

UC Santa Barbara

Newsletters

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UCSB Restoration Register - March 2024

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UC SANTA BARBARA
Cheadle Center for Biodiversity
& Ecological Restoration

Restoration Register

March 2024



Aerial photo of NCOS taken on 1/27/24. This photo was taken after the breach event on 1/22/24 and shows the reduced water levels in the Devereux Slough. You can also see the open connection to the ocean at Sands Beach where the sand berm exists for most of the year. Photo by Bill Dewey.

Updates

Wildflowers



Red Maids (*Calandrinia menziesii*) are just beginning to flower on the NCOS Mesa.

As spring approaches, a variety of native wildflowers are beginning to blossom at various Cheadle Center management areas. At the North Campus Open Space, our Mesa grassland area is showing promising levels of germination following the cultural burn that took place in fall. So far, we've observed Blue Dicks (*Dipterostemon capitatum*), Red Maids (*Calandrinia menziesii*), California Buttercup (*Ranunculus californicus*), Coastal Tarweed (*Madia sativa*), Winecup Clarkia (*Clarkia purpurea*), and Grassland Stebbinsoseris (*Stebbinsoseris heterocarpa*).



Blue Dicks (*Dipterostemon capitatum*) are growing nearby the Mesa trail in the NCOS grassland.



Close up of Blue Dicks (*Dipterostemon capitatum*) flower.



California Buttercup (*Ranunculus californicus*) growing on the Mesa grassland.



Close up of California Buttercup (*Ranunculus californicus*) flower.



This short video shows the transformation of the NCOS Grassland following the cultural burn in Fall 2023.

Wildflowers are beginning to bloom elsewhere at NCOS as well, including around our Visitor Plaza, which has been extremely well-maintained by our fearless weed warriors.



Blue-eyed Grass (*Sisyrinchium bellum*)



Close up of Bush Sunflower (*Encelia californica*)



Close up of Seacliff buckwheat (*Eriogonum parvifolium*)



Hummingbird Sage (*Salvia spathacea*)



Western Vervain (*Verbena lasiostachys*)

On the other side of campus, the wildflower show at the Campus Lagoon is already stunning. The Campus Lagoon has undergone prescribed burns since 2009. In 2016, we transitioned from planting coastal sage scrub species post-burn to sowing large amounts of locally-sourced, native wildflower seeds. These early-blooming, aggressively growing native wildflowers help suppress grasses that may have survived the burn. They fade out by mid-spring, allowing other seeded wildflowers to express themselves in the plot. Currently, California poppy (*Eschscholzia californica*) and Red Maids (*Calandrinia menziesii*) are the most obvious flowers, but a wide variety of other species are present, including common popcorn flower (*Cryptantha clevelandii*), miniature suncups (*Camissoniopsis micrantha*), blue toadflax (*Nuttallanthus texanus*), Nuttal's snapdragon (*Antirrhinum nuttallianum*), common phacelia (*Phacelia distans*), sea-side fiddleneck (*Amsinckia spectabilis*), cobweb thistle (*Cirsium occidentale*), strigose lotus (*Acmispon strigosus*), Spanish lotus (*Acmispon americanus*), winecup clarkia (*Clarkia purpurea*), owl's clover (*Castilleja exserta*), sandy-soil suncup (*Camissonia strigulosa*), and many more!



California poppy (*Eschscholzia californica*)



Red Maids (*Calandrinia menziesii*)

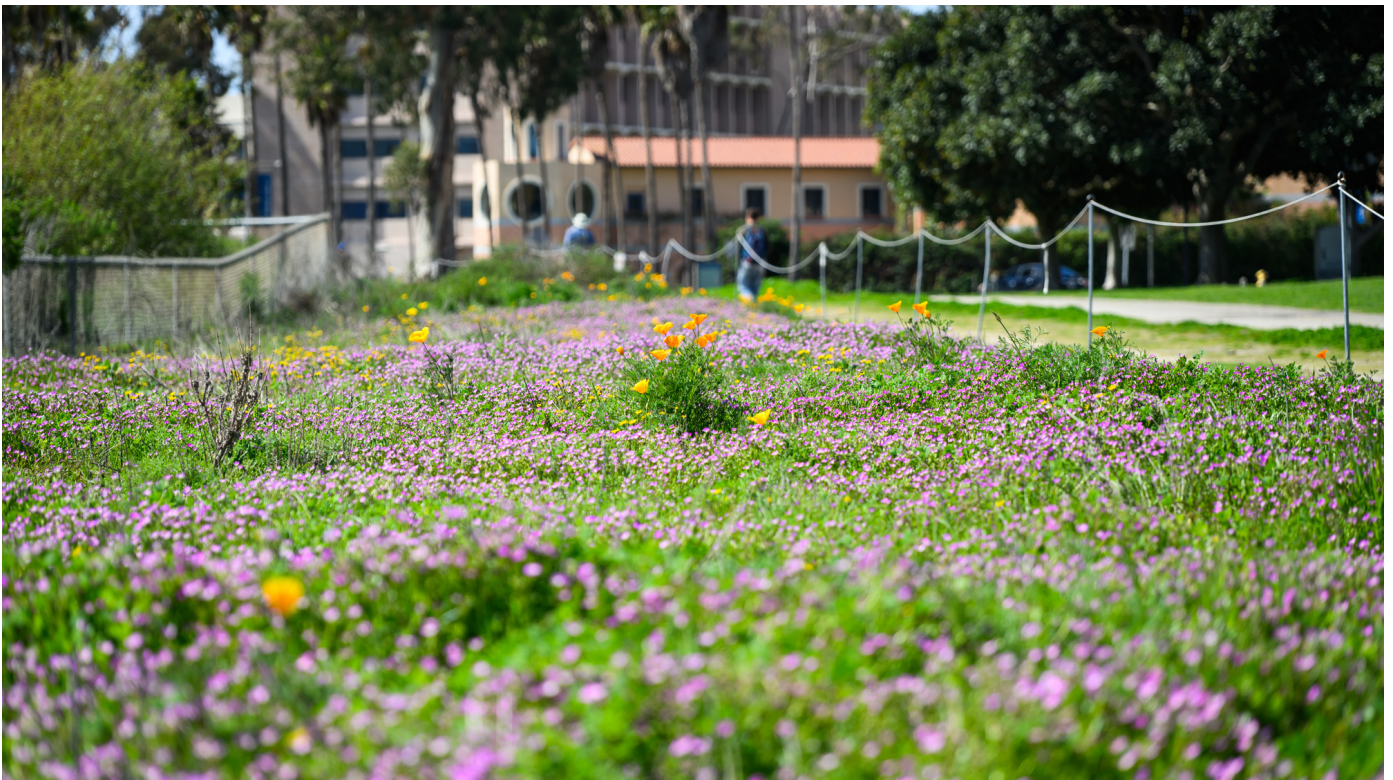


This short video shows the Red Maids (*Calandrinia menziesii*) and California poppy (*Eschscholzia californica*) within the 2020 and 2022 burn plots on Lagoon Island.

You can also take a walk down the bluff from Campus towards Goleta Beach to catch the wildflowers at our small restoration site next to Henley Gate.



Red Maids (*Calandrinia menziesii*) and California poppy (*Eschscholzia californica*) at Henley Gate.



Red Maids (*Calandrinia menziesii*) and California poppy (*Eschscholzia californica*) at the upper site near Henley Gate.

Ellwood Marine Terminal



With a goal of restoring the site for the benefit of the public, UC Santa Barbara has received approval from the California Coastal Commission to initiate the demolition of the Ellwood Marine Terminal (EMT) tanks, pipes and facilities. The project follows the UCSB Cheadle Center's restoration of North Campus Open Space, and its long-term management and ongoing restoration of Coal Oil Point Reserve.

During the restoration process, the eucalyptus trees shielding the tanks will be removed for several reasons. The trees are nearly 100 years old and are at the end of their lifespan; many trees are falling on their own, presenting a significant safety risk to future users of the public trail. Additionally, the site is the highest spot on the coast in this region, and the restoration vision includes the idea of opening up views from the high point to the south, east, and north—from the oceans to the slough and the Santa Ynez mountains. The third reason is that data from the [Breeding Bird Survey](#) and other breeding records from the area demonstrate that the site's function for raptor nesting has been declining significantly over the past 30 years, particularly for White-tailed Kites whose loosely built nests are often unsuccessful in wind-exposed eucalyptus trees. The fourth reason is that many of the oak trees growing adjacent to the windrow are becoming well-established but are less likely to be used for nesting with the overhanging tall trees above them, which make nests vulnerable to raptors. Finally, the restoration work that has happened at NCOS and COPR in support of ground-nesting birds—plovers, shorebirds, lark sparrows, and burrowing owls—changes the dynamic and value of the adjacent open spaces and makes the non-native eucalyptus trees more of a liability to biodiversity than an enhancement.



Downed Eucalyptus trees at the EMT site.

UC Santa Barbara is facilitating a public engagement process to help delineate the public access trails, overlooks and interpretation that will be guided by perspectives from the Chumash community, neighbors, birders, students and other interested users. Public participation is welcome; anyone interested should email ncos@ccber.ucsb.edu for more information.

[Read the full press release here.](#)

Ocean Meadows Housing Project



Ocean Meadows Development has started! You may have noticed work going on behind the green fences on the east sides of the parking lot and of NCOS. Six low income, single story homes are planned for the eastern half of the parking lot and may be done by the end of 2024. 32 units are slated to open by the end of 2025 along the eastern edge of NCOS and are now planned to house approximately 300+ UCSB students, in keeping with the surrounding housing.

NCOS in the NY Times!

The North Campus Open Space was recently featured in a New York Times article focusing on the ecological restoration of golf courses. The article showcases several restoration projects, including the San Geronimo golf course, the Cedar View golf course, North Campus Open Space (formerly Ocean Meadows golf course), and the Mesquite Golf & Country Club.

[Click here to read the full article.](#)

Off-leash Dogs



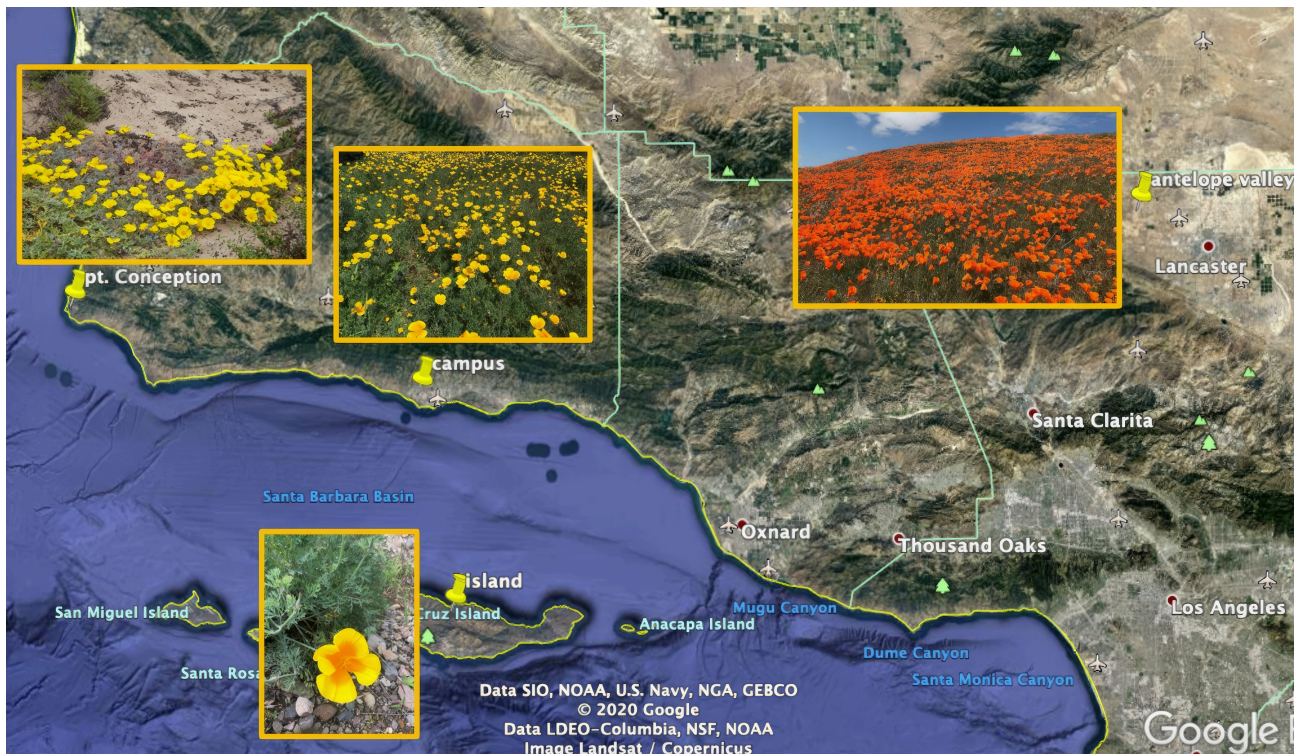
Over the past several weeks, there have been several instances of off-leash dogs at the North Campus Open Space, with some dogs entering the sensitive wetland areas of the site. While the vast majority of owners leash their dogs while utilizing the open space, the presence of just a few off-leash dogs can have enormous impacts for the wildlife living in the area. Off-leash dogs disturb not only wildlife but also community members who are enjoying the peaceful and natural aspects of the site. Respecting the leash rule allows community members to utilize the site to the fullest and have inspiring encounters with wildlife, which can result in some beautiful works of art!



Artwork by Merlie Samonte.

Feature Story

Genetic Diversity and California Poppy (Eschscholzia californica)



Biodiversity encompasses ecosystems, the species within those ecosystems, and the genetic variations within those species. Genetic diversity, in particular, is an essential yet often overlooked component of biodiversity. The images above depict four local variations of the California Poppy (*Eschscholzia californica*). Remarkably, there may exist hundreds of distinct local forms of this species!

Though the concept of local forms (also called local genotypes) of plants is not well understood, the fact that they exist is clear. This means that among plants of the same genus and species, there may be consistent and substantial genetic differences among them from place to place, across their ranges. Many of these unique differences between plants are adaptive (meaning they offer advantages) and can include differences in growth form, flower color, leaf shape or thickness, disease susceptibility or resistance, variation in secondary metabolites, and more.



Local coastal form California Poppy with distinct bi-colored flowers.

Our state flower, California Poppy (*Eschscholzia californica*), is one of the best examples of local genotypes. The presence of locally adapted forms among California's native plants suggests that merely identifying them by their correct names may not fully capture their essence. In reality, we are observing thousands of 'wild heirlooms', each uniquely evolved to suit its specific environment. The California Poppy (*Eschscholzia californica*) is native to a vast region in the Western US, spanning much of California and extending into parts of Oregon, Washington, New Mexico, Arizona, and Baja California. This expansive territory encompasses a wide range of macro and microclimates - think Baja vs the middle of Oregon, or the Bay Area vs western Arizona.

Since plants are sessile organisms, meaning they are fixed in place, they must endure the climatic nuances that these places have to offer. Whether situated in foggy or arid climates, experiencing summer monsoonal rainfall or none at all, enduring constant winds or calm conditions, receiving annual rainfall ranging from 7 inches to 50 inches, or coexisting with or without gophers, each habitat fosters distinct characteristics in the California Poppy (*Eschscholzia californica*).



California Poppy (*Eschscholzia californica*) at the Antelope Valley Poppy Reserve.

The familiar and possibly “best-known” form of California poppy seems to be that which is found at the Antelope Valley Poppy Reserve. Likely this genotype or similar has become the seed-stock for much of the nursery-sold seeds and plants over the last several decades, hence its familiar appearance. This form is typically identified as a notably orange-flowered, erect, and annual plant. Being from the arid interior, it is not adapted to coastal fog, which makes them rapidly succumb to powdery mildew. Since these plants are widely available for sale, when they become adjacent to any local populations, introgressions of their maladapted genes get into the remaining local plants. Note the differences in mildew prevalence and absence between these genotypes!



Interior form that can be found at Antelope Valley Poppy Reserve (left) showing lack of mildew resistance compared to local coastal form (right).

By contrast, our beautiful local form on campus is distinctly bi-colored, with more yellow in the flowers (yellower flowers may be an adaptation to being more visible to native bees in overcast conditions). Adapted to the fog belt, it experiences cool, humid summers- a far cry from the arid, hot summers the poppies in the Antelope Valley experience. Therefore, our local form of poppy is highly resistant to powdery mildew. On any given day in early June, native poppies in our area may experience “June gloom”- 60-degree days and 100% humidity- while on the very same day, the same taxon in the Antelope Valley will be experiencing searing temperatures over 90 degrees, with very low humidity.



Local coastal form California Poppy (left) and interior form that can be found at Antelope Valley Poppy Reserve (right).



Local coastal form California Poppy with distinct bi-colored flowers.

Our local poppies can also be perennials, living for several years. They can survive the dry Mediterranean summers since that are moderated by coastal conditions. By contrast, 100% of the poppies in the interior die from summer drought and are all annuals that spend the summers as seed. This is one way a subtle but beautiful example of biodiversity- local adaptations- can be degraded or lost, paradoxically by the seemingly benevolent action of sowing wildflower seeds. In trying to conserve our local poppy, we often remove “guerrilla gardened” plants prevalent in “seed bombs”. This preserves the genetic uniqueness of our fine-tuned form of poppy that truly represent our area’s wild, biodiverse, botanical heritage.



California Poppy at Point Conception.

So far, we have seen the marked differences between the well-known, interior Antelope Valley genotype and the form that is native to the UCSB campus area. Moving up the coast westward, we come to the place where the state again begins to turn north- Point Conception. There the prevailing winds in the channel are more pronounced and more regular than here in the lower part of the county. This means these delicate herbs predictably endure more coastal fog, strong prevailing winds, and blowing sand than campus plants. These notable differences have created a microclimate at Point Conception that bears both significant similarities and differences to that which we experience on campus. Yes, both are coastal, both are in the same county. The same weather systems and meteorological phenomenon that sweep through the region affect both locations, but in different enough ways that they have created a distinct 'wild heirloom' in each.



California Poppy at Point Conception.

Like our wonderful local form, the poppies at this dune-swept site are strongly mildew-resistant, have yellow in their flowers, and are perennial, but they take these attributes to another level. Unlike our flowers which are often half yellow and orange, these are almost entirely yellow. And while they are beautifully at place in the fog, bearing no powdery mildew, and perennial, they appear to be significantly long-lived. Some of these plants bear visibly large bases of tap roots that indicate a plant of considerable age. How old might they be (research project anyone)? Recall that 100% of the orange-flowered plants in the interior desiccate in summer heat and are short-lived annuals. Strikingly, these poppies are much lower growing than our plants close to home, which reach around 24" in height. Instead, these are profoundly prostrate, or low-lying. Forming a mat and sprawling across the surface of the sand, these plants keep their delicate leaves, stems, and flowers out of the incessant wind.

A genotype encompasses the complete genetic composition of an organism, including traits that are invisible to the naked eye. While we can readily observe adaptations such as flower color, form, and disease resistance, there are also subtle distinctions that elude visual detection. These nuances represent yet another layer of biodiversity, highlighting the remarkable diversity present in nature. Just twenty or thirty miles across the channel, there occurs an island form of *Eschscholzia californica* that looks nearly identical to the form we have on campus. Both forms are erect, bi-colored, mildew-resistant, and may be perennials.



California Poppy (*Eschscholzia californica*) on Santa Cruz Island.

However, there is something very interesting going on with these island plants that their myriad of mainland relatives do not share. Secondary metabolites are molecules made by plants to make themselves more competitive in their environments, and they are sometimes intricately involved in regulating plant-animal relationships, such as herbivory. Familiar metabolites that affect mammals are alkaloids such as nicotine, caffeine, and morphine- all derived from the plant world. The latter comes from the Papaveraceae, the same family that *E. californica* belongs to, meaning they also make secondary metabolites.

While these two genotypes may appear almost identical, all mainland forms have one significant environmental factor that island forms do not: a long evolutionary coexistence with gophers. Botta's pocket gophers are ubiquitous in almost all mainland locations and have eaten California poppies for countless millennia. By contrast, island forms, such as those on Santa Cruz, have had no adjacency to these burrowing rodents for up to 500,000 years. Consequently, island poppies make 2.5 times less gopher-detering alkaloids than their mainland relatives, making them much more desirable to captive gophers when given the option (Watts, 2011). In the same study, island plants were significantly less tolerant of simulated root herbivory compared to mainland plants.

When you look at a wildflower or native plant in its wild place, you are quite likely looking at a locally adapted form of that plant. And when you see sown wildflowers, or native plants planted by humans, it is very likely that you are seeing a form of plant far from where it was originally from and maybe far from where it is ideally suited to growing. By doing this, maladapted genes can be introduced into wild populations, setting back the evolutionary uniqueness that took place over very long timescales to produce a finely tuned local form. We can avoid this misalignment by better understanding and using local genotypes.

Watts SM, Dodson CD, Reichman OJ (2011) The Roots of Defense: Plant Resistance and Tolerance to Belowground Herbivory. PLoS ONE 6(4): e18463. <https://doi.org/10.1371/journal.pone.0018463>

Volunteer Opportunities



"Second Saturdays" at NCOS

March 9th, 9:00 - 12:00

Please RSVP to ncos@ccber.ucsb.edu

Help us restore and create NCOS with plants and more! Meet at 6969 Whittier Drive at 9am. Bring water, sunscreen, and wear a hat, clothes and shoes that are suitable for outdoor work



Thursdays - Greenhouse Associates

Thursdays 9:00 - 12:00

Come help transplant seedlings of native plants with the CCBER team. To join, please send an email to ncos@ccber.ucsb.edu.



Nature Guide Tour

March 16th, 9:30 - 11:00

Come take a walk around NCOS and learn about native plants and animals with a trained Nature Guide.

Community Photos

We are interested in any observations of wildlife activity on NCOS, as well as plants and landscapes. Please send your observations, with or without photos, to ncos@ccber.ucsb.edu. Thank you!



Storm Flow at Phelps Creek on 2/04/24. Photo by Bob Craig.



Storm Flow in the Slough from Phelps Bridge on 2/04/24. Photo by Bob Craig.



Video of storm flow at Phelps Bridge on 2/04/24. Video by Bob Craig.



Belted Kingfisher near Whittier Pond at NCOS. Photo by Daniel Forseth.



Surf Scoter in the Campus Lagoon. Photo by Daniel Forseth.



Hooded Mergansers in the Devereux Slough at NCOS. Photo by Daniel Forseth.



American Bittern at Whittier Pond on NCOS. Photo by Lynn Scarlett



Red-shouldered Hawk at NCOS. Photo by Lynn Scarlett



Green Heron at NCOS. Photo by Susan Cook



Snow Goose flying on the NCOS Mesa grassland. Photo by Susan Cook.



Pacific Chorus Frog near the Mesa Vernal Pools at NCOS. Photo by Jeremiah Bender.



Ring-necked Snake at the South Parcel restoration site. Photo by Jeremiah Bender.



Western Skink at the South Parcel restoration site. Photo by Jeremiah Bender.



A slightly bedraggled Yellow-rumped Warbler at the South Parcel restoration site. Photo by Jeremiah Bender.

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