but continues to shrink. Fewer than 2,500 acres exist in the main area near the Borrego Sink, but with many dead trees. While the Lucy's warbler has only been detected there since 1990, their history indicates ebb and flow so that they could have moved around and could have been in this area before detected in the 1990s. With more groundwater, the bosque was probably larger and it is also likely that mesquite was more widespread elsewhere in the Borrego desert.

It is hard to say if the palms would have been growing in additional or different locations than where they do today. The ones that grow are occasionally affected by human caused fires but the native people would have burned as well. They are also periodically subjected to massive flash floods that topple large trees and carry them downstream. Along the edge of Borrego Valley, they could have been more prominent prior to the drawdown of the water table.

Pinyon pine forests on Whale Peak and elsewhere seem to have been little affected by the presence of European inhabitants. These forests have never been commercially exploited and they grow in remote enough areas that they don't appear to have been cut to any significant level and mining operations did not appear to have had major land clearing efforts there either.

Furthermore, they seem to be more resilient to drought because during drier winters resulting from lack of Pacific storms, the summer monsoon in the desert has often made up for the lower precipitation. While the Cuyamaca and Julian trees were dying from drought and bark beetles, these

trees seemed to be little affected.

At the time of European encounters, the desert wildlife would have also been somewhat different than modern times. Pronghorns were also present down in the desert where bands of pronghorn moved across the lowlands such as Borrego Valley. On the rocky hillsides and canyons, Bighorn sheep were also much more common than they are now, coming down out of the mountains and hills to drink in the canyon bottoms. In the absence of well draw down, the Borrego Sink may have held water more consistently than it does now.

The major change in vegetation in the desert has been the invasion of weed species. In place of the weeds the native wildflowers would likely have not only been more prevalent but more widespread as well. San Diego County still supports more species of most plants and animal groups than any other County in the United States, even though it has been affected by 500 years of impact. While the Grizzly bears and Jaguars may have created danger, they along with the Pronghorns and large populations of deer from the coast to the desert and marine mammals in San Diego Bay and along the coastline California condors and numerous bird and mammal species and the continuous cover of wildflowers in openings in the vegetation, would have made an area that is still a truly spectacular place biologically.

~ **Tom Oberbauer**, Chapter President

References:

Indian country diaries 2006 Assimilation, relocation, genocide http://www.pbs.org/indiancountry/history/calif.html

Antonelis, G. A. Jr. and C. H. Fiscus. The pinnipeds of the California current. CalCOFI Rep. Vol. XXI:68-78.

Killea, Lucy Lytle. "Colonial Foundations of Land Use and Society in San Diego, 1769-1846." Ph.D., History, 1975. University of California, san diego

Scott, C. D. 1955. Story of Southern California Wildflowers (1955)

Valley Center History Museum. 2015. Grizzly Bear https://www.vchistory.org/exhibits/grizzly-bear/

Tremor, Scott. 2017. Mammal Atlas San Diego County. San

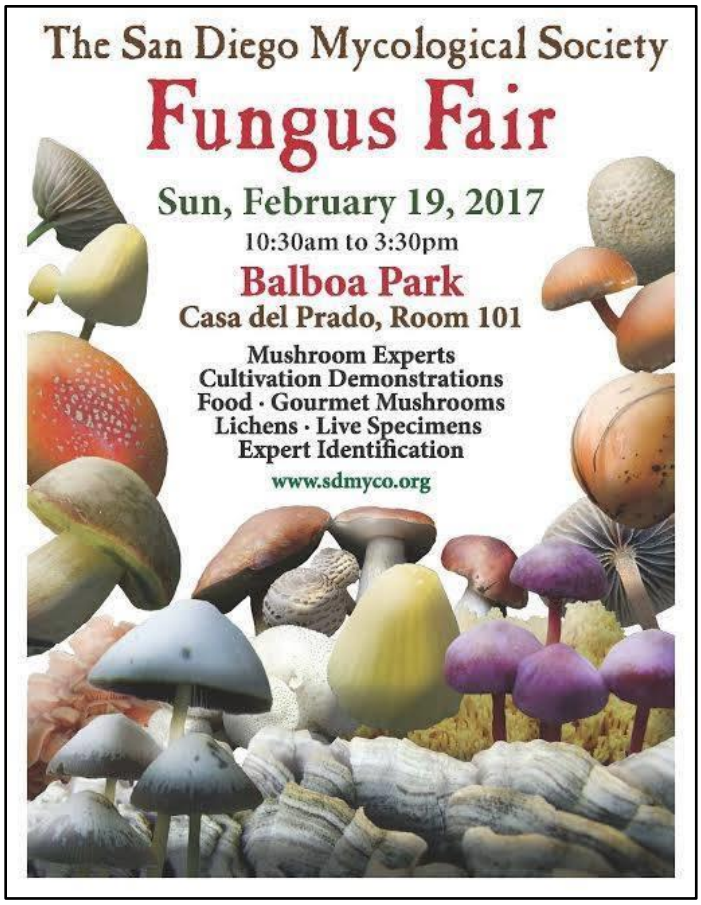
Minnich, R. A. 208. California's fading wildflowers, lost legacy and biological invasions. University of California PressMinnich, R. A..California's Fading Wildflowers: Lost Legacy and Biological Invasions. Berkeley: University of California Press, 2008. Project MUSE,

Van de Water K. M. and H. D. Safford, 2011: A Summary of Fire Frequency Estimates for California Vegetation before Euro-American Settlement. Fire Ecology Volume 7, Issue 3: 26-58

Sugihara, N., J.W. van Wagtendonk, K. Shaffer, J. Fites-Kaufman, and A.E. Thode. 2006. Fire in California's ecosystems. University of California Press, Berkeley, USA.

Sundquist, M. and F. Sundquist. 2017. Wild cats of the world. University of Chicago Press.

Oberbauer, T. 1975. Pinus Lambertiana. Forest Ecology, San Diego State University.



The CNPS-SD Newsletter is generally published 12 times a year. The newsletter is not peer reviewed and any opinions expressed are those of the author identified at the end of each notice or article. The newsletter editor may edit the submittal to improve accuracy, improve readability, shorten articles to fit the space, and reduce the potential for legal challenges against CNPS. If an article, as edited, is not satisfactory to the author, the author can appeal to the board. The author has the final say on whether the article, as edited, is printed in the newsletter. Submissions are due by the 10th of the month preceding the newsletter; that is, July 10 for the August newsletter, etc. Please submit items to newsletter@cnpssd.org

CNPS-SD Activities Calendar February 2018

2/1-3: **Conservation Conference, L.A.**
2/4: **Field Trip – Hollenbeck Cyn, p.1**
2/6: **Conservation Committee Mtg, p.5**
2/7: **Board Meeting, p.3**
2/10: **Winter Workshop, p.4**
2/10: **Old Town Landscape Work Party, p.3**
2/14: **Garden Committee Mtg, p. 3**
2/18: **Field Trip, Santa Margarita River Trail, p.2**
2/20: **Chapter Meeting, p.1**
2/24: **Old Town Landscape Planting Party, p.4**
3/4: **Field Trip, Otay Mtn Truck Trail, p.2**

MEMBERSHIP APPLICATION

___Student or Limited Income $25; ___Individual $45; ___Family $75

___Plant Lover $100; ___Patron $300; ___Benefactor $600; ___Mariposa Lily $1,500

Name(s): _____

Address: _____

Phone: _____ e-mail: _____

Mail check payable to "CNPS" and send to: CNPS, 2707 K Street, Ste 1, Sacramento, CA 95816-5113.

CALIFORNIA NATIVE PLANT SOCIETY

San Diego Chapter

C/o San Diego Natural History Museum

P. O. Box 121390

San Diego, CA 92112-1390

Nonprofit Organization

U.S. Postage

PAID

PERMIT NO. 1522

San Diego, California

February 2018 Newsletter

Dedicated to the preservation of the California native flora

CALIFORNIA NATIVE PLANT SOCIETY – SAN DIEGO

www.cnpssd.org info@cnpssd.org

BOARD MEMBERS

PRESIDENT: Tom Oberbauer ……president@cnpssd.org
VICE PRES: Frank Landis……vicepresident@cnpssd.org
SECRETARY: Michael Evans……secretary@cnpssd.org
TREASURER: Connie di Girolamo ……treasurer@cnpssd.org
Cindy Burrascano…… (858) 342-5246; booksales@cnpssd.org
Bob Byrnes……bob.byrnes@cnpssd.org
Torrey Neel……programs@cnpssd.org
Al Field.....gardening@cnpssd.org
Justin Daniel.....fieldtrips@cnpssd.org
Bobbie Stephenson.....newsletter@cnpssd.org

CHAPTER COUNCIL DELEGATE

Frank Landis…….....chaptercouncil@cnpssd.org

RARE PLANT BOTANIST

Fred Roberts……..rarebotanist@cnpssd.org
(760) 439-6244

APPOINTED COMMITTEE CHAIRPERSONS

BOOK SALES: Cindy Burrascano……booksales@cnpssd.org
(858) 342-5246
CONSERVATION: Frank Landis.....conservation@cnpssd.org
(310) 883-8569
EDUCATION: OPEN
FIELD TRIPS: Justin Daniel……fieldtrips@cnpssd.org
HOSPITALITY: Kye Ok Kim…….....hospitality@cnpssd.org
INVASIVE PLANTS: Arne Johanson (858) 759-4769 &
Bob Byrnes.....invasiveplants@cnpssd.org
LEGISLATION: Peter St. Clair……. legislation@cnpssd.org
LIBRARIAN: OPEN
MEMBERSHIP: Connie di Girolamo….membership@cnpssd.org
NATIVES FOR NOVICES: Sue Marchetti…….
nativesfornovices@cnpssd.org
NATIVE GARDENING: Al Field.....gardening@cnpssd.org
GARDEN TOUR: Judie Lincer… ……tour@cnpssd.org
GARDEN WORKSHOP…… tour@cnpssd.org
HABITAT RESTORATION: Arne Johanson…... (858) 759-4769 &
Bob Byrnes ……habitatrestoration@cnpssd.org
NEWSLETTER: Bobbie Stephenson.....newsletter@cnpssd.org
(619) 269-0055
OLD TOWN NATIVE PLANT LANDSCAPE: Peter St. Clair and
Kay Stewart……..….OldTownLandscape@cnpssd.org
PLANT PROPAGATION: Jim Wadman...propagation@cnpssd.org
619-294-7556
PLANT SALE-FALL: Carolyn Martus..…....plantsale@cnpssd.org
PLANT SALE-SPR: OPEN……springplantsale@cnpssd.org
POSTER SALES: OPEN……postersales@cnpssd.org
PROGRAMS: Torrey Neel……programs@cnpssd.org
PUBLICITY: OPEN…….....publicity@cnpssd.org
PUBLIC OUTREACH: OPEN ……publicoutreach@cnpssd.org
RARE PLANT SURVEYS: Frank Landis...raresurvey@cnpssd.org
(310) 883-8569
SEEDS & BULBS: Cindy Hazuka…..seedsandbulbs@cnpssd.org
VEGETATION: OPEN……vegetation@cnpssd.org
WEBSITE: Joseph Sochor.....webmaster@cnpssd.org