

Chapter 2

THE BIRDS OF BERKELEY'S CREEKS

Jennifer Melville

As the country is settled marked changes take place in the bird life. A few of our species . . . have become more numerous than they were in the early days, but very many more have become noticeably scarcer; some have disappeared altogether. Bird life as a whole has diminished in quantity to an alarming degree.

--Joseph Grinnell, 1914

Introduction

In Western North America more species of birds are associated with riparian woodland than with any other vegetation formation (Miller, 1951). The multistoried and varied flora characteristic of creeks, as well as access to open water, make streamside locations attractive to a wide variety of birds. Modification of creeks and associated riparian vegetation can, therefore, significantly affect avian populations. Berkeley's streams and riparian areas have been considerably altered throughout the city's period of urbanization. This report examines the changes that Berkeley's bird populations have undergone in response to the alteration of local creeks.

Methods

To determine the effects that changes in Berkeley's riparian areas have had on the city's birds, historical observations were researched and a partial census of the creeks was conducted. The study relied heavily on observer's unpublished field notes and species lists compiled either in the Berkeley Hills or on the University of California campus. The early observations made by Joseph Grinnell, the renowned Berkeley naturalist, and by Amelia Sanborn Allen, one of Berkeley's amateur ornithologists, proved to be resources of primary importance. Both Grinnell and Allen published articles on the city's birds, compiled lists of the species present on the University of California campus, and kept extensive field notes. Another of Berkeley's early bird watchers, Charles Keeler, wrote a book containing the observations he made in the Berkeley Hills. More recent references include lists compiled by two University of California ornithologists, Alden Miller and Frank Pitelka. They completed one census of the campus birds and one of the various species occurring in the hills. None of these references pertained specifically to riparian birds, but a few did mention the birds' use of streamside areas.

Because no recent censuses have been completed with which to compare these earlier records, in February, March and April of this year I censused several locations along Harwood and Codornices Creeks. In February and March, fellow student Alphonse Demée made observations on upper Strawberry Creek. Some of the sites are in relatively undeveloped spots, while others are located in urban areas. Even at the less developed sites the vegetation has changed dramatically during the past 100 years (see paper by Demée, this report). We collected data along the creeks and in the associated riparian vegetation. Throughout this paper reference to riparian vegetation includes streamside arboreal vegetation as well as the brushy understory. In just a few months and without formal training, we were unable to conduct a complete census of the birds that use Berkeley's creeks. Long-time Berkeley bird watchers John Westlake and Scott Stine agreed, however, that the birds included in the census do occur in Berkeley's streamside areas. They also provided information about birds that they observed in Berkeley's riparian locations.

Previous Work

Although no study of riparian birds has been undertaken in Berkeley, studies done elsewhere suggest how development of the creeks could affect Berkeley's birds. In 1974, ornithologist David Gaines conducted a study on the impact of agricultural and urban development on riparian bird populations in the Sacramento Valley. He censused the area and compared his results with those published for the same area by Miller and Grinnell in 1944. Gaines found that four species are now more abundant, while 12 have declined or disappeared. He concluded that 9 of these 12 species were victims of the parasitic Brown-headed Cowbird (Molothrus ater), a bird not listed by Miller and Grinnell. With the increase in agricultural use of the land, the Cowbird was able to invade the area and parasitize the native species. The three other birds that declined--the Cooper's Hawk (Accipiter Cooperii), the Red-shouldered Hawk (Buteo lineatus), and the Yellow-billed Cuckoo (Coccyzus americanus)--were probably directly affected by the decrease in availability of riverbottom woodland (Gaines, 1974).

Berkeley's riparian areas and the Sacramento Valley are clearly very different, yet many of the same bird species inhabit the two areas. Six of the birds parasitized by the Cowbird in the Sacramento Valley are found in Berkeley (Miller and Pitelka, 1959). The Song Sparrow (Melospiza melodia), Swainson's Thrush (Hylocichla ustulata), Western Flycatcher (Empidonax difficilis), and Warbling Vireo (Vireo gilvus) are all common Berkeley residents, while the Blue-grey Gnatcatcher (Milioptila caerulea) and the Yellow Warbler (Dendroica petechia; Westlake, 1983, pers. comm.) are occasional visitants.

More importantly, although the Brown-headed Cowbird was not mentioned by any of Berkeley's early ornithologists, it was listed in both of Miller and Pitelka's lists of Berkeley birds. Because no study similar to Gaines' has been done in Berkeley, there is no clear evidence that the city's riparian birds have been affected in the same way that the Sacramento Valley's avian populations were. Nevertheless, because the Cowbird has been able to invade Berkeley, some of the city's birds could

decrease in abundance due to the Cowbird's parasitism.

Another study of riparian bird communities (Stauffer and Best, 1980) examined the effects of reduced and altered riparian vegetation on nesting bird populations. Though this study was conducted in Iowa, some of the findings could have implications for the assessment of changes in bird populations in Berkeley. Stauffer and Best made clear distinctions between highly tolerant and intolerant bird species. Those with low tolerance are the most adversely affected by the loss of their preferred habitat. Several species that occur in Berkeley's riparian areas are listed as intolerant or less-tolerant: the Blue-grey gnatcatcher, Warbling Vireo, Yellow Warbler and Rufous-sided Towhee (Pipilo erthrophthalmus). Along with the complete removal of riparian vegetation, a reduction in width of the habitat and density of the vegetation adversely affects low tolerance species. Stauffer and Best speculated that complete removal of the riparian vegetation would eliminate 32 of the 41 nesting species. Thinning the tree cover and the understory would eliminate birds with very low tolerance and reduce the populations of many more species.

In the areas where Gaines, and Stauffer and Best conducted their studies, crops have replaced much of the riparian vegetation. Though this is clearly not the case in Berkeley, riparian areas here have unquestionably been altered. Although development proceeded differently in the three areas, the results of Gaines' and Stauffer and Best's studies suggest that some of the birds that use Berkeley's riparian areas could be detrimentally affected by habitat alteration. Substantial changes in a habitat may allow invading species to colonize and can deprive native birds of essential resources.

Historical Accounts of Birds That Use Berkeley's Riparian Areas

Berkeley's early bird watchers considered the creeks, with their varied and dense vegetation, important bird habitats. Many of their informal and group walks followed the creeks into the canyons. Allen, Grinnell and the Audubon Society conducted walks in Claremont Canyon and along Strawberry Creek; they usually started just below the University campus. When she first came to Berkeley around the turn of the century, Allen found "the canyon along Strawberry Creek from Telegraph Avenue to the mouth of Strawberry Canyon . . . totally unspoiled" (Allen, 1934). Grinnell, expressing similar impressions, characterized the area along upper Strawberry Creek as "truly 'wild' land . . . that accounts for the occurrence of many less familiar species of birds" (Grinnell, 1914a). When the stadium was built in the canyon in 1922 Allen expressed her concern that "with so many new buildings going up there is little birding territory left" (Allen, notes, 1922). Nearly ten years later, members of the Audubon Society noted that the building program on the campus had caused a reduction in the number of birds present (The Gull, 1931).

Although Berkeley's streamside areas were substantially altered, they continued to provide habitats for many types of birds. Of the 100 or so resident and migrant species referred to in historical notes, over half of them were recorded in the canyons. Because the notes did not always indicate specific

locations, many of the remaining birds may also have been sighted in riparian areas along the canyon bottoms.

Observers rarely noted the birds actually using the creeks. Only a Varied Thrush (Ixoreus naevius; Allen, 1906), a Golden-crowned Kinglet (Regulus satropa; The Gull, 1926) and a Wilson's Warbler (Wilsonia pusilla; Keeler, 1907) were recorded bathing in a creek. More often the ornithologists mentioned the birds' use of riparian vegetation. A few references were made to nests found along streams. Nests of Brown Towhees (Pipilo fuscus), Rufous-sided Towhees, Swainson's Thrushes (Allen, 1919), Wrentits (Chamaea fasciata; Grinnell, notes, 1918), Bushtits (Psaltriparus minimus), Plain Titmice (Parus inornatus), and Orange-crowned Warblers (Vermivora celata; Allen, notes, 1922) were found either in the thick streamside undergrowth or the riparian trees. In his notes, Grinnell (1918) gave special mention to the streamside occurrences of Rufous-sided Towhees, Orange-crowned Warblers, Swainson's Thrushes, Bewick's Wrens (Thryomanes bewicki), Song Sparrows, Anna's Hummingbirds (Calypte anna), Allen's Hummingbird (Selasphorus sasin), Black-headed Grosbeaks (Pneuticus melanocephalus), Lesser Goldfinches (Spinus psaltria), Brown Creepers (Certhis familiaris), and MacGillivray's Warblers (Oporornis tolmiei). Numerous other references were made to birds' use of the vegetation that is often found in riparian areas. For example, Brown Creepers and Western Tanagers (Piranga ludoviciana; Grinnell, notes, 1914) were sighted in bay trees (Umbellularia californica), Bushtits and Sapsuckers (Sphyrapicus varius; Allen, 1919) in willows (Salix sp.) and Song Sparrows in blackberry bushes (Rubus vitifolius; Grinnell, 1918).

Campus Birds - Strawberry Creek

The birds on the campus particularly interested Berkeley's early bird watchers. Several censuses of the campus's avian populations were conducted. These lists are especially important because no comparable censuses were ever taken of bird populations throughout the rest of the city. Because dense riparian vegetation once lined Strawberry Creek where it ran through the campus (Grinnell, 1914), the bird species living along Strawberry were probably similar to those living in Berkeley's other riparian areas. Therefore, the campus lists can be used to help understand the changes that Berkeley's riparian bird communities have undergone.

As the campus lists were updated, they varied only slightly. A few species, however, did become noticeably more abundant. None of these were typically riparian birds; rather, they were generalists. Robins (Turdus migratorius) first began to nest in Berkeley when lawns replaced wooded areas (Storer, 1926). House Sparrows (Passer domesticus), a species introduced from Europe, were able to invade as the area became increasingly urbanized. This invasion may have detrimentally affected the native bird populations (Grinnell, 1914). Colonization of non-native birds, however, probably had less impact on the native species than development of the campus. The campus lists indicate that a few riparian birds have declined in abundance (Miller, 1951). The Yellow Warbler, once a common campus

species (Miller and Pitelka, 1944), now occurs rarely in Berkeley (Stine, Westlake, 1983, pers. comm.). Both the White-breasted Nuthatch (Sitta carolinensis) and the Nuttall's Woodpecker (Dendropos nuttalli) were included on the early campus lists. Yet the later list (Miller and Pitelka, 1944) does not include either species. Lewis's Woodpecker (Asyndesmus lewis) and the Acorn Woodpecker (Melanerpes formicivorus), both of which were occasionally observed on campus in the early years (Grinnell, 1918), are now considered rare species (Miller and Pitelka, 1944).

Census of Birds Along Berkeley's Creeks

Site 1 - Upper Harwood Creek

Upper Harwood Creek in Claremont Canyon provides some of the least disturbed riparian habitat in Berkeley. Though many introduced plant species, such as blue gum (Eucalyptus globulus) and French broom (Cytisus monspessulanus) grow in the canyon, they are mixed in with native riparian plants. The density and type of vegetation along the creek and, therefore, access to the creek, varies greatly. In places where the stream runs close to the road, the vegetation is sparse and the banks are exposed. I chose to make observations in an area where willows, French broom, and coyote bush (Baccharis pilularis) protect the creek's banks and where blue gum and coast live oaks (Quercus agrifolia) provide a thick canopy (see map, p. viii, for location). Across the creek, on the south side of the canyon, woody vegetation covers the hills. In this area I heard and saw a wide variety of birds. Species that are often found in Berkeley's streamside areas (Westlake, Stine, 1983, pers. comm.) frequented this site, whereas House Sparrows and Starlings (Sturnus vulgaris), two introduced birds, did not. Following is a list of species observed on upper Harwood Creek:

SPECIES	OBSERVATIONS
Chestnut-backed Chickadee (<u>Parus rufescens</u>)	very frequently seen and heard, usually in groups in coast live oaks
Common (Red-shafted) Flicker (<u>Colaptes cafer</u>)	occasionally seen, usually perched in blue gum
Lesser Goldfinch (<u>Spinus psaltria</u>)	occasionally seen, generally in groups in oaks or French broom
Black-headed Grosbeak (<u>Pneuticus melanocephalus</u>)	arrived in spring; occasionally seen perched in bushes
Anna's Hummingbird (<u>Calypte anna</u>)	very often seen, particularly in dense undergrowth or blue gum
Rufous Hummingbird (<u>Selasphorus rufus</u>)	arrived in spring; seen occasionally, usually in streamside vegetation
Scrub Jay (<u>Aphelocoma coerulescens</u>)	very frequently seen, commonly in tops of trees or foraging on open ground above creek
Steller's Jay (<u>Cyanocitta stelleri</u>)	very frequently seen, usually in tree tops or on open ground

<u>SPECIES</u>	<u>OBSERVATIONS</u>
Oregon Junco (<u>Junco oreganus</u>)	occasionally seen, usually in oaks or blue gum
Ruby-crowned Kinglet (<u>Regulus calendula</u>)	occasionally seen, usually in oaks
California Quail (<u>Lophortyx californicus</u>)	very frequently seen and heard, usually in coveys of six or fewer, foraging in open areas or in bushes
Robin (<u>Turdus migratorius</u>)	occasionally seen and heard
Golden-crowned Sparrow (<u>Zonotrichia atricapilla</u>)	occasionally seen foraging in bushes, in streamside vegetation or on open ground
Song Sparrow (<u>Melospiza melodia</u>)	very frequently seen and heard, usually in streamside undergrowth or in bushes in upper parts of the canyon
Common Bush-tit (<u>Psaltriparus minimus</u>)	frequently seen, usually in groups, either in oaks or in French broom
Plain Titmouse (<u>Parus inornatus</u>)	occasionally seen; sometimes heard calling from bushes
Wrentit (<u>Chamae fasciata</u>)	very frequently heard and occasionally seen, commonly in thick undergrowth
Brown Towhee (<u>Pipilo fuscus</u>)	often seen, generally foraging in pairs in open area above creek
Rufous-sided Towhee (<u>Pipilo erthrophthalmus</u>)	very often seen in open areas and in undergrowth
Orange-crowned Warbler (<u>Vermivora celata</u>)	arrived in spring; heard occasionally

Site 2 - Lower Harwood Creek; 6 Encina Place

After Harwood Creek debouches onto the piedmont of the Berkeley Hills, it runs in and out of culverts, through gardens, and along streets. I censused the birds that frequent one of the gardens through which the stream runs. In this garden the cement-lined creek is recessed a few feet below the level of the lawn. Shrubs, ferns, and flowers grow along and hang down into the creek. Coast live oaks, a Monterey pine (Pinus radiata), a California buckeye (Aesculus californica), and a coast redwood (Sequoia sempervirens) grow in the garden. There are also a few small patches of lawn. In contrast to the site along upper Harwood Creek, Robins, other generalist species and introduced birds were more prevalent than birds that often occur in riparian areas. Following is a list of species observed on lower Harwood Creek (see map on p. viii for location):

SPECIES	OBSERVATIONS
Chestnut-backed Chickadee (<u>Parus rufescens</u>)	frequently seen and heard, commonly in groups in coast live oak
Mourning Dove (<u>Zenaidura macroura</u>)	frequently seen, generally in pairs in pines or redwoods
American Goldfinch (<u>Spinus tristis</u>)	frequently seen, often in small groups in oak
Red-breasted Nuthatch (<u>Sitta canadensis</u>)	heard once in Monterey pine
Scrub Jay (<u>Aphelocoma coerulescens</u>)	occasionally seen and heard; usually in pine or on the roof of the house
Robin (<u>Turdus migratorius</u>)	very frequently seen and heard, either along the creek, in the trees, in the shrubs or on the lawn
House Sparrow (<u>Passer domesticus</u>)	small flocks in oak often seen
Song Sparrow (<u>Melospiza melodia</u>)	very often seen; generally in the plants that border the creek or in oaks
Common Bush-tit (<u>Psaltriparus minimus</u>)	occasionally seen in oaks
Brown Towhee (<u>Pipilo fuscus</u>)	very frequently seen in pairs; commonly in trees or foraging on the lawn
Orange-crowned Warbler (<u>Vermivora celata</u>)	heard occasionally in oaks

Site 3 - Upper Codornices Creek

Though dense riparian woodland grows in the upper reaches of Codornices Creek, the area is not quite as wide or as secluded as upper Harwood Creek. Trails and houses near Codornices make the creek quite accessible. The creek runs from the densely wooded canyon into Codornices Park (see map on p. viii for location). As the creek enters the park the vegetation thins considerably and few plants protect the stream banks. Because of the proximity to the park, and because trails run through the area, people and dogs frequent this area more than the site censused on upper Harwood Creek (Site 1). As on upper Harwood Creek, I saw and heard a diversity of bird species. The types of birds in the two areas, however, varied only slightly. Following is a list of species observed on upper Codornices Creek:

SPECIES	OBSERVATIONS
Chestnut-backed Chickadee (<u>Parus rufescens</u>)	often seen and heard; generally in small flocks in coast live oaks
Mourning Dove (<u>Zenaidura macroura</u>)	often heard, occasionally seen
Common (Red-shafted) Flicker (<u>Colaptes cafer</u>)	saw one calling from a blue gum along the creek
Allen's Hummingbird (<u>Selasphorus sasin</u>)	occasionally seen feeding in streamside thickets

SPECIES	OBSERVATIONS
Anna's Hummingbird (<u>Calypte anna</u>)	frequently seen, usually in thickets or blue gum
Steller's Jay (<u>Cyanocitta stelleri</u>)	very frequently seen and heard, generally calling from tops of pines or blue gum
Robin (<u>Turdus migratorius</u>)	very frequently seen; commonly perched in trees or foraging near the paths
Song Sparrow (<u>Melospiza melodia</u>)	frequently seen and heard, usually in creek understory or in oaks
Orange-crowned Warbler (<u>Vermivora celata</u>)	often heard
Plain Titmouse (<u>Parus inornatus</u>)	often heard
Wrentit (<u>Chamae fasciata</u>)	very often heard

Site 4 - Lower Codornices Creek

After Codornices Creek runs out of the dense canyon and into the park, it never again flows through any area of thick riparian vegetation. Most of the creek is, in fact, culverted. Between San Pablo Avenue and Ninth Street the creek is open for a few blocks. Here the vegetation is very sparse and not typically riparian. This area probably never had thick riparian vegetation. Access to the creek is very easy because only some trampled grass, a few bushes, and bare soil line the creek banks. The creek itself is littered with trash. At this site (see map, p. viii, for location) I did see several different species of birds, but few of the species that typically occur in riparian areas were present. Following is a list of species observed on lower Codornices Creek:

SPECIES	OBSERVATIONS
Chestnut-backed Chickadee (<u>Parus rufescens</u>)	often seen and heard, commonly in nearby trees or on roof tops
Mourning Dove (<u>Zenaidura macroura</u>)	frequently seen and heard, often in groups of about six, foraging along stream or perched in trees
House Finch (<u>Carpodacus mexicanus</u>)	frequently seen, usually in trees or sitting on telephone wires
Anna's Hummingbird (<u>Calypte anna</u>)	observed one in bushes near stream
Robin (<u>Turdus migratorius</u>)	frequently seen in trees
House Sparrow (<u>Passer domesticus</u>)	frequently seen in small groups, generally in trees, in streamside brush, or in the open storage building bordering creek area
Golden-crowned Sparrow (<u>Zonotrichia atricapilla</u>)	occasionally seen, generally occurring with House Sparrow and White-crowned Sparrows foraging along creek banks and in building

SPECIES	OBSERVATIONS
Song Sparrow (<u>Melospiza melodia</u>)	occasionally seen in streamside bushes
White-crowned Sparrow (<u>Zonotrichia leucophrys</u>)	often seen in small flocks, commonly foraging along creek, in bushes or in building

Site 5 - Strawberry Creek

Alphonse Demée conducted a census of the birds along upper Strawberry Creek (see map, p. viii, for location). In this area the stream bank is well protected by dense vegetation, but paths do run through the area. As in Claremont and Codornices Canyons, the vegetation in Strawberry Canyon is a mixture of native and introduced species. As at the other canyon sites, a wide variety of birds, including species that are usually found in streamside locations, use the area. He observed the following species along upper Strawberry Creek:

SPECIES	OBSERVATIONS
Chestnut-backed Chickadee (<u>Parus rufescens</u>)	very frequently seen and heard in groups, commonly in oaks or bays
Anna's Hummingbird (<u>Calypte anna</u>)	often seen in bare tree tops
Steller's Jay (<u>Cyanocitta stelleri</u>)	observed a pair in a Monterey pine
Oregon Junco (<u>Junco oreganus</u>)	often seen in oaks
Ruby-crowned Kinglet (<u>Regulus calendula</u>)	very frequently seen, generally occurring in oaks or bays
Red-breasted Nuthatch (<u>Sitta canadensis</u>)	occasionally heard
Robin (<u>Turdus migratorius</u>)	occasionally seen, usually in pines or Douglas firs (<u>Pseudotsuga mensiesii</u>)
Golden-crowned Sparrow (<u>Zonotrichia atricapilla</u>)	occasionally seen foraging on ground
Song Sparrow (<u>Melospiza melodia</u>)	frequently seen and heard, generally in oaks
White-crowned Sparrow (<u>Zonotrichia leucophrys</u>)	occasionally seen foraging on ground
Common Bush-tit (<u>Psaltriparus minimus</u>)	occasionally heard
Plain Titmouse (<u>Parus inornatus</u>)	occasionally heard
Wrentit (<u>Chamae fasciata</u>)	often heard; commonly seen in thickets
Brown Towhee (<u>Pipilo fuscus</u>)	frequently seen foraging on ground or in coyote bush

<u>SPECIES</u>	<u>OBSERVATIONS</u>
Rufous-sided Towhee (<u>Pipilo ethrophthalmus</u>)	frequently seen in thickets
Warbling Vireo (<u>Vireo gilvus</u>)	occasionally seen in Monterey pine
Bewick's Wren (<u>Thryomanes bewicki</u>)	seen once in shrubs

Conclusions

Though the data for the five sites are limited, the census does indicate that many more bird species use the upper canyon sites than the disturbed areas. The census also shows that many birds that inhabit the upper streamside sites do not frequent the lower stretches of the creeks. In contrast, introduced and generalist species occur in the disturbed sites more often than in the canyons. At the canyon sites, the birds also tend to occur consistently in specific types of areas. For example, Hummingbirds, Wrentits, Song Sparrows, and Orange-crowned Warblers were usually observed in the dense streamside growth. In contrast, White and Golden-crowned Sparrows, and Brown Towhees were usually foraging along the trails, the most disturbed parts of the canyon sites.

This census of Berkeley's avian populations shows that the creeks and the associated vegetation are important bird habitats. Early accounts as well as recent observations suggest that the riparian vegetation is more significant for the birds than the creeks themselves. As the city has grown, riparian areas have clearly been altered. Berkeley's early observers noted the adverse effects that development had on the bird populations. Because the riparian areas supported a variety of species, the response of the bird populations to the city's growth must have been apparent in the streamside locations. Today only a few unspoiled creek areas are available to Berkeley's birds. To determine how important these areas are for individual species would require a comprehensive, year-long study. My census, other recent observations (Westlake, Stine, 1983, pers. comm.), and the historical evidence do strongly suggest, however, that the degradation of Berkeley's undeveloped streamside areas would adversely affect some of the native species of birds.

REFERENCES CITED

1. Allen, A.S., 1906-1934. Unpublished Notebooks. Museum of Vertebrate Zoology, University of California, Berkeley.
2. _____, 1915. Birds of a Berkeley Hillside: The Condor, v. 17, pp. 78-85.
3. _____, 1922. Birds of the Berkeley Campus: The University of California Chronicle, v. 24, pp. 89-106.
4. Gaines, David, 1974. A New Look at the Nesting Riparian Avifauna of the Sacramento Valley, California: Western Birds, v. 5, no. 3, pp. 61-77.
5. Grinnell, Joseph, 1911. Birds of the University Campus: The University of California Chronicle, v. 8, pp. 110-113.
6. _____, 1914a. A Second List of the Birds of the Berkeley Campus: The Condor, v. 16, pp. 28-40.

7. Grinnell, Joseph, 1914. Bird Life as a Community Asset: California Fish and Game, v. 1, no. 1, pp. 1-3.
8. _____, 1918. Unpublished Notebooks. Museum of Vertebrate Zoology, University of California, Berkeley.
9. The Gull, 1926. The November Field Trip, v. 8, no. 12, p. 4.
10. _____, 1931. The January Field Trip, v. 13, no. 2, p. 4.
11. Keeler, Charles, 1907. Bird Notes Afield: San Francisco, Paul Elder and Co.
12. Miller, A.H., 1951. An Analysis of the Distribution of Birds in California: University of California Publications in Zoology, v. 50, no. 6, pp. 531-644.
13. Miller, A.H. and F.A. Pitelka, 1944. List of Birds of the Berkeley Campus: Museum of Vertebrate Zoology, University of California, Berkeley.
14. _____, 1959. Birds of the Berkeley Hills: Museum of Vertebrate Zoology, U.C., Berkeley.
15. Stauffer, D.F. and L.B. Best, 1980. Habitat Selection by Birds of Riparian Communities; Evaluating Effects of Habitat Alteration: Journal of Wildlife Management, v. 44, no. 1, pp. 1-15.
16. Stine, Scott, May 1983. Personal communication.
17. Storer, Tracey, 1926. Range Extensions by the Western Robin in California: The Condor, v. 28, pp. 264-267.
18. Westlake, John, Ph.D. in Zoology, U.C. Berkeley. Optics Manager, The Nature Company. Personal communication, May 1983.