

REVIEW OF THE STATUS OF THE YELLOW-BILLED CUCKOO IN CALIFORNIA: SACRAMENTO VALLEY POPULATIONS

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Decline in populations of the western race of the Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) in California was noted by Grinnell and Miller in 1944, who stated: "because of removal widely of essential habitat conditions, this bird is now wanting in extensive areas where once found." The paucity of recent records (table 1) has led ornithologists to speculate that the Yellow-billed Cuckoo may presently be absent from much of its former range. Guy McCaskie (pers. comm.) suggests that the area above Laguna Dam on the Colorado River may be "the last stronghold for the Yellow-billed Cuckoo in California."

The relative scarcity of reports in recent years may not reflect the Yellow-billed Cuckoo's status since this species arrives late in the spring (late May and June), nests in areas seldom visited by field ornithologists, and is furtive and thus easily overlooked.

During July and August 1972, I located Yellow-billed Cuckoos at 15 localities along the Sacramento River in the Sacramento Valley, California (fig. 1). This paper presents data on the status and habitat of this population and reviews information concerning the past and present status and distribution of the Yellow-billed Cuckoo in the California region.

METHODS

A series of aerial photographs taken in March 1972 of the Sacramento River from the delta to Red Bluff (242 river miles) were used to locate riparian forest habitat. Census areas were selected to sample the range of available habitat. Areas were surveyed on foot for one or more mornings, using a tape recording of the *kowlp* call of the cuckoo.

Habitat analysis was undertaken at 16 localities, 10 where cuckoos were found and 6 where a thorough investigation was made and no cuckoos were found (fig. 1). The following structural variables were considered (Emlen 1956; James and Shugart 1970):

1. Extent, length, and width of area
2. Per cent of (a) noncultivated, woody vegetation; (b) open water (lakes, marshes, and sloughs exclusive of the main river channel); and (c) gravel banks, fields, and cleared areas
3. Spatial distribution of vegetation, considered in terms of the following four categories:
 - E = even matrix (more or less randomly dispersed)
 - I = uneven (variable coverage in indistinct clumps)

C = in distinct clumps

R = in distinct rows

4. Estimated height and per cent cover of canopy and understory
5. Estimated species composition of woody vegetation by per cent cover

Spatial relationships of the five Yellow-billed Cuckoos observed on Todd Island, Tehama County, were mapped. The area occupied by each cuckoo was estimated and compared with observations from other localities.

RESULTS

Along the Sacramento River, 28 Yellow-billed Cuckoos were observed in 15 of the 30 areas where a thorough search was made. The cuckoos would respond typically to playback of taped calls by alighting near the observer in the crown of a willow (*Salix*) or cottonwood (*Populus fremontii*). There they would call at irregular and well-spaced intervals, spread their tails, and shuffle their wings, accentuating the white tail spots and the bright rufous patches on the primaries. I revisited four areas where cuckoos were found. Tape recordings were just as effective in eliciting a response as they had been on the earlier visits.

Cuckoos were present only where the extent of riparian vegetation exceeds 300 m in length and 100 m in width. Cuckoos were not observed in the narrow (20–100 m wide) strip of apparently suitable habitat that borders the Sacramento River in many places (table 3; habitat analyses C, E, and F).

Yellow-billed Cuckoos were observed only within 100 m of water. The species was most frequent in areas where extensive riparian vegetation is interspersed with lakes, sloughs, and/or marshy areas (table 2; habitat analyses 1, 2, 3, 5, 6, 8, and 10). Proximity of water to nesting site may reflect humid conditions in the cuckoo's population center in the eastern United States (Hamilton and Hamilton 1965).

Cuckoos were usually found in willows and cottonwoods. These varied from stands 20–30 m high with a dense, woody, and herbaceous understory (table 2; habitat analyses 1, 2, 3, 6, 8, and 10) to low, shrubby, but dense stands of irregular distribution (table 2; habitat analyses 4, 5, and 7). On one occasion, a cuckoo was observed in an adjacent walnut

TABLE 1. Sightings of the Yellow-billed Cuckoo in California, 1962-72.

Year	Date	Locality	No.	Source
1962	2 July	Orangevale, Sacramento Co.	1	AFN ^a 16:504
	1 August	Sacramento, Sacramento Co.	1	AFN 16:504
	September	Mouth of Stanislaus River, Stanislaus Co.	5	AFN 17:65
	September 30	Mouth of Stanislaus River	1	AFN 17:65
1963	25 June	Mouth of Stanislaus River	1	Hamilton, pers. comm.
	30 June	Montecito, Santa Barbara Co.	1	Metcalf, 1967
1964	27 June	Morongo Valley, San Bernardino Co.	1	AFN 18:536
	18-19 July	Laguna Dam, Imperial Co.	10	McCaskie, pers. comm.
	August	"three Central Valley locations"	5	AFN 18:533
1965	29 June	Willow Slough, Yolo Co.	1	Kimball, pers. comm.
	8 July	Farallon Islands, San Francisco Co.	1	Condor 69:582
	14 July	Mouth of Stanislaus River	3	Kimball, pers. comm.
	June-July	Laguna Dam	12	McCaskie, pers. comm.
1966	25 June	Laguna Dam	1	McCaskie, pers. comm.
	4 August	Mouth of Stanislaus River	2	Kimball, pers. comm.
1967	16 June	Laguna Dam	3	McCaskie, pers. comm.
	22 June	Santa Barbara, Santa Barbara Co.	1	Metcalf, 1967
1968	27 June	Earp, San Bernardino Co.	1	McCaskie, pers. comm.
	June-July	Laguna Dam	10	McCaskie, pers. comm.
1969	14-15 June	Laguna Dam	3	McCaskie, pers. comm.
	23 August	Oceanside, San Diego Co.	1	AFN 24:100a
1970	24 May	Sespe Canyon, Ventura Co.	1	AB ^b 24:645
	5 July	Rialto, San Bernardino Co.	1	AB 24:717
	June-July	Laguna Dam	4	McCaskie, pers. comm.
1971	14 June	Santa Barbara	1	AB 25:906
	16 June-8 August	Sacramento River near Chico, Butte Co.	1	AB 25:902
	5 July	Laguna Dam	2	McCaskie, pers. comm.
	8 August	Hatfield State Park, Merced Co.	1	AB 25:902
	27 August	Honey Lake, Lassen Co.	1	Manolis, pers. comm.
1972	18 June-30 July	Sacramento River near Chico	5	AB 26:898
	24 June	Laguna Dam	4	McCaskie, pers. comm.
	5 July	Kelso, San Bernardino Co.	1	AB 26:906
	6 July-10 August	15 localities along Sacramento River, Tehama, Glenn, Butte and Colusa Cos.	28	AB 26:898
	16 July	Mouth of Stanislaus River	1	AB 26:898
	2 September	Furnace Creek Ranch, Inyo Co.	1	McCaskie, pers. comm.

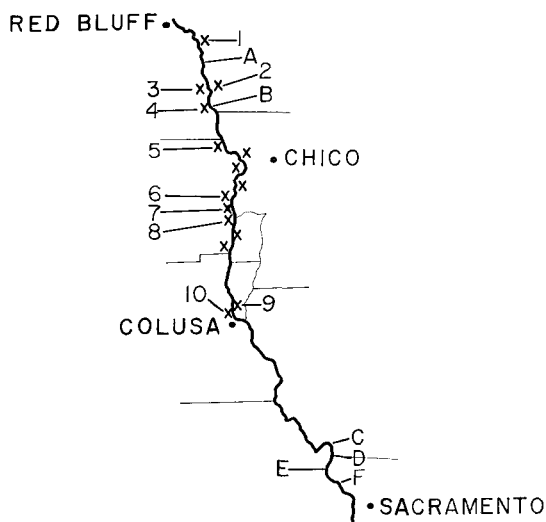
^a Audubon Field Notes^b American Birds

FIGURE 1. Location (a) of 1972 Yellow-billed Cuckoo sightings along the Sacramento River (x); (b) of habitat analyses in areas (1-10) where cuckoos were found; and (c) of habitat analyses in areas (A-F) where a thorough investigation was made and no cuckoos were found.

orchard. Cuckoos were not found in oaks (*Quercus lobata*), sycamores (*Platanus racemosa*), or in areas such as parks where understory vegetation has been removed (table 3; habitat analyses A and B).

The extensive cottonwood-willow forests and thickets which the Yellow-billed Cuckoo inhabits are not found along the Sacramento River from Grimes, Colusa County, south to the delta (130 river miles). They persist north of Grimes primarily on islands, bends in the river, and oxbow lakes, i.e., areas subject to flooding and thus not suited to agriculture. As of March 1972, approximately 1200 ha of such habitat remained between Grimes, Colusa County, and Red Bluff, Tehama County (112 river miles). Yellow-billed Cuckoos were found in 15 of 17 such areas in which a thorough search was made.

Figure 2 maps the spatial relationships of five Yellow-billed Cuckoos observed in the Tood Island area of Tehama County (table 2; habitat analysis 1). These occupied an average

TABLE 2. Habitat analyses in areas (1-10) where Yellow-billed Cuckoos occur.

	Areas									
	1	2	3	4	5	6	7	8	9	10
Extent of habitat (ha)	28	14	7	10	6	27	45	47	25	20
Length (m)	1040	430	300	730	490	850	700	1100	450	670
Width (m)	300	300	300	120	120	300	650	450	400	180
% riparian	65	75	40	65	50	45	35	45	55	75
% open water	10	20	10	0	10	20	0	15	0	5
% gravel banks, fields or cleared	25	5	50	35	40	35	65	40	45	20
Spatial distribution of plant cover	I	E	I	I	R	E	I	E	E	I
Canopy height (m)	15-25	25-30	20-25	5-10	5-15	20-25	10	20-25	20	20-30
Canopy cover (%)	70	80	70	80	50	70	65	70	95	60
Understory height (m)	3-5	2-3	3-4	1-3	2-4	3-4	3-4	3-4	3-6	1-4
Understory cover (%)	80	80	90	60	70	60	50	80	80	60
% cover: <i>Populus fremontii</i>	70	60	40	40	10	40	30	40	80	60
<i>Salix</i>	40	40	40	40	40	60	50	60	30	30
<i>Platanus racemosa</i>	+	-	-	-	-	+	-	-	-	-
<i>Acer negundo</i>	+	10	+	+	+	+	+	+	+	20
<i>Robinia pseudoacacia</i>	10	+	+	+	20	-	-	-	-	+
<i>Quercus lobata</i>	-	-	-	-	+	-	-	-	-	-
<i>Fraxinus latifolia</i>	+	+	-	-	-	-	-	-	-	-
<i>Cephalanthus</i>	+	+	-	-	-	-	-	-	-	-
<i>Sambucus</i>	+	-	-	-	-	-	+	-	-	-
<i>Vitis</i>	10	10	20	+	20	10	+	10	+	15
herbaceous vegetation	80	80	70	60	60	60	50	80	70	60

TABLE 3. Habitat analyses in areas (A-F) where a thorough investigation was made and no cuckoos were found.

	Areas					
	A	B	C	D	E	F
Extent of habitat (ha)	7	16	9	6	8	5
Length (m)	320	380	1100	1200	1200	800
Width (m)	200	380	60	30	50	40
% riparian	15	35	60	25	65	70
% open water	0	0	0	0	0	0
% gravel banks, fields or cleared	85	65	40	75	35	30
Spatial distribution of plant cover	C	C	I	R	I	E
Canopy height (m)	10	5-10	15-20	5-10	5-10	10-15
Canopy cover (%)	50	50	30	50	40	60
Understory height (m)	0	0	3-5	1-2	2-5	1-3
Understory cover (%)	0	0	60	50	50	40
% cover: <i>Populus fremontii</i>	—	—	30	20	20	40
<i>Salix</i>	10	—	+	30	20	20
<i>Platanus racemosa</i>	40	10	—	+	—	+
<i>Acer negundo</i>	—	—	10	+	10	—
<i>Robinia pseudoacacia</i>	—	—	+	—	+	+
<i>Quercus lobata</i>	10	40	—	—	+	40
<i>Fraxinus latifolia</i>	—	—	—	+	+	10
<i>Cephalanthus</i>	—	—	—	—	+	10
<i>Sambucus</i>	—	—	+	+	+	+
<i>Vitis</i>	—	—	+	+	+	+
herbaceous vegetation	—	—	60	45	40	40

of 6 ha per bird. Three cuckoos at locality 6 and three at locality 10 occupied 9 and 7 ha per bird, respectively. Assuming a density of one pair per every 10 ha of suitable habitat, there were roughly 240 Yellow-billed Cuckoos along the Sacramento River south of Red Bluff in 1972.

Four extensive areas of riparian vegetation along the Feather River in Yuba and Sutter counties were searched for cuckoos in mid-

July 1972 without success. Understory vegetation in these areas has been partially cleared to permit grazing by stock. Since Yellow-billed Cuckoos are notably erratic in local abundance, no firm conclusions concerning their occurrence on the Feather River can be drawn.

DISCUSSION

The historical breeding range of the Yellow-billed Cuckoo in California extended north-

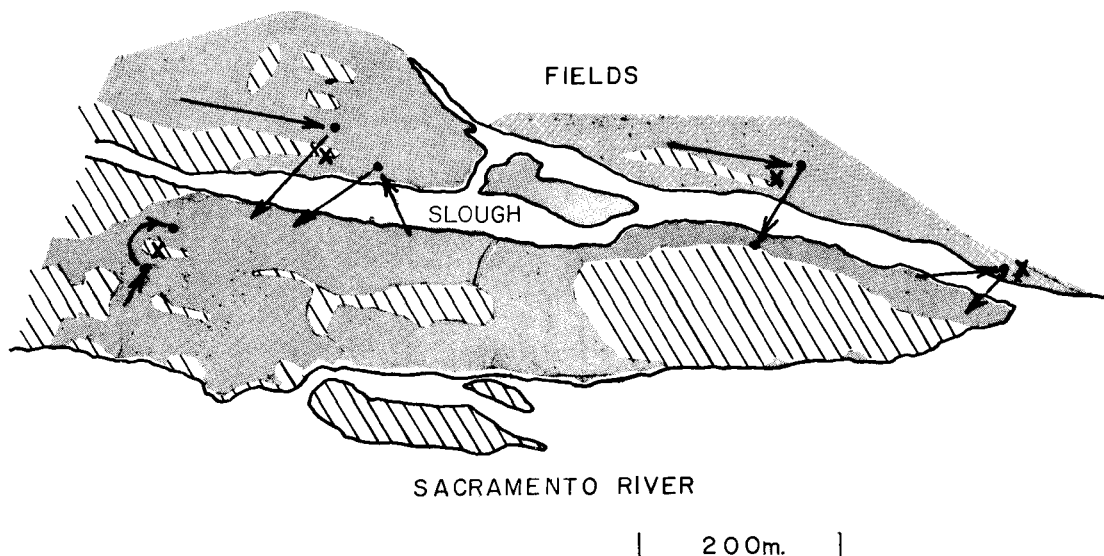


FIGURE 2. Spatial relationships of five Yellow-billed Cuckoos observed in the Todd Island area of Tehama County; stippled area on map is woody vegetation; cross-hatched area is gravel bar; X = points at which tape recording of cuckoo call was played; dots and arrows indicate locations and movements of cuckoos.

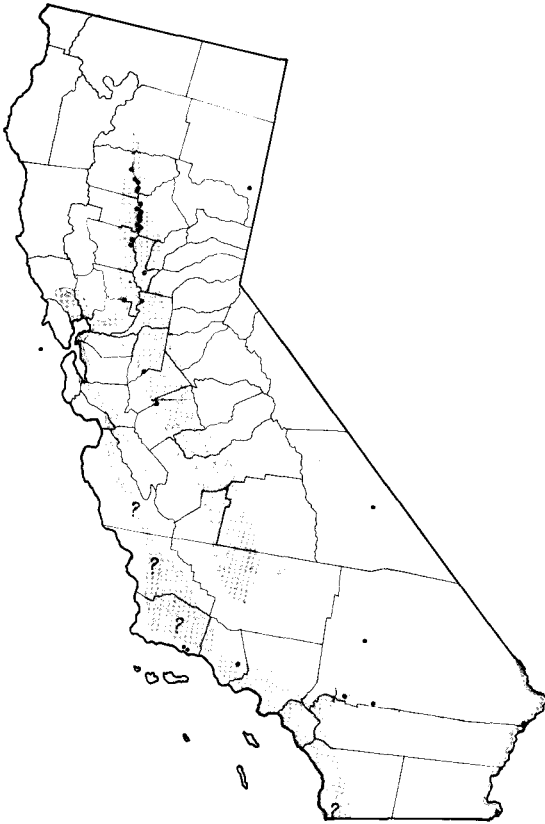


FIGURE 3. Historical nesting range of the Yellow-billed Cuckoo in California based on known nesting localities (stipled area on map); ? = areas where cuckoos probably nested, but definitive records lacking; • = localities of recent sightings.

west from the Mexican line in western San Diego County along the coast belt through the San Francisco Bay region as far as Sebastopol, Sonoma County, and through the San Joaquin and Sacramento valleys, from the vicinities of Bakersfield and Weldon, Kern County, to the vicinity of Redding, Shasta County (fig. 3). The species has also been recorded from the following isolated, outlying localities: Shasta River, Edgewood and Sisson, Siskiyou County; Bishop, Independence, and Death Valley, Inyo County; Kelso, San Bernardino County; Colorado River near Laguna Dam, Imperial County (Grinnell and Miller 1944; Audubon Field Notes).

It is probable that the original density of Yellow-billed Cuckoos in California was greater than the literature implies. By the late 19th century, before the first studies were published, large tracts of floodplain riparian forest had been cut or cleared for fuel or to allow for grazing or crops (Cromie 1868; Thompson 1961). Destruction of habitat as a factor in reducing numbers of cuckoos was recognized in 1911 (Jay 1911). Nevertheless,

the species was still considered "fairly common" in 1915 (Grinnell 1915). In 1944, however, Grinnell and Miller concluded: "in general, population thinly spread; fairly common to even common in earlier years in a few, most favorable localities."

Agriculture, urbanization, and low water tables (the result of dams and irrigation projects) have, to a large extent, claimed the habitat of the cuckoo. Hanna, for instance, referring in 1937 to an area in the San Bernardino Valley where he had located 24 cuckoo nests in the 1920s, observed: "in contrast with those good old times we now have very little water in Warm Creek and seldom any surface water in the Santa Ana River, the large thickets have been replaced by farms and pastures, the trees cut down, and the ever-growing population has crowded in on the old haunts of the cuckoo to such an extent that if they come here now at all they must be exceedingly rare."

In recent years, Yellow-billed Cuckoos have been sighted in numbers only along the Colorado River and in the Sacramento Valley and delta region (table 1; fig. 3). The area above Laguna Dam on the Colorado River is, according to McCaskie (pers. comm.), in imminent danger of destruction since "it is becoming a very popular area for recreation, many trees are being felled and brush is being cleared." Along the Sacramento and Feather rivers, riparian forest is being cleared for orchards or as part of the Army Corps of Engineer's Sacramento River Bank Protection Project.

Common to the published accounts of the Yellow-billed Cuckoo's habitat in California is the mention of dense willows and the proximity of water (Shelton 1911; Jay 1911; Hanna 1937; Bent 1940). My findings, beyond confirming these requirements, suggest that extensive riverbottom vegetation, perhaps as much as 10 ha per pair, may be requisite to nesting.

SUMMARY

Data are presented on the status and habitat preference of the Yellow-billed Cuckoo population along the Sacramento River of California. The study showed that cuckoos occur where (1) the riparian vegetation exceeds 300 m in length and 100 m in width; (2) water is present within 100 m; and (3) there is dense understory vegetation and thickets of willow. They are lacking where (1) understory vegetation is sparse or absent; or (2) the vegetation is not sufficiently extensive, as along the 20–100 m wide strip of otherwise suitable habitat that borders the Sacramento River in many

places. Approximately 240 Yellow-billed Cuckoos were thought to occupy the 1200 ha of suitable habitat remaining along the Sacramento River in 1972.

Formerly, the Yellow-billed Cuckoo was a fairly common nesting species in dense riparian vegetation along the lower floodplains of larger streams throughout California. Destruction of this habitat has so reduced its numbers, however, that survival of California's cuckoos is questionable. Populations are known to persist only along the Sacramento River in Colusa, Glenn, Butte and Tehama counties and along the Colorado River in Imperial County. These populations are threatened by recreational development, agriculture, and flood control programs.

Contingent to the survival of the Yellow-billed Cuckoo in California is an understanding of its ecology and the preservation and management of remaining breeding habitat. The author requests information on recent sightings and breeding records of the Yellow-billed Cuckoo in California.

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LITERATURE CITED

- American Birds* (formerly *Audubon Field Notes*).
- BENT, A. C. 1940. Life histories of North American cuckoos, goatsuckers, hummingbirds and their allies. U.S. Natl. Mus. Bull. 176.
- CROMISE, T. F. 1868. The natural wealth of California. H. H. Bancroft.
- EMLEN, J. T., JR. 1956. A method for describing and comparing avian habitats. *Ibis* 98:565-576.
- GRINNELL, J. 1915. A distributional list of the birds of California. *Pacific Coast Avifauna* 11:75.
- GRINNELL, J., AND A. MILLER. 1944. The distribution of the birds of California. *Pacific Coast Avifauna* 18.
- HAMILTON, W. J., III, AND M. E. HAMILTON. 1965. Breeding characteristics of Yellow-billed Cuckoos in Arizona. *Proc. Calif. Acad. Sci. Fourth Ser.* 32:405-432.
- HANNA, W. C. 1937. California Cuckoo in the San Bernardino Valley, California. *Condor* 39:57-59.
- JAMES, F. C., AND H. H. SHUGART, JR. 1970. A quantitative method of habitat description. *Audubon Field Notes* 24:727-736.
- JAY, A. 1911. Nesting of the California Cuckoo in Los Angeles County, California. *Condor* 13:69-73.
- METCALF, T. N. 1967. Birds of the Santa Barbara Region. *Santa Barbara Mus. Nat. Hist. Occ. Papers* 8:25.
- SHELTON, A. C. 1911. Nesting of the California Cuckoo. *Condor* 13:19-22.
- THOMPSON, K. 1961. Riparian forests of the Sacramento Valley, California. *Ann. Assoc. Amer. Geog.* 51:294-315.

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