

1500 RUC 3/10/93



United States  
Department of  
Agriculture

Forest Service

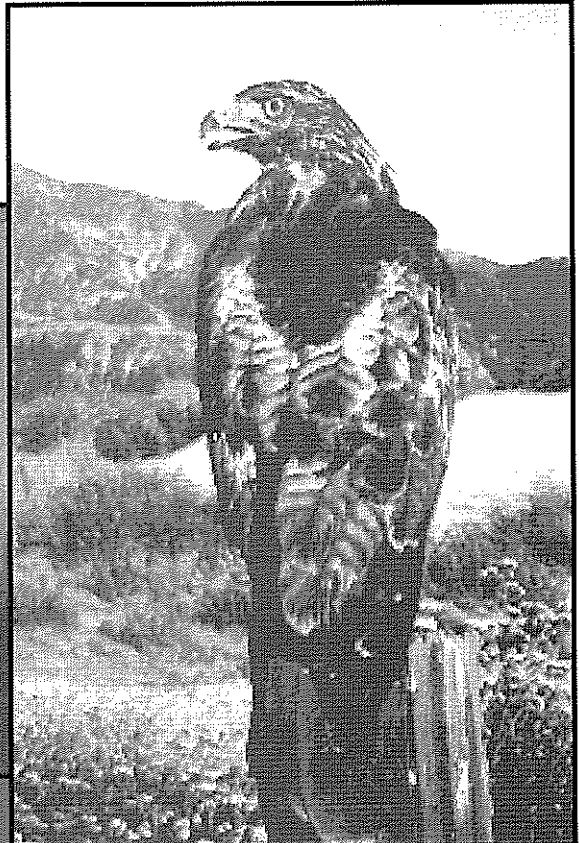
Pacific Southwest  
Research Station

Research Paper  
PSW-RP-209



# Avifauna in Southern California Chaparral: Seasonal Distribution, Habitat Association, Reproductive Phenology

William O. Wirtz II



Wirtz, William O., II. 1991. **Avifauna in southern California chaparral: seasonal distribution, habitat association, reproductive phenology.** Res. Paper PSW-RP-209. Berkeley, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 19 p.

Data were obtained between February 1969 and October 1979 on the seasonal occurrence, habitat association, reproductive phenology, and relative abundance of avifauna at two study sites in the chaparral community of the San Gabriel Mountains of southern California. The purpose of the study was to collect information on bird species use of this habitat and to document changes in the bird community over a 30-year period. During the study, 128 species representing 36 families were noted: 99 in lower elevation (914 to 1280 m) chaparral and 110 at a higher elevation (1400 m) chaparral-yellow pine ecotone site. Eighty-two species were observed at both sites. Residents comprised 35.4 percent of the population at the lower elevation site and 25.4 percent at the higher site. Vagrants comprised 18.2 percent of the population at the lower site and 23.6 percent at the higher site. Insects are consumed by 66.7 percent of all avifauna observed in the chaparral, and seeds by 32.6 percent. Fourteen species reported earlier (1936-1953) at the lower elevation site, mostly migrants, were not observed. Twenty species not reported earlier (1936-1953) at the lower site, mostly vagrants, were noted. Breeding of 24 resident and 13 spring breeding species in the chaparral is documented; an additional 11 resident and 5 spring breeding species are considered likely to breed here. The appendix presents a summary of 11 years of data on abundance at both locations.

*Retrieval Terms:* bird community, seasonal distribution, avifauna, chaparral, San Gabriel Mountains, southern California

---

## The Author:

---

**WILLIAM O. WIRTZ II**, is Professor of Biology, Pomona College, Claremont, California, and a Station cooperator. This paper was presented at the Symposium on the Classification and Distribution of California Chaparral Ecosystems, held in conjunction with the 60th Annual Meeting, Western Society of Naturalists, December 28, 1979, Pomona, California. It has since then been revised and updated.

---

## Acknowledgments:

---

I thank the Pacific Southwest Research Station, USDA Forest Service, for financial support for research in the San Dimas Experimental Forest since 1974, Project Leaders Raymond M. Rice, C. Eugene Conrad, Paul H. Dunn, and Susan G. Conard for their continued support and cooperation, and Charles G. Colver for special support of field work over a 20-year period. Observations at Mt. Baldy were made primarily on the Chapman Ranch, and I especially thank Pat and Bob Chapman for permission to use this area. Many present and former students have aided with field work, especially students of terrestrial ecology in 1976. Special thanks are due Helen Wirtz for her participation in 7 years of field work and for data analysis. Charles T. Collins, California State University, Long Beach, and Daniel A. Guthrie, Claremont McKenna College, Claremont, California, provided helpful criticisms of the manuscript.

*Cover photos* clockwise from top right: Red-tailed Hawk, Fox Sparrow, Rufous-crowned Sparrow, Brown Towhee. Photos by Helen Wirtz.

---

## Publisher:

---

**Pacific Southwest Research Station**  
**P.O. Box 245, Berkeley, California 94701**

**July 1991**

---

# Avifauna in Southern California Chaparral: Seasonal Distribution, Habitat Association, Reproductive Phenology

---

William O. Wirtz II

---

## Contents

---

In Brief .....	ii
Introduction .....	1
Study Areas .....	1
Methods .....	2
Results .....	3
Discussion and Conclusions .....	4
References .....	5
Appendix .....	6

---

## In Brief . . .

---

Wirtz, William O., II. 1991. **Avifauna in southern California chaparral: seasonal distribution, habitat association, reproductive phenology.** Res. Paper PSWRP-209. Berkeley, CA: Pacific Southwest Research Station, Forest Service, U.S. Department of Agriculture; 19 p.

*Retrieval Terms:* bird community, seasonal distribution, avifauna, chaparral, San Gabriel Mountains, southern California

Relatively little information is available concerning the avifauna of the chaparral communities of the San Gabriel Mountains of southern California. A checklist of the birds of the San Dimas Experimental Forest, on the south side of the San Gabriel Mountains in Los Angeles County, covering the period 1936-42, and a later compilation published in 1981 summarize all known information on southern California birds. To provide current information on bird species and to document changes over the 30-year period since that earlier checklist was compiled, the relative abundance, habitat association, reproductive phenology, and seasonal occurrence of avifauna were studied in the San Dimas Experimental Forest from February 1969 to September 1979 and near Mt. Baldy Village from January 1973 to October 1979.

The 128 species noted represent 36 families; 99 species were in the lower elevation (914-1280 m) chaparral of the San Dimas

Experimental Forest; and 110 species in the higher elevation (1400 m) chaparral-yellow pine ecotone near Mt. Baldy Village. Eighty-two species were observed at both sites. Composition of the population was as follows:

<u>Category</u>	<u>Lower elevation (percent)</u>	<u>Higher elevation (percent)</u>
Residents	35.4	25.4
Vagrants	18.2	23.6
Spring breeders	18.2	16.4
Migrants	16.2	15.4

Fourteen species, mostly migrants, reported earlier were not observed at lower sites. Species apparently lost include Dusky and Willow Flycatchers, Hutton's and Solitary Vireos, Burrowing Owl, Yellow-Billed Cuckoo, Winter Wren, and Sage Sparrow. Twenty species, mostly vagrants, not previously reported at lower sites were observed. A noteworthy addition is the Common Raven, now regularly seen in the San Dimas Experimental Forest. Breeding of 24 resident and 13 spring breeding species in chaparral was documented; an additional 11 resident and 5 spring breeding species were considered likely to breed in this habitat. Insects are eaten by 66.7 percent of all species observed in the chaparral, seeds by 32.6 percent, fleshy fruits by 14.7 percent, and vertebrates by 14.7 percent.

---

## Introduction

---

**R**elatively little information is available concerning the avifauna of the chaparral communities of the San Gabriel Mountains in southern California. Wright and Horton (1951, 1953) provide a checklist of the birds of the USDA Forest Service's San Dimas Experimental Forest, located on the south side of the San Gabriel Mountains in Los Angeles County, for the period 1936-1942, with supplemental information available through 1953. They recorded the presence of 121 species representing 33 families in chaparral, oak woodland, or riparian habitats, with comments on their abundance, habitat association, and seasonal occurrence. Included in their records are 17 additional species from 8 families associated with reservoirs in San Dimas and Big Dalton canyons. Garrett and Dunn (1981) summarize all known information on the status and distribution of all bird species in southern California.

This paper reports the relative abundance, habitat association, reproductive phenology, and seasonal occurrence of avifauna in the San Dimas Experimental Forest, excluding the reservoirs in San Dimas and Big Dalton canyons, between February 1969 and September 1979, and similar information collected at a higher elevation site at the chaparral-yellow pine ecotone near Mt. Baldy Village between January 1973 and October 1979.

---

## Study Areas

---

The San Dimas Experimental Forest covers 6,885 ha in the San Gabriel Mountains of southern California about 45 km east of Los Angeles. Elevations on the forest range from 458 to 1,678 m (Hill 1963), and the topography is generally quite steep, with slopes averaging 68 percent (Bentley 1961).

South-facing slopes are covered by chamise (*Adenostoma fasciculatum* H. & A.) dominated chaparral, while more mesic environments support a mixed chaparral community of chamise, ceanothus (*Ceanothus* spp.), bigberry manzanita (*Arctostaphylos glauca* Lindl.), mountain mahogany (*Cercocarpus betuloides* Nutt. ex T. & C.), and scrub oak (*Quercus dumosa* Nutt.). Drier south-facing slopes have, in addition to chamise, black sage (*Salvia mellifera* Greene) and California buckwheat (*Eriogonum fasciculatum* Benth.), while riparian vegetation includes evergreen oaks (*Quercus agrifolia* Nee, *Q. chrysolepis* Liebm.), sycamore (*Platanus racemosa* Nutt.), big leaf maple (*Acer macrophyllum* Pursh.), black cottonwood (*Populus trichocarpa* T. & G.), white alder (*Alnus rhombifolia* Nutt.), willow (*Salix* spp.), and additional shrub species. At higher elevations, and especially on north-facing slopes, are found forests of interior live oak (*Q. wislizenii* A. DC.) and canyon oak (*Q. chrysolepis* Liebm.), with scattered bigcone Douglas-fir (*Pseudotsuga macrocarpa* (Vasey)

Mayr), or yellow pine (*Pinus ponderosa* Dougl. ex P. & C. Lawson), and California bay (*Umbellularia californica* (H. & A.) Nutt.), the latter in more moist canyon bottoms.

Considerable detail about the Experimental Forest is summarized by Mooney and Parsons (1973), and postfire plant succession in the area has been described by Horton and Kraebel (1955), Hanes (1971), Patric and Hanes (1964), Hanes and Jones (1967), and Plumb (1961, 1963).

In addition to recording bird occurrence at the Experimental Forest since 1969, I collected quantitative information from five study sites established in spring 1976 after a major wildfire in late November 1975. Observations on postfire bird succession were reported earlier (Wirtz 1977, 1979), but data collected on these five study areas are also used in this paper.

The study site in Bell Canyon Watershed 803 (975 m) is dominated by chamise and ceanothus, (*C. crassifolius* Torr. and *C. oliganthus* Nutt. in T. & G.), with some black sage, bigberry manzanita, California buckwheat, mountain mahogany, scrub oak, silktassel (*Garrya veatchii* Kell.), toyon (*Heteromeles arbutifolia* M. Roem.), and yerba santa (*Eriodictyon crassifolium* Benth.). It last burned in July 1960. The study site in Oak Canyon (975 m) burned in November 1975, but has revegetated rapidly, with the dominant species being hoaryleaf ceanothus (*C. crassifolius* Torr.), mountain mahogany, scrub oak, chamise, and bigberry manzanita. Toyon and silktassel are more abundant here than in Bell Canyon Watershed 803, and there are scattered stands of interior live oak. Additional shrub species present are yerba santa, honeysuckle (*Lonicera subspicata* H. & A.), coffeeberry (*Rhamnus californica* Esch.), sugar bush (*Rhus ovata* Wats.), elderberry (*Sambucus caerulea* Raf.), and poison oak (*Toxicodendron diversilobum* Greene). The site at the head of the East Fork of San Dimas Canyon (1280 m), which I have named Sunset, also burned in November 1975, but its postfire succession has been different from that in Oak Canyon, presumably due to its higher elevation. The area was dominated by low herbs and grasses (*Cryptantha intermedia* (Gray) Greene, *Stephanomeria virgata* Benth., *Bromus tectorum* L., *Chaenactis artemisiaefolia* (Harv. & Gray) Gray, *Eschscholzia californica* Cham., *Penstemon spectabilis* Thurb. ex Gray, *Sisymbrium altissimum* L., *Emmenanthe pendulifera* Benth., *Cichorium intybus* L. being most frequent) and a shrubby lupine (*Lupinus excubitus* Jones) in 1976. By 1977 the lupine was extremely abundant (frequency = 92 percent), herbs were decreasing in relative abundance, and shrub species were resprouting vigorously. In 1978 the area regained its shrubby nature, with chamise, scrub oak, bigberry manzanita, yerba santa, and ceanothus (*C. crassifolius*, *C. spinosus* Nutt. in T. & G., *C. leucodermis* Greene) being the most common species.

Two grassland study areas within the chaparral are included in this study. Both were converted to grass by use of selective herbicides in conjunction with seeding (Corbett and Green 1965)

after the July 1960 wildfire. The study site in Bell Canyon Watershed 801; (914 m) burned again in November 1975, whereas the site in the West Fork of San Dimas Canyon, in watershed 0506 (914 m), has not burned since 1960. Numerous non-native grasses (*Koeleria* Pers., *Festuca* L., *Oryzopsis* Michx., *Bromus* L., *Avena* L., *Phalaris* L., *Lolium* L., *Melica* L., *Hordeum* L., *Agropyron* Gaertn.) are present at both sites, and individual chamise, toyon, scrub oak, bigberry manzanita, black sage, and laurel sumac (*Rhus laurina* Nutt. in T. & G.) are scattered throughout the grassland. Both sites are surrounded by chaparral that has not burned since 1960.

The higher elevation chaparral-yellow pine ecotone site (1400 m), which I have named Mt. Baldy, lies 5.7 km northeast of the northeast corner of the Experimental Forest, and includes the bottom of San Antonio Canyon 0.9 km north of Mt. Baldy Village. The study site has not burned since the 1800's, though adjacent areas burned in the fire of November 1975. Chaparral at this elevation consists chiefly of chaparral whitethorn (*C. leucodermis* Greene), mountain mahogany, coffeeberry, redberry (*R. crocea* Nutt. in T. & G.), California buckwheat, and goldenbush (*Haplopappus squarrosus* H. & A.). Surrounding forest is nearly pure interior live oak or mixed bigcone Douglas-fir, interior live oak and canyon oak, some ponderosa pine, and, in more moist areas, California bay. The site includes riparian community plants, particularly sycamore, big leaf maple, white alder, black cottonwood, and willow.

---

## Methods

---

Data were collected from the San Dimas Experimental Forest in two ways: (1) casual information collected throughout the Experimental Forest in the course of other studies; and (2) quantitative information collected at five study sites since the spring of 1976. These data were compared with those of Wright and Horton (1951, 1953).

Two types of data are available for analysis: (1) species observed on a given date at a given locality (before spring 1976 in the Experimental Forest, and at the Mt. Baldy site); and (2) quantitative data from the five postfire study sites in the Experimental Forest, for which all individuals were recorded on fixed transects. Data were collected for at least 5 days per month, usually from dawn until 10 or 11 a.m., but occasionally in late afternoon, and starting and ending time was noted so that data could be converted to individuals per species per hour of observation. Both sightings and vocalizations were used as records of occurrence. Records of habitat association and reproductive behavior were kept at all times. Field observations for each species were converted to percentage of days per month on which bird data were recorded that each species was observed. Data for the 11-year period were summarized by month, rounded to the nearest whole number. Species seen only at the Mt. Baldy site, or only at the Experimental Forest, are so indicated (*table 1, appendix*).

The status of each species was designated as:

1. Vagrant (V), if only single individuals were observed or if singles were observed on several unrelated occasions;
2. Migrant (M), if individuals were observed only in spring (usually) or fall (occasionally) or if species spent only the winter on one or more study site;
3. Spring breeder (S), if individuals of both sexes appeared in spring and were known or suspected to breed on the study site;
4. Forest (F) if the species occurred regularly, and was known or suspected to breed in forests at higher elevations and occasionally range into chaparral at these or lower elevations;
5. Resident breeder (R), if members of both sexes were observed year-round and known or suspected to breed in the chaparral. Species for which breeding in the chaparral is documented by this study are indicated in *table 1, appendix*.

The feeding preferences of the species observed were subdivided into 13 categories, based on my field observations or the literature (Martin and others 1951), as follows:

1. Scavenger (SC), feeding on carrion, represented by the Turkey Vulture;
2. Raptor (R), feeding on live vertebrates and some invertebrates, represented by the hawks and owls;
3. Omnivore (O), taking plant and animal food, represented by the crows and jays;
4. Animals/insects (AI), taking lizards and insects (Roadrunner) or fish or aquatic insects, or both (Kingfisher, Dipper, Phalarope);
5. Nectar/insect (N), feeding on nectar and insects, represented by the hummingbirds;
6. Seeds (S), taking seeds (but not acorns) as a major portion of the diet, represented by the Mountain Quail, Mourning Dove, most finches, and some sparrows;
7. Fruits (F), taking fruit as the major diet, represented by the Cedar Waxwing and Phainopepla;
8. Seeds/leaves (SL), taking seeds and tender leaves as the primary diet, represented only by the California Quail;
9. Seeds/fruit (SF), taking seeds (including acorns) as the primary diet, represented only by the Band-tailed Pigeon;
10. Insects/seeds (IS), taking primarily insects and seeds, including many woodpeckers, Western Meadowlark, Brown-headed Cowbird, Lazuli Bunting, towhees, and many sparrows;
11. Insects/fruit (IF), taking primarily insects and fleshy fruits, including the Wrentit, California Thrasher, Robin, Western Bluebird, Yellow-rumped Warbler, Northern Oriole, Western Tanager, and Black-headed Grosbeak;
12. Insects in air (IA), taking insect food on the wing, including the Poor-will, White-throated Swift, and all flycatchers and swallows;
13. Insects/vegetation or ground (IV), gleaning insect food from vegetation or ground, including the Northern Flicker, Hairy Woodpecker, Mountain Chickadee, Plain Titmouse, Bushtit, Blue-gray Gnatcatcher, wrens, kinglets, and most warblers.

Data were collected for a total of 235 days on the five sites at the Experimental Forest between February 1969 and September 1979, and a total of 1047 days at the Mt. Baldy site between January 1973 and October 1979.

---

## Results

---

A total of 128 species representing 36 families were recorded (*tables 1, 2, appendix*); 99 species were observed in the Experimental Forest and 110 were observed at Mt. Baldy. Eighty-two species, or 63.6 percent of the total were observed at both areas, while 22.7 percent were seen only at Mt. Baldy and 14.1 percent only in the Experimental Forest. Vagrants made up 18.2 percent of those species noted in the Experimental Forest, migrants comprised 16.2 percent, birds ranging from higher elevation forests comprised 12.1 percent, spring breeders made up 18.2 percent, and residents 35.4 percent. At the Mt. Baldy site, vagrants comprised 23.6 percent of all species noted, migrants 15.4 percent, birds ranging from nearby forests 19.1 percent, spring breeders 16.4 percent, and residents 25.4 percent.

Birds that forage for insects among chaparral vegetation or on the ground were most prevalent among the species observed (21.7 percent of the total). Species feeding on insects and seeds comprised 17.0 percent of the total, whereas species taking insects and fleshy fruits made up 12.4 percent. Those species taking insects from the air made up 11.6 percent of the total, raptors comprised another 11.6 percent, and species with a diet composed principally of seeds made up 10.8 percent. Insects are found in the diet of 66.7 percent of all species observed in the chaparral, while seeds occur in the diet of 32.6 percent, and fleshy fruits and vertebrates are each eaten by 14.7 percent of the species.

I believe that 35 species are resident at the chaparral sites studied, and breeding was documented in 24 of them by this study (*table 3*). It is possible that four of these species (Sharp-shinned Hawk, Barn Owl, Rock Wren, and Loggerhead Shrike) are absent during some of the warmer months, but my data do not prove this. Records of American Kestrel, Roadrunner, Spotted Owl, and Canyon Wren are sparse, but it is likely that all are resident in low numbers. Most resident species nest in April, May, or June, though Great-horned Owls begin nesting in February and Red-tailed Hawks and Steller's Jays in March. Most breeding species have immatures in the chaparral in June and July. Eight species definitely prefer to nest in riparian habitat (Cooper's Hawk, Red-tailed Hawk, Great-horned Owl, Northern Flicker, Nuttall's Woodpecker, Black Phoebe, Steller's Jay, Song Sparrow), all but the sparrow and phoebe selecting large trees as the preferred nesting site. The remaining species nest in shrubs or on the ground in the chaparral or grassland communities.

Eighteen species move into the chaparral in spring to breed, and breeding was documented in 13 of them during this study (*table 1, appendix and table 4*). Three of these species (White-throated Swift, Violet-green Swallow, Lawrence's Goldfinch) are probably resident in southern California, as they are absent from my field records from the chaparral for only 2 or 3 months of the year. Most spring breeding species return to the chaparral

in April (10 species) or March (5 species), nesting is most prevalent in May (7 species), and immatures are most common in July (6 species). Spring breeding species leave the chaparral in August (5 species), September (5 species), or October (5 species). Two spring breeding species (White-throated Swift and Violet-green Swallow) nest only in rocky outcroppings in this area, swifts are known to nest in cliff faces in San Antonio Canyon (pers. obs.) and swallows along the ridge separating the front range from the drainage of the San Gabriel River to the north. Four spring breeding species (Olive-sided Flycatcher, Northern Oriole, Western Tanager, Black-headed Grosbeak) prefer to nest in riparian habitat, especially at higher elevations, while the remaining species nest in shrubs in the chaparral.

Nineteen species observed in the chaparral are believed to be migrants (*table 5*). Four species (Ruby-crowned Kinglet, Yellow-rumped Warbler, White-crowned Sparrow, Golden-crowned Sparrow) are considered winter residents; breeding was not documented in chaparral in this study, and they are absent from May or June until September. Wilson's Warblers are seen often enough during spring and summer that they may breed in the area. Rufous Hummingbirds are common transients in southern California, while Allen's Hummingbird breeds along the coast and is a transient inland (Garrett and Dunn 1981).

Twenty-one species are considered residents of yellow pine or bigcone Douglas-fir forests that regularly range into chaparral at these or lower elevations (*table 6*). At least 10 of these species were seen in chaparral in virtually every month, and breeding is documented by this study in 5 species by the presence of immatures in chaparral, but no nests have been found. Pygmy Owl records are based chiefly on calls (one sight record from Mt. Baldy Village); the species may be present in higher elevation chaparral at other times of the year. Several forest inhabiting species were occasionally observed at the Mt. Baldy site (White-headed Woodpecker, Clark's Nutcracker, Red-breasted Nuthatch, Brown Creeper, Dipper, Pine Siskin), but apparently seldom leave their preferred forest habitat. Golden Eagles were seen frequently over lower elevation chaparral, and have been observed as low as 300 m (my observations), Green-tailed Towhees appear in higher elevation chaparral in summer (one record at 975 m), and Fox Sparrows move to lower elevations in cooler months. Cassin's Finch appears irregularly in higher elevation chaparral.

Thirty-five species are considered vagrants, or accidental to the chaparral sites studied, based on few sightings or very irregular occurrence (*table 7*), but see Garrett and Dunn (1981), for a discussion of the status of these species in all of southern California. Nine species were observed only once, seven of these at the Mt. Baldy site where there were many more days of observation. More vagrants were observed in March (14 species) or April (20 species) than at any other time, but vagrants were also seen in fall and winter. Some of these sightings may represent rare migrants (i.e., White-throated Sparrow, Lincoln's Sparrow), whereas others may represent wandering spring breeders, or residents from lower elevations (i.e., American Crow, Mockingbird, Phainopepla, Starling, House Sparrow). Some species appeared only in winter, probably as a result of severe weather at more northern latitudes (i.e., Lewis' Woodpecker, Varied



Thrush, Evening Grosbeak). Black Swifts are known to breed in the San Gabriel Mountains (Garrett and Dunn 1981), and one known nesting site is in the Experimental Forest (Collins 1987).

---

## Discussion and Conclusions

---

Most of the bird species reported for the Experimental Forest by Wright and Horton (1951, 1953) were observed during the present study. Twenty species were added to their lists. I considered 15 of these species to be vagrants. Four species (Rock Dove, Spotted Dove, Starling, House Sparrow) are associated with urban areas south of the San Gabriel Mountains. Four species (Common Raven, Clark's Nutcracker, Red-breasted Nuthatch, Cassin's Finch) are regularly found at higher elevations in the San Gabriel Mountains. The absence of ravens from Wright and Horton's (1951, 1953) lists is noteworthy, for the species is now common in the San Gabriel Mountains; immatures were noted in this study, and a postfire increase after the 1975 wildfire was reported earlier (Wirtz 1977, 1979). Say's Phoebe occurs in urban areas of the valleys south of the San Gabriel Mountains (Guthrie 1979), so its occasional occurrence in chaparral is not surprising.

Wright and Horton (1951, 1953) list 14 species not observed during this study. Eight of them were considered migrants in the Experimental Forest (Swainson's Hawk, Vaux's Swift, Hammond's, Willow, Dusky and Gray Flycatchers, Barn Swallow, and Nashville Warbler). Garrett and Dunn (1981) consider Swainson's Hawk and Nashville Warbler to be transients in southern California. Dusky Flycatchers breed in the San Gabriel and San Bernardino mountains, and Willow Flycatchers are transients and rare breeders in the riparian habitat that have been virtually extirpated as breeders since the 1920's (Garrett and Dunn 1981). Three additional species were listed by Wright and Horton (1951, 1953) as rare (Burrowing Owl, Yellow-billed Cuckoo, and Winter Wren). Burrowing Owls are resident locally on agricultural land in valleys south of the San Gabriel Mountains, Yellow-billed Cuckoos have been largely eliminated in valley riparian communities since the 1950's, and Winter Wrens are transients and winter visitors in local foothills (Garrett and Dunn 1981). Winter Wrens were noted during the Claremont, California, Audubon Christmas bird census, which included the Experimental Forest, in 1978 (Guthrie 1979), but neither the cuckoo nor the owl was recorded. Both Hutton's and Solitary Vireos were noted as common in the summer in stream woodland or forest by Wright and Horton (1951, 1953). Hutton's Vireo is presently considered a common resident in coastal and foothill woodlands, and the Solitary Vireo is a transient and uncommon summer resident in this area (Garrett and Dunn 1981). Sage Sparrows were noted by Wright and Horton (1951, 1953) as occasional below 1000 m. They are presently considered to be local residents of dense chaparral in interior foothills (Garrett and Dunn 1981).

The composition of spring and fall migrant populations, or wintering populations (*table 5*) has changed but slightly since Wright and Horton (1951, 1953) collected their data. The absence of, or addition of, some migrant species is of unknown significance, as is movement of higher elevation forest dwelling species into the chaparral (*table 6*). The continued presence of Golden Eagles in the San Gabriel Mountains and the apparent increase of Common Ravens are especially noteworthy.

In this study, more species were observed at the chaparral-yellow pine ecotone site (1400 m) than in the chaparral sites between 914 m and 1280 m. The higher elevation site yielded a greater percentage of vagrant and forest-dwelling species, but lower percentages of spring breeding and resident species. The increased percentage of vagrants may simply reflect the three-fold increase in days of observation at the higher site.

Eighty-two species were common to both areas studied (*table 1, appendix*). Chaparral residents absent at the higher site were California Quail, Mourning Dove, Roadrunner, Barn Owl, and Loggerhead Shrike. Sharp-shinned Hawks were rare at the higher site, and may be more adapted to hunt the lower, more open, shrublands. One spring breeding species, the Black-chinned Sparrow, was not recorded at the higher site. Several spring breeding species, including Blue-gray Gnatcatcher, Lazuli Bunting, Lawrence's Goldfinch, and Lark Sparrow, were occasionally observed at the higher site, but not recorded as breeding there.

This study documents reproduction of 37 species in the chaparral community, including 24 resident and 13 spring breeding (*tables 3, 4*). An additional 11 resident and 5 spring breeding species are considered likely to breed in this community, bringing the total projected size of the breeding community to 53 species. Field observations of a number of these species are rare (Roadrunner, Spotted Owl, Canyon Wren, Rock Wren, Loggerhead Shrike among residents; Black-chinned Hummingbird, Costa's Hummingbird, Western Flycatcher, Warbling Vireo among spring breeding species), so lack of breeding information is not surprising. Most resident species nest in April, May, or June, while nesting of spring breeding species is most prevalent in May. Immatures of both resident and spring breeding species are most prevalent in the chaparral in June and July. At least 12 species nest chiefly in the riparian community, and 8 species for which breeding is not documented probably also prefer this habitat, bringing the total projected size of the riparian breeding community to 20 species, or 38 percent of the projected breeding community for this chaparral habitat.

Wright and Horton (1951, 1953) note the breeding of White-throated Swifts in San Dimas Canyon, the nesting of Rough-winged Swallows on steep banks in San Dimas Canyon, and the nesting of Violet-green Swallows and Cliff Swallows on Big Dalton Dam. These areas were not regularly visited during the present study, so no current information is available. Wright and Horton (1951, 1953) also report the possibility of Black Swifts nesting in East Fork San Gabriel Canyon, where no field observations were made during this study. Black Swifts were found nesting in Wolfskill Canyon in the Experimental Forest before 1987 (Collins 1987).

Bird species living in southern California chaparral rely heavily on insects and seeds for a major portion of their diet, although



quantitative studies have not been done in this area. Insects were found in the diet of 66.7 percent of all species observed in the chaparral and 45.3 percent of the breeding species, while seeds were found in the diet of 32.6 percent of all species and 28.3 percent of the breeding species.

## References

- Bentley, Jay R. 1961. **Fitting brush conversion to San Gabriel watersheds.** Misc. Paper 61. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 8 p.
- Collins, Charles T. Professor of Biology, California State University, Long Beach. (Telephone conversation). March 1987.
- Corbett, Edward S.; Green, Lisle R. 1965. **Emergency revegetation to rehabilitate burned watersheds in Southern California.** Res. Paper 22. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 14 p.
- Garrett, Kimball; Dunn, Jon. 1981. **Birds of southern California: status and distribution.** Los Angeles: Los Angeles Audubon Society, 408 p.
- Guthrie, Daniel A. 1979. **The 79th Audubon Christmas bird count, 1169, Claremont, California.** New York: National Audubon Society, Inc., American Birds 33: 646-647.
- Hanes, Ted L. 1971. **Succession after fire in the chaparral of southern California.** *Ecological Monographs* 41: 27-52.
- Hanes, Ted L.; Jones, Harold W. 1967. **Postfire chaparral succession in southern California.** *Ecology* 48: 259-264.
- Hill, Lawrence W. 1963. **The San Dimas Experimental Forest.** Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 24 p.
- Horton, Jerome S.; Kraebel, Charles J. 1955. **Development of vegetation after fire.** *Ecology* 36: 244-260.
- Martin, Alexander C.; Zim, Herbert S.; Nelson, Arnold L. 1951. **American wildlife and plants. A guide to wildlife food habits.** New York: McGraw-Hill (reprinted 1961 by Dover Publ., Inc.) 500 p.
- Mooney, Harold A.; Parsons, David J. 1973. **Structure and function of the California chaparral - an example from San Dimas.** In: DiCastri, Francesco, Mooney, Harold A. eds. *Mediterranean type ecosystems.* New York: Springer-Verlag: 83-112.
- Patric, James J.; Hanes, Ted L. 1964. **Chaparral succession in a San Gabriel Mountain area in California.** *Ecology* 45: 353-360.
- Plumb, Timothy R. 1961. **Sprouting of chaparral by December after a wildfire in July.** Tech. Paper 57. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 12 p.
- Plumb, Timothy R. 1963. **Delayed sprouting of scrub oak after a fire.** Res. Note 1. Berkeley, CA: Pacific Southwest Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 4 p.
- Wirtz, William O., II. 1977. **Vertebrate postfire succession.** Mooney, Harold A.; Conrad, C. Eugene eds. In: *Proceedings of the symposium on the environmental consequences of fire and fuel management in Mediterranean ecosystems.* Gen. Tech. Rep. WO-3. Washington, DC: Forest Service, U.S. Department of Agriculture; 46-57.
- Wirtz, William O., II. 1979. **Effects of fire on birds in chaparral.** In: Koch, David L. ed. *Transactions of the 10th annual conference, Western Section, The Wildlife Society and California-Nevada Chapter, American Fisheries Society, February 1-3, 1979, Long Beach, California.* Smartsville, CA: Western Section, The Wildlife Society and California-Nevada Chapter, American Fisheries Society; 114-124.
- Wright, Jerome T.; Horton, John S. 1951. **Checklist of the vertebrate fauna of San Dimas Experimental Forest and Range Experiment Station.** Misc. Paper 7. Berkeley, CA: California Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 15 p.
- Wright, Jerome T.; Horton, John S. 1953. **Supplement to checklist of the vertebrate fauna of San Dimas Experimental Forest.** Misc. Paper 13. Berkeley, CA: California Forest and Range Experiment Station, Forest Service, U.S. Department of Agriculture; 4 p.

# Appendix

**Table 1—Avifauna of the chaparral community of the San Gabriel Mountains, February 1969 to October 1979, with abundance as given by Wright and Horton (1951, 1953) for 1936-1953 [W&H]**

	Status <sup>1</sup>	Feeding <sup>2</sup> Niche	Site <sup>3</sup>	W&H <sup>4</sup>
<b>Cathartidae</b>	V	SC	S	O
Turkey Vulture, <i>Cathartes aura</i>				
<b>Accipitridae</b>				
Marsh Hawk, <i>Circus cyaneus</i>	V	R	SB	R
Sharp-shinned Hawk, <i>Accipiter striatus</i>	R	R	SB	C
Cooper's Hawk, <i>Accipiter cooperi</i>	RB <sup>5</sup>	R	SB	C
Red-tailed Hawk, <i>Buteo jamaicensis</i>	RB	R	SB	C
Golden Eagle, <i>Aquila chrysaetos</i>	F	R	SB	O
<b>Falconidae</b>				
American Kestrel, <i>Falco sparverius</i>	RP <sup>6</sup>	R	SB	C
Prairie Falcon, <i>Falco mexicanus</i>	V	R	S	N
<b>Phasianidae</b>				
California Quail, <i>Callipepla californica</i>	RB	SL	S	A
Mountain Quail, <i>Oreortyx pictus</i>	RB	S	SB	A
<b>Phalaropodidae</b>				
Wilson's Phalarope, <i>Phalaropus tricolor</i>	V	AI	B	N
<b>Columbidae</b>				
Rock Dove, <i>Columba livia</i>	V	S	SB	N
Band-tailed Pigeon, <i>Columba fasciata</i>	FB	SF	SB	C
Spotted Dove, <i>Streptopelia chinensis</i>	V	S	B	N
Mourning Dove, <i>Zenaidura macroura</i>	RB	S	S	O
<b>Cuculidae</b>				
Roadrunner, <i>Geococcyx californianus</i>	R	AI	S	O
<b>Tytonidae</b>				
Barn Owl, <i>Tyto alba</i>	R	R	S	O
<b>Strigidae</b>				
Western Screech Owl, <i>Otus kennicottii</i>	R	R	SB	C
Great-horned Owl, <i>Bubo virginianus</i>	RB	R	SB	C
Northern Pygmy Owl, <i>Glaucidium gnoma</i>	RP	R	B	R
Spotted Owl, <i>Strix occidentalis</i>	R	R	SB	R
Long-eared Owl, <i>Asio otus</i>	V	R	S	R
Short-eared Owl, <i>Asio flammeus</i>	V	R	S	M
<b>Caprimulgidae</b>				
Poor-will, <i>Phalaenoptilus nuttallii</i>	RP	IA	SB	C
<b>Apodidae</b>				
Black Swift, <i>Cypseloides niger</i>	V	IA	S	R
White-throated Swift, <i>Aeronautes saxatalis</i>	SB	IA	SB	C
<b>Trochilidae</b>				
Black-chinned Hummingbird, <i>Archilochus alexandri</i>	S	N	SB	S
Anna's Hummingbird, <i>Calypte anna</i>	RB	N	SB	A

continued

Table 1, continued

	Status <sup>1</sup>	Feeding <sup>2</sup> Niche	Site <sup>3</sup>	W&H <sup>4</sup>
Costa's Hummingbird, <i>Calypte costa</i>	S	N	SB	A
Calliope Hummingbird, <i>Stellula calliope</i>	M	N	SB	M
Rufous Hummingbird, <i>Selasphorus rufus</i>	M	N	SB	M
Allen's Hummingbird, <i>Selasphorus sasin</i>	M	N	B	M
Alcedinidae				
Belted Kingfisher, <i>Ceryle alcyon</i>	RP	AI	SB	O
Picidae				
Lewis' Woodpecker, <i>Melanerpes lewis</i>	V	IV	B	N
Acorn Woodpecker, <i>Melanerpes formicivorus</i>	F	IS	SB	O
Yellow-bellied Sapsucker, <i>Sphyrapicus varius</i>	V	IV	SB	A
Nuttall's Woodpecker, <i>Picoides nuttallii</i>	RB	IV	SB	O
Downy Woodpecker, <i>Picoides pubescens</i>	F	IV	B	O
Hairy Woodpecker, <i>Picoides villosus</i>	R	IV	SB	C
White-headed Woodpecker, <i>Picoides albolarvatus</i>	F	IV	SB	O
Northern Flicker, <i>Colaptes auratus</i>	RB	IV	SB	C
Tyrannidae				
Olive-sided Flycatcher, <i>Contopus borealis</i>	SB	IB	SB	C
Western Wood Peewee, <i>Contopus sordidulus</i>	S	IA	SB	C
Western Flycatcher, <i>Empidonax difficilis</i>	S	IA	S	C
Black Phoebe, <i>Sayornis nigricans</i>	RB	IA	SB	A
Say's Phoebe, <i>Sayornis saya</i>	SP	IA	S	N
Ash-throated Flycatcher, <i>Myiarchus cinerascens</i>	SB	IA	SB	C
Western Kingbird, <i>Tyrannus verticalis</i>	M	IA	S	O
Hirundinidae				
Tree Swallow, <i>Tachycineta bicolor</i>	V	IA	S	M
Violet-green Swallow, <i>Tachycineta thalassina</i>	SB	IA	SB	S
Northern Rough-winged Swallow, <i>Stelgidopteryx serripennis</i>	V	IA	SB	S
Cliff Swallow, <i>Hirundo pyrrhonota</i>	V	IA	S	S
Corvidae				
Steller's Jay, <i>Cyanocitta stelleri</i>	RB	O	SB	A
Scrub Jay, <i>Aphelocoma coerulescens</i>	RB	O	SB	A
Clark's Nutcracker, <i>Nucifraga columbiana</i>	F	S	B	N
American Crow, <i>Corvus brachyrhynchos</i>	V	O	SB	O
Common Raven, <i>Corvus corax</i>	FB	O	SB	N
Paridae				
Mountain Chickadee, <i>Parus gambeli</i>	F	IS	SB	A
Plain Titmouse, <i>Parus inornatus</i>	RB	IS	SB	C
Aegithalidae				
Bushtit, <i>Psaltiriparus minimus</i>	RB	IV	SB	C
Sittidae				
Red-breasted Nuthatch, <i>Sitta canadensis</i>	F	IV	B	N
White-breasted Nuthatch, <i>Sitta carolinensis</i>	F	IV	B	O
Certhiidae				
Brown Creeper, <i>Certhia americana</i>	F	IV	B	O

continued

Table 1, continued

	Status <sup>1</sup>	Feeding <sup>2</sup> Niche	Site <sup>3</sup>	W&H <sup>4</sup>
<b>Troglodytidae</b>				
Rock Wren, <i>Salpinctes obsoletus</i>	RP	IV	SB	O
Canyon Wren, <i>Catherpes mexicanus</i>	RP	IV	SB	C
Bewick's Wren, <i>Thryomanes bewickii</i>	RB	IV	SB	C
House Wren, <i>Troglodytes aedon</i>	RB	IV	SB	C
<b>Cinclidae</b>				
Dipper, <i>Cinclus mexicanus</i>	F	AI	B	C
<b>Muscicapidae</b>				
Golden-crowned Kinglet, <i>Regulus satrapa</i>	V	IV	B	N
Ruby-crowned Kinglet, <i>Regulus calendula</i>	M	IV	SB	C
Blue-gray Gnatcatcher, <i>Poliophtila caerulea</i>	SB	IV	SB	O
Western Bluebird, <i>Sialia mexicana</i>	F	IF	SB	C
Mountain Bluebird, <i>Sialia currucoides</i>	V	IF	B	N
Townsend's Solitaire, <i>Myadestes townsendi</i>	V	IF	SB	O
Swainson's Thrush, <i>Catharus ustulatus</i>	M	IF	SB	M
Hermit Thrush, <i>Catharus guttatus</i>	M	IF	SB	M
Robin, <i>Turdus migratorius</i>	FB	IF	SB	O
Varied Thrush, <i>Ixoreus naevius</i>	V	IF	B	R
Wrentit, <i>Chamaea fasciata</i>	RB	IF	SB	C
<b>Mimidae</b>				
Northern Mockingbird, <i>Mimus polyglottos</i>	V	IF	B	O
California Thrasher, <i>Toxostoma redivivum</i>	RB	IF	SB	A
<b>Bombycillidae</b>				
Cedar Waxwing, <i>Bombycilla cedrorum</i>	V	F	SB	M
<b>Ptilonotidae</b>				
Phainopepla, <i>Phainopepla nitens</i>	V	F	SB	C
<b>Laniidae</b>				
Loggerhead Shrike, <i>Lanius ludovicianus</i>	RP	R	S	O
<b>Sturnidae</b>				
Starling, <i>Sturnus vulgaris</i>	V	IS	B	N
<b>Vireonidae</b>				
Warbling Vireo, <i>Vireo gilvus</i>	S	IV	SB	C
<b>Emberizidae</b>				
Orange-crowned Warbler, <i>Vermivora celata</i>	M	IV	SB	O
Yellow Warbler, <i>Dendroica petechia</i>	M	IV	SB	C
Yellow-rumped Warbler, <i>Dendroica coronata</i>	M	IV	SB	O
Black-throated Gray Warbler, <i>Dendroica nigrescens</i>	M	IV	SB	O
Townsend's Warbler, <i>Dendroica townsendi</i>	M	IV	SB	M
Hermit Warbler, <i>Dendroica occidentalis</i>	M	IV	S	M
MacGillivray's Warbler, <i>Oporornis tolmiei</i>	M	IV	SB	M
Wilson's Warbler, <i>Wilsonia pusilla</i>	M	IV	SB	O
Yellow-breasted Chat, <i>Icteria virens</i>	M	IV	B	S
Summer Tanager, <i>Piranga rubra</i>	V	IF	B	N
Western Tanager, <i>Piranga ludoviciana</i>	SB	IF	SB	S

continued

Table 1, continued

	Status <sup>1</sup>	Feeding <sup>2</sup> Niche	Site <sup>3</sup>	W&H <sup>4</sup>
Black-headed Grosbeak, <i>Pheucticus melanocephalus</i>	SB	IF	SB	C
Lazuli Bunting, <i>Passerina amoena</i>	SB	IS	SB	O
Green-tailed Towhee, <i>Pipilo chlorurus</i>	F	IS	SB	O
Rufous-sided Towhee, <i>Pipilo erythrophthalmus</i>	RB	IS	SB	C
Brown Towhee, <i>Pipilo fuscus</i>	RB	IS	SB	A
Rufous-crowned Sparrow, <i>Aimophila ruficeps</i>	RB	IS	SB	C
Chipping Sparrow, <i>Spizella passerina</i>	M	IS	SB	M
Black-chinned Sparrow, <i>Spizella atrogularis</i>	SB	IS	S	S
Lark Sparrow, <i>Chondestes grammacus</i>	SB	IS	SB	O
Fox Sparrow, <i>Passerella iliaca</i>	F	S	SB	R
Song Sparrow, <i>Melospiza melodia</i>	RB	IS	SB	C
Lincoln's Sparrow, <i>Melospiza lincolni</i>	V	S	B	R
White-throated Sparrow, <i>Zonotrichia albicollis</i>	V	IS	B	N
Golden-crowned Sparrow, <i>Zonotrichia leucophrys</i>	M	IS	SB	M
White-crowned Sparrow, <i>Zonotrichia atricapilla</i>	M	IS	SB	M
Dark-eyed Junco, <i>Junco hyemalis</i>	V	IS	B	N
Oregon Junco, <i>Junco h. oregonus</i>	FB	IS	SB	A
Western Meadowlark, <i>Sturnella magna</i>	V	IS	SB	O
Brown-headed Cowbird, <i>Molothrus ater</i>	SB	IS	SB	R
Hooded Oriole, <i>Icterus cucullatus</i>	V	IF	B	N
Northern Oriole, <i>Icterus galbula</i>	SB	IF	SB	C
Scott's Oriole, <i>Icterus parisorum</i>	V	IF	B	N
Fringillidae				
Purple Finch, <i>Carpodacus purpureus</i>	F	S	SB	O
Cassin's Finch, <i>Carpodacus cassinii</i>	F	S	B	N
House Finch, <i>Carpodacus mexicanus</i>	RB	S	SB	C
Pine Siskin, <i>Carduelis pinus</i>	F	S	B	R
Lesser Goldfinch, <i>Carduelis psaltria</i>	RB	S	SB	A
Lawrence's Goldfinch, <i>Carduelis lawrencei</i>	SB	S	SB	C
American Goldfinch, <i>Carduelis tristis</i>	V	S	B	O
Evening Grosbeak, <i>Coccothraustes vespertinus</i>	V	IS	B	N
Ploceidae				
House Sparrow, <i>Passer domesticus</i>	V	IS	B	N

<sup>1</sup>Status: V-vagrant or single sightings; M-migrant, observed spring and fall; F-foraging from nearby forest; S-spring, breeding or probably breeding; R-resident, breeding or probably breeding.

<sup>2</sup>Feeding Niche: SC-scavenger; R-raptor; O-omnivore; AI-vertebrates and or invertebrates; F-fruit; SL-seeds and tender leaves; SF-seeds and fruit; IS-seeds and insects; IF-insects and fruit; IA-insects in air; IV-insects from vegetation or ground.

<sup>3</sup>Site: S-San Dimas Experimental Forest; B-Baldy site.

<sup>4</sup>W&H: Wright and Horton (1951-1953); A-abundant; C-common; O-occasional; R-rare; M-migrant; S-summer visitor (their definitions). N-not reported by Wright and Horton.

<sup>5</sup>B: breeding documented by this study.

<sup>6</sup>P: probable status, but not verified by this study.

See text for further explanation of these categories.

Table 2—Frequency of occurrence of avifauna in San Gabriel chaparral<sup>1</sup>

Resident Species	JAN		FEB		MAR		APR		MAY		JUNE		JULY		AUG		SEPT		OCT		NOV		DEC	
	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B
Sharp-shinned Hawk	31	3	9	1	6		2		4		22	33									9	2	1	27
Cooper's Hawk	15	3	23		27	1	11		8	1	22		19		2	2	19	1	45	4	11		40	4
Red-tailed Hawk	54	10	59	5	48	7	41	2	27	4	28	2	25	14	40	2	75	3	36	9	67	4	40	4
American Kestrel	38		14		9	4					12		20		25		18		33		1	33		
California Quail	38		36		21		28		23		22		19		20		6		18		22		27	
Mountain Quail	8	10	68	21	39	12	61	29	69	23	28	9	12	15	50	38	12	13		11		4	33	2
Mourning Dove			18	9		33		81		72		62		30		6			22		7			
Roadrunner	23		9	6		17		8					10								7			
Barn Owl	15		4		3	2									12						7			
Western Screech Owl	15	3	14	2	6	1	2		3		6				4		9	10		1		5		
Great-horned Owl	15	16	23	9	9	9	2	10	12	9	6	12	19		4		12	10	18	14	11	9	20	20
Spotted Owl					3	1				1		8		2		2		2		13		2	7	14
Poor-will			4	6	3	6	213		13		20		5		4		25	9	1		1	11		
Anna's Hummingbird		12	14	20	15	37	28	50	46	43	61	18	25	28		46	19	40	9	10		6	7	4
Nuttall's Woodpecker	15	4		4	3	18	2	11	2	63		6		8		3		7		5	13	7		
Hairy Woodpecker	8	1		1	3	7	2	8		4		3			10		9		1		2		7	
Northern Flicker	54	9	36	12	52	20	37	23	50	15	44	15	56	20	50	24	44	20	64	15	67	12	67	16
Black Phoebe	31	2			12		9	2		2	11		6	11			2		14		8	20	7	
Steller's Jay	8	59		47	3	58	4	58	8	52		37	6	52		76		56		50		50		47
Scrub Jay	54	31	50	32	54	42	52	39	58	18	56	8	56	15	60	34	62	36	64	15	33	16	73	18
Plain Titmouse		49		38	6	42	4	42	12	29	17	22		32		46		30		25	11	31	27	38
Bushtit	8	1	23	1	27	4	26	4	19	2	22	2	12		20	2			1		2		27	
Rock Wren					2												12				1		2	
Canyon Wren		1			3	1	2				6				4		3				6		5	
Bewick's Wren	23	7	50	4	48	5	28	1	38	4	22	2	38		30		38	10	27	18	33	8	27	11
House Wren		1	9		9	7	28	20	42	26	28	23	6	12	40	28	6	17		3			7	
Wrentit	69	13	82	12	67	11	61	11	81	5	67	6	81	17	90	24	31	11	45	9	78	12	80	13

Continued

Table 2, continued

Resident Species	JAN S B		FEB S B		MAR S B		APR S B		MAY S B		JUNE S B		JULY S B		AUG S B		SEPT S B		OCT S B		NOV S B		DEC S B	
California Thrasher	69	2	68	1	36		50		58		17		31		30	8		1			11		47	2
Loggerhead Shrike	46		9									6					6		27		44		20	
Rufous-sided Towhee	8	50	45	40	48	33	48	28	77	28	78	18	31	12	30	18	19	34	36	11	33	11	13	25
Brown Towhee	69	40	68	25	70	38	87	42	85	33	89	32	75	28	80	48	81	58	64	28	44	21	93	36
Rufous-crowned Sparrow	23		14	2	12		33	1	12		44	6					38		18		11		13	
Song Sparrow	31	26	4	20	21	15	33	19	65	12	38	11	31	5	20	4	19	17	36	12	11	18	33	25
House Finch	62	30	32	28	27	19	50	31	73	26	44	18	44	24	60	22	50	8	9	1		11	47	33
Lesser Goldfinch	15		27		18	2	48		46	3	28	2	25	6	20	8	44	10	18	11	33	4	20	2
Spring Breeding Species																								
White-throated Swift			18	1	21	1	26	6	8	10	11	12	25	2	10			1			11		13	
Black-chinned Hummingbird					6		6	12	17	6	3		9		12									
Costa's Hummingbird							4		23	1	6													
Olive-sided Flycatcher							8		4	29	11	29		15		16			1					
Western Wood Peewee							2	2	23	21	11			11		12								
Western Flycatcher							4		4		6													
Ash-throated Flycatcher							35	15	54	36	55	23	32	12		2								
Violet-green Swallow			18		9	2	17	1	15	30	6	34	25	12		14		1		2				
Blue-gray Gnatcatcher					3	1	10		12		6		19											
Warbling Vireo					3		2	1		1							1		9					
Western Tanager							10	2	8	10	11	3		4		12		8						
Black-headed Grosbeak							24	43	50	48	39	17	19	46		26		4						
Lazuli Bunting							17		42		50		31	1		4		1						
Black-chinned Sparrow			23				28		35		38		6											
Lark Sparrow					3		17		8		11		6		20				1					
Brown-headed Cowbird							4	27	19	30	11	9	12	10										
Northern Oriole					3		6	58	12	52	17	31	6	21		8		1						

Continued



Table 2, continued

Migrant Species	JAN S    B	FEB S    B	MAR S    B	APR S    B	MAY S    B	JUNE S    B	JULY S    B	AUG S    B	SEPT S    B	OCT S    B	NOV S    B	DEC S    B
Lawrence's Goldfinch	2	4    4			5	19    8	6    7	4	6    4	1		
Calliope Hummingbird				2    1								
Rufous Hummingbird			6    9	2    2		6	6	2	6			
Allen's Hummingbird							1					
Western Kingbird				6	4							
Ruby-crowned Kinglet	2	9    2	9    7	2    3						7	15	33    9
Swainson's Thrush					1							
Hermit Thrush		4								3		
Orange-crowned Warbler				4					4	1		
Yellow Warbler				2	2		2					
Yellow-rumped Warbler	8    2	9	9    2	9    6	4					1	1	27    2
Black-throated Gray				6    2							1	
Warbler												
Townsend's Warbler	1			9    2							1	
Hermit Warbler			3    9									
MacGillivray's Warbler				2    2	4							
Wilson's Warbler				6    2			2	2	3	4		
Yellow-breasted Chat									2			
Chipping Sparrow			6    1	6	8				19    8	1		
White-crowned Sparrow	8    3	18    2	18    8	17    10	1				25    39	27    50	56    24	27    11
Golden-crowned Sparrow	31	9    17	18    36	4    30	5					18    33	32	33    29
Forest Species												
Golden Eagle		4    1	9	2	3					1	11	
Band-tailed Pigeon	8    16	38	51	15    46	31    31	6    23	33	50	45	9    18	8	11
Pygmy Owl		2	4	1								
Acorn Woodpecker	42	33	41	45	28	6    25	42	54	17	16	21	24
Downy Woodpecker	4	1	4	6	5	3	11		2	2	1	2

Continued

Table 2, continued

Forest Species	JAN		FEB		MAR		APR		MAY		JUNE		JULY		AUG		SEPT		OCT		NOV		DEC	
	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B
White-headed Woodpecker							2												1				7	
Clark's Nutcracker																			1					
Common Raven	46	4	32	4	30	3	41	6	19	17	6	2	12	6	30	16	38	10	27	8	33		7	
Mountain Chickadee	39			27	3	33	2	32	4	23	6		20		42		12	24	20		38	7	22	
Red-breasted Nuthatch																			1					
White-breasted Nuthatch	33		30		33		38		7		5		15		36		30		22		39		40	
Brown Creeper	1				1														1		1			
Western Bluebird	62	19	50	11	48	6	26	11	8		3				2								2	
Robin	46	13	23	31	6	41	31		34		20		50		10	12	6	13	27	25	33	15	33	31
Green-tailed Towhee							2	1	10		2		33		36		37		22		22	25	40	24
Fox Sparrow	17		6		3	7	10						1		16		14							
Oregon Junco	23	58	18	52	27	56	9	34	30		6	6					2		9		19	7	22	
Purple Finch	14		18		9	29	2	19	15		6	20	6	28	52		6	52	9	54	44	49	60	47
Cassin's Finch	7		7		6		18		4				18		30		15		16		22		24	
Pine Siskin					3		5		1				4		2				1					
Vagrant Species																								
Turkey Vulture	15				3		6		4								6				11		4	
Marsh Hawk			9		6		4										6		9		44		20	
Prairie Falcon							2																	
Wilson's Phalarope									1															
Rock Dove					6		2		3				5		10		9							
Spotted Dove							1		2		1		1											
Long-eared Owl					6		2																	
Short-eared Owl			4																					
Black Swift									4															
Continued																								


Table 2, continued

Vagrant Species	JAN		FEB		MAR		APR		MAY		JUNE		JULY		AUG		SEPT		OCT		NOV		DEC	
	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B	S	B
Belted Kingfisher					5		2	5	3		5		1		2				1				7	
Lewis' Woodpecker							2										1							
Yellow-bellied Sapsucker		8			6										2		2		15		10		2	
Say's Phoebe	8																9							
Tree Swallow					3																			
Rough-winged Swallow							2	2	2						2									
Cliff Swallow							4				6													
American Crow			9		2	2		2																
Golden-crowned Kinglet																								2
Mountain Bluebird					1														1		1			
Townsend's Solitaire			1		3	4		1																13
Varied Thrush		11		25		43		19											3		24		13	
Mockingbird		1																			1		1	
Cedar Waxwing		4		2			2	1									1		1		1	13	4	
Phainopepla		2			3	1																		2
Starling							1		1															
Summer Tanager									1															
White-throated Sparrow		2			4		1														6			
Lincoln's Sparrow							1										1		3					
Dark-eyed Junco		21		10		11		3											8		18			
Western Meadowlark	8								4										1					
Hooded Oriole							2																	
Scott's Oriole																			1					
American Goldfinch							1										1							
Evening Grosbeak				1																				
House Sparrow					1		1		1															

<sup>1</sup>S = San Dimas Experimental Forest; B = Mt. Baldy.

**Table 3—Resident chaparral species and known breeding phenology**

Species	Month of Year <sup>1</sup>											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sharp-shinned Hawk												
Cooper's Hawk					N	I						
Red-tailed Hawk			N	N	I	I						
American Kestrel												
California Quail					I	I	I					
Mountain Quail						I	I	I	I			
Mourning Dove					N	I						
Roadrunner												
Barn Owl												
Western Screech Owl												
Great-horned Owl		N	N	I	I							
Spotted Owl												
Poor-will												
Anna's Hummingbird					N	I	I					
Nuttall's Woodpecker						I						
Hairy Woodpecker												
Northern Flicker						N						
Black Phoebe						N						
Steller's Jay			N	N	N	I	I					
Scrub Jay							I					
Plain Titmouse				N			I					
Bushtit				N								
Rock Wren												
Canyon Wren												
Bewick's Wren					N		I					
House Wren				N	N							
Wrentit					N							
California Thrasher					N	N						
Loggerhead Shrike												
Rufous-sided Towhee					N	I	I	I				
Brown Towhee						I						
Rufous-crowned Sparrow						I						
Song Sparrow					N							
House Finch					N	N	I					
Lesser Goldfinch							I					


<sup>1</sup>  = present on one or more study site;

N = nesting

I = immatures present

Table 4—Phenology of spring-breeding chaparral species

Species	Month of Year <sup>1</sup>											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
White-throated Swift <sup>2</sup>						N	N					
Black-chinned Hummingbird												
Costa's Hummingbird												
Olive-sized Flycatcher					N	N						
Western Wood Pewee												
Western Flycatcher												
Ash-throated Flycatcher					N	N						
Violet-green Swallow <sup>2</sup>												
Blue-gray Gnatcatcher							I					
Warbling Vireo												
Western Tanager									I			
Black-headed Grosbeak						I	I	I	I			
Lazuli Bunting						I						
Black-chinned Sparrow					N							
Lark Sparrow					N	I						
Brown-headed Cowbird							I					
Northern Oriole				N	N	N	I					
Lawrence's Goldfinch							I					

<sup>1</sup>  = present on one or more study site;

N = nesting;

I = immatures present;

<sup>2</sup>Resident in southern California (Garrett and Dunn 1981)


Table 5—Phenology of migrant species in California chaparral

Species	Month of Year <sup>1</sup>											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Calliope Hummingbird												
Rufous Hummingbird												
Allen's Hummingbird												
Western Kingbird												
Ruby-crowned Kinglet												
Swainson's Thrush												
Hermit Thrush												
Orange-crowned Warbler												
Yellow Warbler												
Yellow-rumped Warbler												
Black-throated Gray Warbler												
Townsend's Warbler												
Hermit Warbler												
MacGillivray's Warbler												
Wilson's Warbler												
Yellow-breasted Chat												
Chipping Sparrow												
White-crowned Sparrow												
Golden-crowned Sparrow												

<sup>1</sup> = present on one or more study site

**Table 6—Phenology of species resident in higher elevation forests that frequently forage in or over chaparral, and breeding phenology if determined in this study**

Species	Month of Year <sup>1</sup>											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Golden Eagle												
Band-tailed Pigeon							I	I				
Pygmy Owl												
Acorn Woodpecker							I					
Downy Woodpecker												
White-headed Woodpecker												
Clark's Nutcracker												
Common Raven							I					
Mountain Chickadee												
Red-breasted Nuthatch												
White-breasted Nuthatch												
Brown Creeper												
Dipper												
Western Bluebird												
Robin				N	N	I	I	I				
Green-tailed Towhee												
Fox Sparrow												
Oregon Junco						N	I					
Purple Finch												
Cassin's Finch												
Pine Siskin												

<sup>1</sup>  = present on one or more study site;


**N** = nesting

**I** = immatures present



Table 7— Vagrants observed in chaparral communities of the San Gabriel Mountains, 1969–79

Species	Month of Year <sup>1</sup>											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Turkey Vulture												
Marsh Hawk												
Prairie Falcon				S								
Wilson's Phalarope					B							
Rock Dove												
Spotted Dove												
Long-eared Owl												
Short-eared Owl		B										
Black Swift					S							
Belted Kingfisher												
Lewis' Woodpecker												
Yellow-bellied Sapsucker												
Say's Phoebe												
Tree Swallow			S									
Rough-winged Swallow												
Cliff Swallow												
American Crow												
Golden-crowned Kinglet												B
Mountain Bluebird												
Townsend's Solitaire												
Varied Thrush												
Mockingbird												
Cedar Waxwing												
Phainopepla												
Starling												
Summer Tanager					B							
White-throated Sparrow												
Lincoln's Sparrow												
Dark-eyed Junco												
Western Meadowlark												
Hooded Oriole				B								
Scott's Oriole										B		
American Goldfinch												
Evening Grosbeak												
House Sparrow												

<sup>1</sup>  = present on one or more study site

S = single sighting in San Dimas Experimental Forest

B = Single sighting at Mt. Baldy



**The Forest Service, U.S. Department of Agriculture**, is responsible for Federal leadership in forestry. It carries out this role through four main activities:

- Protection and management of resources on 191 million acres of National Forest System lands
- Cooperation with State and local governments, forest industries, and private landowners to help protect and manage non-Federal forest and associated range and watershed lands
- Participation with other agencies in human resource and community assistance programs to improve living conditions in rural areas
- Research on all aspects of forestry, rangeland management, and forest resources utilization.

**The Pacific Southwest Research Station**

- Represents the research branch of the Forest Service in California, Hawaii, American Samoa and the western Pacific.
- 

Persons of any race, color, national origin, sex, age, religion, or with any handicapping conditions are welcome to use and enjoy all facilities, programs, and services of the U.S. Department of Agriculture. Discrimination in any form is strictly against agency policy, and should be reported to the Secretary of Agriculture, Washington, DC 20250.

**Avifauna in Southern California Chaparral: Seasonal Distribution,  
Habitat Association, Reproductive Phenology**



Federal Recycling Program  
Printed on Recycled Paper