

News from the Friends of

The Bernard Biological Field Station

Of the Claremont Colleges

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P.O. Box 1101, Claremont, CA 91711

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www.fbfs.org

Sightings

- ✓ flurry of wings on the water—coots chasing each other, then sedately swimming
- ✓ sun shining through willow leaves, glowing yellow
- ✓ the last few clusters of bright red berries decorating the toyons
- ✓ flat-topped mushrooms peeking out from the leaf litter under oaks
- ✓ bushy new growth at the base of elderberries and laural sumac in the burn
- ✓ coyote brush covered in fluffy white fruits
- ✓ a last few bright yellow pinebush daisies
- ✓ legions of mosquito fish darting at the lake edge
- ✓ mourning doves exploding into flight
- ✓ disappearance of Harvester Ant nest entrances—hunkered down for the winter
- ✓ shallow holes dug in the ground—who's searching for food?
- ✓ pallidwinged grasshoppers, busily chomping
- ✓ ducks at the lake: Bufflehead, Ring-necked, Ruddy, Mallard
- ✓ Painted Lady butterflies dancing on pinebush
- ✓ Anna's hummingbirds sipping from small, yellow trumpets on the golden currants

Meet the Inhabitants!

Honeypot Ants

by Nancy Hamlett

Ants living in arid climates (like Southern California) are hard-pressed to find food much of the year and often store food supplies in their underground nest. Honey pots, which eat nectar and honeydew, have most unusual vessels for creating food reserves—they store concentrated nectar (“honey”) in their fellow ants!



Repletes in a honeypot ant colony at the Oakland Zoo. Photo by TomD via Flickr.

These specialized worker ants, called “repletes”, spend their whole lives hanging from the ceiling of an underground chamber. When nectar and honeydew are plentiful, other worker ants feed the excess to the repletes, who store the nectar in their abdomens. As they eat more and more, their abdomens expand; the abdominal plates of the exoskeletons separate leaving only a membrane covering most of the translucent abdomen, which can be as large as a grape!

When food is scarce, other ants in the colony can tap the replete's stores for food. A worker ant will stroke a replete's antennae, signaling the replete to regurgitate the liquid which the worker

Tours of the BFS

Community and school groups can take tours of the BFS. If you are interested in bringing your group up to learn about what is there, please call or email (909-398-1751, wallace.meyer@pomona.edu).

can eat herself or carry to another member of the colony.

Because the repletes are full of sweet honey, they are a target for predators from lizards to badgers, and for humans as well. The native people of Australia have long regarded honeypot ants as a tasty treat, as can be seen in this video:

(<http://www.youtube.com/watch?v=jwzzbjYHC3w>)

At the BFS, we have at least two species of honeypot ants--*Myrmecocystus testaceus* and *Myrmecocystus wheeleri*--although they are not often seen as they primarily forage at night.

The yellowish-brown *M. testaceus* is found from southern Washington to northern Baja California and east to Idaho and Utah. *M. testaceus* forages in the evening. Workers begin to assemble at the nest entrance about 15-20 minutes prior to sunset and may completely block the entrance with their heads. Within a few minutes, the area around the nest, for up to a meter, is virtually covered with ants. The ants then spread out into the surrounding vegetation, forage for a few hours, then return to the nest.

The rusty orange *M. wheeleri* forages in the daytime and regularly visits flowers for nectar, especially buckwheat (*Eriogonum* sp) as seen in the photo below. If you'd like to learn more about these fascinating ants, you can check out "Ants of the Desert: Documentary on the Honeypot Ants of the Arizona Desert" on YouTube:

<http://www.youtube.com/watch?v=7Jrr2vORHts>



Myrmecocystus wheeleri foraging on California Buckwheat (*Eriogonum fasciculatum* var. *foliolosum*) at the BFS. Photo by Nancy Hamlett.



Soap Plant

California soaproot, or Amole (*Chloragalum pomeridianum*) is a perennial bulb in the lily family. It produces wavy-edged blue-green leaves up to 2ft long from a basal rosette in spring. In late spring or early summer, 2-4ft tall, airy, leafless, branched flowering stalks emerge from the rosette. The elegant flowers have three curving petals and three sepals up to 1 ½" long. They are white, often with a purple or green stripe on the midrib, and have long stamens with bright yellow anthers. The flowers open in the late afternoon or evening and are pollinated by moths or other nocturnal insects.

Both Native Americans and early settlers mixed the juice of the bulb with water to produce a lather for washing and a shampoo good for dandruff, hence the name 'soaproot'. The fibers covering the bulb were made into small brushes and the bulb was also used to make a glue to attach feathers to arrows or a sealant. The leaves are edible as are the bulbs if roasted well enough to break down the saponins they contain. Saponins are toxic to fish so crushed bulbs were tossed in the water to stun the fish and make them easier to catch. Preparations of the bulbs were used as an antiseptic, as a poultice for treating arthritis, as a diuretic, and as a laxative.

Soaproot is a good drought-tolerant garden plant, although the leaves disappear in late summer. It will grow in sun or light shade. It is common throughout California and is found mostly in grasslands, woodlands, chaparral, and coastal sage scrub. There are several patches at the BFS.

Outstanding student research

(for more details, see the blog on the BFS website)

One of the major functions of the BFS is to provide the opportunity for students to conduct original research. All science majors carry out a senior thesis project and this year two that won awards were based at the field station:

- **Courtney (Liz) Miranda** (Scripps '13) received the 2013 McClintock Science Award for the best senior thesis in science at Scripps College for her thesis "*Facilitative Interactions Among Native Perennial Shrubs and Native and Exotic Annuals in Recovering Coastal Sage Scrub.*"
- **Megan Wheeler** (HMC '13) received the Harvey Mudd Biology Department prize for Outstanding Thesis, and she was also the co-recipient of the Mindlin Prize for Innovative Ideas in the Sciences for her thesis, "*Carbon Storage in Coastal Sage Scrub and Non-Native Grassland Habitats*".

BFS Volunteer Days

First Saturday of the month, 10:00 a.m. until noon, followed by a tasty pizza lunch for the volunteers. You can see photos of some of the hardy volunteers on the BFS blog (click "News" at www.bfs.claremont.edu).

For questions or to be added to the volunteer list, please contact the BFS Volunteer Coordinator, Nancy Hamlett (hamlett@hmc.edu) or 909-964-2731.

Sustainable Claremont Garden Club

Free and open to everyone interested in any type of gardening. Meetings are on the second Wednesday of most months at 7pm at the Napier Center at Pilgrim Place. There is a monthly email newsletter. More info at sustainableclaremont.org or email gardenclub@sustainableclaremont.org.



"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

Some Notes on Fire Adaptation



As coastal sage scrub and chaparral age, the amount of dead plant material increases and the amount of open area decreases, resulting in less room for native annuals or shrub seedlings to grow. Historically, fires due to lightning strikes burned off accumulated thatch and dead wood every 30-100 years. This returned the nutrients locked up in the wood to the soil, allowed

sun to reach more of the surface, and temporarily reduced competition for water between mature shrubs and annuals and shrub seedlings. Consequently, the ecosystem was regularly rejuvenated. In the last few hundred years, the encroachment of humans and human habitation on natural areas has altered the likelihood of fire.

Some of the CSS shrubs are not fire resistant but they reproduce well from seeds after a burn. Others depend mainly on dormant buds at ground level (the "crown") starting into growth to regenerate the shrub. Some like laural sumac do both but, because its seedlings are not very drought-tolerant, these almost all die and most regrowth in the landscape is from crown-sprouting. The photo above shows an elderberry crown-sprouting.

Studies have shown that CSS native annual seeds take advantage of the temporary increase in access to sun, nutrients, and water after a fire. If the burn interval is over about 20 years, the buildup of dead material is greater and the fire burns hotter, killing many exotic seeds in the soil and allowing the natives to outcompete non-native grasses. However, if fires are frequent, as has been seen in some parts of the Santa Monica Mountains, the buildup of combustible material is small, the fires burn less hotly, and the grasses are favored.

It's been a very long time since there was a fire in the area that is now the BFS and there seems to be some evidence that the native annuals are coming up in abundance in the burn while there are fewer of the non-native grasses sprouting than in past years. If this is so, and we get a reasonable amount of rain, there should be a good wildflower show this spring along with vigorous regrowth on some of the shrubs. Keep an eye out when you go past the BFS, and we'll also keep you posted!

Friends of the Bernard Biological Field Station
P.O. Box 1101
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The Friends is a non-profit, grassroots organization.

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and the Environment”*

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Claremont, CA 91711 Phone: 621-4761
Inland Valley Daily Bulletin: 2041 E. Fourth St, Ontario CA 91764

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. The current 85 acres is just large enough to maintain reasonable stability in the existing ecosystems. 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, so the center bit of the BFS alone would not be sustainable.

Who uses it?

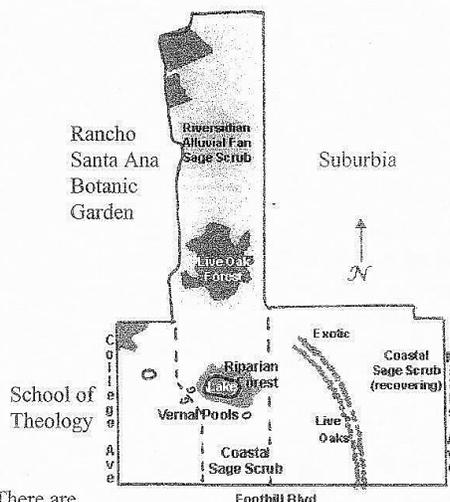
The BFS is used by Claremont Colleges faculty and hundreds of students every year, as well as by many schoolchildren from Claremont and the surrounding areas. It has also been used by college classes from as far away as Long Beach, by scout troops, and by members of the public.

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.

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

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.



There are 3 parts to the BFS:

Owned by HMC	←	Owned by CUC	→
Temporary protection		No protection	

Note: west part now owned by CGU and HMC; eastern part to be sold to Pitzer, HMC and Scripps
See fbbfs website for map showing divisions