View southeast from block F8 of Griffith Park (see Figure 2) showing downtown Los Angeles (at right) and the Los Angeles River (center).

RARE PLANTS OF GRIFFITH PARK, LOS ANGELES

by Daniel S. Cooper

Rising more than a thousand feet off the floor of the Los Angeles Basin, Griffith Park divides the eastern San Fernando Valley from the coastal plain of Los Angeles and protects more than 4,000 acres of rugged slopes and canyons at the eastern end of the Santa Monica Mountains. Although portions of the park are heavily used, with golf courses, grassy picnic areas, and other attractions situated mainly at the park's borders, its rugged interior is still surprisingly wild, owing to both its steep topography and lack of established trails.

WILDFIRE PROVIDES IMPETUS FOR NEW RESEARCH

On May 8, 2007, an arson-caused wildfire burned about 20% of the park, essentially the entire southeastern corner, threatening such landmarks as the Griffith Observatory and the Los Angeles Zoo, none of which sustained damage. Just a few weeks earlier, on March 30, an arson fire had swept up toward the northwestern corner of the park, burning a large area of high-elevation chaparral atop Cahuenga Peak, the highest point in the eastern Santa Monica Mountains. While these fires radically altered portions of the park's vegetation—at least temporarily—their more lasting

contribution may have been the increased awareness they elicited from local conservationists and city staff alike, most of whom had never explored the park. Suddenly, the park seemed like a worthy subject of immediate ecological exploration, perhaps because it was almost completely reduced to ash-covered slopes.

Just prior to the fires and continuing to the present, a collection of neighborhood groups and the Los Angeles/Santa Monica Mountains Chapter of CNPS funded several projects aimed at gathering baseline biological data on its plants and animals. These were carried out in conjunction with the development of a wildlife management plan funded by the City of Los Angeles (Cooper and Mathewson 2009). While the flora of the Santa Monica Mountains as a whole has been well documented (Wishner 1997; Gibson and Prigge 2003; California Native Plant Society, undated), that of the far eastern end of the range is comparatively less well-known than the large, protected areas to the west such as Topanga Canyon State Park and the Santa Monica Mountains National Recreation Area.

Aside from scattered references (e.g., McAuley 1985), the flora of Griffith Park had never been synthesized, although dozens of specimens had been collected here since the mid-1800s, mostly prior to 1950 (Consortium of California Herbaria 2011). The one available checklist of the plants of the park (Brusha 2003) does not differentiate between planted and naturally occurring taxa, and presents just a fraction of the true species diversity. Currently an as-yet unpublished checklist of the park's flora stands at more than 500 species vouchered or photographed (Cooper, forthcoming). This is nearly half the known flora of the Santa Monica Mountains and includes 350 natives. Still, the park has apparently never been a popular place for botanizing, probably because of its rugged topography and the fact that most readily accessible hiking areas (mainly fire roads) have been degraded by weed abatement practices and non-native vegetation.

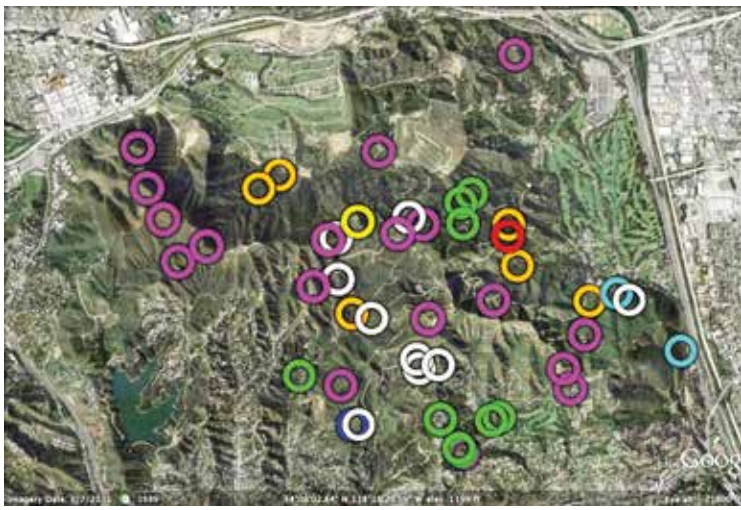
SURVEY LAUNCHED

To remedy this information gap and to identify critical areas for plant conservation, an informal, volunteer-based "Griffith Park Rare Plant Survey" was launched in spring 2010 (Cooper 2010). The botanical history of an area can be a challenge to uncover, even for trained researchers. Most parts of California remain very poorly known botanically, including sites within urban areas. Often there are a few local experts who have botanized in an area and have kept at least some field notes (or today, digital photographs), and can help put together a list of species likely to occur based on their experience in the region. Such observations may be supplemented by plant collections in local herbaria, which are often the only record of species long gone from urban sites such as native wildflowers.

Through my own fieldwork conducting wildlife surveys in the park since 2007, I was able to identify key habitat features most likely to hold rare or interesting plants, such as rock outcrops and remote canyons. To begin the task of locating rare and significant species and populations, a list of target species was developed with the help of Richard Fisher, Bart O'Brien, and Carl Wishner, local botanists familiar with the flora of the Santa Monica Mountains. Included in this list were both CNPS rare taxa (California Native Plant Society 2010), as well as a group of species we felt were significant, either because they are rare in the region, or because if found, they would represent disjunct occurrences from populations farther west in the Santa Monica Mountains, or to the north in the Verdugo and/or San Gabriel Mountains.

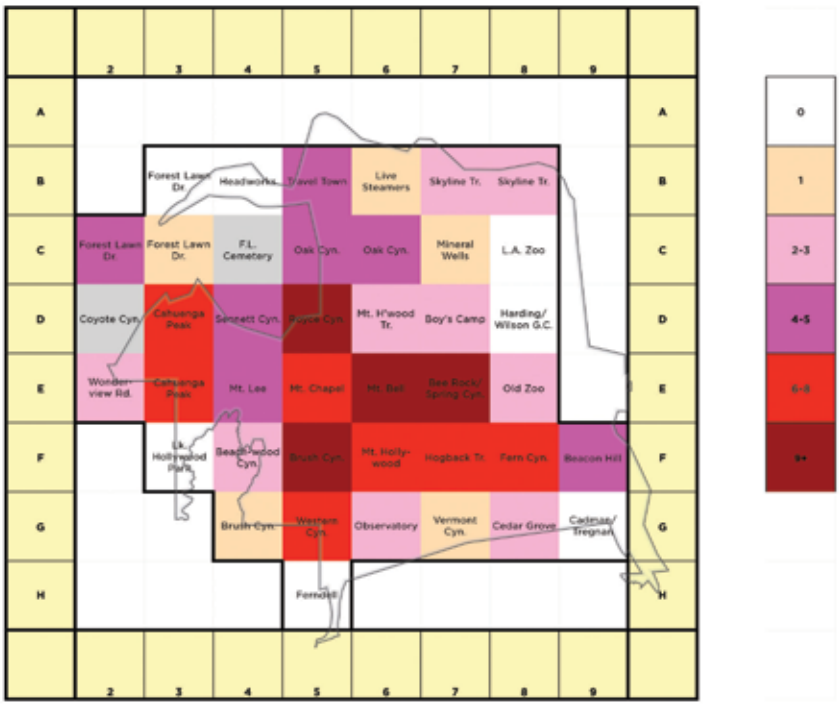
I also searched for taxa known in the area only from historical collections (Consortium of California Herbaria 2011), though some of these were likely collected in areas no longer undeveloped (e.g., the Los Angeles River and "Providence Ranch," since converted to Forest Lawn Memorial Park). A small group of volunteers used this species list, along with a map of the park (Cartifact, Inc. 2007) that had been divided into 40 survey blocks, and

Figure 1. Locations of Rare Plants in Griffith Park



KEY:
Green: Nevin's barberry (presumed planted)
Magenta: Plummer's mariposa lily (generalized locations; plant is very widespread)
White: Catalina mariposa lily
Yellow: Slender mariposa lily
Dark Blue: Clay bindweed
Light Orange: Humboldt lily
Light Blue: Hubby's phacelia
Red: San Gabriel Mountains leather oak (pending further identification)

Figure 2. Distribution of Rare and Locally Rare Plant Species in Griffith Park, by Survey Block



Outline of park is drawn in gray. This grid system follows that used by Cartifact, Inc. (2007) for a Griffith Park map, and notable natural and physical features are listed within each block. The colors correspond to the number of rare species found within each block, as indicated by the key on the right. For example, pale pink blocks had two to three rare species, while the darkest red blocks had nine or more.

sent me photos and notes from their forays throughout spring 2010.

RARE SPECIES FINDINGS

From this effort, 13 rare species (California Rare Plant Ranks 1, 2, and 4) were identified as occurring or having occurred in or adjacent to Griffith Park. Of these, nine were found to be extant (still in existence), and four are known only from historical specimens (Table 1). (A description of the California Rare Plant Ranks, formerly the CNPS Lists, is available at *http://www.cnps.org/cnps/rareplants/ranking.php*.) Of the four species believed extirpated from Griffith Park, only one, the Brewer's redmaids (*Calandrinia breweri*), has been collected recently in the region near the park (Verdugo Mountains); the remaining species are apparently very rare in the Los Angeles area if they persist at all.

Three species of mariposa lily occur in the park, and exhibit an interesting, non-overlapping pattern of occurrence, with Plummer's mariposa lily (*Calochortus plummerae*) by far the most common. Hundreds of these spectacular pink and yellow lilies were encountered on thin, gravelly soil along ridges, often in association with yucca (*Hesperoyucca whipplei*), giant stipa (*Achnatherum coronatum*), coast buckwheat (*Eriogonum fasciculatum*), and chamise (*Adenostoma fasciculatum*). They were often found along small trails and footpaths (including equestrian routes), where this activity appeared to limit non-native grasses, among other plants, that might otherwise overtake the lilies.

Catalina mariposa lily was found in pockets of grassland on moist, heavy clay soil near the south-central area of the park, with two large populations discovered that exceed 100 plants. Finally, the slender mariposa lily (*Calochortus clavatus* var. *gracilis*) was discovered prior to the start of the survey, in a single patch of fewer than 10 individual plants in a grassy opening in chaparral on a remote peak near the center of the park. No other populations of this stunning yellow lily were encountered, despite much searching.

Humboldt lily (*Lilium humboldtii* var. *ocellatum*) appears to be confined to just four oak-shaded canyons in the park, with most plants (50+ individuals) located in Brush

LEFT: Plummer's mariposa lily is found frequently on steep ridges on eroding soil throughout Griffith Park, Los Angeles. All photographs by the author unless otherwise specified. • MIDDLE: Chaparral pea emerging atop Cahuenga Peak after 2007 fire in Griffith Park. • RIGHT: The rare Humboldt lily is found beneath oaks in several deep canyons in Griffith Park. Photograph by Gerry Hans.

TABLE 1. SPECIAL STATUS PLANTS AT GRIFFITH PARK

Species	Legal status	Representative specimen[1]	Park status (40 survey blocks)
Nevin's barberry *Berberis nevinii*	Federal: Endangered State: Endangered CA Rare Plant Rank 1B.1	SBBG37272	Probably introduced; found in 5 survey blocks
Brewer's redmaids *Calandrinia breweri*	CA Rare Plant Rank 4.2	JEPS17234	Historical specimen(s); no modern record
Catalina mariposa lily *Calochortus catalinae*	CA Rare Plant Rank 4.2	RSA15196 ("Cahuenga Pass")	8 survey blocks; heavy clay soil
slender mariposa lily *Calochortus clavatus* var. *gracilis*	CA Rare Plant Rank 1B.2	(photograph only)	1 survey block, < 10 plants
Plummer's mariposa lily *Calochortus plummerae*	CA Rare Plant Rank 1B.2	LA29033	13 survey blocks, gravelly ridges
Clay bindweed *Convolvulus simulans*	CA Rare Plant Rank 1B.2	UCR216375	1 survey block, < 10 plants
many-stemmed liveforever *Dudleya multicaulis*	CA Rare Plant Rank 1B.2	RSA397814	Historical specimen(s); no modern record
large-leaved filaree *Erodium macrophyllum*	CA Rare Plant Rank 4.2	RSA390952 ("Providencia Ranch")	Historical specimen(s); no modern record
southern California black walnut *Juglans californica*	CA Rare Plant Rank 4.2	JEPS58691	Common park-wide; not mapped
Humboldt lily *Lilium humboldtii* var. *ocellatum*	CA Rare Plant Rank 4.2	(photograph only)	6 survey blocks, mesic canyons
Hubby's phacelia *Phacelia cicutaria* var. *hubbyi*	CA Rare Plant Rank 4.2	UCR209589	2 survey blocks, sedimentary rock
Cooper's rein-orchid *Piperia cooperi*	CA Rare Plant Rank 4.2	RSA382793 ("Providencia Ranch")	Historical specimen(s); no modern record
San Gabriel Mountains leather oak *Quercus durata* var. *gabrielensis*	CA Rare Plant Rank 4.2	RSA652868	1 survey block

[1] Location is "Griffith Park" unless otherwise indicated.
SBBG = Santa Barbara Botanic Garden
JEPS = Jepson Herbarium, UC Berkeley
RSA = Rancho Santa Ana Botanic Garden Herbarium
LA = UCLA Herbarium
UCR = UC Riverside Herbarium

Sources: Consortium of California Herbaria 2011; Cooper 2010.

Dwarf broadiaea, a locally rare plant otherwise unknown in the eastern Santa Monica Mountains, was discovered just outside the park boundary in 2010.

Canyon in the southwest corner. Hubby's phacelia (*Phacelia cicutaria* var. *hubbyi*) was found on exposed, eroding sedimentary deposits at the far southeast corner of the park, on soil probably deposited by the ancient Los Angeles River that flows nearby. Thousands of these plants bloom in early spring in the understory of open black walnut woodland. The tiny clay bindweed (*Convolvulus simulans*) was found by a volunteer in 2010 on a moist, grassy slope on heavy clay near the southwestern border of the park just north of Hollywood, a site that also supports the only park population of chocolate lily (*Fritillaria biflora*).

Nevin's barberry (*Berberis nevinii*) is arguably the most famous rare plant in the park, and also the most problematic. Most stands (dozens of plants each) occur in two populations. Scattered plants located since 2007 have all been along major roads (strongly suggesting a horticultural origin), or just down-slope of established populations. Whether plants at Griffith Park originated from locally-collected seed decades ago—possibly from now-extirpated native populations in the Los Angeles area—it seems likely that the current population is not naturally-occurring (USFWS 2009). Still, Griffith Park is within the historical range of the species and all plants occur in a low-elevation, arid chaparral community with a species composition very similar to known natural occurrences.

Another difficult-to-assess rare plant in the park is the San Gabriel Mountains leather oak (*Quercus durata* var. *gabrielensis*, California Rare Plant Rank 4.2), which is known from a single collection in 1991. However, more study and collection of various scrub oaks in the park are needed, particularly since Griffith Park may lie within an introgression zone between the flora of the Santa Monica and San Gabriel Mountains. This variety appears to be otherwise unknown in the Santa Monica Mountains.

A map showing the distribution of the above rare species in the park is provided in Figure 2 on page 20.

LOCALLY RARE SPECIES

Several locally rare species were found in substantial populations in Griffith Park. Both Nevin's brickle-bush (*Brickellia nevinii*) and Ft. Tejon milk-aster (*Stephanomeria cichoriaceae)* are frequent on rock outcrops and roadcuts throughout the park and even in surrounding residential areas to the south. Eastwood's manzanita (*Arctostaphylos glandulosa* ssp. *mollis*), chaparral pea (*Pickeringia montana*), and interior live oak (*Quercus wislizenii* var. *frutescens*) occur high atop Cahuenga and Burbank peaks within a dense chamise-manzanita chaparral above the 1,600-foot elevation level, with smaller numbers of manzanita and a single clump of interior live oak near Mt. Hollywood.

"Moss gardens," where soil has collected at seeps on rock faces, support a variety of bryophytes, ferns, and rare annuals at Royce Canyon and east along the north side of Mt. Bell, including California saxifrage (*Saxifraga californica*), Peninsular onion (*Allium peninsulare*), Fremont star-lily (*Zigadenus fremontii*), and (Royce Canyon only) a white-flowered form of Cleveland's shooting-star (*Dodecatheon clevelandii*). A few areas of private land adjacent to the park were found to be rich in scarce flora, and more probably await discovery. The only known population of dwarf brodiaea (*Brodiaea terrestris* var. *kernensis*) in the eastern Santa Monica Mountains (A. Gibson, pers. comm.) was also discovered by a volunteer during the survey.

Uncommon species reaching a local distributional limit near the park include erect goldenaster (*Heterotheca sessiliflora* var. *fastigiata*), the *latifolium* subspecies of the widespread California fuchsia (*Epilobium canum*), and valley cholla (*Cylindropuntia californica* var. *parkeri*). A few common wildflowers in the park show more of a San Gabriel Mountains affinity, including Canterbury bells (*Phacelia minor*), one of the most abundant spring annuals in the park, becoming much more localized farther west in the Santa Monica Mountains.

The population of southern California black walnut (*Juglans californica*) in the park is so large that it was not mapped during the survey. Black walnuts form a continuous woodland/high shrubland on sedimentary soils in the southeastern corner of the park, and this is also a dominant species in the chaparral that cloaks the northern slope of the park.

PATTERNS OF DIVERSITY

Although areas at the lowest elevations at the perimeter of the park tended to support fewer target species, several featured a handful of locally rare species. Important populations, including the only known local occurrences, were found at multiple and scattered locations, making it difficult to declare a given area unimportant for any rare plant. Not surprisingly, the fewest target species overall were found in the northeastern corner of the park. This area that has probably seen the most intensive human-caused impacts over the years, including the construction of a large landfill in the

1950s, the installation of a vast network of metal irrigation pipe designed for fire control (but never functional), and widespread planting of eucalyptus and pines, ostensibly for "beautification" starting in the early 1900s.

It also became clear in our survey that most scrub-covered slopes in the park were largely devoid of rare plants, with diversity mainly confined to microhabitats such as seeps in deep canyons, sandy/gravelly ridges, moss gardens, rock outcrops, and patches of grassland on wet clay soils. Areas of the park that combined these features predictably supported both a high diversity of rare species and large populations of them.

The identification and documentation of these microhabitats are critical to making management decisions that benefit biodiversity, and the distribution of rare and localized plants can be an important first step in a site's conservation. The involvement of local volunteers not only contributes information to this process, it helps ensure that the human community will be invested in resource conservation in "Hollywood's backyard."

REFERENCES

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California Native Plant Society. 2010. Inventory of Rare and Endangered Plants. Vols. 7–10. http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi/Home.

Cartifact, Inc. 2007. Griffith Park (map). City of Los Angeles, Office of Councilman Tom LaBonge.

Consortium of California Herbaria

Nevin's barberry, one of the rarest plants in California (in the wild), thrives in Griffith Park, although the entire population is suspected to have been introduced decades ago. It is a large shrub found very locally on loose, gravelly soils within chaparral, and is endemic to southern California. Photographs by Gerry Hans.