

INTERIOR BIRD SPECIES EXPAND BREEDING RANGES INTO SOUTHERN CALIFORNIA

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Distributional records of birds, scattered in space and time, reach their full potential when fitted together to form a previously unseen pattern. This fact underscores the value of accumulated details of distribution even though single records can be considered trivial when studied alone. Rarely, sufficient information on breeding occurrence of birds in one area is available for two different periods of time. When this happens, some comparisons of interest to general ecologists become possible. For example, the response of the avifauna to habitat change may be studied (Emlen 1974). Or, turnover (versus stability) of the breeding bird species in relation to time may be investigated, as has been attempted with varying degrees of success for certain island avifaunas (Lynch and Johnson 1974).

In California field zoologists painstakingly described and documented the distribution of each species of vertebrate during the first several decades of this century. These efforts resulted in remarkably dependable old records which now can be compared with data from more recent years. At many of the early survey sites the environments have been drastically altered and the avifaunas have changed; the original specimens and notes thus form an irreplaceable record of the past. Importantly, however, at some localities where essentially complete early avifaunal surveys were conducted, the habitats have not been modified appreciably in the ensuing years. Especially surprising is to note that despite this apparent stability of habitats the breeding avifaunas have changed in certain of these undisturbed areas, without any apparent explanation. The purpose of this paper is to summarize records of eight species of birds that in recent years have expanded or are presently attempting to expand their breeding distributions into historically unmodified habitats in southern California from centers of population abundance in the interior of the western or southwestern United States. The following accounts detail recent evidence of range expansion for these species.

Whip-poor-will (*Caprimulgus vociferus*).

The first evidence of probable breeding of the Whip-poor-will in California was reported by Jones (1971), who discovered two calling individuals near Lake Fulmor in the San Jacinto Mountains, Riverside County, on 2 May 1968. From spectrographic study of a tape-recorded song, Jones concluded that the race *C. v. arizonae* was involved. This record significantly extended the summer range of this subspecies westward from the Hualapai Mountains, Mohave County, Arizona (Phillips et al. 1964) and the Sheep Range, Clark County, Nevada (Johnson 1965). Convincing evidence that this colonization of the San Jacinto Mountains was successful is provided by the fact that the Whip-poor-will has been found annually during the breeding season at Lake Fulmor, from 1968 through 1974 (Jones 1971; McCaskie 1971, 1972, 1973a; Sadie Brown and J. Van Remsen pers. comm.) and at least three additional localities in the same range (McCaskie 1972, 1973b; Jones 1971). The discovery of a calling bird in the Laguna Mountains, San Diego County, on 8 July 1971 (McCaskie 1971), suggests that the breeding range also has expanded into other mountain ranges of southwestern California.

The species also occurs, and probably nests, in eastern San Bernardino County, for on the evening of 22 June 1974, Garrett and William Principe heard a Whip-poor-will calling on the north slope of Clark Mountain. On the following morning shortly before dawn two birds were calling in the same area. They occurred on a rugged and steep canyon slope near 6000 feet elevation at the lower edge of the White Fir (*Abies concolor*) and Singleleaf Pinyon (*Pinus monophylla*) association described by Miller (1940). Although the western subspecies prefers oak-conifer woodlands in its range in Arizona and Mexico, the steep and well-wooded terrain of this section of Clark Mountain seems at least marginally suitable. The occurrence of Whip-poor-wills on Clark Mountain provides another northwestern outpost in the breeding range. Although the time of the probable colonization of Clark Mountain is unknown, it is likely that this species has been overlooked in recent years because the limited field work conducted there since Miller's (1940) earlier visits has been restricted to the daylight hours.

Evidence of breeding of Whip-poor-wills should be sought at additional localities in dry oak-conifer associations of montane areas of San Diego, Riverside, and San Bernardino counties. Furthermore, a specimen is needed from California to substantiate the belief that *C. v. arizonae* is the breeding subspecies.

Broad-tailed Hummingbird (*Selasphorus platycercus*).

This Great Basin and Rocky Mountain species is known to breed west to the White, Inyo, Grapevine, and Clark Mountain areas in east-central

California (Grinnell and Miller 1944), where it is fairly common in the vicinity of canyon-bottom thickets in the pinyon-juniper association. Recent records to the southwest of the known breeding distribution in California suggest the possibility of colonization of other ranges. For example, McCaskie (1968a) reports an individual present some 25 miles southeast of Clark Mountain, in the New York Mountains, San Bernardino County, on 12 May 1968. Much farther west, a male was observed in the San Bernardino Mountains at Green Valley on 10 June 1971 (McCaskie 1971), and Garrett observed a male along Arrastre Creek, east of Baldwin Lake in the same range, on 13 May 1972. None of these individuals was known to have bred at these localities. However, the more inconspicuous nesting females might easily have been overlooked, and breeding is a strong possibility in view of the dates and habitat. The Arrastre Creek locality has open woodland of juniper (*Juniperus*) and Singleleaf Pinyon, with a willow-lined creek and numerous flowering shrubs, and thus affords habitats similar to those occupied by this species in the western Great Basin. Grinnell (1908) did not record this species from the San Bernardino Mountains. Although occurrence of the Broad-tailed Hummingbird in this range could be strictly casual, the species may be preparing to colonize and we wish to alert observers to this possibility.

Gray Flycatcher (*Empidonax wrightii*)

Johnson (1966:72) mapped breeding localities for this species in the western portion of its range in California and Nevada. Known records occurred southward on the east side of the Sierra Nevada to the Inyo and Grapevine mountains and included the high mountains of Clark County, Nevada. A major recent southwestward extension of breeding range in California, into formerly unoccupied woodland of mature Singleleaf Pinyon, is supported by new records from the eastern part of the southern Sierra Nevada of Tulare County (singing commonly, and breeding specimens taken by Johnson at 1.5 mi. N and 3 mi. W Chimney Peak, 7900 ft., 23 May 1973, and at 2.5 mi. S and 4.5 mi. W Chimney Peak, 6800 ft., 25 May 1973), and from Clark Mountain, eastern San Bernardino County (two singing males on north slope, at 6500 and 6700 ft., 26 May 1973; three singing males on north slope between 6400 and 7300 ft., 30 May 1974).

The first record to suggest expansion of breeding range into southwestern California was obtained by Shumway Suffel, who collected a male with enlarged (5 x 3 mm) testes on 10 June 1966, at Sheep Creek, 5000 feet, north of Wrightwood, San Gabriel Mountains, San Bernardino County. This specimen (Los Angeles County Museum No. 66118) has been examined and the identification verified. Importantly, it is a first-

year individual, the age category that is often involved in examples of vagrancy or pioneering. The Gray Flycatcher also has colonized the eastern portion of the San Bernardino Mountains in recent years. McCaskie (1968b) suspected breeding east of Baldwin Lake in 1968, for he reported the species throughout the period 1 June to 15 August. In 1969, Gray Flycatchers were breeding commonly east of Big Bear Lake (McCaskie 1969). Garrett observed a family group at Arrastre Creek on 27 July 1971. Finally, Johnson found six singing males on territories between 6700 and 6900 feet elevation in the vicinity of Arrastre Creek, from 27 to 28 May 1974, and took a male with enlarged testes.

Although it cannot be stated with total assurance that Gray Flycatchers were formerly absent in the Chimney Peak area, because of inadequate past field work there, colonization in recent decades of the Clark Mountain region and of the eastern portion of the San Bernardino Mountains is reasonably certain because both areas had been the sites of intensive vertebrate surveys which did not record this species (Johnson et al. 1948, Grinnell 1908). An earlier report by Grinnell (1908; under "*Empidonax griseus*") of the Gray Flycatcher from the San Bernardino Mountains was withdrawn (Grinnell and Miller, 1944:258-259; under "Wright Flycatcher" [= *Empidonax wrightii* at that time]) because the specimens and notes upon which the report was based were found to pertain to mis-identified Dusky Flycatchers (*Empidonax oberholseri*), the common form of *Empidonax* that breeds in the high mountains of southern California.

Solitary Vireo (*Vireo solitarius plumbeus*).

The very distinctive form *V. s. plumbeus* of the Solitary Vireo was not recorded in California during the breeding season until 1962, when DeBenedictis and McCaskie (1967) reported a summer specimen and sight records from two localities in the White Mountains, Inyo County. Since these initial records Johnson has collected specimens of *V. s. plumbeus* in breeding condition also in the White Mountains (Westgard Pass, 7200 ft., Inyo County, 7 June 1969; Queen Canyon, 6900 ft., southern Mineral County, Nevada, 11 June 1969), in Tulare County (3 mi. N and 2 mi. W Chimney Peak, 7600 ft., 23 May 1973; 1.75 mi. S and 0.5 mi. E Kennedy Peak, 6800 ft. 24 May 1973), in Death Valley National Monument (specimens from Grapevine Mountains taken in Nevada approximately 1 mi. E of California state line; see Johnson 1974), and in San Bernardino County (N face Clark Mountain: singing male taken at 6400 ft. on 28 May 1973 and two singing males [one with mate] seen at 6800 ft. on 30 May 1974; Arrastre Creek, 6800 ft., San Bernardino Mountains, 28 May 1974, pair at nest and laying female taken). Garrett found *V. s. plumbeus* at Arrastre Creek on 10 July 1971, on which date

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an adult was feeding a recently-fledged juvenile. He also saw the species at the same place on 21 June 1972. All of the foregoing records were from areas grown to mature Singleleaf Pinyon.

These records indicate that the breeding range of *V. s. plumbeus* has undergone a major westward expansion, perhaps during the last decade. This form was not found in earlier years by several thorough field expeditions that visited the White Mountains (Miller and Russell 1956), the Grapevine Mountains (Miller 1946), Clark Mountain (Miller 1940, Johnson et al. 1948; *V. s. cassinii* is a spring migrant in this area), and the San Bernardino Mountains (Grinnell 1908; *V. s. cassinii* breeds in the southern and western portions of these mountains). That the breeding distribution of *V. s. plumbeus* has changed is supported also by similar data on recent range adjustments of the same form in southern Nevada (Johnson 1965, 1973, 1974).

Virginia's Warbler (*Vermivora virginiae*).

This interior species is known as a summer resident in California from the White Mountains in Inyo County and from Clark Mountain in eastern San Bernardino County (Grinnell and Miller 1944:396; Miller and Russell 1956). A surprising extension of known breeding range to a point approximately 110 miles southwest of Clark Mountain, the nearest known breeding locality, was recorded on 27 May 1974, when Johnson found three individuals on territories in the San Bernardino Mountains, San Bernardino County. Along Arrastre Creek, 6900 feet elevation, a pair of Virginia's Warblers responded to squeaks and imitated owl calls and approached to within 10 feet in an area covered with mixed mahogany (*Cercocarpus*), juniper, serviceberry (*Amelanchier*), Singleleaf Pinyon, and scattered Ponderosa Pine (*Pinus ponderosa*). One individual carried nesting material. One-quarter mile upstream, at 7000 feet, a singing male of this species was patrolling an area of vegetation similar to that just described for the pair. This bird sang from Ponderosa Pines and mahogany and was watched for approximately one-half hour. The following day another Virginia's Warbler was found along the South Fork of the Santa Ana River, at 6000 feet elevation and, importantly, in the coastal drainage of the San Bernardino Mountains. The bird responded well to hissing and imitated owl calls and came within five feet on a steep and rather arid slope approximately one hundred yards above the creek. The vegetation here was open mahogany scrub woodland with much mixture of juniper, small White Firs, small Ponderosa Pines, serviceberry, and a few Canyon Live Oaks (*Quercus chrysolepis*) and Incent Cedars (*Libocedrus decurrens*). The distinctive call note was heard for 15 minutes after the bird had retreated into the thick under-

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story and a nearby nest was suspected. Habitat similar to that at both localities where these warblers were discovered occurs widely in the eastern San Bernardino Mountains and it is likely that a breeding population of Virginia's Warblers is scattered through this general region.

Miller (1940) estimated that the population on the north slope of Clark Mountain consisted of four pairs in 1939. The species still breeds there in small numbers. Johnson found three pairs on 26-28 May 1973, and at least two pairs on 30 May 1974. Garrett, with William Principe, recorded a pair and a single bird on the north slope of Clark Mountain on 23 June 1974.

Grace's Warbler (*Dendroica graciae*).

There are two previously published records of Grace's Warbler in California, both of fall vagrants or migrants, a specimen from near Imperial Beach, San Diego County, on 29 October 1966, and an individual (banded and photographed) from Point Loma, San Diego County, on 8 September 1968 (Craig 1970). The first indication of possible breeding occurrence in the state came on 30 May 1974, when Johnson found a steadily-singing male in the mixed forest of White Fir and pinyon at 7100 feet elevation on the north slope of Clark Mountain, San Bernardino County. The bird stayed within close range and was watched for over one hour as it sang and infrequently foraged in both firs and pinyons. Although this bird definitely was established on a clearly circumscribed area, actual nesting is questionable because neither Garrett and Principe nor McCaskie and party could find the species on later visits to the same site (22-23 June 1974, and 29-30 June 1974, respectively). Even though Grace's Warbler may not yet have colonized Clark Mountain, where the habitat for the species is marginal at best, the record of the singing bird is of interest because it suggests westward pioneering.

In view of the dramatic colonization of Grace's Warbler in the last decade into the yellow pine forests of southern Nevada, where it now is a summer resident in at least five mountain ranges (Johnson 1965, 1973, 1974), breeding occurrence at present in appropriate habitat in southern California seems very likely. The species should be sought in warm and arid stands of yellow pines, particularly on flats or gently-sloping ground. In the eastern portion of the San Bernardino Mountains, for example, there is much habitat that appears suitable.

Painted Redstart (*Setophaga picta*).

Records of the Painted Redstart in California have been summarized by Unitt (1974). Here we simply wish to note that this species

illustrates another example of a form from the interior of the southwest that seems to be presently colonizing or attempting to colonize southern California, as the following new observations help to document.

On 26 May 1973, Johnson found a singing individual of this species in the top of a White Fir at 7300 feet on the north slope of Clark Mountain, San Bernardino County. The bird did not seem to be patrolling a territory, for it left the area soon after being seen and was not noted subsequently. However, the mixed forest of White Fir and pinyon at this site, where shaded by huge cliffs at the bases of which water trickled from melting snow, seemed to offer at least some of the environmental requisites for breeding of this redstart. The species was not found on Clark Mountain in the breeding season of 1974, during the three known visits there by ornithologists.

On 28 May 1974, two Painted Redstarts, both singing, occupied adjacent territories along the north-facing slope above the South Fork of the Santa Ana River, 6100 feet elevation, San Bernardino Mountains, San Bernardino County. Here there was considerable shade from large Ponderosa Pines, White Firs, a few Sugar Pines (*Pinus lambertiana*), and some Incense Cedar. The birds chased soon after Johnson had encountered them in the same group of conifers. Then one remained where first found; the other patrolled for 100 to 200 yards upstream. Both continued to sing. One was watched for an hour during which time it sang and foraged from near the ground in Canyon Live Oak and Interior Live Oak (*Quercus wislizenii*) up into the mid-levels of mature pines and firs.

Hepatic Tanager (*Piranga flava hepatica*).

Phillips et al. (1964) include the Hualapai Mountains, Mohave County, in northwestern Arizona in the breeding range of this species. For Nevada, Johnson (1965) provides records of occurrence in the Sheep Range, Clark County and the Clover Mountains, Lincoln County, in June 1963.

The Hepatic Tanager was unrecorded in California by Grinnell and Miller (1944). Among the first records for the state was that of a male observed in the pinyon-juniper belt in Round Valley, east of Baldwin Lake in the San Bernardino Mountains, 21 May 1967 (McCaskie 1967). A male at the same locality on 30 May of the following year (McCaskie 1968a) indicated regular summer occurrence of this species in the San Bernardino Mountains. Garrett and J. Menke discovered a pair of Hepatic Tanagers along Arrastre Creek, at approximately 6700 feet elevation, at the ecotone of pinyon-juniper and yellow pine, on 10 July 1971, at a site less than 5 miles from Round Valley. The pair was observed until at least 27 July 1971, but no evidence of nesting was ob-

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tained until 1972, when at least two pairs returned to the Arrastre Creek area by 11 May (McCaskie 1972). On 18 June 1972, J. Dunn and Garrett located an active nest of this species in a yellow pine 20 m from Arrastre Creek. During the following week the nest was observed by several individuals, including Shumway Suffel and Shirley Wells. The nest was placed approximately 20 m from the ground and 2.5 m from the main trunk. Both adults fed 3 or 4 young on 21 June, and a fledged bird was being fed by the adults on 8 July (Suffel pers. comm.). The tanagers returned to Arrastre Creek and nested with apparent success in 1973 (McCaskie 1973b), but were not observed there in 1974.



Arrastre Creek, San Bernardino Mountains, San Bernardino County, California, showing permanent willow-lined stream, scattered mature yellow pines, and an extensive mature pinyon-juniper association on the surrounding hillsides. Hepatic Tanagers nested in the tall yellow pine on the right in 1972, and Gray Flycatchers and Plumbeous Solitary Vireos have nested nearby.

Photo courtesy of G. Shumway Suffel

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In addition to the San Bernardino Mountains, the Hepatic Tanager has colonized Clark Mountain, San Bernardino County, in recent years. It was not found here during the extensive field work of 1939 and 1940 (Miller 1940, Johnson et al. 1948), but was present in the pinyon belt and mixed pinyon-fir zone between 6100 and 6700 feet on the north slope in 1973, when Johnson observed two pairs and collected a singing male (testis 10 x 6 mm) on 28 May. On 23 June 1974, Garrett and William Principe observed a pair, in the pinyon-fir zone, which was extremely responsive to a taped recording of an Hepatic Tanager song.

In its Arizona range, this species is common in dense oaks and fairly common in pines and large pinyons (Phillips et al. 1964). Although the few available records indicate a preference for open pinyon-dominated woodland in California, the Hepatic Tanager should be looked for in pine and deciduous oak woodlands on warm and arid slopes of all mountains in southern California.

DISCUSSION

As the pages of *California Birds* and of Small (1974) indicate, a number of species in California have adjusted their breeding distributions in recent years. Just what proportion of the new records represent genuine range changes and what proportion are "new" localities for species always present in poorly-studied areas, but previously overlooked, is not easily determined. Even when the comparison of old and recent data clearly demonstrates a real extension of breeding range, habitat change, through lumbering, agriculture, grazing, planting of ornamental vegetation, and construction of water impoundments, has surely been a major influence.

In contrast, the species discussed in the foregoing accounts do not seem to have colonized California in response to any of the aforementioned kinds of habitat change. None are birds usually associated closely with man, his plantings, or domestic animals. Furthermore, the localities of many of the new records, namely Clark Mountain and the eastern section of the San Bernardino Mountains, both in San Bernardino County, have not been seriously disrupted by fire or human activity in recent years. The pinyon zone in both places is excellent and consists mostly of old-growth trees. The fir stand on Clark Mountain also is original growth.

One can reasonably ask if most or all of these species were present but overlooked during the early surveys of Clark Mountain (Miller 1940, Johnson et al. 1948) and of the San Bernardino Mountains (Grinnell 1908). For Clark Mountain this possibility is very remote; the extensive and thorough study of the breeding avifauna of this area by numerous

expert naturalists, in the late spring and early summer of 1938, 1939, and 1940, leaves little room for doubt on this point. Also the fir zone on Clark Mountain, from where most of the new records from that area were obtained, is small enough to be surveyed easily for birds in a single day. For the San Bernardino Mountains we can be less certain because of the enormity of the range and the consequent possibility that some of the species discussed here actually were present but perhaps occurred at low density and were thus overlooked. But it is known that Grinnell (1908) spent long periods of time at several of the localities where the new records were obtained and that his talents as a thorough field ornithologist are legendary.

That we are dealing with a group of examples of natural breeding range expansion is suggested by two additional points (1) at least six of the species discussed here also have spread northward or northwestward, presumably since the early 1960s, to breed in previously unoccupied mountain ranges of southern Nevada (Johnson 1965, 1974); (2) all of the species are derived from the interior of the western United States, in the Great Basin-Rocky Mountains region, or from the southwestern United States and northwestern Mexico. Thus, the species have similar biogeographic affinities, and to propose that they are responding as a group to some common environmental stimulus, or complex of stimuli, seems reasonable. It is appropriate to note here the report of Brown (1973) of recent western range extensions in Arizona of three other species of the southwestern interior, the Scaled Quail (*Callipepla squamata*), Montezuma Quail (*Cyrtonyx montezumae*), and Coppery-tailed Trogon (*Trogon elegans*), although especially for the quail the possible influence of habitat change through grazing and/or fire in permitting the distributional change cannot easily be excluded.

Because the eight species are present at the western periphery of their respective breeding distributions in southern California only during the spring and summer months, we suspect that some environmental change operative during that portion of the year is the most likely explanation. At present the exact nature of the suspected environmental change has not been identified but we speculate that it probably will be found to relate to some complex pattern of change in recent decades of spring and summer average moisture and temperature regimes and associated food resources.

Finally, we wish to emphasize that studies such as this, that attempt to synthesize distributional patterns from scattered information, are possible only because of the continued and combined efforts of many ornithologists to gather and preserve carefully-documented field records. With this in mind we encourage others to search for additional information bearing on breeding range extensions of montane species in southern California. Added data on breeding status and occurrence is needed for

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many of the species we discuss. Furthermore, readers should be alerted to the probability that other interior species are currently colonizing the mountains of this area and that concentrated field work there is likely to be rewarding.

SUMMARY

In recent decades eight species of birds, derived from avifaunas of the Great Basin or the southwestern United States, have extended their breeding distributions into montane habitats of southern California. Because the range adjustments of these species seem unrelated to historical trends of habitat change or to other obvious man-caused environmental influences, we suspect that a subtle climatic shift affecting spring and summer temperature and moisture patterns and the availability of resources could be responsible.

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