Wildlife of Fern Dell, Griffith Park
Los Angeles, California

Brood of American Robins (*Turdus migratorius*) at nest in palm, lower Fern Dell, May 21, 2013 (photo by Michael C. Long).

Prepared for:

Friends of Griffith Park

by:

Daniel S. Cooper
Cooper Ecological Monitoring, Inc.
255 Satinwood Ave.
Oak Park, CA 91377
wwwcooperecological.com
dan@cooperecological.com

March 10, 2014

SUMMARY

We report on a seven-month study of the wildlife of Fern Dell, Griffith Park, in 2013, which included springtime nesting bird surveys from April to June, and a mammal survey using wildlife cameras between June and October. From these surveys, we found evidence of at least potential breeding for nearly 30 species of birds, including two raptors (Cooper's Hawk and Great Horned Owl), and document the scarcity of several resident scrubland birds along Fern Dell proper, mainly of which were recorded only in habitat along the borders of the study area. We detected 13 species of mammals, including most of the large and mid-sized mammals known to occur in Griffith Park with the exception of gray fox, notably including "P-22", the resident mountain lion in the park. We documented few reptiles or amphibians, which probably reflects both the high human usage of the site as well as the lack of downed wood, native shrubs, and other habitat features that could support them. This represents the first survey and analysis of the fauna of Fern Dell.

INTRODUCTION

Fern Dell, constructed over a period of several years in the early 1900s, is one of the oldest picnic and hiking areas in Los Angeles, and remains a major attraction of Griffith Park, itself the largest registered municipal landmark in the U.S. (PGAdesign 2012). Essentially a modified canyon bottom as it emerges from rugged hills (i.e., the interior of Griffith Park), its 20+ acres are dominated by a stream course that has been confined and altered over the years using both natural materials as well as masonry, stonework, and other construction materials. Water, piped into the site but augmented by natural artesian springs, flows perennially through its lower/downstream half, which is deeply shaded and planted with a variety of trees, large shrubs, and vines, including many historical specimens. Upstream, water flows rarely (and then only briefly), during the heaviest rain events.

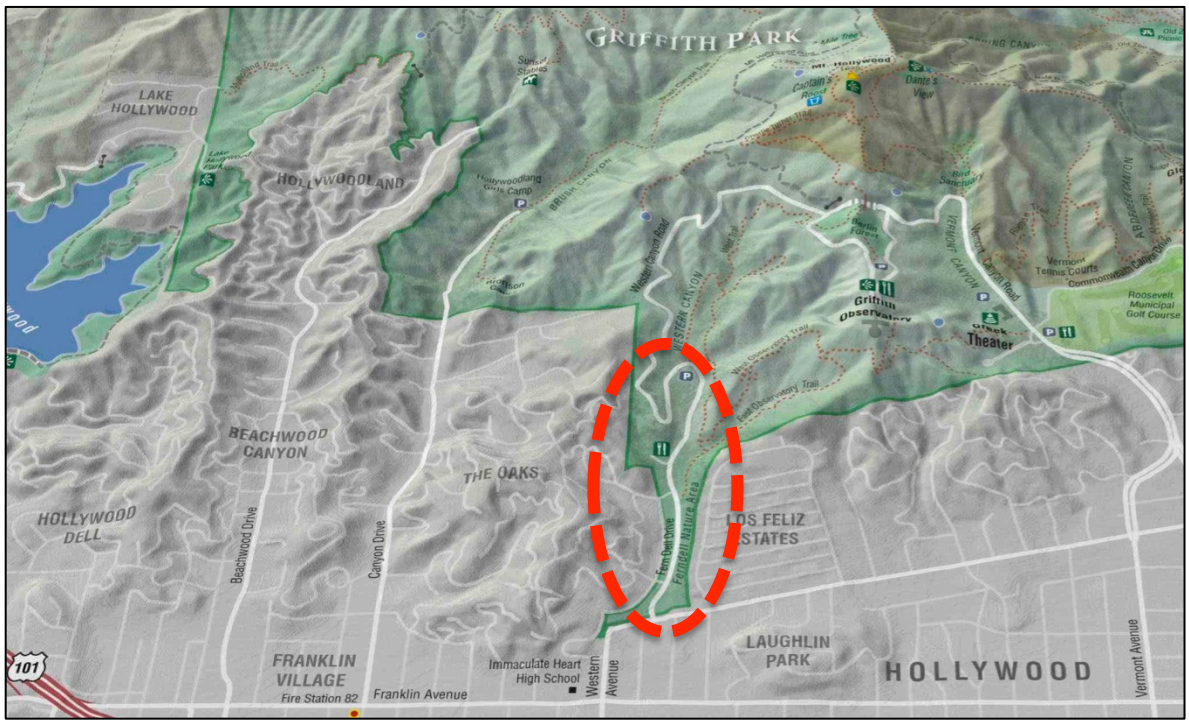
Pathways allow for a small number of clearly defined human movement routes through the lower half of Fern Dell, passing beside decades-old landscape and water features both above and below the level of the walking paths. By contrast, the upper half of Fern has less well-defined footpaths, and is relatively sunnier and drier, with sizable barren areas where human foot traffic is most intense. Upper Fern Dell is also less narrowly constricted by surrounding residential development of Los Feliz, and is more contiguous to adjacent natural open space of the park. Upper Fern Dell also includes the trailhead for several routes leading up into Griffith Park, including at least two to Griffith Observatory, which contributes to exceptionally high level of human foot traffic – using wildlife cameras, we estimated 500+ trips per day by hikers, dog-walkers and joggers along each of the more well-used paths during summer/fall 2013.

Ecologically, most of Griffith Park, including Fern Dell, is essentially a lower-foothill site in coastal southern California, with elevations ranging from near 100 meters a.s.l. along the Los Angeles River (northern and eastern boundary) up to just over 500 meters a.s.l. atop several peaks along a central ridge. The park features numerous steep seasonal drainages flowing down from ridges, a few of which have running water year-round (Figure 1). Daytime temperatures are hot and dry from late spring through fall, with cooler periods in late winter; average low/high temperatures in May are 58/75 degrees F, and 48/69 F in December (however, late summer temperatures, at least on ridges, frequently approach and occasionally

exceed 100 F). Most precipitation (from Pacific storms) falls in January and February, and averages around 15 inches per year (though many years are much drier[1]). Graded fire roads and informal footpaths form trails, and provide access the majority of the entire park.

The natural communities of Griffith Park have only recently been formally described and mapped (Melendrez 2004, Keely and Sawyer-Wolf 2006, AIS 2007, Cooper and Mathewson 2009), the majority of which are dominated by chaparral and scrub. The vegetation at Fern Dell is unusual for several reasons: it is essentially a mixed evergreen woodland, but its dominant trees represent both native and non-native species, as well as both planted and naturally-occurring individuals of those species (with distinctions between the four categories often obscure). Certain larger coast live oak, western sycamore and California bay are likely relicts of a time prior to the development of the site for a picnic and walking area. Others, such as pines (*Pinus* spp.) and coast redwood (*Sequoiadendron sempervirens*) are clearly introduced; however, a handful of white alder (*Alnus betulifolia*) along the lower stretch of the stream may be natural, or they may have been planted decades ago. The same may be said for the shrubs other plants of Fern Dell, including the famous ferns along the creek – most are non-native species that were brought in, but a few may be naturally-occurring.

Figure 1. Relief map of Griffith Park, showing location of Fern Dell (red dashed oval). Map courtesy of Cartifact, Inc.



[1] www.weather.com; data from Glendale, CA

METHODS

Following the mapping of Fern Dell by PGAdesign (2012), we divided the area into four areas for our surveys: upper Fern Dell, north/upstream of and including the area around Trail's Café; middle Fern Dell, which includes the irrigated portion of the stream between Trail's Café, south to a point roughly halfway down the lower half of the site; and lowermost Fern Dell (called the "Entry" by PGAdesign), the area south/downstream of Black Oak Drive, where the stream crosses east under Western Canyon Drive and runs southeast along the eastern edge of a grassy picnic area toward Los Feliz Blvd. (Figure 2).

Our study had two main components: a walking transect survey for birds and other wildlife between April 22 and June 4, 2013, and a wildlife camera conducted between June 30 and October 5 (Appendix A). In addition, we conducted two 2-hour evening visits for nocturnal birds and amphibians in June and August (Table 1).

Birds are readily detectable by sight and sound during the spring nesting season, and nesting birds are often used in biodiversity assessments because species are particularly dependent on a given habitat area at this time (as opposed to being present briefly, as in migration). As populations require successful breeding to persist in a given area, tracking potential nesting attempts is a good way to confirm colonization or extirpation in an area over time. Morning surveys lasted for around 2 hours each as observers (Cooper, Mickey Long, Kevin Long) slowly walked the main pathways of Fern Dell, listening for and observing birds and other wildlife with binoculars. All species and breeding activity were recorded on aerial photos, and the results compiled in a table of observations.

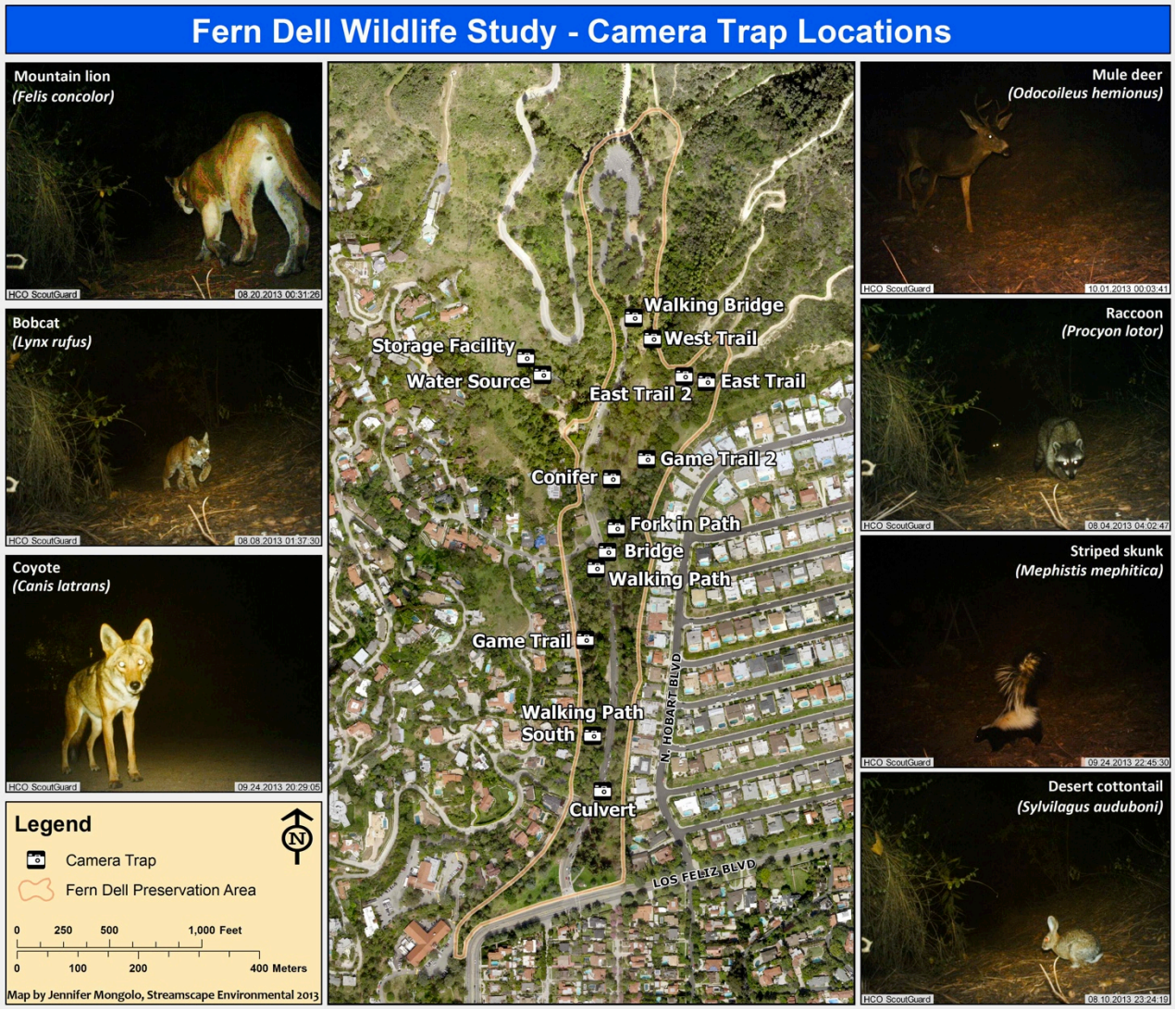
Table 1. Summary of bird surveys at Fern Dell, 2013.

Date	Time	Observers
April 22, 2013	8:15 – 10:20 AM	Dan Cooper, Mickey Long, Kevin Long
April 30, 2013	8:55 – 10:55 AM	Mickey Long, Kevin Long
May 7, 2013	9:25 – 11:35 AM	Mickey Long, Kevin Long
May 13, 2013	8:00 – 10:10 AM	Mickey Long, Kevin Long
May 21, 2013	8:45 – 10:45 AM	Mickey Long, Kevin Long
June 4, 2013	8:00 – 10:20 AM	Dan Cooper
June 19, 2013	8:30 – 10:30 PM	Miguel Ordeñana, Matt Whitmire
August 8, 2013	8:30 – 10:30 PM	Miguel Ordeñana, Matt Whitmire

For mammals, aside from three local species of squirrels (eastern fox squirrel *Sciurus niger*, western gray squirrel *Sciurus griseus*, and California ground-squirrel *Otospermophilus beecheyi*), most mammals are difficult to detect simply through direct observation. For this reason, we employed a network of "camera traps" placed in 13 locations within upper, middle, and lower Fern Dell (Figure 2, Table A1). These specialized wildlife cameras have sensors that take photographs when tripped by a moving object. The photographs are stored on a memory card and can be easily downloaded and analyzed at regular intervals (typically every 10-15 days). During 2013, our cameras were active a total of 268 camera-days. Locations were selected for being most likely to capture mid-sized and large mammals moving through the habitat, and to be representative of the areas where mammals might traverse, including

dirt roads, bridges, culverts, and game trails (small footpaths obviously used by large mammals).

Figure 2. Locations of camera traps set in Fern Dell, June – October 2013.



RESULTS

Bird Survey

A total of 30 potentially nesting bird species were recorded during the April – June bird survey (a handful of obvious transient migrants were also detected, and are discussed below). Of these, twelve were confirmed nesting, with the presence of an active nest, young, or adults observed carrying food or nesting material. These include Cooper's Hawk, Great Horned Owl, Allen's Hummingbird, Black-chinned Hummingbird, Nuttall's Woodpecker, Black Phoebe, Common Raven, Oak Titmouse, American Robin, Bushtit, California Towhee, Dark-eyed Junco, and Lesser Goldfinch. The remaining species were either considered "probable" or "possible" nesters, depending on whether a pair was present in suitable breeding habitat ("probable"), or simply a singing bird (or birds; "possible"). We also draw on prior observations (of DSC) from recent years, to augment the information below.

Cooper's Hawk (*Accipiter cooperi*)

An active nest was observed in a tall shamel ash (*Fraxinus udhei*) on April 30 just east of Trails Café in upper Fern Dell on April 30; at least one juvenile was heard vocalizing from this nest on June 4, documenting successful breeding. This is probably a regular phenomenon – 4 (calling) juveniles were observed on June 29, 2007 near upper Fern Dell (D.S. Cooper, unpubl. notes).

Red-tailed Hawk (*Buteo jamaicensis*)

One was in upper Fern Dell on April 22, the only detection. In 2007, an adult was observed carrying nesting material (June 29) over Trails Café, near the location of a 2013 Common Raven nest (see below). It is possible that ravens co-opted this nest in 2013 (D.S. Cooper, unpubl. data).

Band-tailed Pigeon (*Patagioenas fasciata*)

A pair on two dates (May 21, June 4) suggests local nesting, but this was not confirmed for Fern Dell proper.

Mourning Dove (*Zenaida macroura*)

Singles were singing on most visits, but no indication of nesting was obtained (which can be difficult; they are rarely seen carrying nesting material, and feed young by regurgitation rather than by carrying food items to them).

Great Horned Owl (*Bubo virginianus*)

This species was detected during both nighttime surveys in June and August, with two adults and a fledgling heard along the lowermost portion of the Observatory Trail, east of Trail's Café, on June 19, and two fledglings heard near the upper parking lot on August 8. This would seem to confirm local breeding. No other owl species were heard during these visits.

Anna's Hummingbird (*Calypte anna*)

Now apparently displaced by Allen's Hummingbird, the only record was of three birds, including a "singing" male, in upper Fern Dell on April 22. This species is presumably more frequent in the interior of the park, replaced by Allen's Hummingbird at the edge in more urban situations.

Allen's Hummingbird (*Selasphoris sasin*)
At least two active nests found, along the stream in lower/middle Fern Dell (at right, photo M. Long).

Black-chinned Hummingbird (*Archilochus alexandri*)
A female was observed carrying nesting material in upper Fern Dell on April 22; later, three birds were detected on June 4. The nesting distribution of this species requires clarification. It likely breeds high in sycamores but is simply difficult to detect, and is (now) probably outnumbered by the more common Allen's Hummingbird, especially in lower-most Fern Dell. Interestingly, 10 birds, including several displaying were recorded in the Fern Dell area (including upper Western Canyon) on both April 20 and June 29, 2007, and up to eight birds were detected in side canyons east of Fern Dell on late April and early June surveys the following year (2008; D.S. Cooper, unpubl. data).

Acorn Woodpecker (*Melanerpes formicivorus*)
Two birds recorded once, upper Fern Dell, where likely resident to the north/interior of the park. The rarity of this species elsewhere in Fern Dell during the study is difficult to explain; they are very common elsewhere in Griffith Park (but totally absent in some areas).

Nuttall's Woodpecker (Picoides nuttallii)
Two active nests were found in upper Fern Dell, and a pair in lower/middle Fern Dell on April 22 suggests a territory here as well.

Black Phoebe (*Sayornis nigricans*)
After single, singing birds were noted, family groups were noted on May 21 and June 4 (two) in both lower/middle and upper Fern Dell, indicating successful breeding.

Pacific-slope Flycatcher (*Empidonax difficilis*)
Up to six singing birds were detected throughout the period and in both upper and lower Fern Dell, though no indication of breeding was obtained by the end of the survey on June 4 (though this undoubtedly occurred). This species tends to nest under bridges and rock overhangs, and can require a more directed search than "casual birding" to find its nest.

Hutton's Vireo (*Vireo huttonii*)
Two singing on April 22 were the only ones detected. Its rarity here is odd, as it is a characteristic resident in foothill canyon habitat throughout the park (e.g., 6 singing birds counted in Western Canyon on June 29, 2007; D.S. Cooper, unpubl. data). Because of its habitat preference, and its loud song/calls, it would make a good candidate for a restoration indicator species.

Common Raven (*Corvus corax*)
An active nest was observed in a tall pine above Trails Café in upper Fern Dell on April 22; a pair with young in the same area on June 4 suggesting successful breeding.

Oak Titmouse (*Baelophorus inornatus*)
An active nest was in upper Fern Dell on April 22, and two birds accompanied by a likely juvenile was in the same area on June 4. This species, like House Wren and Hutton's Vireo, would make a good candidate for a restoration indicator species, as it is common in native oak woodland habitat throughout the park.

Bushtit (*Psaltriparia minima*)
After small numbers had been recorded through the survey period, an active nest was in lower/middle Fern Dell on May 13, and on June 4, upper Fern Dell saw two family groups and a bird nest-building just to the west.

Bewick's Wren (*Thryomanes bewickii*)
A single bird was recorded at lower/middle Fern Dell on three dates (singing on April 22 and May 7); four birds were singing at upper Fern Dell on April 22. Like several other chaparral and woodland species, presumably more common in the park interior; it would be a suitable indicator species for future habitat restoration.

House Wren (*Troglodytes aedon*)
One-two singing birds were found on several visits, with a juvenile at lower/middle Fern Dell on June 4 the only suggestion of breeding (though this bird could have wandered in from elsewhere in the park). This species appears to be genuinely scarce at Fern Dell (single bird calling, not singing, during a morning census of Fern Dell on April 20, 2007; D.S. Cooper, unpubl. data). It may be more common to the north, in upper Western Canyon (2-3 singing here on April 24, 2007, *Ibid*), and might make a good candidate for a restoration indicator species, as it nests commonly in sycamore-lined canyons throughout the region.

Wrentit (*Chamaea fasciata*)
One heard singing from upper Fern Dell in April 22 and two singing from lower/middle Fern Dell on June 4 were all in the lush landscaping at the edge of the residential area surrounding Fern Dell (see Spotted Towhee, another native-habitat-obligate species). The Wrentit would make a good candidate for a restoration indicator species.

American Robin (*Turdus migratorius*)
Multiple active territories (with occupied nests observed), mainly in lower/middle Fern Dell. A family group in lower Fern Dell on June 4 indicates successful breeding (at right, photo M. Long).

Northern Mockingbird (*Mimus polyglottos*)
Up to two singing males were detected, but no indication of nesting was obtained for this urban-adapted species.

Spotted Towhee (*Pipilo maculatus*)
Up to four singing birds were detected through the period, mainly from the lush landscaping in yards at the borders of Fern Dell; no indication of nesting in Fern Dell proper was obtained. The fact that this species favors dense native habitat would make it a good candidate for a restoration indicator species.

California Towhee (*Melozone crissalis*)
Pairs were found on several dates through the survey period, with one carrying either food or (more likely) nesting material on April 22 in lowermost Fern Dell. No young were detected, but fledging could have occurred later in the survey period.

Song Sparrow (*Melospiza melodia*)
A singing bird was singing on each visit in lower Fern Dell, possibly the same individual each time. This species is normally very common in riparian and brushy canyon habitat locally, and its rarity may be a function of the dearth of native ground cover which it prefers. It would be a good candidate for an indicator species for restoration.

Dark-eyed Junco (*Junco hyemalis*)
One of the more common species at Fern Dell, a family group was detected in upper Fern Dell during the first survey on April 22, with another pair carrying nesting material in the same area on the same date. Birds were observed carrying food to young in lower/middle Fern Dell on April 30, and a singing bird was in lowermost Fern Dell on May 21, indicating that breeding was probably widespread (at left, photo M. Long).

Bullock's Oriole (*Icterus bullockii*)
This conspicuous summer resident was detected just once, singing in lower/middle Fern Dell on April 22, and then possibly just a transient. More common along the Los Angeles River and even in urban areas with tall trees such as sycamores, its rarity in Fern Dell is difficult to explain.

Hooded Oriole (*Icterus cucullatus*)
One feeding on berries in lower/middle Fern Dell on June 4 was the only one detected. The scarcity of (planted) palms here probably limits the occurrence of this species at Fern Dell; it is common in urban areas nearby.

House Finch (*Haemorhous mexicanus*)
One-two singing males were recorded during each visit, but somewhat oddly, no indication of breeding was obtained. Like Hooded Oriole, this species nests commonly in urban areas to the south, and Fern Dell may simply be too "wild" for its taste.

Purple Finch (*Haemorhous purpureus*)
Pairs, including singing males (up to eight birds) were recorded most visits through the survey period, but no breeding evidence was obtained.

American Goldfinch (*Spinus tristis*)
A pair and a singing male were detected on the first visit (April 22) but not thereafter. This species can nest very early, so it is possible they were finished nesting; however, it is more likely this goldfinch occurs only as a winter resident (especially at sycamores) rather than a breeder in riparian areas as it does along the Los Angeles River.

Lesser Goldfinch (*Spinus psaltria*)
A family group was in upper Fern Dell on April 22, and another was in lower/middle Fern Dell on June 4; singing birds (1-2) were recorded most visits, and an adult was carrying nesting material in upper Fern Dell on June 4, suggesting a protracted breeding season (i.e., into mid-summer).

Several species of chaparral and woodland birds that are found commonly in Griffith Park went undetected during our survey, presumably because of the lack of dense native shrub cover at Fern Dell. These include California Quail (*Callipepla californica*) and California Thrasher (*Toxostoma crissalis*) year-round[2], both of which are present just upstream of Fern Dell in the more natural parts of Western Canyon (and throughout the park's interior).

Five additional species were detected during the 2013 breeding bird survey but aren't believed to have been nesting in or adjacent to Fern Dell during the survey period: Yellow-chevroned Parakeet (*Brotogeris chiihi*), Western Scrub-jay (*Aphelocoma californica*), Cedar Waxwing (*Bombycilla cedrorum*), Western Bluebird (*Sialia mexicana*) and Orange-crowned Warbler (*Oreothlypis celata*). The scrub-jay, bluebird and warbler might be at least irregular breeders here, since they are known to nest commonly in Griffith Park.

During winter, many additional species of birds arrive. Participants in Fern Dell on a Los Angeles Christmas Bird Count on Dec. 30, 2012[3] observed Red-shouldered Hawk (*Buteo lineatus*, 1), Rock Pigeon (*Columba livia*/domestic, 2), Red-breasted Sapsucker (*Sphyrapicus ruber*, 1), Northern Flicker (*Colaptes auratus*, 3), Red-breasted Nuthatch (*Sitta canadensis*, 2), White-breasted Nuthatch (*Sitta carolinensis*, 1), Ruby-crowned Kinglet (*Regulus calendula*, 6), Hermit Thrush (*Cathares guttatus*, 4), California Thrasher (*Toxostoma redivivum*, 4), Townsend's Warbler (*Setophaga townsendi*, 3), and Fox Sparrow (*Passerella illiaca*, 1). Additional wintering species include Golden-crowned Sparrow (*Zonotrichia auracapillus*), found mainly in the park interior (D.S. Cooper, unpubl. data). Most of these wintering species are found only in winter (October – March), though Red-shouldered Hawk, Rock Pigeon, and California Thrasher nest in or adjacent to the park.

During spring and fall migration, many additional species may be observed as they migrate through the area. Though they were not a target of this study, our surveys detected only a handful, including Wilson's Warbler (*Cardellina pusilla*; 3 on April 22), Western Tanager (*Piranga ludoviciana*; 1 on April 30), and Swainson's Thrush (*Catharus ustulatus*; 2 on May 7). Late April walks at Fern Dell/Western Canyon on April 20 and 24, 2007 (D.S. Cooper, unpubl. data) produced additional transients, all of which are expected spring migrants in the Los Angeles area: Turkey Vulture (*Cathartes aura*), Dusky Flycatcher (*Empidonax oberholseri*),

[2] See, e.g. http://ebird.org/ebird/view/checklist?subID=S5713805
[3] http://ebird.org/ebird/view/checklist?subID=S12421312

Ash-throated Flycatcher (*Myiarchus cinerascens*), Nashville Warbler (*Oreothlypis ruficapilla*), Black-throated Gray Warbler (*Setophaga nigrescens*), MacGillivray's Warbler (*Oporornis tolmiei*), Lazuli Bunting (*Passerina amoena*), and Black-headed Grosbeak (*Pheucticus melanocephalus*).

Mammals

Of approximately 40,000 images taken by our cameras, 388 were recognizable as (non-human) mammals (the remainder were typically of people, or were "blank"). These images are summarized in Appendix A. At least 13 species of mammals were detected using Fern Dell (including two that are non-native, eastern fox squirrel and Norway rat *Rattus norvigans*). The two largest mammals known from Griffith Park were detected, mountain lion (*Felis concolor*) and mule deer (*Odocoileus hemionus*), and all large and mid-sized mammals known from the park (Mathewson et al. 2008, Cooper and Mathewson 2009) were detected with the exception of gray fox (*Urocyon cinereoargenteus*). Due to the short duration of the survey, it is probably not possible to generalize about the distribution of mammal species throughout the entire site; however, it is noteworthy that mule deer were essentially confined to the upper portion of Fern Dell, with just a single capture on 132 camera-days in middle and lower Fern Dell (versus dozens in upper Fern Dell).

Mountain Lion (*Felis concolor*)
The mountain lion was the radio-collared "P-22", first photographed in February 2012 near the Hollywood Reservoir. It was captured on film just once, on August 20, 2013 by the camera "Game Trail 2", located along a footpath east across from Trail's Café. This lion has been known to wander widely within the park, so its appearance at Fern Dell is not a total surprise (at right).

Mule deer (*Odocoileus hemionus)*
Mule deer were captured on 48 camera-days from 8 locations (with some overlap likely – the same deer may have been photographed by different cameras on the same day, or by the same camera on different days), all but one located in upper Fern Dell. Identification of individual mule deer is difficult, but different males (bucks) may be counted on the basis of antler shape/# of "points". Our cameras revealed no fewer than three separate adult bucks during the survey, including a likely 8-pt. buck at "Conifer" (Figure B1), a likely 6-pt. buck at "Storage Facility" (Figure B2), and a likely 4-pt. buck at "Walking Bridge" (Figure B3). This represents a conservative count; additional photographs of bucks were too blurry/dark to determine whether they represent different individuals. In addition, at least two young males (two stubby horns) were photographed at "Game Trail 2" on Sept. 5 and 7 (Figures B4 and B5), and a single, possibly one of these two, was at "West Trail" on Sept. 12. Interestingly, a group of three mule deer at "Storage Facility" on Sept. 20 may have included these young

males as well, though one (the middle individual) looks almost fawn-like and it may represent a second family group in the area (Figure B6).

Bobcat (*Lynx rufus*)
Bobcats were detected at 5 locations throughout Fern Dell on 12 camera-days. At least two individuals were identified, one readily so by its colored ear-tags (part of an ongoing UCLA study on bobcat genetics and disease in the Santa Monica Mountains). This animal was photographed on August 13 at "Bridge" (Figure B7); interestingly, three days before (August 10), a second (un-tagged) individual was photographed by the same camera, with distinctly rusty, washed-out flank color (Figure B8). What appears to be a second ear-tagged bobcat (note black stripe pattern on right front leg, less-distinct spotting on flanks) was at "Game Trail 2" on August 10 (Figure B9). The remaining bobcat photos appear to show at least one, and possibly as many as three more un-tagged individuals, one with paler, almost whitish flank coloration photographed at "Game Trail 2" on August 29 (Figure B10); rustier individuals at "Game Trail 2" earlier in the month (Figures B11 and B12); and an apparent young animal at both "Game Trail" and at "Walking Path" in July (Figures B13 and B14).

Coyote (*Canis latrans*)
Coyote was the most frequently recorded mammal, photographed at all camera stations on 117 camera-days. Groups of 2-3 coyotes were frequently photographed, as expected. Due to the sheer number of images and the similarity of individuals (hundreds of photographs), we did not attempt to analyze coyote images to try to determine the total number of individuals involved.

Raccoon (*Procyon lotor*)
Raccoons were detected on 23 camera-days from 7 sites, but most activity was inside a small culvert, where up to three individuals at a time were recorded.

Striped skunk (*Mephistis mephitica*)
Skunks were photographed, always singly on 21 camera-days at scattered sites. Unlike other areas of the park, the skunk population, at least based on the results of the camera study, does not appear unusually large.

Squirrels
All three species known from Fern Dell were photographed by our cameras, with the most commonly-photographed being western gray squirrel (79 camera-days). Eastern fox-squirrel showed up on 28 camera days, and California ground-squirrel was just found on a single camera day at one site (both gray and fox squirrels were recorded much more widely). Since ground-squirrels tend to not stray far for their burrow areas, it is likely that none of the camera locations coincided with active burrow complexes.

Both western gray and eastern fox squirrel were recorded most often at the "Game Trail 2" site (24 and 6 camera-days, respectively). The western gray squirrel was detected beneath the roadbed at "Culvert", where neither of the other squirrel species were observed; interestingly, eastern fox-squirrel was not captured at the West Trail site, where western gray squirrel was photographed on 13 camera-days.

Virginia opossum (*Didelphis virginiana*)
Oddly uncommon, opossum was only detected at a single site ("Bridge"), on seven camera-days. However, it is largely an arboreal species and would not be expected to be captured on film frequently.

Desert cottontail (*Sylvilagus auduboni*)
Cottontail rabbits were photographed on 24 camera-days, mainly at the "Game Trail 2" site. Like ground-squirrel, they may simply not wander from preferred areas to feed, and hence were not detected widely.

Rats
Of the 27 camera-days in which rats were detected, most were within the same culvert that captured the many raccoon images ("Culvert" camera). The number of rat species involved is not known; most appear to be the Norway rat (*Rattus norvigans*), a non-native pest species identified by its brownish pelage, rather short tail (shorter than head + body length) and blunt-tipped face. At least one appears to be a native woodrat (at right), probably the dusky-footed woodrat (*Neotoma fuscipes*), moving through the culvert on July 31, "bookended" by images of probable Norway rats.

Of additional note, birds were occasionally recorded on the cameras, except for "Water Source", which predictably captured many images (267) of birds of six species coming in for water between Sept. 8-21. All six are common visitors to Fern Dell (common raven, oak titmouse, dark-eyed junco, white-crowned sparrow, California towhee, house finch), so are not analyzed further.

Reptiles/Amphibians
Spring is not always the ideal time to search for reptiles and amphibians in the Los Angeles area – days are often too cool for reptiles (and overcast through the morning), yet there is often too little rain to bring out amphibians to the surface. Still, from this survey and data recorded on prior visits, Fern Dell itself appears to be exceptionally poor reptile habitat, presumably because of the high human visitation and soil disturbance.

We have evidence for two ubiquitous species, western fence-lizard *Scelorporus occidentalis* (two observed on May 13, 2013; four were in "upper Fern Dell" on April 24, 2007; D.S. Cooper, unpubl. data) and Pacific tree frog *Pseudocris regilla* (two heard either at Fern Dell or in a side canyon just to the east on Jan. 30, 2008 (D. Cooper, unpubl. data).

Other common herptiles known from Griffith Park near Fern Dell include southern Pacific rattlesnake (*Crotalus oreganus helleri*), Pacific gopher snake (*Pituophis cantifer cantifer*), striped racer (*Coluber lateralis lateralis*) and San Bernardino ringneck snake (*Diadophis punctatus modestus*), the latter recorded recently as a roadkill on September 26, 2013 (Gerry Hans; specimen to LACM). All would be expected to occur at least occasionally at Fern Dell, or adjacent to it (Cooper and Mathewson 2009). Other lizard species documented in Griffith Park that could occur at Fern Dell include southern alligator lizard (*Elgaria multicarinata webbii*) and possibly western skink (*Plestidon skiltonianus skiltonianus*).

In addition to incidental observations during this survey, on Jan. 30, 2008, DSC spent two hours searching for salamanders in Fern Dell and side canyons to the east, finding none. It is likely that the lack of downed wood, leaf litter, and other natural debris in Fern Dell has rendered the site unusable for amphibians; two slender-salamanders *Batrachoseps* sp. were found in lower Royce Canyon later that day, and three were at Coolidge Canyon, all under oak bark on the ground, the next day (Feb. 1, 2008). The expected species would be the black-bellied slender-salamander *B. nigriventris*, though the nearly-identical *B. major*, could also occur. Western toad (*Anaxyrus boreas halophilus*) could also occur, particularly with modest habitat restoration, as it breeds commonly in nearby Brush Canyon.

Other Wildlife

Invertebrates were not covered by our survey, but we made an effort to record all observations of butterflies, since they are unique in being so conspicuous. Just five species were detected during the bird survey, which coincided well with what is typically peak butterfly activity in the area (April-June). Four species are very widespread, more or less urban-adapted species that are also widespread in urban areas of Los Angeles [western tiger swallowtail (*Papilio rutulus*), cabbage white (*Pieris rapae*), mourning cloak (*Nymphalis antiopa*) and gulf fritillary (*Agraulis vanillae*)], while one, the California sister (*Adelpha californica*), is more of a wildland species, closely tied to oaks.

No special effort was made which may have detected additional species; interestingly, none of the familiar blues and hairstreaks typical of native scrub or riparian habitats were noted, mirroring the pattern with resident scrubland birds being rather scarce in Fern Dell proper (e.g., wrentit, California thrasher). The population of California sister in Fern Dell is probably low as only a single individual was observed, at upper Fern Dell (on May 13, 2013); prior to this, one was in the same area on April 24, 2007 (D.S. Cooper, unpubl. data). This species is rarely abundant even in its preferred habitat in the Santa Monica Mountains, little-disturbed coast live oak woodland, but is usually present and conspicuous through the spring/summer where found (pers. obs.).

Two other conspicuous animal species were noted during our survey that deserve mention, goldfish (*Carassius auratus*) and crayfish (species undetermined); we observed both to be common in the perennial stretch of the creek in lower Fern Dell.

Acknowledgments

Funding for this study was provided by Friends of Griffith Park. Special thanks are due to Gerry Hans who served as a liaison between FOGP and Cooper Ecological. Fieldwork was conducted by Miguel Ordeñana (wildlife cameras, owl surveys), Mickey and Kevin Long

(bird survey), and Matt Whitmire (owl surveys). Jennifer Mongolo assisted with photo sorting and the camera survey map.

Literature Cited

AIS 2007. Mapping descriptions, USGS-NPS Vegetation mapping program, Santa Monica Mountains National Recreation Area. Report by Aerial Information Systems, Inc., 112 First St., Redlands, CA 92373 (submitted to SMMNRA, Thousand Oaks, CA).

Cooper, D.S. and P. Mathewson. 2009. Griffith Park Wildlife Management Plan (Final). Prepared by Cooper Ecological Monitoring, Inc. for the Los Angeles Dept. of Recreation and Parks. 22 January 2009. Available online at: http://www.griffithparkwildlife.org.

Keeler-Wolf, T. and J.M. Evans. 2006. Vegetation Classification of the Santa Monica Mountains National Recreation Area and Environs in Ventura and Los Angeles Counties, California. Version 1-Association Level and Specific Alliances (Report submitted to the National Park Service, SMMNRA, Thousand Oaks, CA).

Mathewson, P., S. Spehar and D.S. Cooper. 2008. A preliminary large mammal survey of Griffith Park, Los Angeles, California. Bull. So. Calif. Acad. Sci. 107:57-67.

Melendrez Design Partners. 2004. Griffith Park Master Plan. 2nd draft. Available online at: http://www.lacity.org/RAP/dos/parks/griffithPK/masterplan2005/masterplan2005.htm.

PGAdesign. 2012. Fern Dell, Griffith Park, Cultural Landscape Assessment. Prepared for Friends of Griffith Park by PGAdesign^{inc} Landscape Consultants, Oakland, California. May 22, 2012.

Appendix A. Detail on camera traps.

Table A1. Locations of wildlife cameras and summary of results.

	General location	Description	Days deployed	Species detected
Name				
Walking Bridge	Upper	Along canyon bottom just east of Western Cyn. Rd.	15	Mule deer, coyote, western gray squirrel, eastern fox squirrel
West Trail	Upper	Along canyon bottom just east of Western Cyn. Rd.	14	Mule deer, coyote, striped skunk, western gray squirrel
Storage Facility	Upper	Behind Trails Café	29	Mule deer, bobcat, coyote, striped skunk, western gray squirrel
Water Source	Upper	Behind Trails Café	14	Mule deer, coyote, striped skunk, western gray squirrel, eastern fox squirrel
East Trail	Upper	East of canyon bottom, at base of Observatory Trail	0*	
East Trail 2	Upper	East of canyon bottom, at base of Observatory Trail	8	Mule deer, bobcat, coyote, raccoon, western gray squirrel, eastern fox squirrel
Conifer	Upper	Canyon bottom, just east of Trails Café	18	Mule deer, coyote, raccoon, eastern fox squirrel
Game Trail 2	Upper	Up slope just east of "Conifer"	38	Mountain lion, mule deer, bobcat, coyote, raccoon, striped skunk, western gray squirrel, eastern fox squirrel, Calif. ground squirrel, cottontail
Fork in Path	Middle	Along canyon bottom, just east of Red Oak Dr./Western Cyn. Rd. intersection	9	Coyote
Bridge	Middle	Along canyon bottom, just east of Red Oak Dr./Western Cyn. Rd. intersection	33	Mule deer, bobcat, coyote, raccoon, striped skunk, western gray squirrel, eastern fox squirrel, opossum, cottontail, Norway rat
Walking Path	Middle	Along main Fern Dell path next to stream (west of Western Cyn. Rd.)	12	Bobcat, coyote, raccoon, striped skunk
Game Trail	Middle	Just south of "Walking Path", up slope to west	36	Bobcat, coyote, raccoon, western gray squirrel, eastern fox squirrel
Walking Path South	Lower	Just south of Game Trail (along stream)	8	Coyote
Culvert	Lower	Culvert just east of Western Cyn. Rd., near Black Cyn. Dr. intersection	34	Raccoon, western gray squirrel, Norway rat, dusky-footed woodrat

Table A2. Additional detail on camera trap survey.

	Sample period			Number of days where species recorded														
amera	Date start	Date stop	Total days	Mtn. Lion	Mule Deer	Bobcat	Coyote	Raccoon	Striped Skunk	W. Gray Squirrel	E. Fox Squirrel	CA Ground squirrel	Opossum	Cottontail	Rat sp.	Birds	Unk	Hu bla
ridge	8/16/13	9/8/13	24	0	0	0	2	1	1	4	5	0	6	2	6	2	0	
ridge	8/3/13	8/16/13	9	0	1	2	3	0	0	1	1	0	1	0	1	2	0	
onifer	8/16/13	8/24/13	9	0	1	0	8	1	0	0	1	0	0	0	0	0	1	
onifer	8/3/13	8/11/13	9	0	0	0	8	0	0	0	0	0	0	0	0	0	0	
ulvert	7/15/13	8/3/13	18	0	0	0	0	8	0	6	0	0	0	0	14	0	4	
ulvert	6/30/13	7/15/13	16	0	0	0	0	5	0	4	0	0	0	0	6	0	1	
ast Trail	9/21/13	9/28/13	8	0	1	1	8	1	0	2	1	0	0	0	0		1	
ork in ath	8/3/13	8/11/13	9	0	0	0	4	0	0	0	0	0	0	0	0	0	0	
ame rail	7/15/13	8/3/13	20	0	0	1	3	1	0	3	2	0	0	0	0		2	
ame rail	6/30/13	6/15/13	16	0	0	0	1	0	0	2	2	0	0	0	0		2	
ame rail 2	8/16/13	9/8/13	24	1	6	2	10	2	1	18	6	0	0	11	0	0	3	
ame rail 2	8/3/13	8/16/13	14	0	0	4	6	2	0	6	0	1	0	11	0		0	
orage acility	9/21/13	10/5/13	15	0	8	1	13	0	8	7	0	0	0	0	0		0	
orage acility	9/8/13	9/21/13	14	0	10	0	11	0	4	3	0	0	0	0	0	12	0	
alking ridge	9/21/13	10/5/13	15	0	3	0	11	0	0	3	2	0	0	0	0	0	0	
alking ath	6/30/13	7/9/13	10	0	0	1	8	2	1	0	0	0	0	0	0		0	
alking ath	7/16/13	7/17/13	2	0	0	0	0	0	0	0	0	0	0	0	0		0	
alking ath outh	7/15/13	7/22/13	8	0	0	0	1	0	0	0	0	0	0	0	0		0	
ater ource	9/8/13	9/21/13	14	0	10	0	13	0	5	7	8	0	0	0	0	267	0	
est Trail	9/8/13	9/21/13	14	0	8	0	7	0	1	13	0	0	0	0	0	2	1	
otal				1	48	12	117	23	21	79	28	1	7	24	27	285	15	

Note: Counts of "Birds" and "Unk." are total images captured, not by total number of days when photographed.

Appendix B. Additional images of wildlife from camera traps at Fern Dell, 2013.

Figure B1. Apparent 8-pt. buck, "Conifer", August 23.

Figure B2. Apparent 6-pt. buck, "Storage Facility", October 1.

Figure B3. Apparent 4-pt. buck, "Walking Bridge", Sept. 26.

Figure B4. Young male mule deer (first of two), "Game Trail 2", Sept. 5.

Figure B5. Apparent second young male mule deer, "Game Trail 2", Sept. 7.

Figure B6. Group of three mule deer, with at least one apparent fawn, "Storage Facility", Sept. 20.

Figure B7. Bobcat with yellow and red ear tags, "Bridge", August 13.

Figure B8. Untagged bobcat on same bridge, August 10.

Figure B9. Second(?) ear-tagged bobcat at "Game Trail 2", August 10.

Figure B10. Probable second (untagged) individual (note pale coloration), "Game Trail 2", August 29.

Figure B11. Untagged bobcat, "Game Trail 2", August 8.

Figure B12. Untagged bobcat at "Game Trail 2", August 23.

Figure B13. Likely third untagged bobcat (note left front leg stripes, ear shape, black nose compared to above untagged individuals) at "Game Trail", July 17. This individual appears to be a young animal, with a proportionately small head and long ears.

Figure B14. Possibly the same (young?) bobcat as in Figure B13 (above), at "Walking Path" on July 2 (also appears to be a young animal).