

News from the

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Email to: friends@fbbfs.org

Website at: www.fbbfs.org



**FRIENDS OF THE
BERNARD
BIOLOGICAL
FIELD STATION**

Meet the Inhabitants



Acemispom glaber

Deerweed is one of the plants included in the newly planted demonstration gardens at the Mills end of the Foothill frontage of the BFS, and it is doing very well! (You might know it by a previous name, *Lotus scoparius*.)

Deerweed is a common small shrub growing up to 4 feet wide and tall but most often smaller, and plants typically live less than 10 years. Blossoming from March to August, it can be found on dry slopes and fans, especially after burns, and in disturbed areas below 5000 feet. It thrives in coastal sage scrub, chaparral, coastal strand areas and on the Channel Islands. Today it lines much of Highway 210 and many of our remaining open fields. It is common on the BFS. Deerweed has thin, bright green stems with widely spaced branches, and tiny green leaves composed of 3 leaflets which give it a delicate look. It is, however, quite tough and colonizes open areas and disturbed patches, helping to prevent erosion. As do many members of the pea family, it harbors nitrogen-fixing bacteria in its roots. These change atmospheric nitrogen gas into nitrates, a form that plants can use to produce proteins, so deerweed is important in maintaining soil quality. Deerweed also provides food for hummingbirds, bees, butterfly larvae, deer, and other wildlife.

Sightings

- masses of purple phacelia and bright golden amsinkia
- a patch of volunteer golden currents in one of the demo gardens
- bees visiting the deerweed
- large-leaved mounds of datura, decorated with 8" white trumpets
- vibrant red spires of scarlet delphinium
- a very unusual white penstemon (photo from Nancy Hamlett)



- birds hunting for insects in the oaks and leaf litter
- ground squirrels popping out of their burrows

The \$5000 donation the Friends made to help with establishing the Ecological Walk along the Foothill frontage is being used to buy plants and pay students to water them during their first year. To help fund the Walk contact the Director.

The tiny flowers of deerweed occur in groups of 3-7 along the ends of the branches at the leaf bases. They resemble those of sweet peas and mature flowers are generally yellow. On many plants buds, pollinated flowers, and dying, unpollinated flowers are reddish orange. Bees learn quickly to visit only the unpollinated, mature yellow flowers. This saves the bees time and energy, and benefits the plant by having more bee visits result in fertilization. (Side note: a student experiment added nectar to the orange flowers and the bees learned to visit them within a day or two!). After fertilization, each flower produces a fruit like a miniature pea pod containing two seeds.

Deerweed (Migali) was used by the Gabrielleno-Tongva who lived in our area. It offers little in the way of food although its tiny leaves were gathered and eaten raw. However it offered much in the way of medicine. The whole plant was soaked in water providing a wash for pregnant women. And after giving birth, the mother was bathed ritually in Migali wash to purify her for her motherhood. A mild tea was made from the entire plant and drunk as a blood builder. The roots were used in a decoction for coughs and sometimes crushed for use as a “soap”. The leaves were gathered and brewed into a mild tea for chills and fevers and into a stronger brew for coughs. An excellent ‘weed’!

California Ground Squirrel

Otospermophilus beecheyi

One of these popped up in the westernmost demo garden when we were clearing the non-native grasses from the site. We covered the hole with a rock and the squirrel promptly made a new entrance the next day.

California ground squirrels have a body about 12 inches long, plus a 6 inch bushy tail. Their fur is gray and tan, with a mottled appearance on top and a buff one underneath. There is slightly darker fur on the head, shoulders, and down the back a bit that gives the appearance of a ‘cape’. All of this may help camouflage them from predators. There are narrow white rings around the eyes and black edges to the ears.



Ground squirrels are very common and can be found in almost all our local habitats except the desert. They like relatively open areas such as fields and oak woodlands and live in burrows. They may dig these away from other squirrels or several may dig communal tunnels. The tunnels may be several feet below ground and up to 35 ft long. These longer ones may be branched and have several openings. One communal burrow on record had 33 openings and 741 feet of tunnels with the deepest 28 feet below ground! The same tunnels may be used by succeeding generations of squirrels—or by other animals if the squirrels no longer use them. Ground squirrels are active during the day and rarely venture further than 50 yards from the nest opening. They eat assorted fruits and seeds, including acorns, and also relish insects such as grasshoppers and caterpillars. They can carry quite a lot in their cheek pouches and they bury extra food. They use sounds, tail signals, and scents to communicate with each other. They while away the time

grooming, dust-bathing, and sometimes sprawling on the ground soaking up the sun, but always keeping a sharp eye out for predators. When they see one (hawks, foxes, coyotes, snakes, cats of all kinds), they usually make sharp, warning 'clicks' and dive into their burrows. Where there are many rattlesnakes, some populations have developed an immunity to the venom, and some exhibit a number of interesting behaviors. Mothers may chew up shed rattlesnake skins and then lick their pups to disguise their smell. Rattlesnakes locate prey by its infra-red production. Squirrels may raise their body temperature and fluff out their tails and wave them vigorously near the snake, increasing their heat signature. This may signal to the snake that, although the squirrel is not a threat, it's too big to be an easily-acquired snack. They may also kick sand at the snake.

California ground squirrels hibernate in the colder parts of their range for a large part of the year, waking up every few days and eating some of their stored food. The further south they live, the shorter this hibernation is. At the BFS, the squirrels probably hibernate for a very short time or not at all. Mating occurs in early spring. The females may mate with several males which means their offspring can have different fathers. The fathers do not care for the young, leaving that to the mothers. About a month after mating, half a dozen or so young are born. At 5 weeks their eyes open and at 8 weeks they are ready to venture outside, closely watched by the mother. In the wild, California ground squirrels usually live no more than 6 years. *(Photo by Nancy Hamlett)*

The Demonstration Gardens in the Ecological Walk

In January and February, the Garden Club, with help from the BFS volunteers, put the plants that CalBG had been growing for them into two small native gardens at the Mills end of the foothill frontage of the BFS. All of these were grown from seeds or cuttings taken from the BFS. The plants are doing very well and there have even been some volunteers: several daturas and a patch of golden current seedlings. The Garden Club also sprinkled quite a few wildflower seeds (again from the BFS) and they provided some nice color soon after the shrubs were planted. The Friends of the BFS were awarded a grant from the Metropolitan Water District to pay for a sign for the gardens, and that should be in place by the end of the summer.



Left: The view from Mills before work started. Right: clearing out the hardscape area in the western plot



Top: concrete pavers and gravel in formal design, with flags indicating where plants should go; shrubs in July

Middle: outlining sitting area at Mills end of eastern plot; volunteers putting in plants along informal decomposed granite path

Bottom: shrubs in eastern plot in July

Two new species seen at the BFS in 2022

One new butterfly (Dainty Sulphur, *Nathalis iole*) and one new plant (Coffee Fern, *Pellaea andromedifolia*)

Still no word from the colleges about their promise of permanent protection for the center part of the BFS (the Temporarily Restricted Property, the TRP).

BFS Publications for the 2022-23 Academic Year

I am taking this opportunity to celebrate the hard work of the faculty and students whose efforts will help us better address many of the daunting environmental challenges our society is currently facing (e.g., global climate change, habitat destruction, and biodiversity loss). This work is critically important in southern California as this area is part of one of the world's biodiversity hotspots. These are small areas of the world that harbor an extremely high diversity of plants and animals that are found nowhere else on the planet. Unfortunately these species are threatened because they have lost a significant proportion of their native habitat.

While the Bernard Field Station (BFS) is often recognized as an important educational resource for the Claremont Colleges and the broader Claremont Community, research from the BFS is also contributing to a better understanding of the ecology of our region.

This is a great year to highlight the importance of the BFS as a resource for rigorous research as productivity this academic year has been high. Six peer-reviewed papers were published from the BFS this past academic year in the following journals: *Diversity* (4 manuscripts as part of a special issue on California sage scrub conservation), *Urban Science*, and *Ecology and Evolutionary Biology*.

Combined this research explored:

- how non-native mustards influence soil microbial assemblages
- how best to explore coyote genetic differences across urban landscapes
- how herbivores influence plant recovery following a fire
- how important fall-blooming shrubs are for pollinators and other flower-visiting insects
- how native systems should be used as a baseline to understand how landscaping modifications influence carbon dynamics
- how genetic differences influence parasitic infection

In addition to peer-reviewed publications, there were numerous senior theses that explored how much carbon is stored in trees, the ecology and reproductive behaviors of white-crowned sparrows, and if certain fire-following plants can act as nurse plants, to highlight just a few. These papers provide critical insights into how we might best preserve biodiversity, reduce carbon emissions, and create a sustainable future in southern California.

As the 2023-24 academic year is on the horizon, I wanted to highlight the illuminating work being conducted by our amazing faculty and students. I look forward to learning more from the BFS community in the subsequent years.

Wallace M. Meyer
Director, Bernard Field Station

Tours of the BFS

Community and school groups can arrange to take tours. If you are interested in bringing your group to the BFS to learn about what is there, contact the Director: 909-398-1751 wallace.meyer@pomona.edu

BFS Volunteer Days

Covid permitting, the first Saturday of the month, 10:00 am until noon, followed by a tasty pizza lunch. If you have questions or want to be added to the volunteer list, please contact the BFS Volunteer Coordinator: Nancy Hamlett (909-964-2731) (hamlett@hmc.edu)

Claremont Garden Club

The Club is free and open to everyone interested in any type of gardening. Events are currently on hiatus as we need to increase the Board. If you would like to help, please get in touch.

www.claremontgardenclub.org
info@claremontgardenclub.org

Friends website

www.fbbfs.org

for past newsletters and a map showing which colleges now own which parts of the Field Station.

City of Claremont: www.ci.claremont.ca.us

P.O. Box 880, Claremont, CA 91711

City Clerk: 399-5460

Claremont Colleges: www.claremont.edu

The Claremont Courier : (909) 621-4761

114 Olive St, Claremont, CA 91711

*The Friends is a non-profit,
grassroots organization*

***"Dedicated to Education
and the Environment"***

The BFS: A Facility of the Claremont Colleges

How big is big enough?

A field station is land left in its natural state for use in the study of complex interactions between plants and animals. The usefulness of such natural laboratories depends on size and shape. Extinctions occur frequently in small areas, due to smaller populations. Narrow shapes increase the amount of pollution by noise, air, water, and pesticides from surrounding areas, and increase the chances of competition from exotic (non-native) species. The current 85 acres from College to Mills is just large enough to maintain reasonable stability in the existing ecosystems. The center bit of the BFS alone, which is all that is currently protected, would not be sustainable if Harvey Mudd, Scripps, and Claremont Graduate University build on the parts they have now purchased.

Who uses it?

The BFS is used by Claremont Colleges faculty and hundreds of students every year, as well as by many schoolchildren from Claremont and the surrounding areas. It has also been used by college classes from as far away as Long Beach, by scout troops, and by members of the public and for research by other institutions.

What's there?

There are over 30 acres of the fast-disappearing coastal sage scrub community along with a number of species of state or federal concern. There is a stand of oak woodland in the north where water wells up along an earthquake fault, there is annual grassland slowly returning to coastal sage scrub in the east, and there is a one-acre, man-made lake excavated in 1978 which is a sanctuary for western pond turtles displaced by development.

**→ *Since much of Claremont was originally
covered with coastal sage scrub,
it is a fascinating window into our past***



***"A tour of the property readily convinces
visitors of the importance of keeping such a
beautiful expanse of land, shrubs, and trees
for scientific purposes."***

Robert J. Bernard in "An Unfinished Dream" pg 708