

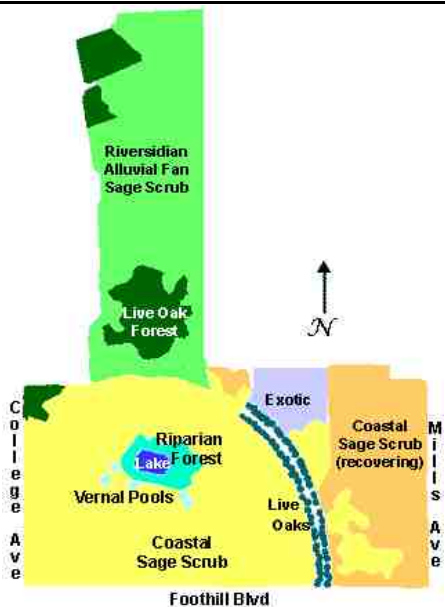
Friends of the Bernard Biological Field Station
P.O. Box 1101
Claremont, CA 91711
The Friends is a non-profit, grassroots organization.

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www.fbbfs.org

*“Dedicated to Education
and the Environment”*

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Claremont CA 91711 Phone: 621-4761
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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.

Who uses it?

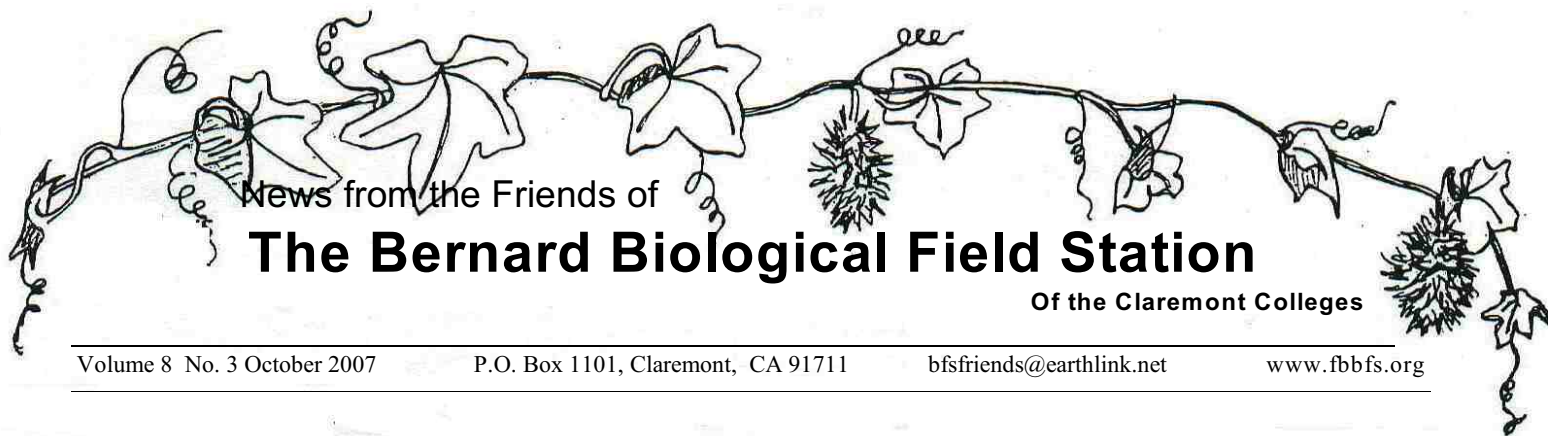
The BFS is used by Claremont Colleges faculty and hundreds of students every year, as well as by many schoolchildren from Claremont and the surrounding areas. It has also been used by college classes from as far away as Long Beach, by scout troops, and by members of the public.

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.



News from the Friends of The Bernard Biological Field Station

Of the Claremont Colleges

Volume 8 No. 3 October 2007

P.O. Box 1101, Claremont, CA 91711

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www.fbbfs.org

🌻🌻🌻 Village Venture 🌻🌻🌻

Stop by at our game booth in the Children's area on Saturday, October 27, or better yet, volunteer to help. Kids love spinning the wheel and every spin's a win! If you can spend an hour or two, send us an email.

Sightings 🌻🌻🌻🌻🌻🌻🌻🌻🌻

- mounds of doveweed with gray, fuzzy leaves accenting the dry, tan grass
- groups of small, yellow daisies amid the bright green needlelike leaves of pinebush
- acorns almost fully-grown on the oaks
- coveys of quail, each individual leaning forward with topnot bobbing
- dragonflies, orange and blue, darting and mating
- tiny, white flowers on short summer annuals, braving the heat
- small, dark mosquitofish cruising the lake, snapping up unwary insects
- Rings of russet petals around the harvester ant nests
- huge, white trumpets of thornapple
- lovely red, yellow, and orange leaves on the poison oak
- the crunch of leaf litter under the oaks
- untidy piles of woodrat nests tucked under shrubs
- new growth on laurel sumac damaged by last winter's frost
- ground squirrels flicking out of sight
- students doing surveys



BFS and our Claremont schools

Every spring, Pitzer's Leadership in Environmental Education Partnership program brings elementary school students to the BFS for a semester-long introduction to the natural environment. Recently the AP Biology classes at Claremont High toured the area, learning about adaptations to the coastal sage scrub ecosystem. Currently projects are being developed which will involve older elementary students in long-term monitoring projects to provide much needed information on baseline conditions and changes at the field station.

Sustainability notes:

The League of Women Voters has finished its Sustainability Guidebook for Claremont Residents. The booklet presents information on how we can reduce our impact on the resources we have available. Copies are available at the library and at the League office (Garner House in Memorial Park) The City is putting together a Sustainability Task Force and is now inviting applications. The forms can be picked up at City Hall.

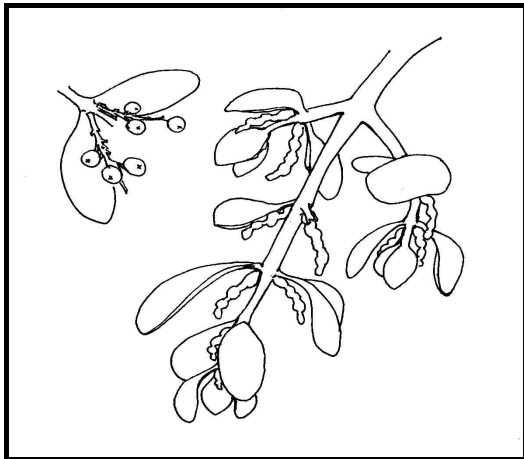
Time Capsule: The City's new time capsule was sealed October 9. The Friends put in a newsletter, coloring book, bookmark and a short letter. Check it out in 25 years!

Teachers and Group Leaders

Any time is a great time to visit the BFS!

To arrange a visit,
call (909) 625-8701

Meet the Inhabitants!



Big leaf mistletoe

Phoradendron macrophyllum

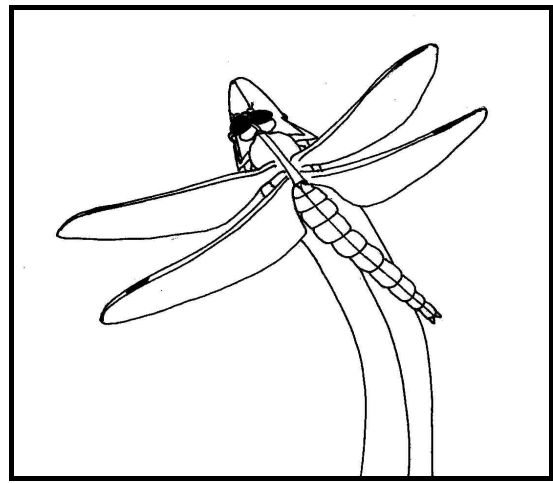
Clumps of this mistletoe can be seen around Claremont and on the field station in hardwoods like our native sycamores, although it does not affect oaks. The leaves are opposite, oval, medium yellow-green, somewhat fleshy and slightly hairy. The base of the stems can become woody and the stems themselves can be 2-3 ft long.

Seeds are distributed by birds (from one end or the other!) and germinate best in rainy weather. The young seedling puts out rootlike structures that invade the host plant, providing anchorage and tapping into the plant's vascular systems. Since the stems and leaves are green, they do some photosynthesis for themselves but these parasites depend on the host for water, nutrients and extra carbohydrates. Over time, this loss can harm the host plant if it is heavily infested.

Mistletoes are dioecious, that is, some individuals produce pollen and separate plants produce eggs. The flowers appear in winter and each produces a small, sticky, white or pinkish fruit with one seed. These are poisonous to people, as is the rest of the plant, but many animals can eat them. Mistletoes provide food and shelter for many animals, from deer to butterflies.

Mistletoe (chayal) was an important plant in the life of the Gabrielleno-Tongva who lived in our area, including on the BFS. They knew how to detoxify mistletoe and brewed a pleasant tea from the fruit of some species, although many mistletoes are highly toxic (do not attempt this yourself!). Desert Mistletoe was a trade item and the fruit was ground, mixed with ashes and boiled before eating.

Medicinally, the berries were used in a poultice for wounds and the leaves of most mistletoes were used for a toothache poultice.



Dragonflies

(wing veins not drawn in)

Some of the most entertaining animals at the Field Station are the dragonflies that dart around pHake Lake. These large insects have four net-veined, elongated wings of similar size which they hold at right angles to the body at rest. The front and rear wings move independently of each other giving dragonflies the ability to change direction quickly and to hover. Common species are mostly blue or orange, with the males generally more colorful than the females. Today the largest dragonflies have wing spreads of 5 or 6 inches (darners are around 4 inches), but 200 million years ago there were species with a span of 27 inches!

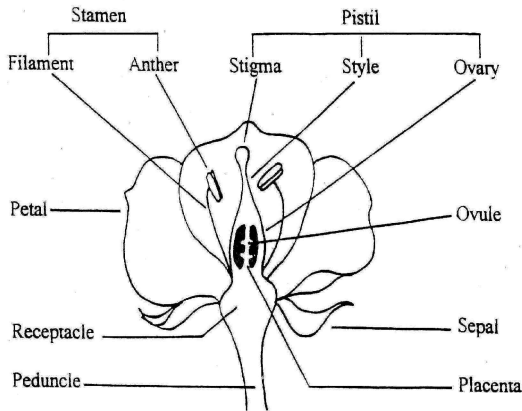
Dragonflies are skillful predators and will eat pretty much any flying insect they can catch, including other dragonflies. They can warm up enough to fly by perching on vegetation and basking in the sun, or like some other large insects, by vigorously vibrating the flight muscles in the thorax. They can cool down by moving to the shade or pointing their abdomen up at the sun, thereby reducing the surface area being heated. This is called the "obelisk" position.

Most dragonflies live about a year. Adults emerge in the spring, grow and mate from April through October. Males establish territories and actively search for females. When they find one, they pounce, holding on in "tandem linkage" for up to several hours. During this period, the male removes any sperm packets left by previous males, replacing them with his own. Many females use a long ovipositor to insert the eggs into vegetation at water level—sometimes the male stays attached for this, preventing other males from bumping off his sperm.

Eggs hatch into aquatic larva which look somewhat like short, squat, wingless adults, and these are ferocious predators too. The larvae grow and shed their exoskeletons as many as 15 times before they acquire the adult body size, shape and wings. Generally the larvae go through the last few molts in the spring.

Fruits

- ★ The botanical definition of a fruit is ‘derived from the mature ovary of a flower’.
- ★ Usually fruits contains seeds although some plants such as cultivated bananas and naval oranges may develop fruits without forming seeds. Fruit development without fertilization is termed “parthenocarpy”.
- ★ Many ‘vegetables’ are actually fruits: tomatoes, beans, peas, squash, cucumbers, peppers, eggplant, corn
- ★ Walnuts, dandelion fluff, sunflower ‘seeds’, eucalyptus pods, maple keys, sycamore balls are all fruits.



Carpel: the ovules are enclosed by modified leaves called carpels (imagine a pea pod wrapped around the peas as a model for the ancestral carpel). A flower may have one carpel (also called a simple pistil) or several carpels may be united (a compound pistil). If you cut a tomato crosswise, you can see it is made up of several fused carpels.

The ovary wall matures into the pericarp which is made up of two or three layers (the inside endocarp, middle mesocarp, and outside exocarp). Any layer can be dry or fleshy, thick or thin—masses of variety!

☞ **Simple fruit:** develops from one or from several united carpels. May be fleshy, dry and woody, or papery.

- Fleshy:** berry : one or more carpels, many seeds (tomatoes, grapes),
hesperidium: exocarp leathery and rough, tough partitions between carpels (citrus)
pepo: a berry with a ‘rind’ (cucumber, squash, watermelon)
drupe: one or occasionally more ‘stones’(peaches, olives)
pome: fleshy portion develops from tissues outside of ovary (apples, pears)

Dry (dehiscent = split open when mature):

- follicle: splits open along one edge when mature (milkweed, larkspur, peony)
legume : splits open along both edges when mature (peas, beans)
silique : splits on both edges but seeds attached to a papery central portion (radishes, honesty)
capsule: splits open along several seams (yucca), or small holes appear around one edge (poppies)

(Indehiscent = do not split open)

- achene: small with a single seed anchored to the wall at one spot (dandelion, sunflower)
samara : single seed, extensions of ovary form ‘wings’ (elm)
caryopsis: small, single seeded, with the seed coat fused to the ovary wall (oat, corn, wheat)
nut: one seed, fruit very hard outside, usually sits in a ‘cap’: (acorn, hazelnut)
schizocarp: compound pistil, one-seeded carpels separate but don’t open (parsley, cheeseweed, maples)

☞ **Aggregate fruit:** one developed from a flower in which there were a bunch of separate carpels which each developed into a separate fruit. Magnolias, strawberries, and raspberries are aggregate fruits.

☞ **Multiple fruit:** one in which the ovaries of a number of separate flowers fused together to make one big fruit. Pineapples are a multiple fruit (of berries) as are figs (of achenes with a lot of fleshy receptacle growth).

Species identified at the Field Station as of October, 2007

23 Mammals	167 Birds
17 Reptiles/amphibians	253 Plants
3 Fish	350 Insects
7 Mollusks	31 Lichens



“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