

Nesting Raptors of Griffith Park and Surrounding Area 2018

Final Report



[Red-tailed hawk juvenile at RTHA-LA-10. Photo courtesy of Gerry Hans.]

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EXECUTIVE SUMMARY

For the second year of the Griffith Park Nesting Raptor Survey (2018), we increased the number of monitored nests from 49 to 54, and expanded our geographic scope east into Pasadena. Red-tailed Hawks were again the most common nest found, with 29 active nests monitored, 25 of which were deemed to have fledged young. Cooper's Hawk was the next-most-common species, with 14 of 16 monitored nests fledging. Red-shouldered Hawk and Great Horned Owl were represented by 6 and 4 nests, respectively. Most of our nests in 2018 were in the Griffith Park area (25), vs. only 10 here the prior year. The most common nest substrate were pine trees (22), followed by eucalyptus and related species (12), and sycamores (10). Again, just a single raptor nest was found in an oak. Nearly 60% of Red-tailed Hawk nests active in 2017 were again active in 2018, vs. 29% of Cooper's Hawk nests.

1.0 INTRODUCTION

Raptors are important apex predators in most of the earth's ecosystems, and coastal southern California supports (or once supported) around a dozen breeding species (Garrett and Dunn 1981). Of these, several are known to nest, or formerly nested, in Griffith Park, one of the largest urban parks in the U.S., if not the world. Cooper Ecological Monitoring, Inc. has been conducting surveys on the flora and fauna in Griffith Park since 2007, when the Griffith Park Wildlife Management Plan (Cooper and Mathewson 2009) first documented the park's flora and fauna and suggested best management practices for the future, including improved species monitoring.

Based on prior records (e.g., eBird, www.ebird.org), the Study Area provides potentially suitable nesting habitat for resident raptors including Turkey Vulture (*Cathartes aura*), Red-shouldered Hawk (*Buteo lineatus*), Red-tailed Hawk (*Buteo jamaicensis*), Cooper's Hawk (*Accipiter cooperii*), Great Horned Owl (*Bubo virginianus*), Barn Owl (*Tyto alba*), Western Screech-Owl (*Megascops kennicottii*), Peregrine Falcon (*Falco peregrinus*) and American Kestrel (*Falco sparverius*). Former nesters include Golden Eagle (*Aquila chrysaetos*) and Long-eared Owl (*Asio otus*), but both are rare today at any season. Osprey (*Pandion haliaetus*) is frequently seen through the nesting season (mainly along the Los Angeles River), but does not regularly nest in the study area. A handful of species of raptors occur locally in migration and/or winter (e.g., White-tailed Kite (*Elanus leucurus*), but nesting has not been suspected as occurring in the study area.

Life-history summaries the more commonly encountered nesting raptors in the study area are provided in Appendix A.

Our "Griffith Park Raptor Survey", launched in 2017 (Cooper et al. 2017), is an attempt to continue this momentum, with the goal of documenting and tracking each raptor nest in the park and surrounding landscape. While a handful of Los Angeles-area raptor nesting sites have been documented by prior work (e.g., Allen et al. 2017) and individual nests are generally afforded protection when found during utility line replacement and other agency activities, these data represent the first specific, comprehensive dataset of an entire raptor community in the Los Angeles area.

2.0 STUDY AREA AND METHODS

2.1 Location

The “Study Area” in for 2018 centers on Griffith Park, and extends west roughly to the 405 Freeway in the west, north to Victory Blvd, south to Interstate 10, and east to the Arroyo Seco/Pasadena. This area includes the entire eastern Santa Monica Mountains, as well as Elysian Park, the Los Angeles River, Silverlake Reservoir, Echo Park, Debs Park, Eagle Rock, and surrounding neighborhoods. A handful of raptor nests outside this area were monitored opportunistically, but are excluded from certain analyses. The City of Los Angeles Department of Parks and Recreation manages Griffith, Elysian, Echo, and Debs Park; numerous other agencies operate in the remaining open space of the eastern Santa Monica Mountains (e.g., Mountains Recreation and Conservation Authority), and the study area contains a large amount of private land, mainly occupied by single-family homes and yards.

Griffith Park itself contains over 4,000-acres of rugged wilderness and is one of the largest municipal parks in the United States. It sits at the eastern-most end of the Santa Monica Mountain range and is surrounded by three major freeways on its western, northern and eastern borders, and by dense urban development (Hollywood) to the south. Still, the park boasts a large and vibrant wildlife population that includes both diurnal and nocturnal birds of prey. The climate is Mediterranean, with low or no summer precipitation and cool winters, and periods of drought. February receives the highest levels of precipitation with an annual average rainfall of 14”. Fairly regular El Niño effects once or twice per decade can result in much higher annual rainfall amounts, and regular droughts can reduce rainfall to half the normal amount (or less in exceptional years). Of note, the year of the project launch (2017) followed an exceptional four-year drought in the Los Angeles area.

Habitats within the Study Area vary considerably from managed parks to urban neighborhoods, to rugged, deep canyons in isolated, “wilderness-like” areas. Griffith Park has well-manicured parkland on its perimeter with most of the native habitat dominating the inner portions of the park. Two large golf courses, Wilson & Harding and the Roosevelt golf course, border the park with open grass and large native and non-native trees. Other developed portions of the park area include the Los Angeles Zoo, Crystal Springs picnic area, the Old Zoo area, Forest Lawn Cemetery, the Greek Theater, and the Griffith Observatory. The predominant habitat of the park is chaparral but also includes areas of coastal sage scrub, oak woodlands, and limited riparian areas in the canyon bottoms. Large planted trees, mainly pines and eucalyptus, are found throughout the park’s eastern and southern portions, and along roads through the park. The Los Angeles River borders the northeastern portion of the park, with large transmission towers along its course. Finally, there are several large rock outcrops in Griffith Park such as Bee Rock that could potentially support raptor nests, and which were checked as part of this study.

The other parks in the study area (Elysian Park, Debs Park) support a similar mix of native and manicured habitats, albeit on a much smaller scale than Griffith Park. Franklin Canyon and other open space areas to the west support largely native chaparral and oak woodland habitat, some of which has been “augmented” by planted trees (notably conifers). We were denied access to the large protected habitat area around Stone Canyon Reservoir (Los Angeles Dept. of Water and Power), which has been closed to birders/researchers for many years.

2.2 Survey Methods

Cooper and McCammon conducted surveys in the Griffith Park area during late winter to identify and map existing and potential raptor nests here and the surrounding areas. Additional surveys were completed opportunistically as time allowed, and dates of those are not included above. Surveys were performed mostly by foot through the entirety of the park and surrounding residential areas, and were conducted using 8-10x binoculars and 20x spotting scopes to determine nest activity and the presence or absence of birds of prey. Surveys were timed to avoid undue disturbance to breeding raptors and other birds during the most critical breeding periods later in spring.

For our second year (2018), we again held two training sessions attended by 40+ volunteer “citizen-scientists” in late winter (Jan. 27, Feb. 10), and by the end of June, we had roughly 100 potential raptor nests/territories located, with more than 50 of them active at some point during the spring. As in 2017, we then assigned nests to one or more volunteers based on their location preferences and birding ability. Volunteers were asked to visit their assigned nests twice per month (and no more than weekly) to identify nesting stages throughout the season, and were asked to send back completed data sheets at least monthly. Each active nest was confirmed (by photograph if possible) by Cooper, McCammon, or G. Hans to ensure data reliability. Completed data sheets were kept in a central location for easy access and may be provided upon request. GPS coordinates of nests were collected with ArcCollector app in the field, or later using volunteers’ written descriptions and Google Earth Pro. Coordinates were taken as close to the nest tree as possible, but the accuracy of nest coordinates may vary due to access issues, proximity of the edge of a tree to the nest, or the inability to obtain accurate readings under dense tree canopy.

2.3 Classifying Nest Structures

The following designations were used to classify nesting success for this survey:

- Inactive – A likely or historical raptor nest in which no current nesting activity was observed;
- Active – A territory in which nest-building, incubation, and/or brooding was observed in 2017;
- Failed – An active nest that produced no young, but where nesting activity had been observed in 2017;

- Successful – A known nest where one or more young reached at least 3 weeks of age (cases where recently-fledged juveniles were observed without a physical nest were considered on a case-by-case basis).
- Unknown – Ambiguous observations, such as one or both adults still at the nest but no indication of eggs or young; or where we did not have enough observations to make a determination of success.

For 2018, we added an additional category, “Territory”, to indicate the presence of a pair of raptors exhibiting breeding behavior (tandem flights, copulation, stick-carrying). Some of these territories were confirmed as active when birds were eventually seen at a nest. However, in several cases, a nest was never found (or a potential nest was found, but the birds were never seen using it). We termed these cases “Non-breeding Territories”, and regard them as important to track since they likely indicate attempted nesting where conditions are not conducive for nesting success, for various reasons.

3.0 RESULTS

3.1 Species Patterns

Our 2018 survey documented 55 raptor nests within the study area that were active at some point during spring (February-June) 2018¹ (vs. 49 found and monitored in the study area in 2017²), and 39 potential raptor nests (or non-breeding territories) that were deemed inactive for 2018 (vs. 41 in 2017). Some of the inactive nests may have been active earlier in the season, but were found too late to determine the species (or prior status).

Looking only at active raptor nests, Tables 1a and 1b provide a breakdown of species and outcome for both 2017 and 2018:

Table 1a. Nesting species documented, and outcome, 2017.

Species	# Active nests	# Fledged	# Failed	# Unk. outcome
Red-tailed Hawk	22	16	5 ³	-
Red-shouldered Hawk	5	4	-	1
Cooper's Hawk	17	12	1	4
Great Horned Owl	5	5	-	-

Table 1b. Nesting species documented, and outcome, 2018.

Species	# Active nests	# Fledged ⁴	# Failed	# Unk. outcome
Red-tailed Hawk	29	25	-	4
Red-shouldered Hawk	6	3	-	3
Cooper's Hawk	16	14	-	2
Great Horned Owl	4	3	1	0

¹ This does not include three nests located outside the study area that were nonetheless monitored by project volunteers, but does include several nests found after the volunteer monitoring ended in June that were identified as active owing to physical nest evidence (whitewash around nest) and the presence of young juveniles in or near the nest.

² This figure includes nests active in 2017 that were not "discovered" until 2018.

³ Of the failed nests, one was cut down (tree removed) during incubation (reported to authorities), and four were apparently abandoned.

⁴ We consider nests where young were observed outside the nest (i.e., "branching" or flying independently) to have "fledged".

Phenology data were gathered by volunteers, so this information is somewhat incomplete for both years, owing to variation in data-gathering abilities. Since we only asked volunteers to visit the nests every two weeks, major gaps arose, particularly with respect to start dates of the nesting phenomena. Due to a low sample size, we have elected to combine both survey years, which show that Red-shouldered Hawk nestlings appeared nearly a full month after those of the first Red-tailed Hawk chicks, and that Cooper's Hawk nestlings appeared c. 6 weeks after Red-tails (Table 2). This obviously pushed fledging dates into mid-summer for Cooper's Hawks (first noted June 14), with the first fledgling by Red-tails and Red-shoulders occurring in May.

Table 2. Phenology by species, first date of each nesting stage (2017 and 2018 combined).

Species	Incubating	Nestlings Visible	Branching	Fledging
Red-tailed Hawk	February 13	March 25	April 22	May 9
Red-shouldered Hawk	March 6	April 20	May 18	May 26
Cooper's Hawk	March 16	May 10	June 6	June 14
Great Horned Owl	No data	April 3	April 26	April 30

In addition to these species, we found or were told of two potential nesting territories of two scarce species in the study area, Barn Owl and Peregrine Falcon. A likely Barn Owl roost was discovered in a *Washingtonia* palm in a residential neighborhood of Sherman Oaks south of Ventura Blvd. on 18 Mar. 2018 (D. Cooper, unpubl. data), and a vocalizing pair of Peregrine Falcon was observed near a rock ledge on Cahuenga Peak on 7 April 2018 (C. Stapelmann, ebird), perhaps prospecting for a nest site.

We did not document nesting or potential nesting by Western Screech-owl and American Kestrel as in 2017. Little is known about the exact nesting requirements of these two species in the local area, and as they were not "monitored" like the other raptors, neither is discussed further here (though we hope to find and track more screech-owl and kestrel nests in future years). We likewise did not detect any potential nesting by Turkey Vulture, we did not make a special effort to locate their nests. Turkey Vultures, including potential pairs, were observed within the study area through the survey period, particularly near large blocks of open space (e.g., Griffith Park, D. Cooper, pers. obs.).

3.2 Geographic and Habitat Patterns

We provide the geographic location of these nests, and the nesting substrate (tree type) below. Griffith Park had far more nests found in 2018 than in 2017, with fewer nests discovered in the other subregions of the study area.

Table 3a. Geographic distribution, by species, 2017.

Species	Griffith Park ⁵	Eastern SMM	Elysian Park area ⁶	Northeast L.A. ⁷	San Fernando Valley (floor)
Red-tailed Hawk	8	5	4	2	3
Red-shouldered Hawk	0	1	0	3	1
Cooper's Hawk	1	5	6	4	1
Great Horned Owl	1	2	1	1	0
TOTAL	10	13	11	10	5

Table 3b. Geographic distribution, by species, 2018⁸.

Species	Griffith Park	Eastern SMM	Elysian Park area	Northeast L.A.	San Fernando Valley (floor)
Red-tailed Hawk	13	4 ⁹	6	3	2
Red-shouldered Hawk	2	4	0	0	0
Cooper's Hawk	7	1	2	3	1
Great Horned Owl	3	1	0	0	0
TOTAL	25	10	8	6	3

⁵ Includes all area between 101 Fwy. and I-5

⁶ Includes Silver Lake and Echo Park

⁷ Includes Mt. Washington, Eagle Rock, Debs Park area

⁸ Three nests were monitored in the Pasadena area (two Cooper's Hawks, one Red-tailed Hawk).

⁹ Includes one nest where a pair was observed early in the season but that was not diligently checked later.

Table 4a. Substrate (tree) usage, by species (active nests only), 2017.

Species	Eucalyptus	Pine	Sycamore ¹⁰	Oak ¹¹	Other/Unk.
Red-tailed Hawk	3	12 ¹²	4	0	3
Red-shouldered Hawk	2	2	0	0	1 ¹³
Cooper's Hawk	4	4	2	0	7
Great Horned Owl	0	4	0	1	0
TOTAL	9	22	6	1	11

Table 4b. Substrate (tree) usage, by species (active nests only), 2018.

Species	Eucalyptus	Pine	Sycamore	Oak	Other/Unk.
Red-tailed Hawk	6	15	4	0	4 ¹⁴
Red-shouldered Hawk	4	1	1	0	0
Cooper's Hawk	2	4	5	1	4 ¹⁵
Great Horned Owl	0	3	0	0	1 ¹⁶
TOTAL	12	23	10	1	9

3.3 Nest Re-usage

Our resurvey in 2018 allowed us to investigate patterns of nest re-use, either by geographical area or by species (Table 3a and 3b). Calculating re-usage is complicated by the fact that we had incomplete information for many nests during both survey years (e.g., in cases where a nest was discovered in 2018, we rarely knew if it had been active the year prior). In other cases, we learned of the location or fate of a prior year's nest after that season had ended, though some of these were documented by photographs.

We found a 39% re-usage rate across all species (22 of 54 of the 2017 nests were re-used in 2018), and that Red-tailed Hawks maintain a higher-than-average rate (59%), meaning that more than half of Red-tailed Hawk nests found the first survey were also active the following year. The lowest fidelity of the four species was found in Cooper's Hawk (29% re-usage rate), meaning fewer than a third of Cooper's Hawks nests were re-used the following year. While the sample sizes were small, 2 of the 7 Great Horned Owl nests found in 2017 were active in 2018 (28%), and just 1 of the 4 Red-shouldered Hawk nests from 2017 was active in 2018 (25%).

¹⁰ Includes the native western sycamore (*Platanus racemosa*) as well as non-native/hybrid plane trees (*Platanus* sp.), which are planted as street trees.

¹¹ Coast live oak (*Quercus agrifolia*) unless noted.

¹² Incl. several *Pinus* spp. and one nest in a deodar (*Deodorus* sp.).

¹³ Palm (*Washingtonia* sp.)

¹⁴ One on rock ledge (Bee Rock), one in palm (*Washingtonia* sp.), and one in a power tower (Eaton Canyon), with a fourth unknown.

¹⁵ Three nests in *Ficus* trees, one in a large *Acacia*.

¹⁶ Building ledge

Table 5. Patterns of nest re-use, 2017-2018.

Species	Nests active in 2017¹⁷	Nests re-used (2018)	Total active nests (2018)
Red-tailed Hawk	22	13	29
Red-shouldered Hawk	4	1	6
Cooper's Hawk	21	6	16
Great Horned Owl	7	2	4
TOTAL	54	22	55

A summary spreadsheet is provided in Appendix B (without precise spatial information). As in 2017, the full spreadsheet with location information will be provided to the Friends of Griffith Park separately due to the sensitive nature of the data.

¹⁷ These numbers are higher than in the above tables since we learned about several 2017 nests in 2018, so could not include them in the monitoring effort that year.

4.0 DISCUSSION

4.1 Species Patterns

Both the inaugural year of the survey (2017) and 2018 yielded roughly 100 confirmed and potential raptor nests in and around Griffith Park monitored each year. Somewhat surprisingly, we were able to locate and monitor roughly the same number of active nests during both years (49 in 2017, 55 in 2018), and of these, a similar proportion were confirmed or suspected as having fledged in both years (75-81% each year).

The species breakdown was also nearly identical in both years, though with more Red-tails in 2018 (29 vs. 22), roughly equal numbers of Cooper's Hawks (17 vs. 16 nests), and numbers of Red-shouldered Hawk and Great Horned Owl also similar both years, with 4-6 nests for each. As noted in 2017, given that Cooper's Hawk nests are much more difficult to locate than Red-tailed Hawk nests, it is likely that there were more Cooper's Hawk nests in the study area that will simply need to be found (and monitored) to get an accurate tally of each. However, the similarity of results suggests that we have adequately sampled the actual nesting raptor community year to year within our study area.

4.2 Geographic and Habitat Patterns

Unlike the species breakdown, the geographic pattern of where nests were located (or more accurately, where we found them) changed dramatically between 2017 and 2018 (see Figures 3a and 3b), when we had more than twice as many nests overall in the Griffith Park subregion of the study (i.e., Cahuenga Pass east to the Los Angeles River), with fairly dramatic drops in the subregions immediately to the west (eastern Santa Monica Mountains) and west (Elysian Park area which includes Silverlake and Echo Park). Counts of nests in the San Fernando Valley and Northeast Los Angeles remained fairly stable. Obviously these are small sample sizes and arbitrary geographical breaks, but the patterns are intriguing nonetheless.

It is possible that the raptors in the study area maintain fairly stable populations by shifting nesting sites from year to year and moving around, hence the variability in number of nests per subregion. Or, they may "pause" breeding for a year (or more) if conditions become unfavorable in a given area, and then resume the following year, among other strategies. And different species may employ these strategies to different effect, depending on the location of their territories (assuming these are the same pairs nesting in the same general area year after year, which we don't know for sure).

We again observed that the "native" interior of Griffith Park had relatively few raptor nests, but 2018 found multiple nests of various species in the "edge habitats" at the park's periphery, in places like Fern Dell and the two golf courses (exact locations undisclosed here). Again, just a single raptor nest in the entire study was located in a native oak tree (a Cooper's Hawk in Fern

Dell), confirming our suspicion in 2017 that this species is simply little-used by local raptors; ten nests (20%) were in (probably native) sycamores (vs. five in 2017).

Pines again represented a large percentage of the nest trees in the study, with 23 nests in pines in 2018 (vs. 22 in 2017). Another well-used non-native, eucalyptus, accounted for 12 active nests in 2018, roughly the same as in 2017, when 9 were in eucalyptus; sycamores supported few nests, but coast live oaks again supported just a single nest in 2018.

The finding highlights the importance of the very large, non-native trees in and around the park, many of which have matured – and are now the tallest trees around – since they were planted decades ago. While non-native, they clearly provide excellent nesting opportunities to the local raptor community, and have essentially outpaced native substrates.

As in 2017, few raptor nests were among many stick nests observed on transmission towers, signs, and other structures during the study; these seem to (now) be the exclusive domain of the Common Raven, and this probably does not vary in the study area from year-to-year.

4.3 Nest Re-usage Patterns

The finding that site fidelity varied across species, with Red-tailed Hawk showing a much higher-than-average rate of re-use is not surprising, as this is the largest species, and it constructs the largest, most elaborate nests, and is well-known for re-using these nests. The lower rates of re-use found in the other species, in particular the Cooper's hawk, may either be an adaptation to varying conditions of "urban life", or it may indicate the opposite – a vulnerability to loss of nest sites.

Additional years of monitoring are probably needed to assess this, but preliminary analysis suggests that while Cooper's Hawk is increasing in the region, Red-shouldered Hawk may be declining (D. Cooper, unpubl. data), suggesting that the "flexibility strategy" may be working for one species (Cooper's Hawk) and not the other (Red-shouldered Hawk). Anecdotally, two of the four Red-shouldered Hawk nests, and three of seven Great Horned Owl nests, from 2017 appear to have been blown out of their trees by high winds. And while Great Horned Owl is still relatively common across the study area (the low numbers of nests reflect the difficulty of observing this largely nocturnal species), the Red-shouldered Hawk is rather scarce. At least one Red-shouldered Hawk was still present in spring 2018 in the vicinity of the Johnny Carson Park nest (www.ebird.org), but the 2017 nest appeared dilapidated and unused this year (*fide* D. Cooper). The 2017 Cahuenga Pass nest, located in a tall backyard eucalyptus tree within a residential area, survived to be active in 2018. Given these results, it would be helpful to learn if the various "lost" nesting species of the region, such as American Kestrel, were similarly pushed from nest site to nest site until none remained.

5.0 LITERATURE CITED

- Allen , L.W., K.L. Garrett, and M.C. Wimer. 2017. Los Angeles County Breeding Bird Atlas. Los Angeles Audubon Society.
- Artuso, Christian, C. Stuart Houston, Dwight G. Smith and Christoph Rohner.(2013).Great Horned Owl (*Bubo virginianus*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: <https://birdsna-org.bnaproxy.birds.cornell.edu/SpeciesAccount/bna/species/grhowl>
- Beebe, F.L. 1974. Field studies of the falconiformes of British Columbia: vultures, hawks, falcons, eagles. British College Proceedings Museum Occasional Paper No. 17. Victoria, BC, Canada.
- Bennett, J.R. and P.H. Bloom. 2005. Home range and habitat use by great horned owls (*Bubo virginianus*) in southern California. Journal of Raptor Research. 39 (2):119-126.
- Bloom, P.H. 1985. Raptor movements in California. pp. 99 – 123. In Harwood, M. ed. Proceedings of Hawk Migration Conference IV. Rochester, NY.
- Bloom, P.H., M.D. McCrary, and M.J. Gibson. 1993. Red-shouldered Hawk home range and habitat use in southern California. J. of Wildlife Manage. 57:258-265.
- Bloom, P.H. and J. Catino. 2016. Nesting Raptors of the Irvine Ranch Wildlands and Associated Environs. Unpublished.
- Boarman, W.I. and B. Heinrich. 1999. Common Raven (*Corvus Corax*), The Birds of North America (P.G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: <https://birdsna-org.bnaproxy.birds.cornell.edu/Species-Account/bna/species/comrav>
- Chiang, S.N., P.H. Bloom, A.M. Bartuszevige, and S.E. Thomas. 2012. Home Range and habitat use of Cooper's Hawks in urban and natural areas. Urban bird ecology and conservation. Studies in Avian Ecology (no. 45).
- Clark, R.J. 1977. Cooper's Hawk hunting in the city. Auk 94:142-143.
- Cooper, D.S. and P. Mathewson. 2009. Griffith Park Wildlife Management Plan. Retrieved from the Friends of Griffith Park: <http://www.friendsofgriffithpark.org/wp-content/uploads/2016/10/GP-WMP-Final.pdf>
- Cooper, D.S., C. Aiken and A. Spyрка. 2017. Nesting raptors of Griffith Park and the surrounding area, 2017. Report to Friends of Griffith Park, July 15, 2017.

Garrett, K. and J. Dunn. 1981. Birds of Los Angeles County: Status and Distribution. Los Angeles Audubon Society.

Preston, C. R. and R. D. Beane.(2009).Red-tailed Hawk (*Buteo jamaicensis*), The Birds of North America (P. G. Rodewald, Ed.). Ithaca: Cornell Lab of Ornithology; Retrieved from the Birds of North America: <https://birdsna-org.bnaproxy.birds.cornell.edu/Species-Account/bna/species/rethaw>

APPENDIX A. Life History Information on Locally-nesting Raptors

1.1.1 Red-tailed Hawk

One of the most common large raptor species in North America, Red-tailed Hawks are abundant nesters in Los Angeles. They can nest in almost any habitat and on a variety of structures including buildings, cliffs and rock outcrops, native and non-native trees, and power line towers, but prefer very high sites, often somewhat protected from the elements (e.g., along a canyon bottom or toe of a slope, but with a broad/unobstructed view of the surrounding landscape. Breeding populations in Southern California are comprised primarily of resident birds that migrate only during their first few years (Bloom and Catino 2016).

Mating for life, pairs typically visit two or more nests from previous years before rebuilding one for the current season. Nest building can begin as early as December in some cases, and the female begins incubation once the first egg is laid. Usually a clutch of 2-3 eggs but Red-tailed Hawks can sometimes have a clutch of 4. Incubation lasts about 30 days with young fledging at 7 weeks of age. Young hawks may disperse up to 1,000 miles from their nest site, however studies indicate most return to breed within 50 miles of where they fledge (Bloom 1985; this distance may be much smaller in urban populations). They primarily feed of small mammals, but they have also been known to forage on small birds and snakes. They seem particularly affected by rodenticide, with poisoned, “tame” individuals appearing around golf courses and parks.

1.1.2 Red-shouldered Hawk

In California, the Red-shouldered Hawk is strongly associated with riparian and forested habitat (Dixon 1928, Bloom et al. 1993). While they continue to nest locally in lush residential areas with large, old trees, increased development has likely affected its distribution. The Red-shouldered Hawk has one of the smallest average home ranges of any diurnal raptor in North America, 0.25 square miles or less (Bloom et al. 1993). In Los Angeles, they are becoming less common than their larger cousin, the Red-tailed Hawk. Normally a very vocal species, especially during breeding season, the Red-shouldered Hawks encountered thus far in Los Angeles are quieter and less vocal.

1.1.3 Cooper’s Hawk

Over past decades, Cooper’s Hawk populations have increased in urban and suburban habitats such as Los Angeles. Because of the apparent “boom” in urban populations, researchers have found their home ranges to be smaller than that of non-urban habitat. These species could also be benefitting greatly from their urban nesting pattern because there are fewer natural nest predators. The presence of domestic dogs and the lack of natural predators, such as the raccoon (*Procyon lotor*) and bobcat (*Lynx rufus*), might have enabled Cooper’s Hawks to have high nesting success (Chiang et al., 2012), but certainly the decline in shooting hawks and taking

their young for falconry (prevalent into the 1980s) has resulted in local increases as well. Cooper's Hawks use a combination of prey-capture methods that include brief perch-and-scan episodes to locate prey, followed by a sudden burst of speed in addition to hunting from higher flight (Beebe 1974, Clark 1977, Fischer 1986). They primarily prey on smaller bird species but it is not uncommon for them to forage on small mammals and reptiles.

1.1.4 Great Horned Owl

A large owl species, Great Horned Owls are habitat generalists allowing them to have the most flexibility in nesting sites of any American owl (Houston et al., 2013). They often nest in abandoned hawk or raven nests, as well as cliff ledges and manmade structures. Great Horned Owl nesting season begins earlier than other diurnal or nocturnal raptors, laying 2-4 eggs per clutch, often initiating nesting in fall. The Great Horned Owl diet consists primarily (90%) of small mammals, but can include rabbits, gophers, squirrels, and other bird species. Their home ranges in California can range from 135 ha (0.6 square miles) to as high as 1198 ha (4.5 square miles) depending on the sex of the bird and the surrounding habitat (Bennett and Bloom 2005).

1.1.5 Common Raven

Note: While we noted Common Raven nests where we found them, and monitored a handful, they were not a target species in the study, and are not considered "raptors".

The Common Raven is one of the most widespread (naturally-occurring) birds in the world. It is a scavenger of animal carcasses and human garbage, providing an important ecological service to urban areas and wildlands alike. Ravens are generalist species and can also predate fledgling birds, hunt for small mammals and reptiles, and steal food from other birds. Present throughout much of North America, the Common Raven is believed to have been historically associated with the Great Plains and the American bison (*Bison bison*); today, they occupy of a broad range of habitats. They traditionally preferred heavily contoured landscape, which provides thermals for long-distance foraging (Boarman and Heinrich 1999), but are now totally urban-adapted and are resident throughout the Los Angeles Basin floor. Nest site can vary but can include trees, buildings, cliffs, and power towers.

APPENDIX B. Survey Results, 2018 update

Nest	Species	General Location	Status in 2017	Status in 2018	Tree Species
COHA-LA-21	Cooper's Hawk (<i>Accipiter cooperii</i>)	Elysian Park	Successful	Inactive	Eucalyptus
COHA-LA-30	Cooper's Hawk (<i>Accipiter cooperii</i>)	Van Nuys	Successful	Inactive	Liquidambar
COHA-LA-31	Cooper's Hawk (<i>Accipiter cooperii</i>)	Hollywood Bowl	Successful	Inactive	Pine
COHA-LA-34	Cooper's Hawk (<i>Accipiter cooperii</i>)	Los Feliz	Unknown	Inactive	Ficus
COHA-LA-52	Cooper's Hawk (<i>Accipiter cooperii</i>)	Silverlake Neighborhood	Successful	Unknown	Ficus
COHA-LA-57	Cooper's Hawk (<i>Accipiter cooperii</i>)	Hollywood area	Successful	Inactive	Sycamore
COHA-LA-63	Cooper's Hawk (<i>Accipiter cooperii</i>)	Occidental College	Unknown	Inactive	Eucalyptus
COHA-LA-64	Cooper's Hawk (<i>Accipiter cooperii</i>)	Silverlake Neighborhood	Failed	Inactive	Eucalyptus
COHA-LA-67	Cooper's Hawk (<i>Accipiter cooperii</i>)	Eagle Rock	Inactive	Inactive	Pine
COHA-LA-73	Cooper's Hawk (<i>Accipiter cooperii</i>)	Beverly Glen Terrace	Unknown	Inactive	Pittosporum undulatum
COHA-LA-78	Cooper's Hawk (<i>Accipiter cooperii</i>)	101/Sunset	Successful	[usurped by RTHA]	Sycamore
COHA-LA-79	Cooper's Hawk (<i>Accipiter cooperii</i>)	101/Silverlake	Successful	Successful	Acacia
COHA-LA-83	Cooper's Hawk (<i>Accipiter cooperii</i>)	West Hollywood	Successful	Inactive	Ficus
COHA-LA-85	Cooper's Hawk (<i>Accipiter cooperii</i>)	Beverly Hills	Unknown	Inactive	Pine
COHA-LA-94	Cooper's Hawk (<i>Accipiter cooperii</i>)	Debs Park	Successful	Inactive	Pine
COHA-LA-95	Cooper's Hawk (<i>Accipiter cooperii</i>)	Highland Park	Successful	Successful	Eucalyptus
COHA-LA-96	Cooper's Hawk (<i>Accipiter cooperii</i>)	Merry-go-Round	Successful	Successful	Aleppo Pine
COHA-LA-102	Cooper's Hawk (<i>Accipiter cooperii</i>)	Los Feliz	Successful ¹⁸	Inactive	Ficus
COHA-LA-104	Cooper's Hawk (<i>Accipiter cooperii</i>)	Glendale	Successful ¹⁵	Inactive	Sycamore
COHA-LA-106	Cooper's Hawk (<i>Accipiter cooperii</i>)	Lake Hollywood	Inactive	Successful	Pine
COHA-LA-110	Cooper's Hawk (<i>Accipiter cooperii</i>)	La Canada	Successful ¹⁵	Inactive	Pine
COHA-LA-120	Cooper's Hawk (<i>Accipiter cooperii</i>)	Glassell Park	Successful	Successful	Pine
COHA-LA-135	Cooper's Hawk (<i>Accipiter cooperii</i>)	Glendale	Unknown	Successful	Sycamore
COHA-LA-138	Cooper's Hawk (<i>Accipiter cooperii</i>)	Fern Dell	Unknown	Successful	Coast live oak
COHA-LA-151	Cooper's Hawk (<i>Accipiter cooperii</i>)	Van Nuys	Unknown	Successful	Sycamore
COHA-LA-155	Cooper's Hawk (<i>Accipiter cooperii</i>)	UCLA	Unknown	Unknown	Eucalyptus
COHA-LA-157	Cooper's Hawk (<i>Accipiter cooperii</i>)	East Pasadena	Unknown	Successful	Sycamore
COHA-LA-161	Cooper's Hawk (<i>Accipiter cooperii</i>)	Atwater Village	Successful	Successful	Sycamore
COHA-LA-168	Cooper's Hawk (<i>Accipiter cooperii</i>)	Pasadena	Unknown	Successful	Sycamore
COHA-LA-173	Cooper's Hawk (<i>Accipiter cooperii</i>)	Los Feliz	Unknown	Successful	Ficus
COHA-LA-176	Cooper's Hawk (<i>Accipiter cooperii</i>)	Griffith Park	Unknown	Successful	Pine
GHOW-LA-09	Great Horned Owl (<i>Bubo virginianus</i>)	Hollywood Bowl	Successful	Inactive	Pine
GHOW-LA-14	Great Horned Owl (<i>Bubo virginianus</i>)	Observatory Drive	Successful	Inactive	Pine
GHOW-LA-23	Great Horned Owl (<i>Bubo virginianus</i>)	Debs Park	Successful	Inactive	Pine
GHOW-LA-24	Great Horned Owl (<i>Bubo virginianus</i>)	Lake Hollywood	Successful ¹⁵	Successful	Pine
GHOW-LA-33	Great Horned Owl (<i>Bubo virginianus</i>)	Franklin Canyon	Successful	Inactive	Oak

¹⁸ Nest "discovered" following 2017 season (via email sent by resident).

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GHOW-LA-40	Great Horned Owl (<i>Bubo virginianus</i>)	Boys Camp	Inactive	Successful	Pine
GHOW-LA-41	Great Horned Owl (<i>Bubo virginianus</i>)	Royce Canyon	Inactive	Successful	Pine
GHOW-LA-99	Great Horned Owl (<i>Bubo virginianus</i>)	Elysian Park	Successful ¹⁹	Unknown	Unknown
GHOW-LA-101	Great Horned Owl (<i>Bubo virginianus</i>)	UCLA	Successful	Failed	Building ledge
GHOW-LA-114	Great Horned Owl (<i>Bubo virginianus</i>)	Mt. Washington	Successful ¹⁵	Inactive	Pine
RSHA-LA-61	Red-shouldered Hawk (<i>Buteo lineatus</i>)	Johnny Carson Park	Successful	Inactive	Pine
RSHA-LA-62	Red-shouldered Hawk (<i>Buteo lineatus</i>)	Occidental College	Successful	Inactive	Eucalyptus
RSHA-LA-69	Red-shouldered Hawk (<i>Buteo lineatus</i>)	Rose Hills	Successful	Inactive	Palm Tree
RSHA-LA-76	Red-shouldered Hawk (<i>Buteo lineatus</i>)	Cahuenga Pass I	Successful	Successful	Eucalyptus
RSHA-LA-158	Red-shouldered Hawk (<i>Buteo lineatus</i>)	LA Zoo	Unknown	Unknown	Eucalyptus
RSHA-LA-162	Red-shouldered Hawk (<i>Buteo lineatus</i>)	Beachwood Canyon	Unknown	Successful	Pine
RSHA-LA-165	Red-shouldered Hawk (<i>Buteo lineatus</i>)	Encino ²⁰	Unknown	Unknown	Sycamore
RSHA-LA-169	Red-shouldered Hawk (<i>Buteo lineatus</i>)	Cahuenga Pass II	Unknown	Successful	Eucalyptus
RTHA-LA-01	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Mineral Wells	Successful	Successful	Sycamore
RTHA-LA-03	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Pony Rides	Inactive	Successful	Sycamore
RTHA-LA-08	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Lake Hollywood	Successful	Successful	Pine
RTHA-LA-10	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Griffith Observatory	Successful	Successful	Pine (dead)
RTHA-LA-17	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Wilson & Harding GC	Failed	Inactive	Sycamore
RTHA-LA-18	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Wilson & Harding GC	Successful	Successful	Sycamore
RTHA-LA-27	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Allesandro	Inactive	Successful	Eucalyptus
RTHA-LA-28	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Greek Theatre	Successful	Inactive	Pine
RTHA-LA-35	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Montecito Heights	Failed	Unknown	Pine
RTHA-LA-37	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Moonstone Drive	Failed	Inactive	Pine
RTHA-LA-43	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	(Boys) Camp Dr.	Unknown	Successful	Pine
RTHA-LA-45	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Lake Hollywood (Tahoe Dr.)	Inactive	Successful	Pine
RTHA-LA-51	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Hansen Dam Equestrian Center	Successful	Successful ²¹	Sycamore
RTHA-LA-53	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Hollywood Bowl	Successful	Inactive	Pine
RTHA-LA-55	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Mt. Washington Dr.	Successful	Successful	Pine
RTHA-LA-58	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Echo Park	Unknown	Successful	Eucalyptus
RTHA-LA-59	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	"Live Steamers" (Griffith Park)	Successful	Successful	Pine
RTHA-LA-60	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Elysian Park	Successful	Successful	Eucalyptus
RTHA-LA-65	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Meadow Valley Terrance	Inactive	Successful	Pine
RTHA-LA-66	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Elysian Tennis Courts	Successful	Inactive	Silk Oak
RTHA-LA-70	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Coldwater Canyon	Successful	Xx	Eucalyptus
RTHA-LA-74	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Bel-Aire	Successful	Unknown	Pine
RTHA-LA-75	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Erwin Street, Van Nuys	Successful	Unknown	Pine

¹⁹ Listed as "Successful" based on repeated sightings of adults and then of fledglings; nest never found.

²⁰ Nest located just west of 405 Fwy., but still within Sepulveda Pass, so included here.

²¹ Not included in analysis (out of range)

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RTHA-LA-77	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	405/101 freeway	Successful	Successful	Pine
RTHA-LA-78	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	101/Sunset	N/A	Successful	Sycamore
RTHA-LA-84	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Franklin Canyon	Successful	Unknown	Deodar
RTHA-LA-89	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Echo Park (Bard)	Inactive	Successful	Eucalyptus
RTHA-LA-97	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Sherman Oaks (Hopevale)	Successful?	Unknown	Unknown
RTHA-LA-98	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Hobart St., Los Feliz	Successful	Successful	Pine
RTHA-LA-105	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Bellevue Park	Successful	Unknown	Pine
RTHA-LA-109	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Roosevelt Café	Inactive	Successful	Pine
RTHA-LA-112	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Pasadena-Eaton Cyn. Dr.	Unknown	Successful	Power tower
RTHA-LA-117	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Highland Park	Successful	Successful	Eucalyptus
RTHA-LA-125	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Mt. Washington	Successful	Inactive	Pine
RTHA-LA-131	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Montecito Rec. Center	Unknown	Successful	Pine
RTHA-LA-133	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Lake Hollywood (Dam)	Unknown	Successful	Pine
RTHA-LA-141	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Nicada Dr.	Unknown	Unknown	Pine
RTHA-LA-154	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Sherman Oaks (Longridge)	Unknown	Successful	Palm
RTHA-LA-159	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	LA Zoo	Unknown	Successful	Pine
RTHA-LA-167	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Bee Rock	Unknown	Successful	Cliff
RTHA-LA-175	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Stone Canyon I	Unknown	Successful	Eucalyptus
RTHA-LA-176	Red-tailed Hawk (<i>Buteo jamaicensis</i>)	Stone Canyon II	Unknown	Successful	Unknown