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Griffith Park Rare Plant Survey

Plummer's mariposa-lily *Calochortus plummerae* (CNPS 1B.2) blooms near Skyline Trail in the northeastern corner of Griffith Park, 26 May 2010 (ph. DSC).

Prepared by:

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Part I. Summary of Findings

Part II (species accounts) begins after p. 26.

We present information on extant occurrences of 15 special-status species, subspecies and/or varieties of vascular plants in Griffith Park and contiguous open space, including three for which no known local specimen existed prior to this study: slender mariposa-lily (*Calochortus clavatus* var. *gracilis*; CNPS 1B.2), Humboldt lily (*Lilium humboldtii* var. *ocellatum*; CNPS 4.2), and Hubby's phacelia (*Phacelia hubbyi*; CNPS 4.2). Using lists developed by local botanists, we document - from specimens or digital photographs - extant occurrences of nearly 40 additional plant taxa felt to be of conservation concern in the eastern Santa Monica Mountains, including 16 for which no prior specimen existed for the park or surrounding open space. We also identify several dozen taxa known from the specimen record but unconfirmed in the park in recent years.

From this information, we discuss patterns of occurrence of rare plants in the park, drawing attention to "hotspots" for rare species diversity, such as Spring Canyon and Royce Canyon, and identify areas, particularly in the northeastern corner of the park and along the southeastern border, where rare plants are relatively poorly represented in the landscape. This serves as the most comprehensive review of the status of rare plants in the eastern Santa Monica Mountains to date, and should assist in future biodiversity research and conservation in the region.

INTRODUCTION

Griffith Park encompasses more than 4,000 acres of open space wholly within the city of Los Angeles at the far eastern end of the Santa Monica Mountains. Topographically, it features a long, high ridge that rises steeply just east of Cahuenga Pass (incl. Cahuenga Pk, 1,820' a.s.l.) and runs east and south toward the Los Feliz neighborhood of Los Angeles. The park, as well as several hundred acres of open space to the west (in various ownerships) are largely isolated from more extensive open space in the rest of the Santa Monica Mountains to the west, and the Verdugo Mountains to the north. The park supports several steep, rugged drainages, most of which ultimately drain into the Los Angeles River (via culverts), and at least two are fed by natural, permanent springs (Brush Canyon, Spring Canyon). The vegetation of the park is dominated by chaparral, but significant sycamore-oak riparian woodland and local microhabitats are also present, including "moss gardens" on rocky outcrops that support a diverse community of mosses, lichens, and delicate annuals in early spring. Human usage over the past century has resulted in considerable local ecological impact, particularly at lower elevations at its borders; for example, the entire eastern half of the park was covered with a grid of metal pipe and irrigated during the mid-1900s (an early attempt at fire control), and most roads through the park were landscaped with non-native trees (mainly pines and eucalyptus). Cooper and Mathewson (2009) present a complete ecological description of the park and its natural resources.

In May 2007, an 800-acre fire burned a large part of the southeastern corner of Griffith Park, and spurred public interest in documenting the flora and fauna of the park as part of the restoration effort. The Griffith Park Rare Plant survey emerged from this movement. As part of our contribution on the Dept. of Recreation and Parks' Postfire Management Team, Richard Fisher (City of Los Angeles) and Cooper had started amassing plant records from

the park from a variety of sources in hopes of publishing a complete flora of the park. Quickly realizing the difficulty of this task (the flora of the park currently stands at over 350 native species and subspecies, with additional 150+ exotic taxa), Cooper began investigating opportunities for continuing this work in some capacity, one that would give highest priority to furthering our knowledge of the rarest and most critical-to-protect plant species and occurrences in the park and surrounding open space. In 2010, we initiated the Griffith Park Rare Plant Survey with the support of several neighborhood and non-governmental organizations, with this goal in mind. This builds on his and other's recent investigation into the natural history of this unique park (see Mathewson et al. 2008; Cooper and Mathewson 2009; Cooper and Kristan, *in prep.*).

The 2010 Rare Plant Survey mobilized a cadre of volunteers to locate and photograph notable plant occurrences, to confirm difficult identifications and voucher specimens, and to identify additional sources of funding to keep the project alive (see acknowledgments). All specimens are being identified and vouchered at the herbarium at Univ. of California, Riverside, with the assistance of collections manager Andrew C. Sanders.

METHODS

Target Species

We developed a list of plants for volunteers to search for using several sources, beginning with the draft flora prepared by Fisher and Cooper in 2007 (*in prep.*), which serves as a baseline for the species and subspecies/varieties of all native and non-native plants known from the park and adjacent areas and notes on their form of documentation (e.g., herbarium specimen, observer report). This flora originally consisted of species vouchered at the UCLA herbarium, which has a reasonably complete sample of plants from the entire Santa Monica Mountains, including many specifically from Griffith Park. This list was augmented by searches on common local place-names using the California Consortium of Herbaria ("the Consortium"; http://ucjeps.berkeley.edu/consortium/), including "Cahuenga Pass" and "Hollywood" in addition to "Griffith Park". We reviewed a previous plant list for the park (Brusha 2003), but this list included no indication as to how species were identified, and focused largely on ornamental (and non-native) species in the park. However, some of the species and locations listed in this popular list were subsequently found by our volunteers, and confirmed with digital photographs and/or specimens.

To build the target species list - the "rare plants" to be surveyed - we used three categories of rarity, starting with those taxa on the statewide (California) database of threatened and/or range-restricted taxa maintained by the California Native Plant Society (CNPS 2010). Of the dozens of "CNPS-Rare" taxa known from Los Angeles County, we found evidence for the occurrence of 15 at Griffith Park, either in the specimen record or as living examples in the park, including recent (post-2007) discoveries. We designated these as "Category I" species (see Table 1). However, this list proved limited in terms of identifying key areas for rare plants parkwide, as half of them (seven) were known from the park only through historical specimens, which were often vaguely-labeled (e.g., "Hollywood Hills"), and most had not been seen in decades. This left only a handful of species to use to draw inferences about plant/habitat conservation in Griffith Park, one of our main aims.

We elected to expand the list to include plants that, while not uncommon elsewhere in the state, were regionally or locally rare. For this broader list, we solicited the help of consulting botanist Carl Wishner, an authority on the flora of the Santa Monica Mountains, to develop a list of taxa that were rare and localized in the range, yet not (yet) considered rare on a statewide or national level. From his extensive list (Wishner 2007; Table 2), we identified a suite of readily-identifiable taxa known from specimens and/or sight records from Griffith Park and vicinity, and identified these as "Category II" taxa (during the course of the survey, we added a few more from the "Wishner list" that had not been previously recorded in the park). We did not include as target species several plants listed by Wishner that had a high potential for confusion with look-alike species (e.g., *Stephanomeria diegensis*).

Finally, while the Wishner list expanded our palette of species to search for and document, it was clear that this still neglected several species of interest, including a few that were rare in Griffith Park, yet common farther west in the Santa Monica Mountains. Several appear to be true ecological isolates in the eastern Santa Monicas (e.g., Eastwood's manzanita *Arctostaphylos glandulosa* ssp. *mollis*), and are significant for this reason alone. Bart O'Brien (Rancho Santa Ana Botanical Garden) reviewed the draft flora prepared for Griffith Park and flagged those for which their occurrence (or subsequent discovery) in the park would be considered ecologically significant, which we consider "locally rare" (Category III)[1].

Together, these target species represent around 10% of the known plant taxa of the park. By this tiered approach, we sought to gain a fuller picture of the diversity of the park's flora, and to more confidently identify areas for conservation attention.

"Missing" and single-occurrence species

As the survey progressed, we found that a number of "non-target" species - that is, plants that were not widely felt to be locally or regionally uncommon - were not being observed during our visits to the park, despite their being known from specimens collected in the park or nearby (e.g., "Hollywood"). These are presented in Table 3. While some of them may yet be located in the park, others may be truly absent/extirpated, and yet others may be included in herbaria as the result of labeling or identification errors. These should be considered high priority for future botanical investigations in the park, and for herbaria staff to re-check labels, a task outside the scope of this project.

We have also identified plants - also non-target species - for which there to appear to be just a single occurrence in the park, or an otherwise very small population. Many are scarce annuals associated with a soil type, or wetland plants found in one or two drainages in the park, and while it would make sense to draw attention to these, we feel that because the study has only been conducted for a single season, and because new populations of interesting species are still being found on nearly every visit, it would be premature to list these locally-scarce species at this time. And, for consistency's sake, since they were not

[1] In soliciting other applicable lists of sensitive species for Griffith Park, T. Sagar (National Park Service) provided a list of species that have been encountered rarely or not at all from the Santa Monica Mountains National Recreation Area (T. Sagar, unpubl. data, Apr. 2010). This list mostly includes species identified in other lists, with the addition of three taxa, *Amorpha californica* var. *californica* (<5 plants known from 2 blocks, D2 and F8), *Silene antirrinha* (<10 plants, G5), and *Menzelia micrantha* (locally common on sandy soils throughout park).

included in the lists provided by our "experts" as being of local concern, we are leaving them out here. However, we are maintaining a database of all notable species occurrences in the park, and will hopefully incorporate these data into a future publication.

Table 1. List of special-status plant taxa (n = 15) known from Griffith Park (Category I).

We use the following color codes to indicate the known status of each taxon in the park:

Blue: Pre-2007 specimen(s), recent photograph/collection
Magenta: Pre-2007 specimen(s); no recent photograph/collection (extirpated?)
Green: Recent photograph/collection; no historical specimen

Nevin's barberry *Berberis nevinii* (Fed. End./State End.)	H[2]
Brewer's redmaids *Calandrinia breweri* CNPS 4.2	H
Catalina mariposa-lily *Calochortus catalinae* CNPS 4.2	H
Slender mariposa-lily *Calochortus clavatus* var. *gracilis* CNPS 4.2	H
Plummer's mariposa-lily *Calochortus plummerae* CNPS 1B.1	H
Clay bindweed *Convolvulus simulans* CNPS 4.2	H
Many-stemmed liveforever *Dudleya multicaulis* CNPS 1B.1	H
Large-leaved filaree *Erodium macrophyllum* CNPS 4.2	H
Southern California black walnut *Juglans californica* CNPS 4.2	H
Large-flowered linanthus *Leptosiphon grandiflorus* CNPS 4.2	H
Humboldt lily *Lilium humboldtii* var. *ocellatum* CNPS 4.2	ph
Hubby's phacelia *Phacelia hubbyi* CNPS 4.2	H
Cooper's rein-orchid *Piperia cooperi* CNPS 4.2	H
San Gabriel Mtns. leather oak *Quercus durata* var. *gabrielensis* CNPS 4.2	H
San Bernardino aster *Symphyotrichum defoliatum* CNPS 1B.1	H

[2] Population in Griffith Park believed to be derived entirely from introduced material, and not naturally-occurring at the site (discussed below).

Table 2. Rare native plant species of the Santa Monica Mountains and/or Griffith Park (Categories II and III).

Note: This list includes those identified by Wishner (2007) as "locally uncommon or rare" in the Santa Monica Mountains ("Category II"), and those felt to be locally rare in the Los Angeles area by various authorities ("Category III"; see Fisher and Cooper, *in prep.*), even if they are more common in the western Santa Monica Mountains and/or the San Gabriel Mountains. We note below if the taxon is known from a herbarium specimen ("H"), a diagnostic photograph ("ph"), or has simply been reported by a knowledgeable observer as occurring ("R"). Importantly, we acknowledge that many of the species below are *not* known from the eastern Santa Monica Mountains, and so would not be expected to occur; however, we felt it was preferable to include the entire table from Wishner (*Ibid*), rather than to make our own judgments about which species would be unlikely (or impossible) in Griffith Park.

We use the following color codes to indicate the known status of each taxon in the park:

Blue: Pre-2007 specimen(s), recent photograph/collection
Magenta: Pre-2007 specimen(s); no recent photograph/collection (extirpated?)
Green: Recent photograph/collection; no historical specimen
Yellow: Unconfirmed report/questionable record

FERNS AND ALLIES		
Equisetaceae		
Equisetum sp.	II	
Aspleniaceae		
Asplenium vespertinum	II	
Blechnaceae		
Woodwardia fimbriata	II	
Dennstaedtiaceae		
Pteridium aquilinum	II	ph
Dryopteridaceae		
Dryopteris arguta	III	H
Pteridaceae		
Adiantum capillis-veneris	II	R
Adiantum jordanii	III	H
Aspidotis californica	III	H
Cheilanthes sp.	II	
Notholaena californica	II	
Polypodiaceae		
Polypodium californicum	II	H
Thelypteridaceae		
Thelypteris puberula	II	
FLOWERING PLANTS - DICOTS		
Apiaceae		
Hydrocotyle umbellate	II	
Lomatium dasycarpum	III	
Lomatium utriculatum	III	

Oenanthe sarmentosa II

Osmorhiza brachypoda	II	H
Sanicula arguta	III	H
Sanicula bipinnata	II	H
Sanicula crassicaulis	III	H[3]
Sanicula tuberosa	III	H

Tauschia hartwegii III

Asclepiadaceae

Funastrum hartwegii II

Asteraceae

Ancistrocarphus filagineus II
Baccharis douglasii II
Baccharis plummerae II
Baccharis malibuensis II

Brickelia nevinii	III	H
Heterotheca sessiliflora	II	H

Helenium puberulum II
Hieracium argutum II
Microseris douglasii II
Microseris elegans II

Monolopia lanceolata	II	H
Psilocarphus tenellus	II	R[4]

Senecio aphanactis II
Senecio breweri II

Senecio californicus	III	H

Symphyotrichum subulatus var. *ligulatus* (= *Aster exilis*) II
Aster greata III

Stephanomeria cichoriacea	II	ph
Stephanomeria diegensis	II	R[5]

Betulaceae

Alnus rhombifolia II

Boraginaceae

Plagiobothrys acanthocarpus II
Plagiobothrys canescens II
Plagiobothrys tenellus II

Brassicaceae

Arabis glabra II

Boechera sparsiflora	II	H

Erysimum suffrutescens ssp. *insulare* II

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[3] This species was originally included as a Category III plant; however, observations since 2007 have revealed it to be locally common in the park, and it was not included as a target plant species during this survey (cf. *Stephanomeria diegensis*).

[4] As discussed in the text, the difficulty of identification of this taxon resulted in its being omitted from the list of target species for the survey; more material is desired.

[5] As discussed in the text, this is presumably a common species in the park, but no specimen has been obtained. Therefore, it was not included as a target species for volunteers to search for, but more material is desired to separate from other species of *Stephanomeria* (e.g., *S. exigua*).

Caulanthus heterophyllus II H

Cactaceae

Cylindropuntia californica var. *parkeri* III ph

Opuntia sp. II ph

Campanulaceae

Githopsis diffusa II

Lobelia dunnii II

Nemacladus ramosissimus II

Caprifoliaceae

Lonicera hispidula III

Caryophyllaceae

Polycarpon depressum II

Silene verecunda ssp. *platyota* II

Spergularia macrotheca II

Convolvulaceae

Calystegia purpurata II H

Dichondra occidentalis II

Crassulaceae

Dudleya caespitosa III

Dudleya cymosa II

Dudleya blochmaniae II

Sedum spathulifolium II

Ericaceae

Comarostaphylis diversifolia II

Arctostaphylos glandulosa ssp. *mollis* III H

Fabaceae

Astragalus brauntonii II

Astragalus trichopodus var. *lonchus* II

Glycyrrhiza lepidota II

Lotus argophyllus II H

Lotus hamatus II H

Lotus micranthus II

Lotus oblongifolius II

Lupinus burkei ssp. *burkei* III

Lupinus concinnus II

Lupinus latifolius II

Lupinus polycarpus[6] II

Lupinus nanus II

Pickeringia montana II H

Trifolium obtusiflorum II

Trifolium microcephalum II ph

Vicia hassei II

Fagaceae

Quercus wislizeni var. *frutescens* II H

[6] If this refers to *Lupinus bicolor*, this was found to be fairly common in several blocks, particularly along Forest Lawn Dr., and in open, sandy soils in the southeastern corner of the park. This was not included as a target species in 2010.

Quercus dumosa (not *Q. berberidifolia*) II

Geraniaceae

Erodium macrophyllum II H

Hydrophyllaceae

Phacelia brachyloba II

Phacelia egena II

Phacelia tanacetifolia II H[7]

Pholistoma racemosum II

Lamiaceae

Lepichinia fragrans II

Monardella hypoleuca II

Monardella lanceolata II

Salvia spathaceae III

Satureja douglasii II

Lythraceae

Lythrum californicum II H

Malvaceae

Malacothamnus davidsonii II

Myricaceae

Myrica californica II

Onagraceae

Camissonia boothii ssp. *decorticans* II

Camissonia lewisii III H

Papaveraceae

Meconella denticulata II H

Polemoniaceae

Eriastrum densifolium II

Gilia australis II

Leptodactylon californicum III H

Leptosiphon grandiflorus III H

Linanthus pygmaeus ssp. *continentalis* II

Microsteris gracilis (=*Phlox g.*) II H

Navarretia atractyloides III H

Saltugilia australis III

Polygalaceae

Polygala cornuta var. *fishae* III

Polygonaceae

Chorizanthe wheeleri II

Eriogonum "gracile"[8] II

Eriogonum cithariforme II ph

Eriogonum davidsonii III H

Eriogonum parvifolium II

Mucronea californica II

Portulacaceae

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[7] This record/specimen questioned by several authorities; this foothill/montane species is easily confused with other, more common species of *Phacelia*, including *P. hubbyi*, which occurs.

[8] Wishner writes (2007): "Yellow flowered form with dimorphic tepals is undescribed".

	Calandrinia breweri II	H
Primulaceae		
	Dodecatheon clevelandii III	H
	Samolus parviflorus II	
Resedaceae		
	Oligomeris linifolia II	
Rosaceae		
	Holodiscus discolor III	H
	Horkelia cuneata II	
	Potentilla anserina ssp. *pacifica* II	
Rubiaceae		
	Galium cliftonsmithii II	
Salicaceae		
	Salix lucida ssp. *lasiandra* II	
	Salix gooddingii II	R
	Populus balsamifera III	ph
	Populus fremontii III	H
Saxifragaceae		
	Boykinia occidentalis II	
	Boykinia rotundifolia II	
	Saxifraga californica III	H
Scrophulariaceae		
	Castilleja applegatei ssp. *martinii* II	
	Collinsia parryi II	
	Mimulus floribundus II	
	Orobanche spp. II	
Solanaceae		
	Lycium californicum II	
	Nicotiana quadrivalvis II	ph
Urticaceae		
	Hesperocnide tenella II	ph
Violaceae		
	Viola pedunculata III	H
Vitaceae		
	Vitis girdiana II	H

MONOCOTS

Cyperaceae	
	Carex barbarae II
	Carex globulosa III
	Carex praegracilis II
	Carex senta II
	Carex spissa II
	Carex globosa II
	Eleocharis macrostachys III
	Eleocharis montevidensis II
	Eleocharis radicans II
	Scirpus cernuus II

Juncaceae

Juncus patens	II	
Juncus phaeocephalus var. *paniculatus*	II	
Juncus rugulosus	II	H
Juncus textilis	II	H
Juncus torreyi	II	

Liliaceae

Allium peninsulare	II	H
Brodiaea terrestris var. *kernensis*	II	H
Calochortus plummerae	II	H
Fritillaria biflora	III	H
Calochortus splendens	II	
Calochortus venustus	II	
Lilium humboldtii ssp. *ocellatum*	II	ph
Zigadenus fremontii	III	H

Lemnaceae

Lemna gibba	II	
Lemna trisulca	II	
Wolfiella lingulata	II	

Orchidaceae

Epipactis gigantea	II	
Piperia unalascensis	II	

Poaceae

Agrostis exarata	II	R
Andropogon glomeratus var. *scabriglumis*	II	
Aristida adscensionis	II	
Elymus stebbinsii	II	
Elymus multisetus	II	
Festuca elmeri	II	
Hordeum depressum	II	
Hordeum intercedens	II	
Melica californica	II	
Muhlenbergia asperifolia	II	
Paspalum distichum	II	
Phragmites australis	II	
Puccinellia simplex	II	
Sporobolus airoides	III	
Sporobolus indicus	II	

Table 3. "Missing" species.

Below is a list of known herbaria specimens of distinctive, easily-recognized species collected in Griffith Park for which there have been no observations since the start of bio-monitoring in 2007. Several of these may represent misidentifications or name-changes (*fide* A. Gibson, UCLA), especially for "problematic" groups such as *Camissonia*, *Ceanothus*, and *Lupinus*. We have omitted specimens likely from the Los Angeles River (e.g., *Azolla filiculoides*). All specimen records are labeled as being from "Griffith Park" unless noted otherwise. The

montane fern *Athyrium filix-femina* var. *californicum* (RSA692512) is not included, and was likely planted.

LA: Univ. of Calif., Los Angeles (not currently on-line)
UC: University Herbarium, UC Berkeley
RSA: Rancho Santa Ana Botanic Garden Herbarium
POM: Pomona Herbarium in RSA
SD: San Diego Natural History Museum
SAMO: National Park Service Headquarters, Santa Monica Mountains
CAS: Calif. Academy of Sciences
JEPS: Jepson Herbarium, UC Berkeley

FERNS

Pellaea mucronata var. *mucronata* LA3541

DICOTS

Asteraceae

Ambrosia confertiflora "Just below Hollywood Reservoir", RSA1280013
Ericameria parishii var. *parishii* RSA127981
Gutierrezia californica UC63374
Microseris heterocarpa Hollywood, POM363440

Boraginaceae

Plagiobothrys nothofulvus LA40190

Brassicaceae

Caulanthus heterophyllus var. *pseudosimulans* RSA429523
Caulanthus lasiophyllus "Near summit of Mt. Hollywood, alt 1657ft. Santa Monica Mtns.", RSA67366
Erysimum capitatum ssp. *capitatum* RSA530313

Capparaceae

Isomeris arborea RSA440786

Dastiscaceae

Dastisca glomerata UC56519

Fabaceae

Lupinus formosus RSA414782
Lupinus sparsiflorus RSA414813

Gentianaceae

Centaurium venustum POM128274

Hydrophyllaceae

Phacelia longipes LA 38515

Lamiaceae

Stachys ajugoides var. *rigida* UC57022
Trichostema lanceolatum Hollywood, UCSC649

Loasaceae

Mentzelia affinis Hollywood, RSA440349
Mentzelia lindleyi SD38198

Onagraceae

Camissonia ignota RSA449009
Camissonia intermedia RSA449018

Papaveraceae

Dendromecon rigida LA200721
Platystemon californicus LA200730

Plataginaeae

Plantago erecta JEPS6416

Polemoniaceae

Gilia tricolor RSA469709
Leptosiphon liniflorus UC52493
Linanthus dianthiflorus LA52345
Saltugilia splendens RSA469477

Ranunculaceae

Ranunculus californicus UC56420

Rhmanaceae

Ceanothus crassifolius Hollywood Reservoir, RSA580973
Ceanothus cuneatus RSA399013
Ceanothus leucodermis "Mt. Hollywood Dr, ca 0.8 mi S of Vista del Valle Dr"; LA32016
Ceanothus oliganthus RSA399728

Rosaceae

Fragaria californica "Mount Hollywood", RSA499367

Scrophulariaceae

Castilleja exserta ssp. *exserta* LA51890
Mimulus brevipes LA51876
Mimulus pilosus "near w. boundary of park", SAMO 152
Penstemon centranthifolius RSA412437
Penstemon heterophyllus "Mulholland Dr. NW of Hollywood", UCR136922

MONOCOTS

Cyperaceae

Carex triquetra "Floor of Vermont Canyon, Griffith Park", CAS177316

Poaceae

Agrostis pallens RSA652849
Bromus arizonicus Hollywood, RSA187201
Vulpia octoflora POM353004

Field Searches

We asked volunteers to use a grid system overlain onto the most recent Griffith Park map (Cartifact, Inc. 2007), which yielded c. 40 similarly-sized blocks (Figure 1). In spring 2010, these blocks were assessed in terms of our existing knowledge (some had been visited many times by Cooper and other volunteers, while others were essentially un-studied), and focused our searches on the more poorly-known, least-disturbed blocks. Locations of all target species were noted on maps, and transferred to a spreadsheet for organization, and to digital maps using Google Earth.

As 2010 fieldwork progressed, we found it impractical to map and document the occurrence of a handful of target species, either because they were found to be too common (e.g., southern California black walnut *Juglans californica*), or because identification issues posed

challenges that could not be resolved using a volunteer corps of observers (e.g., *Psilocarphus tenellus*, *Stephanomeria diegensis*). However, the majority of the target species were selected so as to be easily identified even by volunteer observers, such as large, bright wildflowers, or otherwise distinctive taxa. Table 5 presents a summary of effort during 2010.

Table 5. Summary of effort, 2010[9]. Observers include Daniel S. Cooper (DSC), Art Gibson (AG; UCLA), Tarja Sagar (TS; NPS), Jay Sullivan (JS), and Tony Valois (TV; NPS).

Date	**Block**	**Time afield**	**Observer**
24 Feb.	B6	2 hrs	DSC
	G3	30 min.	DSC
04 Mar.	F7	2.5 hrs	DSC
	G6/G7	1 hr	DSC
08 Mar.	D7, C2	1.5 hr	DSC
10 Mar.	F7/G7	2 hr	DSC
13 Mar.	B7/C7/D7, C5/C6	5 hr	JS
19 Mar.	E6	2 hr	DSC
	C5	1 hr	DSC
23 Mar.	G8	2 hr	DSC
	F8	30 min	DSC
26 Mar.	F8/F9	2 hr	DSC
09 Apr.	D5	1.5 hr	DSC
	F9	30 min.	DSC
18 Apr.	B6, C5/C6/C7, D5	5 hr	JS
19 Apr.	E6	2 hr	DSC, TS
	G5/E5	2 hr	DSC, TS
	F6	1.5 hr	DSC, TS
	F5	30 min.	DSC, TS
23 Apr.	G6	1 hr	DSC
	G4/G5	1 hr	DSC
27 Apr.	F9/G9	30 min.	DSC
29 Apr.	F6	1 hr	DSC
05 May	D7	2 hr	DSC
10 May	C5	2 hrs	DSC
	C6	30 min	DSC
13 May	E2/E3, D2/D3	3 hrs	DSC
16 May	E7/E8, F7/F8/F9	5 hrs	JS
26 May	B7/B8	2 hrs	DSC

[9] This table does not include visits by Gerry Hans, who resides adjacent to the park and hiked it several times a week during spring/summer 2010, providing us with invaluable observations and photographs of plants.

09 June	B7, C2, C5	3 hrs	DSC, AG, TV
12 June	E6/E7/E8, F7/F8/F9	5 hrs	JS
13 June	E3	2 hr	DSC
16 June	E3/D3	2 hr	DSC, TS, TV
21 June	G5	1 hr	DSC
01 July	G7/G8	1 hr	DSC
	C2/C3	30 min.	DSC
26 Aug.	B5	1 hr	DSC, AG
27 Aug.	E7	1.5 hr	DSC

Figure 1. Griffith Park (courtesy of Cartifact, Inc.), showing grid system (see borders of map).

RESULTS

Target Species, by the Numbers

Of the 15 "official" special-status species known from the park and adjacent areas (Category I), nine were found to be extant, although one of these nine, the southern California black walnut (*Juglans californica*), a CNPS-4.2 taxon, was found to abundant in the park and so was not mapped.[10]

The eight remaining Category I taxa that were documented during the survey include: Nevin's barberry (*Berberis nevinii*); three species of mariposa-lily (*Calochortus* spp.), Catalina (*C. catalinae*), slender (*C. clavatus* var. *gracilis*) and Plummer's (*C. plummerae*); Humboldt lily (*Lilium humboldtii* var. *ocellatum*); Clay bindweed (*Convolvulus simulans*); Hubby's phacelia (*Phacelia hubbyi*). The San Gabriel Mountains leather oak (*Quercus durata* var *gabrielensis*) collection in the park was not verified during the survey, but we assume it is valid and extant, as it is located in a remote area of the park that has not burned since the collection was made. As of 2010, each was found to maintain sizeable populations in the park except for slender mariposa-lily, clay bindweed and the leather oak[11] (see Part II for status of each).

Six Category I species known from specimen records were *not* found, Bernardino aster (*Symphyotrichum defoliatum*), Brewer's redmaids (*Calandrinia breweri*), Many-stemmed liveforever (*Dudleya multicaulis*), Large-leaved filaree (*Erodium macrophyllum*), Large-flowered linanthus (*Leptosiphon grandiflorus*), and Cooper's rein-orchid (*Piperia cooperi*). Although the Brewer's redmaids has been collected recently in the nearby Verdugo Mountains, the others are very rare in the area, and are probably extirpated from the park.

Of the 35 Category II/III target species found to be extant in the park, several were reported and/or collected for the first time in Griffith Park during the 2010 rare plant survey. Some of the remaining taxa not found are known from specimens only (mainly historical) are probably extirpated in the park (e.g., *Monolopia lanceolata* and *Senecio californicus*), while others were possibly collected outside the park boundaries and may never have actually occurred within the study area (e.g., *Lotus argophyllus* var. *argophyllus*, collected in "Cahuenga Pass" in 1904). Thus, it is not appropriate to declare these taxa extirpated, since we do not have good enough data on where they were actually found, nor have we exhaustively searched the park for them, year after year. Furthermore, some Category II species, e.g., *Lotus hamatus*, appear to have been recorded based on mis-identification with other, more widespread species that look similar (A. Gibson, *pers. comm.*).

A table of the distribution of each target species, by block, is provided as an Appendix.

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[10] The population of black walnut in the park is so large, and the tree is so widespread, that it was beyond our abilities to adequately map it. We suggest a different approach, perhaps using aerial photography (taken in early winter, when the foliage is bright yellow), to observe its extent. Clearly, important areas include the extreme southeastern corner of the park (Coolidge Cyn./Beacon Hill), as well as the Oak/Royce Canyon drainages on the north side of Mt. Lee/"Hollywood" sign.

[11] We have not attempted a serious effort to identify scrub oaks in Griffith Park. It may well be that San Gabriel Mountains leather oak is more widespread than the single collection would indicate. Richard Fisher (pers. comm.) has observed at least one apparent hybrid leather/scrub oak (*Quercus berberidifolia*) in the park, near the leather oak collection, and notes that such hybrids are frequent in the San Gabriel Mountain foothills.

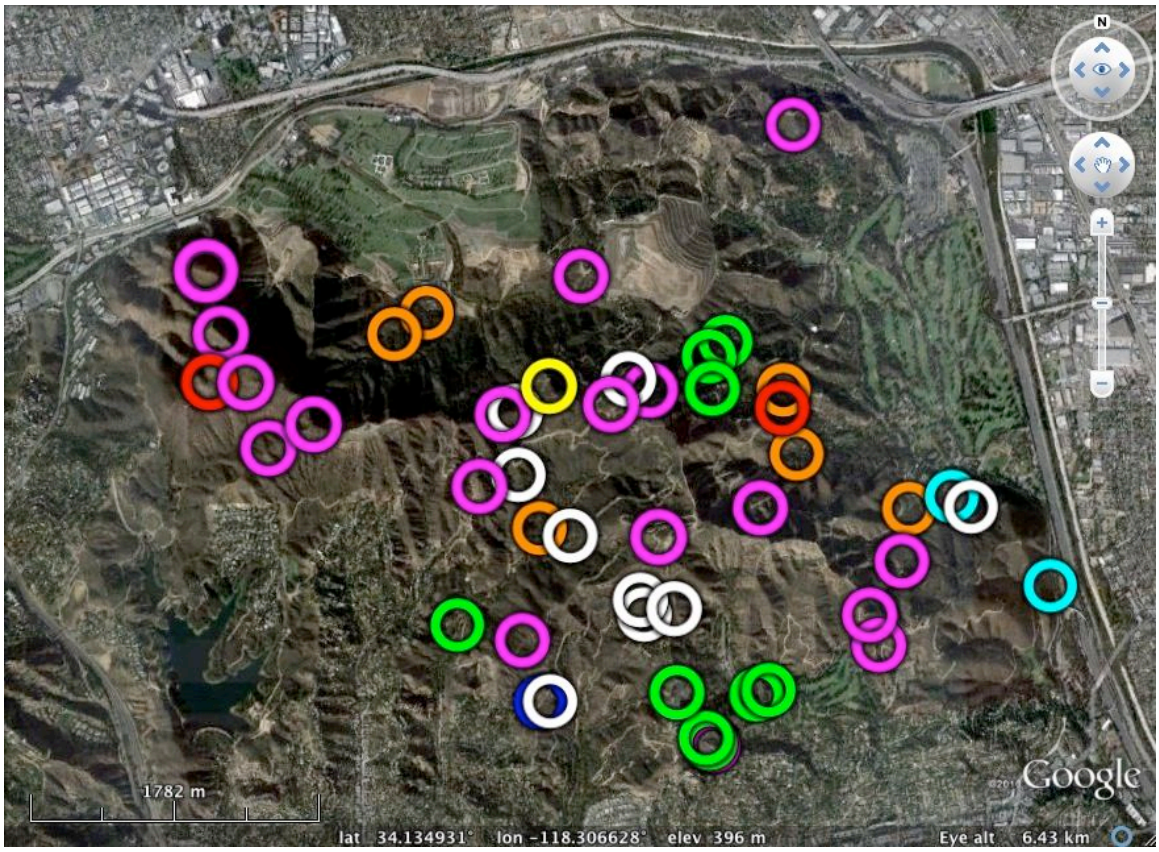
General Patterns

The distribution of the target species, not unexpectedly, exhibited an uneven distribution, in that there were more blocks with low numbers of target species than high (Figure 3). For example, we found no target species in eight of the 40 blocks surveyed (20%), and roughly two-thirds of the blocks had fewer than five target species. The highest number of target species per block was found to be 16 (E7); both this block and D5 (14 target species) lie to the north and east of the main central ridge within the park (vic. Mt. Chapel, Bee Rock), and include large, wooded drainages (Royce Canyon, Spring Canyon), as well as unique microhabitats for rare plants, including moss gardens (grassy/mossy patches of soil amid flat rock outcrops, best-developed in D5), and (in E7) permanent springs. The next richest blocks, both with 10 or more rare species (E6, F5), also encompass both high ridges and canyon-bottom habitat (incl. Mt. Bell and Brush Cyn.). After these, most of the rare-species-rich blocks are contiguous, largely within the interior of the park or are along the remote western border with contiguous undeveloped open space east of Cahuenga Pass.

While blocks located at the lowest elevations and at the perimeter of the park tended to support fewer target species, several were still notable for being above average, supporting four or more target species, including blocks in and around Fern Canyon/Beacon Hill in the southeast, and along Oak Canyon in the north (vic. Travel Town; Figure 4). So, while the blocks with the greatest topographical relief tended to support the highest rare plant diversity, important populations of rare plants were found to park-wide, including many "single-occurrence species" found nowhere else in the park, sometimes within in blocks with relatively low diversity. Therefore, it is nearly impossible to point to a given region of the park and declare it unimportant for rare plants, as defined here.

However, true "special-status species", those treated by CNPS are rare, are largely confined to the higher ridgelines and major canyons of the park (Table 2), and interestingly, are nearly absent from the entire northeastern corner of the park (i.e., the Skyline Trail area). It also became clear in the course of the study that "random slopes" within the park were nearly devoid of rare plants, and that the park's microhabitats - drainages, sandy/gravelly ridges, landslides, moss gardens, rock outcrops, and patches of wet clay soils - were key places to search for and find our target species. Areas park that combined these features, such as the Spring Canyon drainage near Bee Rock, predictably supported both a high diversity of rare species, and large populations of them. These areas are summarized below.

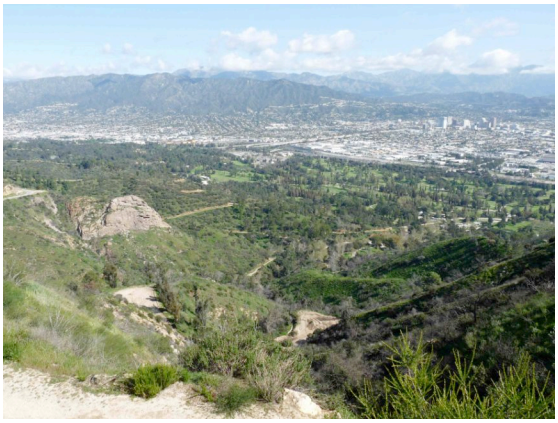
Figure 2. Distribution of special-status species in Griffith Park (includes both populations and single individuals; see Part II for descriptions).



Magenta: *Calochortus plummerae*
White: *Calochortus catalinae*
Orange: *Lilium humboldtii* var. *ocellatum*
Green *Berberis nevinii* (presumed planted; see USFWS 2009)
Light blue: *Phacelia hubbyi*
Red: *Quercus durata* var. *gabrielensis*
Yellow: *Calochortus clavatus* var. *gracilis*
Dark blue: *Convolvulus simulans*

Key Areas for Rare Plants in Griffith Park

Please refer to Map and Guide of Griffith Park (Cartifact, Inc. 2007) for locations of blocks used below. All photos by Daniel S. Cooper

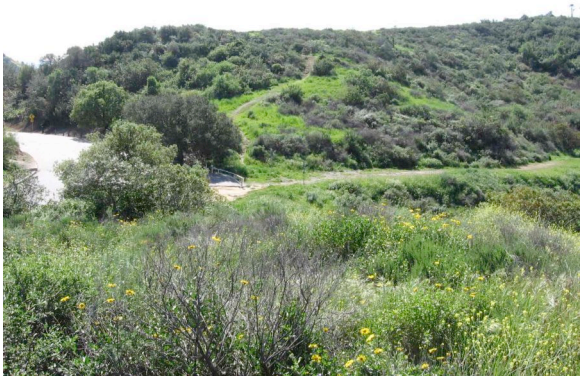


Spring Canyon (E7)

Spring Canyon drains a large area of the steep, rocky eastern slopes of Griffith Park, from Bee Rock east through the "Old Zoo" site (now a picnic area), and into the Wilson and Harding Golf Courses (not surveyed). The combination of permanent water within a shady canyon, steep rock outcrops, and microhabitats such as patches of both clay and sandy soils has resulted in extremely high floristic diversity, particularly with ferns and riparian-associated species.

Royce Canyon (D5)

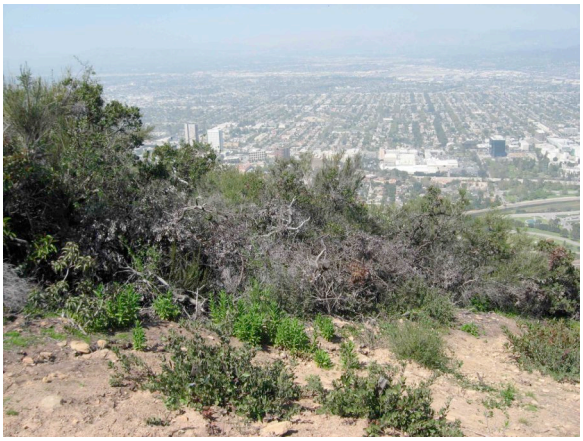
Royce Canyon flows west from the northwestern edge of the park into Forest Lawn cemetery property. It protects by far the largest and least-disturbed moss gardens on a steep rock outcrop on the southern (north-facing) slopes of the canyon. The patches of soil around the rock support many rare annuals (*Dodecatheon clevelandii*, *Viola pedunculata*, *Allium peninsulare*, *Saxifraga californica*). Mt. Chapel, atop this rock formation, also supports several scarce annuals (see below).



One-Mile Tree (G5)

Located at the southwestern border of the park adjacent to an unremarkable stretch of Western Canyon Rd., the open space just east of this local landmark (One-Mile Tree) features the second-largest "clay lens", an isolated patch of heavy, poorly-drained soil, located on a gently north-facing slope on a ridge between Brush and Western canyons (the largest clay lens is in upper Brush Canyon, described below). This site may have more "single-location" species in the park than any other, including the only known occurrence of one sensitive species, *Convolvulus simulans*. *Fritillaria biflora*, *Silene multinerva*, *Scutellaria tuberosa*, *Ericameria palmeri* also occur in some of their only occurrences in the park, and *Calochortus catalinae* is abundant.

Mt. Chapel/Mt. Bell (E5/E6)
Located near the park's center, these high peaks are located along the main ridge between Cahuenga Peak and Mt. Hollywood, and feature (at Mt. Chapel) all three species of mariposa-lily (*Calochortus*) in the park. The gravelly ridge west from Mt. Chapel (toward Mt. Lee) supports a high diversity of delicate spring annuals, and the north side of Mt. Bell to the east represents an eastward extension of the moss gardens of Royce Canyon, but with a reduced floristic diversity.



Cahuenga/Burbank Peak (D3 and vic.)
This high ridge was recently (2010) acquired as an addition to Griffith Park by the non-profit Trust for Public Land. Our investigations since 2008 have documented an extensive "elfin forest" of manzanita *Arctostaphylos glandulosa* ssp. *mollis* atop this ridge, as well as locally-significant occurrences of *Pickeringia montana*, *Calochortus plummerae*, and an abundance of scarce annuals (incl. *Lomatium lucidum*, *Oxalis albicans*).

Brush Canyon (F5)
Brush Canyon is one of two permanent streams in the park (Spring Canyon being the other), and supports most of the woodland and riparian species that occur in the park. The largest known population of *Lilium humboldtii* in the park is here, as are rare park occurrences of *Populus balsamifera* and *Juncus textilis*. Of extreme importance is a large clay-soil meadow on the eastern slope of the canyon, which supports some of the largest populations of geophytes such as *Calochortus catalinae* and *Zigadenus fremontii* in the park.

Mt. Hollywood (F6)

One of the most-visited areas of the park, this low but steep ridge extends north from the Griffith Observatory, and includes several overlooks (Captain's Roost, Dante's View). Patches of clay soils on the south-facing slopes of Mt. Hollywood, and steep, eroding slopes, mainly to the north, support a high diversity of species including a low-elevation occurrence of *Artostaphylos glandulosa* ssp. *mollis*. The park's only known population of *Allium haematochiton* occurs just north of the tunnels over Western Canyon Rd., an exceptional area for spring wildflowers.

Fern Canyon (F8)

Several tributaries of what is called Fern Canyon drain a small, steep bowl at the far southeastern corner of the park. A small population of *Lilium humboldtii* occurs along the (seasonal) creek bed, and rare annuals are common and diverse on shale atop the ridge east of the main canyon, perhaps encouraged somewhat by the fire in 2007 that opened up the habitat. Just to the east (in F9), the Lower Beacon Trail passes through significant areas for clay-soil-associated wildflowers (incl. *Sanicula* spp.), which await further study.

Figure 3. Number of rare/target plant species within Griffith Park, by block.

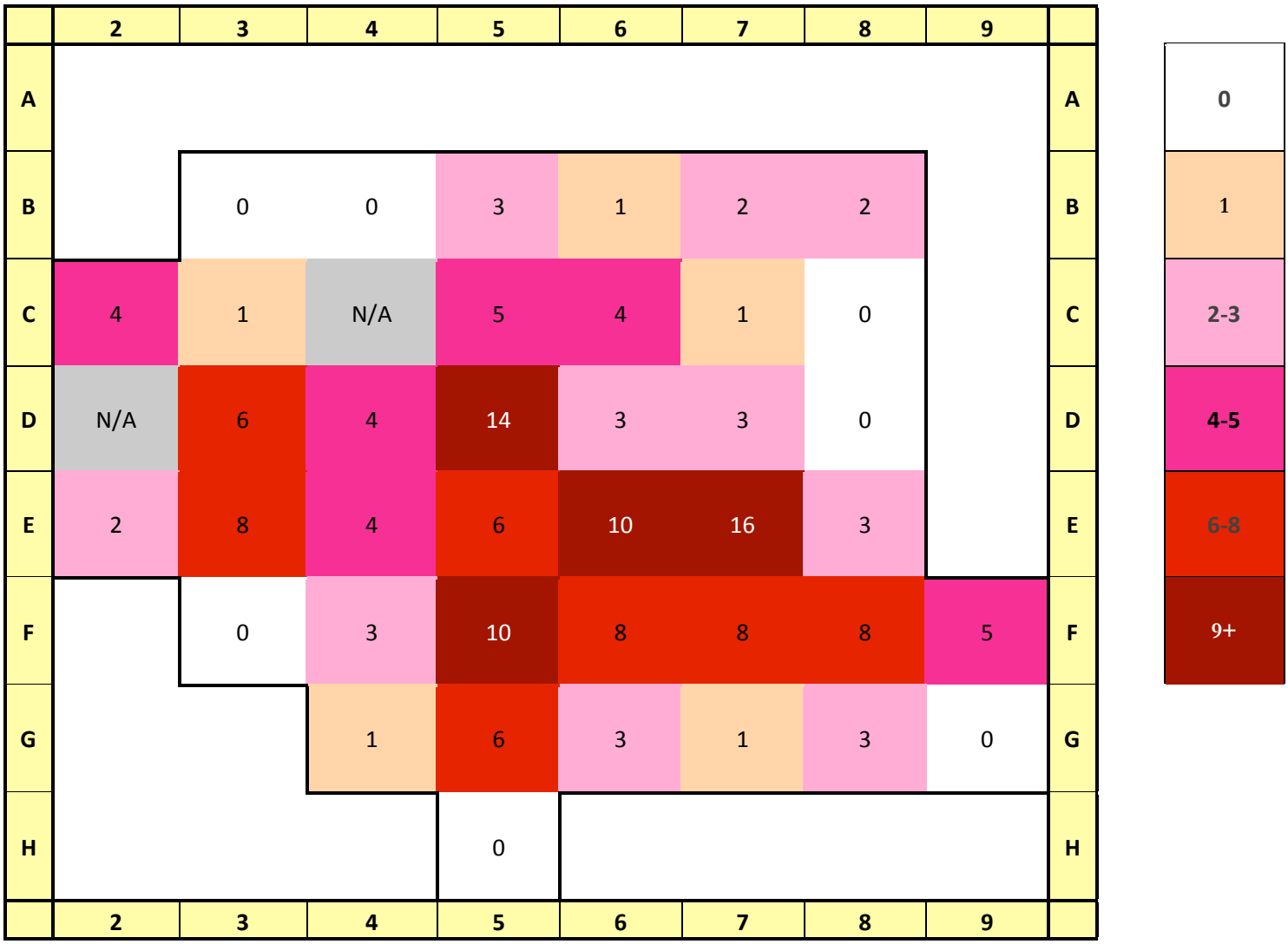
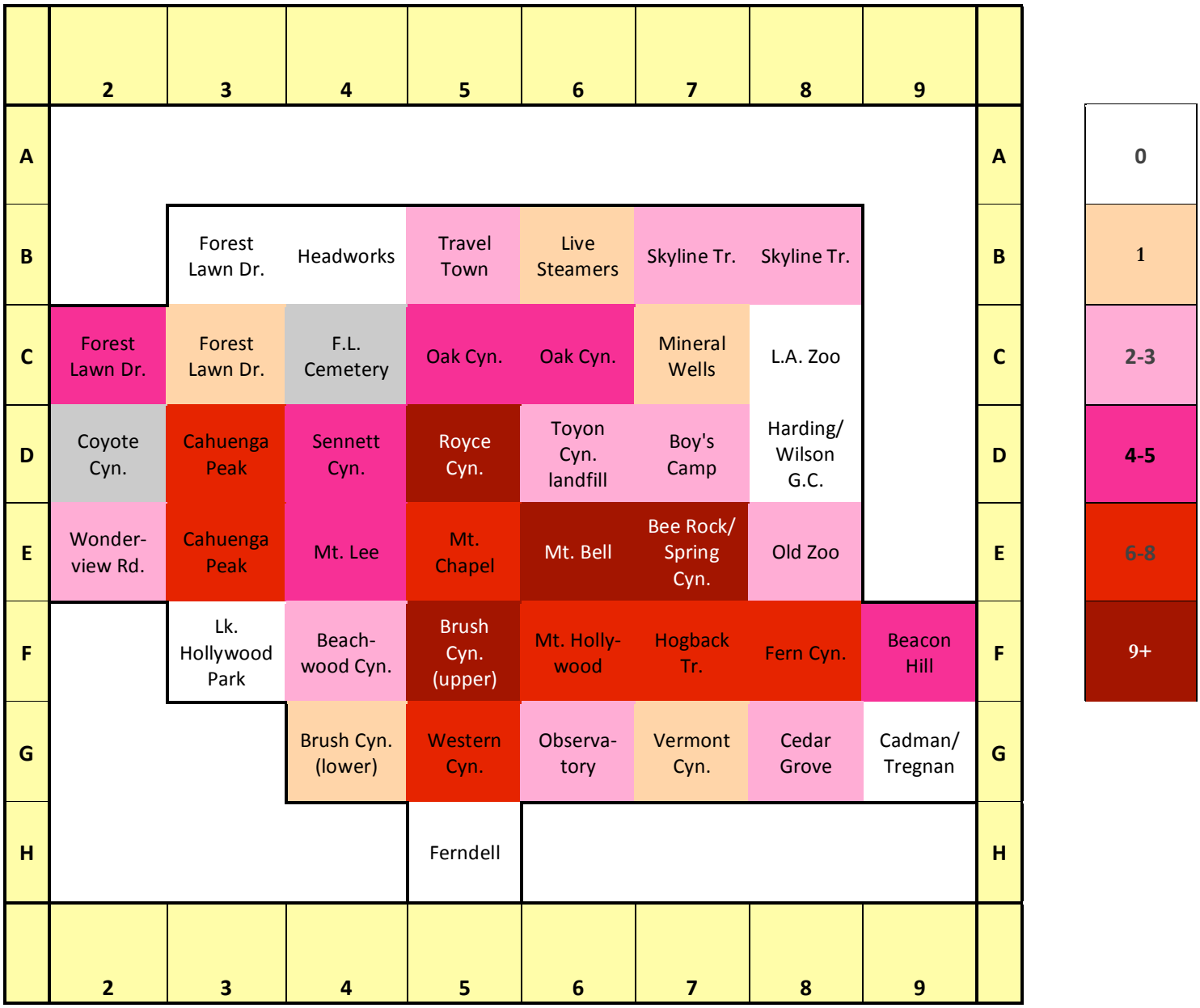


Figure 4. Main feature(s) within each block, shaded by number of rare/target species.



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Part II. Special-status and high-interest plant taxa documented at Griffith Park (as of October 2010).

Rarity categories:

Category I: State/U.S.-listed, incl. CNPS-Rare
Category II: Scarce or local in Santa Monica Mountains (Wishner, *in litt.*)
Category III: Widespread in western Santa Monica Mountains, but locally rare in the eastern Santa Monica Mtns. (B. O'Brien, R. Fisher, *in litt.*)
All photographs by Daniel S. Cooper unless otherwise indicated.

FERNS

Aspidotis californica California lace-fern
Category III (Local)
Historical: No record.
Recent: Known from 5 blocks in just two-three areas of the park, including an undated specimen (2001?) for "Brush Cyn." (location unk.; coll. Keifer, LA200067). At least two plants were found on the eastern side of the peak of Mt. Bell on 19 Apr. 2010 (T. Sagar, DSC), and several individuals have been observed on the rocky slope around a relict population of manzanita *Arctostaphylos glandulosa* ssp. *mollis* east of Dante's View (F6/F7/E7).
Note: This fern is greatly outnumbered by other species in the park, and appears to be confined to the largest rocky outcrops, where scarce.

Adiantum capillus-veneris Venus-hair fern
Category II (SMM rare)
Historical: No record.
Recent: Reported (R. Fisher) in May 2008 from a steep, seasonal drainage northwest of the park boundary (C2), for the only credible record. Confirmation/collection is desirable.

Adiantum jordanii California maiden-hair fern
Category III (Local)
Historical: No record.
Recent: Collected (2001) at what appears from the description to be the uppermost portion of Royce Cyn. near Mt. Chapel (LA200059, Keifer, 2001); otherwise found in just two blocks, a single, small patch growing at a spring in middle Spring Cyn. (E7), and around at least one seep along Lower Beacon Tr. in the extreme southeastern corner of the park (F9).

Note: This species, along with *A. capillus-veneris*, appears to be genuinely rare in Griffith Park, and probably dependent on seeps that remain moist and shady throughout the year. Photograph by Jorge Ochoa.

Dryopteris arguta Coastal wood fern
Category III (Local)
Historical: One collection (LA200097, Keifer, 2001?).
Recent: Fairly common in the park, found in 11 blocks (typically several occurrences per blocks) generally in loamy soil in the shady understory of oak woodland.
Note: This is the expected/common large fern in the park.

Polypodium californicum California polypody
Category II (SMM rare)
Historical: Several historical collections.
Recent: Known from 9 scattered blocks where it occurs in small pockets, often with other ferns (esp. goldback fern *Pentagramma triangularis*).
Note: This nondescript fern is not uncommon in shady, moist drainages and around rock outcrops on north-facing peaks, and at least in the park, it seems no more or less common than those other fern species, but perhaps more associated with rocky sites.

Pteridium aquilinum var. *pubescens* Bracken fern
Category II (SMM rare)
Historical: No record.
Recent: Located in moist drainages in 4 scattered blocks, including the floor of the Bird Sanctuary (Vermont Cyn.), where possibly planted historically. Apparently "wild" populations occur in an unnamed drainage south of Mt. Lee (E3, where common); in Upper Spring Cyn.; as well as a in the lowermost portion of the drainage that starts along Boys Camp Rd., adjacent to the Wilson and Harding Golf Courses parking lot (D7).

DICOTS

APIACEAE

Ozmorhiza brachypoda California sweet-cicely
Category II (SMM rare)
Historical: One collection, LA51815 ("Griffith Park", Epling, n.d.).
Recent: No record.
Note: This species occurs in intact oak woodland in the western and central Santa Monica Mountains, but despite much searching since 2007, it has not been located in similar habitat at Griffith Park. It is possible that the open oak woodland that does exist in the park is too impacted by human usage; the more remote oak groves on steep slopes of the park feature a dense understory of chaparral species and may not support appropriate habitat for this plant.

Sanicula arguta Snake root
Category II (SMM rare)
Historical: Three collections known, e.g., LA32912 ("Griffith Park", Epling, 1957), with additional specimens from "Providence Ranch" and "Hollywood" (at RSA).
Recent: Known from 7 blocks in the park, all in heavy clay grassland. Royce Canyon has the largest population, but this species, along with others in its genus, appears to be variable in abundance from year to year, and at Griffith Park it is greatly outnumbered by the similar Pacific sanicle *S. crassicaulis*, in similar habitat.

Note: A fourth species, *S. tuberosa* (Category II) is known from a historical collection (LA33037, Epling, 1957) and may persist in rocky areas of the park.

Sanicula bipinnata Poison sanicle
Category II (SMM rare)
Historical: No record.
Recent: Found in small pockets within three blocks, all in heavy clay grassland: Royce Canyon (within moss gardens on rock outcrops south of creek), upper Spring Canyon (north base of Bee Rock), and Lower Beacon Tr.).

ASTERACEAE

Baccharis douglasii Douglas's baccharis
Category II (SMM rare)
Historical: One collection, UC63384 ("Griffith Park", E. Braunton, 1 Aug. 1902). No information is given on where this was collected; however, it is a wetland species that may have actually been collected along the Los Angeles River adjacent to the park, which was not part of our 2010 survey (several historical collections of plants exist for the river).
Recent: No recent record

Brickellia nevinii Nevin's bricklebush
Category III (Local)
Historical: One early collection for "Hollywood Hills" (A. Davidson, April 1912, UCR70777).
Recent: Found in 7 blocks, with most plants on steep, south-facing slopes in the western and central portion of the park. The largest aggregation (50+ plants) occurs within E4, on slopes south of Mt. Lee (vic. Mulholland Dr.), with smaller numbers on rock outcrops in upper Western Canyon northwest of the Observatory.

Note: This plant does not appear to be particularly rare or imperiled in the park, but like a suite of other rock-outcrop-dwelling species, is tightly confined to a specific habitat.

Heterotheca sessiliflora var. *fastigiata* Erect goldenaster
Category II (SMM rare)
Historical: No record.
Recent: Several patches discovered (collected) in late summer 2010 on a gravelly slope on the south side of Zoo Dr., adjacent to Forest Lawn Cemetery (B5).
Note: This location is shared by several rare species in the park, including *Brickelia nevinii, Lepitospartum squamatum*, and the park's only known occurrence of *Epilobium canum* var. *latifolium*, a foothill and lower-montane species.

Monolopia lanceolata Common monolopia
Category II (SMM rare)
Historical: One collection, UC50102 ("Cahuenga Pass", W.H. Brewer, Feb. 1861).
Recent: No recent record.

Note: This species would be expected to occur on gravelly, arid sites (see *Lotus argophyllus* var. *argophyllus*). Interestingly, Brewer's account of his travels in California mentions the following detail about February 1861: "On Monday, February 11, we left Los Angeles and came on about twelve miles and camped in the Cahuenga Pass, where the Overland road passes through the Sierra Santa Monica, there a range of hills about 1,600 feet high. It is not much of a pass. We stopped there until Wednesday morning, then entered the San Fernando Valley." (Farquhar 1930).

Psilocarphus tenellus Wooly-heads
Category II (SMM rare)
Historical: No record.
Recent: Reported (B. O'Brien) from a flat ridgetop in G5; maybe be more widespread, as plants appearing to be this species have been observed in similar situations (by DSC); however, more collection/study is needed, to avoid confusion with *Stylocline gnaphlioides* .

Senecio californicus California butterweed
Category II (SMM rare)
Historical: One collection, RSA472892 "foothills n. end of Vermont Ave."; H.M. Oster, 1924).
Recent: No record.
Note: Recent Los Angeles Co. collections are all from the Santa Clarita area, and it may be extirpated in the eastern Santa Monica Mtns.

Stephanomeria cichoriaceae Ft. Tejon milk-aster
Category II (SMM rare)
Historical: No record.
Recent: Found clinging to steep, cliff-like rock outcrops and landslides in 6 blocks, with the largest populations on the north face of the main high ridge through the park, from Cahuenga Peak southeast to Dante's View. Most plants (dozens) are found on the roadcut along the north side of Mt. Lee. Small numbers are also present on roadcuts just outside the southwestern park boundary (F4, G4), where they are persisting amid houses and slopes dominated by native species.

Stephanomeria diegensis San Diego wreath-aster
Category II (SMM rare)
Historical: No record.
Recent: Apparently the common small *Stephanomeria* in the park, found widely in chaparral and (especially) coastal sage scrub in 2010 (so not searched for as a rare/target species during survey).

Symphyotrichum defoliatum Bernardino aster
Category I (CNPS 1B.2)
Historical: One collection, RSA417630 ("Hollywood, Los Angeles County"; A. Davidson, 1893). No other information is known about where this (now scarce) aster was found.
Recent: No record.
Note: If this plant ever occurred in the park, it is almost certainly no longer extant. It requires seasonally damp, lowland meadows, and has only been collected just once in the county since the 1930s (San Gabriel Mtns.).

BERBERIDACEAE

Berberis nevinii Nevin's barberry
Category I (FE/SE)
Historical: No record (first collected in 2000).
Recent: Found in 5 blocks, with most individuals in two main areas (dozens of plants each): 1) within a band around the observatory (G6), and 2) near a water tank in the northeastern corner of F6. Scattered individuals were discovered widely during 2007-2010, nearly all along major roads through the park, (suggesting a horticultural origin), or just below/downhill of established plants along roads, including lower Brush Canyon, Vermont Cyn., and upper Boy's Camp Rd.

Note: While plants at Griffith Park may have been collected locally, perhaps from a now-extirpated native population, it seems likely that the current population, if thriving, is not naturally-occurring (summarized in USFWS 2009). Still, they occur within the historical range of the species, and in a low-elevation, arid chaparral community with a species composition very similar to other known occurrences, so should probably be treated differently from a "typical" non-native plant.

BRASSICACEAE

Arabis sparsiflora var. *californica*: See *Boechera sparsiflora*

Boechera sparsiflora
Category II (SMM rare)
Historical: Two collections, LA200296, LA202572 ("Griffith Park"; Epling, 1963). No information is given on where in the park this was found; however, Royce Canyon or seems a likely location, but despite much searching in 2010, no individuals were located.
Recent: No record.
Note: Only one collection known from Los Angeles Co., so probably genuinely scarce in area, and possibly extirpated here.

CACTACEAE

Cylindropuntia californica var. *parkeri* Valley cholla
Category II (SMM rare)
Historical: No record.
Recent: Found in five blocks, all in the northeastern corner of the park, where it occurs on steep, often inaccessible slopes within coastal sage scrub (including that which has obviously burned in recent years).
Note: Plants were recently (2010, DSC) found at the Hollywood Bowl, located just west of Griffith Park (across the 101 Fwy.), far from known populations on the northeastern side of the park, so it is possible this species occurs more widely here.

Opuntia littoralis/oricola Coast prickly-pear
Category II (SMM rare)
Historical: *O. oricola* is known from one collection, UC306247 ("Hollywood", A. Davidson, May 1916); no specimen record of *O. littoralis*.
Recent: "Coast prickly-pear" is known from small patches within at least 9 blocks in the park, mainly at the lower elevations at the park's borders within coastal sage scrub dominated by coast buckwheat *Eriogonum fasciculatum*.
Note: Several patches of non-native Indian-fig *O. ficus-indica* also occur at these urban-interface sites, but hybridization has not been investigated here. Whether the plants currently at Griffith Park are referable to *O. littoralis* or *O. oricola* is not known; although the 1916 collection is listed as *oricola*, *O. littoralis* is actually the expected taxon in the eastern Santa Monica Mountains, with *oricola* occurring along the immediate coast (T. Sajar, pers. comm.). Clearly, this situation should be resolved, by careful photography and/or collection.

CONVOLVULACEAE

Convolvulus simulans Clay bindweed
Category I (CNPS 4.2)
Historical: One collection, RSA398346 ("Brumholly Hill, Hollywood", A. Davidson, n.d. [probably c. 1900]
Recent: This species was "rediscovered" adjacent to the park in 2010 (Tarja Sagar), a population consisting of <10 plants growing on a moist, grassy slope on heavy clay just west of the park boundary (G5), near the only known local population of *Fritillaria biflora* chocolate lily and other localized taxa.

Several individuals were in bloom on 19 April 2010.
Note: Interestingly, a "Bronhill Dr." (cf. historical collection, above) exists with a mile west of this location, and heavy clay soil similar to that within block G5 is also found here.

CRASSULACEAE

Dudleya multicaulis Many-stemmed liveforever
Category I (CNPS 1B.2)
Historical: Three early collections (1905-1925) including RSA397814 ("Foothills N, between Vermont and Western Ave.", H.M. Oster, 27 Apr. 1924).
Recent: No record.
Note: This original location now includes lands occupied by Griffith Observatory, and may no longer exist. This species has not been found despite much searching near the observatory and in similar areas throughout park (incl. Royce Cyn., Brush Cyn., all peaks). However, because of its small size, inconspicuous appearance, and tendency to grow within grasses taller than itself, it should not necessarily be considered extirpated from the park. Extant populations are known from the eastern San Gabriel Valley, including in fairly urbanized areas, so it may yet be located, perhaps high on a steep slope atop a rock outcrop.

ERICACEAE

Arctostaphylos glandulosa ssp. *mollis* Eastwood's manzanita
Category III (Local)
Historical: Several collections from two populations (both still extant), the north side of Cahuenga Peak and just north of Mt. Hollywood.
Recent: Known from two areas of the park representing six blocks (one population, north of Mt. Hollywood, occurs at the intersection of four blocks). Plants are numerous (100s of individuals) on the northwest-facing summit of Cahuenga Peak, west along a high bench to Burbank Peak (>1,800' a.s.l.), where recently impacted by an arson-caused fire. The second population is much smaller (<20 plants), is located to the southeast, on a lower but very steep-sided ridge leading north from Mt. Hollywood.

Note: This species co-occurs with chaimse (*Adenostoma fasciculatum*) in both populations, forming a mixed manzanita-chamise chaparral, possibly maintained by consistent a spring/early summer marine layer that forms above c. 1,500' in the Los Angeles Basin. This Mt. Hollywood site has been impacted even more severely by recent (2007) fire than the main population, yet most burned individuals appear to have quickly re-sprouted. However, Mt. Hollywood plants that have *not* burned appear to be in the process of being overtaken by more vigorous, lower-elevation chaparral plants. Its absence from seemingly suitable habitat in the intervening peaks between Cahuenga Peak and Mt. Hollywood (incl. Mt. Chapel) is difficult to explain.

FABACEAE

Lotus argophyllus var. *argophyllus*
Category II (SMM rare)
Historical: One collection, UC75502 ("near Cahuenga Pass", coll. unk., June 1904). This species occurs on hot, arid sites, and if it persists, it may be discovered within the Cahuenga Peak burn area.
Recent: No record
Note: This species has been widely collected in the San Gabriel Mtns., so it may yet be found.

Lotus hamatus
Category II (SMM rare)
Historical: Known from one collection, RSA406153 ("Providencia Ranch, behind Mt. Hollywood" [= lands now occupied by Forest Lawn cemetery], A. Davidson, 28 May 1905).
Recent: No record.
Note: Like above species, widely collected in the San Gabriel Mtns. (and Channel Islands); however, confusion with other annual species of *Lotus* has apparently resulted in many erroneous reports of this taxon from the Santa Monica Mountains, none of which have been confirmed (per T. Sagar). Therefore, pending an examination of the actual specimen, this record is best considered provisional.

Pickeringia montana Chaparral-pea
Category II (SMM rare)
Historical: Known from one collection, RSA412027 ("Hollywood", A. Davidson, June 1893).
Recent: Discovered during an exploration of the burn area atop Cahuenga Peak on 13 May 2010 (DSC), a sizable population of this striking shrub consists of patches of several dozen plants spread across the high plateau that runs from Cahuenga Peak to Burbank Peak (D3, E2).

Note: Subsequent review of previous photographs taken by DSC confirm that this species emerged in 2009 but was not recognized as such until it bloomed the following year. This plant is poorly represented in the Santa Monica Mountains, with most known populations near Topanga Canyon in the central-western portion of the range (T. Sagar, pers. comm.). The location of the 1893 collection ("Hollywood") is not known.

Trifolium microcephalum Small-headed field clover
Category II (SMM rare)
Historical: No record.
Recent: Photographed by J. Ochoa at "Fern Canyon" (E8/F8) on 24 April 2008. Confirmation/collection is desirable. Photograph by Jorge Ochoa.

FAGAGEAE

Juglans californica Southern California black walnut
Category I (CNPS 4.2)
Historical: Several specimens
Recent: Widespread and very common throughout park, forming near-solid stands along Mt. Hollywood Rd. (D6), and in the southeastern corner of the park (esp. G8); not tracked as a target/rare plant.

Quercus durata var. *gabrielensis* San Gabriel Mountains leather oak
Category I (CNPS 4.2)
Historical: No record.
Recent: Single collection in E7, at the northeastern base of Bee Rock (RSA652868, R. Martinolich, 7 Apr. 1991). This plant was not searched-for during the Rare Plant Survey, and likely persists. A possible candidate for this species, showing the distinctive rolled-under leaf edges and fuzzy leaf undersides was photographed in 2009 atop the ridge between Cahuenga and Burbank peaks (D3; see photo), but pending further collection and review, was not included as a confirmed record. Clearly, more study/collection of the "scrub oaks" in Griffith Park is desirable, especially since the park lies along the likely introgression zone between the Santa Monica and San Gabriel mountains flora.

Quercus wislizenii var. *fructescens* Canyon live oak
Category II (SMM rare)
Historical: No record.
Recent: Two populations consisting of evenly-aged clusters (= clones?) within chaparral have been discovered (and collected) since 2008, one on a north-facing slope in the Vermont Canyon area (F7), between the tennis courts and Mt. Hollywood; the other on the high plateau along the ridgeline between Cahuenga Peak and Burbank Peak (D3), within the manzanita-chamise chaparral area.

Note: Like the manzanita in the park (see above), these populations appear to be true relicts. Both are on north-facing slopes within chaparral, neither population has been observed with acorns, and the viability of each seems limited. It may not be coincidental that both taxa are restricted to the high ridge of Cahuenga Peak and vic. Mt. Hollywood, following a similar distribution as manzanita.

GERANIACEAE

Erodium macrophyllum Large-leaved stork's-bill
Category I (CNPS 1B.1)
Historical: One collection, RSA390952 ("Providencia Ranch, Hollywood" [=lands now occupied by Forest Lawn cemetery], A. Davidson, 12 May 1906].
Recent: No record.
Note: Modern collections are known from the Santa Clarita area and the western Santa Monica Mtns., so it may yet be rediscovered locally.

HYDROPHYLLACEAE

Phacelia hubbyi Hubby's phacelia
Category I (CNPS 4.2)
Historical: No record.
Recent: Two known populations of 100+ plants each, both on loose, eroding sedimentary rock on very steep slopes in the extreme southeastern corner of the park (F8, F9). This taxon blooms early and briefly; plants in F8 were in full bloom by late March (26 Mar. 2010).

Note: Formerly considered a variety of the more widespread *Phacelia cicutaria* ("var. *hubbyi*"), recent evidence suggests that this is in fact a distinct species (fide A. Sanders), and a southwestern California endemic. This is still fairly common within the urban Los Angeles area on its distinctive microhabitat (exposed sedimentary layers), and more

populations may await discovery on this substrate in the southeastern corner of the park. Photograph by Gerry Hans.

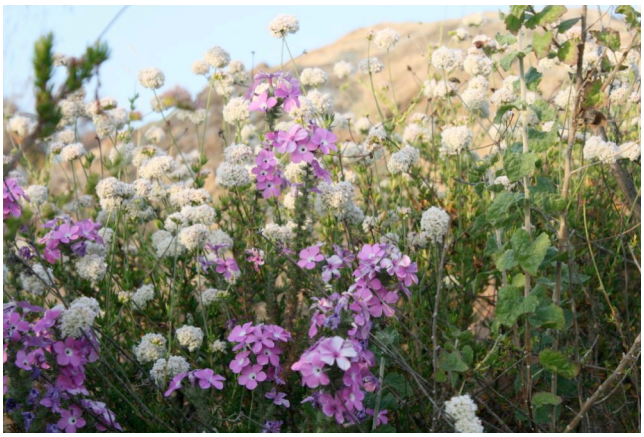
LYTHRACEAE

Lythrum californicum
Category II (SMM rare)
Historical: One collection, UC56517 ("Griffith Park," E. Braunton, 13 June 1902), may have been actually collected along the Los Angeles River, as little of the swampy riparian habitat favored by this species exists in Griffith Park.
Recent: No record.
Note: This taxon has been widely collected in Santa Monica and San Gabriel Mtns., but is felt to be extirpated from the Los Angeles Basin (*fide* R. Fisher).

PAPAVERACEAE

Meconella denticulata Small-flowered meconella
Category II (SMM rare)
Historical: One collection (to UCR, RSA, LA) from "Griffith Park" by M. Hilend, 28 Apr. 1928.
Recent: No record.
Note: Several collections exist from nearby Verdugo Mtns., so it may be discovered in the park in future years, particularly following fire.

POLEMONIACEAE



Leptodactylon californicus Prickly phlox
Category III (Local)
Historical: Four collections, 1861-1983.
Recent: Known from 5-6 blocks perhaps representing fewer than 10 individual plants, including individuals in the Cahuenga Peak/Mt. Lee area (D3/E3/E4); and at three points along the arc of the ridge that forms upper Western Canyon (F5/F6/G6).
Note: This striking, distinctive shrub is seemingly on the brink of disappearance in the park, and is confined to dense, unburned chaparral on steep, eroding ridges and slopes, and never numerous. Photograph by Gerry Hans.

Leptosiphon grandiflorus Large-flowered linanthus
Category I (CNPS 4.2)
Historical: One collection, RSA468530 ("Griffith Park", A. Eatherton, May 1930).
Recent: No record.
Note: There are just two collections known from Los Angeles Co., so it is unlikely to be found in the park, and may be extirpated in the area.

Microsteris gracilis var. *gracilis* Slender phlox
Category II (SMM Rare)
Historical: One collection, LA52353 ("Griffith Park," Epling, n.d.).
Recent: No record.
Note: Only early collections from Los Angeles Basin, probably at sites long since developed, and possibly extirpated from the park.

Navarretia atractyloides Hook-leaved navarretia
Category III (Local)
Historical: One collection (UC52510, E. Braunton, 13 June 1902, from "n[orth] side Griffith Park").
Recent: A plant collected in a small, sandy debris basin just south of Forest Lawn Dr. - also on the north side of Griffith Park - in 2008 (C2) was identified as this species.
Note: Efforts to relocate a population in 2010 were not successful; however, a similar plant, *Navarretia hamata* ssp. *hamata* (shown here), previously uncollected in the park, was found to be locally common in 2010, with pockets atop Cahuenga Peak and on a dry ridge in the far northeastern corner of the park (B7). We recommend examining all local collections of *N. atractyloides* for comparison with (the apparently more common) *N. hamata*.

POLYGONACEAE

Eriogonum cithariforme Cithara buckwheat
Category II (SMM rare)
Historical: No record.
Recent: Reported (Jorge Ochoa) near head of Royce Canyon (D5) in 2009; however, the photographs provided are not definitive, and confirmation/collection is desirable (subsequent searches have found only *E. elongatum* here). Photograph by Jorge Ochoa.

Eriogonum davidsonii Davidson's buckwheat
Category II (SMM rare)
Historical: Two collections from 1905 (RSA393173, A. Davidson; RSA393180, B.C. Templeton, both listed as "Hollywood"). No information is known about where this species may (have occurred) in the park. The "expected" basal-leaved buckwheat in the park is *Eriogonum elongatum*, which is locally common on steep, exposed slopes, often on eroding or rocky soil.
Recent: No record.

Note: There exist 100+ collections from the San Gabriel Mtns., yet none from the Santa Monica Mtns. except the above collection(s), suggesting that the plant may yet be found at Griffith Park, which supports several taxa with a largely San-Gabriel-Mtns. distribution. Still, the original specimens should be reviewed for accuracy.

PORTULACACEAE

Calandrinia breweri Brewer's redmaids
Category I (CNPS 4.2)
Historical: One collection, JEPS17234 ("Vermont Canyon, Los Angeles, Griffith Park", J.T. Howell, 1928)
Recent: No record.
Note: This species has been recently collected in the Verdugo Mtns., so it may eventually be found in the park, particularly in sandy areas or recent burns.

PRIMULACEAE

Dodecatheon clevelandii Cleveland's shooting-star
Category III (Local)
Historical: Three collections from Griffith Park (no further location information)
Recent: One of the rarest, and most stunning, wildflowers in the park, a white form (shown here) is confined to grassy moss gardens on the south slope of Royce Canyon (D5), where it blooms in early spring (February/March).
Note: The number of emerging plants is variable from year to year, but several dozen individuals may be present in a "good" year. Despite considerable searching, this species has not been found elsewhere in the park, although it would be expected to occur at nearby Mt. Bell in similar habitat (E6). Photograph by Jorge Ochoa.

ROSACEAE

Holodiscus discolor Creambush
Category III (Local)
Historical: One collection from "Griffith Park" (UC56556, E. Braunton, 13 June 1902).
Recent: Rediscovered in 2009 by J. Ochoa in a steep upper tributary of Spring Canyon uphill of Vista del Valle Rd. (E7). A second occurrence (one plant) was reported in spring 2010 by J. Sullivan from Royce Canyon, along the creekbed, but has not yet been verified/collected. Photograph by Jorge Ochoa.

Saxifraga californica California saxifrage
Category III (Local)
Historical: No record.
Recent: Fairly common in moss gardens in Royce Canyon (D5), and two small patches found on the north slope of Mt. Bell (E6), blooming in early spring (February).

SALICACEAE

Populus balsamifera Black cottonwood
Category III (Local)
Historical: No record.
Recent: Known from a handful of trees near permanent water in two drainages, Brush Canyon (F5), and Coolidge Canyon (G8), in the southeastern corner of the park, both near permanent water, the latter site maintained by urban runoff.

Populus fremontii Fremont cottonwood
Cateogry III (Local)
Historical: No record.
Recent: Cluster of c. 10 trees at mouth of Oak Canyon, just west of Travel Town. An abundant species along the Los Angeles River channel adjacent to the park, this appears to be the only known occurrence away from the river bottom.

Salix gooddingii Black willow
Category II (SMM rare)
Historical: No record.
Recent: Willows fitting this species have been observed in lower Brush Canyon (near debris basin; F4, F5); however, confirmation and further collection is desirable.

Note: This species is also presumably common along the Los Angeles River, which borders the park to the north and east.

SOLANACEAE

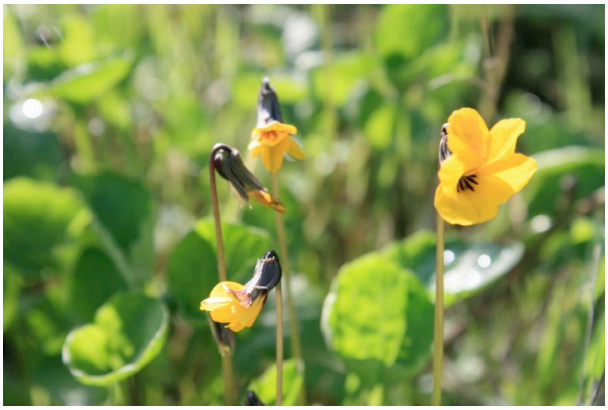
Nicotiana quadrivalvis Indian tobacco
Category II (SMM rare)
Historical: No record.
Recent: One large plant in bloom was photographed (Jorge Ochoa) 22 April 2008 on the floor of the drainage behind Vermont Canyon tennis courts; confirmation/collection desirable.
Note: This observation was made the year following a major fire, which may have resulted in its appearance (and overall rarity locally). Photograph by Jorge Ochoa.

URTICACEAE

Hesperocnide tenella Western stinging nettle
Category II (SMM rare)
Historical: One collection from "Griffith Park" (LA 51805, Epling, 1973).
Recent: Apparently widespread in shady areas of the park (fide J. Ochoa). We did not include it as a target species due to potential confusion with the similar More collection/study is needed, particularly to avoid confusion with dwarf nettle *Urtica urens*. Photograph by Jorge Ochoa

VIOLACEAE

Viola pedunculata Johnny-jump-up
Category III (Local)
Historical: Two (or the same?) collections from "Griffith Park" at UCLA.
Recent: Found in only one drainage (Royce Canyon) in one block (D5), where fairly common in mesic, grassy patches of moss gardens on the north-facing slope, blooming by April.
Note: Its rarity in the park is difficult to explain, and is simply one of the floristic quirks of the flora of Griffith Park. However, it is worth noting that several otherwise common and widespread (in California) native annuals that we found to be rare or absent in the park (and otherwise common in the Santa Monica/San Gabriel mountains) are, like *Viola*, pollinated by large



native butterflies such as fritillaries (incl. paintbrushes, *Castilleja* spp.); these large butterflies appear to be extirpated in the park (none seen in four summers of observation in the park, 2007-10; D.S. Cooper, pers. obs.), so perhaps there is a link between the two phenomena. Other annual wildflower/insect links deserve study; for example, nearly every representative of the phlox family (Polemoniaceae), which are also pollinated by butterflies, is rare or extirpated in the park. Photograph by Gerry Hans.

VITACEAE

Vitis girdiana Desert wild grape
Category II (SMM rare)
Historical: Two specimens (LA), no location data other than "Griffith Park" (1928, 1965).
Recent: The only two park occurrences appear to be around the large water tank in upper Oak Cyn. (C5), and at a seep north of the top of Bee Rock (E7); just outside the park's northwestern boundary, this vine is fairly common along Forest Lawn Dr. (C2/C3), where it probably persists as a remnant of the historical Los Angeles River flora.
Note: Oddly, this grape has not been found in canyons on the south side of the park (incl. Royce, Brush), which drain the Ballona Creek watershed, while the extant populations are in the Los Angeles River watershed.

MONOCOTS

JUNCACEAE

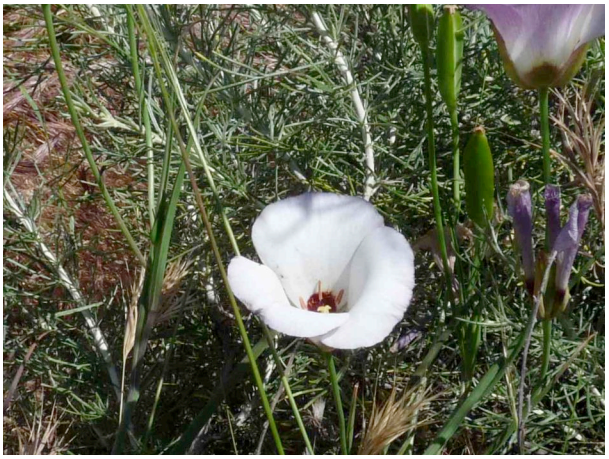
Juncus rugulosus wrinkled rush
Category III (Local)
Historical: Collected from the Los Angeles River at Griffith Park (RSA3968078, A. Davidson, 01 Sept. 1923).
Recent: Known from a single location (E7) along Spring Canyon, where growing along a rocky, seasonal drainage with other scarce species (incl. *Juncus macrophyllus*, *Mimulus cardinalis*) at the southern base of Bee Rock.

Juncus textilis basket rush
Category II (SMM rare)
Historical: No record.
Recent: Known from two blocks (C5, F5), both semi-permanent water along canyon bottoms: Oak Canyon (where fed from run-off from adjacent Forest Lawn cemetery), and lower Brush Canyon.

LILIACEAE

Allium peninsulare Peninsular onion
Category II (SMM rare)
Historical: One collection, LA21590 ("Griffith Park", Epling, 1963)
Recent: Known from two populations in two blocks (D5, E6) within the park, both within moss gardens (south of Royce Cyn.; Mt. Bell). The largest, with several hundred plants (in 2010), is found on the southern slope of upper Royce Canyon.
Note: Although this rock formation extends along the north face of the main ridge of the park, both west (adj. to Forest Lawn cemetery) and east of here, to Mt. Bell, near the center of the park, this species is still highly local.

Brodiaea terrestris var. *kernensis* Dwarf brodiaea
Category II (SMM rare)
Historical: No record; however, RSA378011 "*Triteleia laxa*", coll. in "Hollywood" by A. Davidson, c. 1900?, may be referable to this species, as *Triteleia laxa* is not found in the Los Angeles area, and superficially resembles *Brodiaea terrestris* (or it may have been mislabled).
Recent: Discovered on Forest Lawn property (D4) on 09 May 2010. This population consists of c. 100 plants growing on a low bench on the south side of lower Royce/Sennet Canyon.
Note: The actual site where the plant occurs appears to have been cleared of vegetation, possibly through mowing (and is otherwise surrounded by oak-sycamore woodland and coastal sage scrub), but still supports this and other geophytes (incl. golden-stars *Bloomeria crocea*). This indicates that the soil surface was not disced/bull-dozed or seriously disturbed, and occasional mowing may well have helped this stunning wildflower survive locally.



Calochortus catalinae Catalina mariposa-lily
Category I (CNPS 4.2)
Historical: One specimen, RSA15196 ("Cahuenga Pass", C.B. Wolf, 1926)
Recent: Found in up to 8 blocks, with nearly all plants on slopes in the south-central portion of the park, on heavy clay, often moist with a lush growth of grasses and other geophytes (e.g., golden-stars *Bloomeria crocea*, blue-eyed grass *Sisyrinchium bellum*). Two populations with 100+ plants are found in blocks F5 and F6.

Calochortus clavatus var. *gracilis* Slender mariposa-lily
Category I (CNPS 1B.2)
Historical: No record.
Recent: Single tiny population on north side of Mt. Chapel (D5), consisting of <10 plants growing in clay on an otherwise steep, rocky slope within mixed chaparral.
This species was only discovered in the park in 2008 (Gerry Hans), and no other populations in or adjacent to the park are known. It may be told from the more

widespread *C. clavatus* var. *clavatus* by the presence of reddish-brown lines above the nectaries, (barely) visible here.

Calochortus plummerae Plummer's mariposa-lily
Category I (CNPS 1B.2)
Historical: One specimen, LA29033 ("Bronson Canyon" [= Brush Canyon], Hood, n.d.)
Recent: Found in 13 blocks; fairly common on higher ridges by late May, especially in western portion of park (E3, E4, E5).
Note: This spectacular lily was invariably found on thin, gravelly soil, in association with yucca *Hesperoyucca whipplei*, giant stipa *Acnatherum coronaratum*, coast buckwheat *Eriogonum fasciculatum,* and chamise *Adenostoma fasciculatum*. It typically occurs in areas free of annual grass, such as open spaces within chaparral and coastal sage scrub, and not uncommonly along the borders of smaller trails and footpaths, where foot traffic limits grass sufficiently but is not so severe as to trample the lilies as they emerge.

Fritillaria biflora Chocolate lily
Category III (Local)
Historical: Two collections (during the same month, Mar. 1929) from "Griffith Park" (RSA367719 and 367732).
Recent: Currently known from a single location, a mesic, north-facing, clay-rich slope just off the southwestern boundary of the park above Ferndell at "One-Mile Tree" (G5), where it occurs with *Calochortus catalinae* and other geophytes. Photograph by Gerry Hans.

Lilium humboldtii var. *ocellatum* Humboldt lily
Category I (CNPS 4.2)
Historical: No record.
Recent: Found in just four drainages within six blocks, each site along permanent streams well-shaded by mature coast live oaks *Quercus agrifolia*. These include Brush Canyon (E5/F5; the largest population with 50+ plants); Sennet Canyon (extending onto Forest Lawn property), Spring Canyon (three separate tributaries, both north and south of Bee Rock); and

Fern Canyon (<5 plants). Though no local specimen exists, we have not gotten ourselves to collect this emblematic (and enormous) Griffith Park flower. Photograph by Gerry Hans.

Zigadenus fremontii Fremont star-lily
Category III (Local)
Historical: Three specimens, incl. UCR17246 ("Griffith Park off Bronson", A. Mayers, 14 May 1978).
Recent: Found within five blocks, the largest population occurring in a grassy opening on the eastern slope of upper Brush Canyon, within a very large population of *Calochortus catalinae* and other clay-dwelling annuals. Other plants occur in mesic, grassy openings within chaparral and scrub, typically on north-facing slopes near peaks (e.g., Mt. Chapel, Mt. Bell).
Note: Photograph by Gerry Hans.

ORCHIDACEAE

Piperia cooperi Cooper's rein orchid
Category I (CNPS 4.2)
Historical: One collection, RSA382729 ("Providencia Ranch, Hollywood" [= lands now occupied by Forest Lawn cemetery], A. Davidson, 12 May 1906)
Recent: No record.
Note: Only six collections from Los Angeles Co. since 1950, all but one from Santa Catalina Isl., so probably unlikely to be found in the park.

POACEAE

Agrostis exarata Spike bentgrass
Category II (SMM-rare)
Historical: No record.
Recent: Reported (Richard Fisher) from Royce Canyon, without details. Confirmation/collection is desirable.