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THE DISTRIBUTION OF THE FLAMMULATED OWL IN CALIFORNIA

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Although the Flammulated Owl (*Otus flammeolus*) is a wide-spread temperate and neo-tropical species, its basic biology is obscurely known. The literature on this species is scattered and somewhat fragmented. Little is available on the distribution and relative abundance of this owl throughout most of its range. Current knowledge of this owl is largely due to the work reported by Jacot (1931), Johnson (1962), Marshall (1939, 1957, 1967), A. Miller (1947), L. Miller (1936), Phillips (1942), Phillips, Marshall and Monson (1964) and Ross (1969).

The smallest member of the genus *Otus*, the Flammulated Owl breeds in the mountains west of the Great Plains from southern British Columbia (Godfrey 1966) to Vera Cruz, Mexico (Sutton and Burleigh 1940). Its winter range remains rather vague but it is known to occur from Sierra Autlan, Jalisco, Mexico to Guatemala (Phillips et al. 1964). Since Grinnell and Miller (1944) briefly summarized the distribution of this owl in California a significant amount of new distributional information has accumulated. This paper clarifies the current distributional status of the Flammulated Owl in California.

METHODS AND MATERIALS

In an effort to locate all extant specimens of this species from California, I searched 45 collections throughout North America including one in Mexico (Appendix A). In addition, I surveyed a select group of 44 observers whose field abilities were known to me personally to obtain sight records that would fill in gaps in distribution not substantiated

by specimen material (Appendix B). The remaining records were obtained from the literature. I used 148 records (59 specimen and 89 sight records) in the study. For the purposes of this analysis, a single specimen constitutes a single record. A sight (or heard) record on a single date in a given area is considered a single record regardless of the number of individual birds involved.

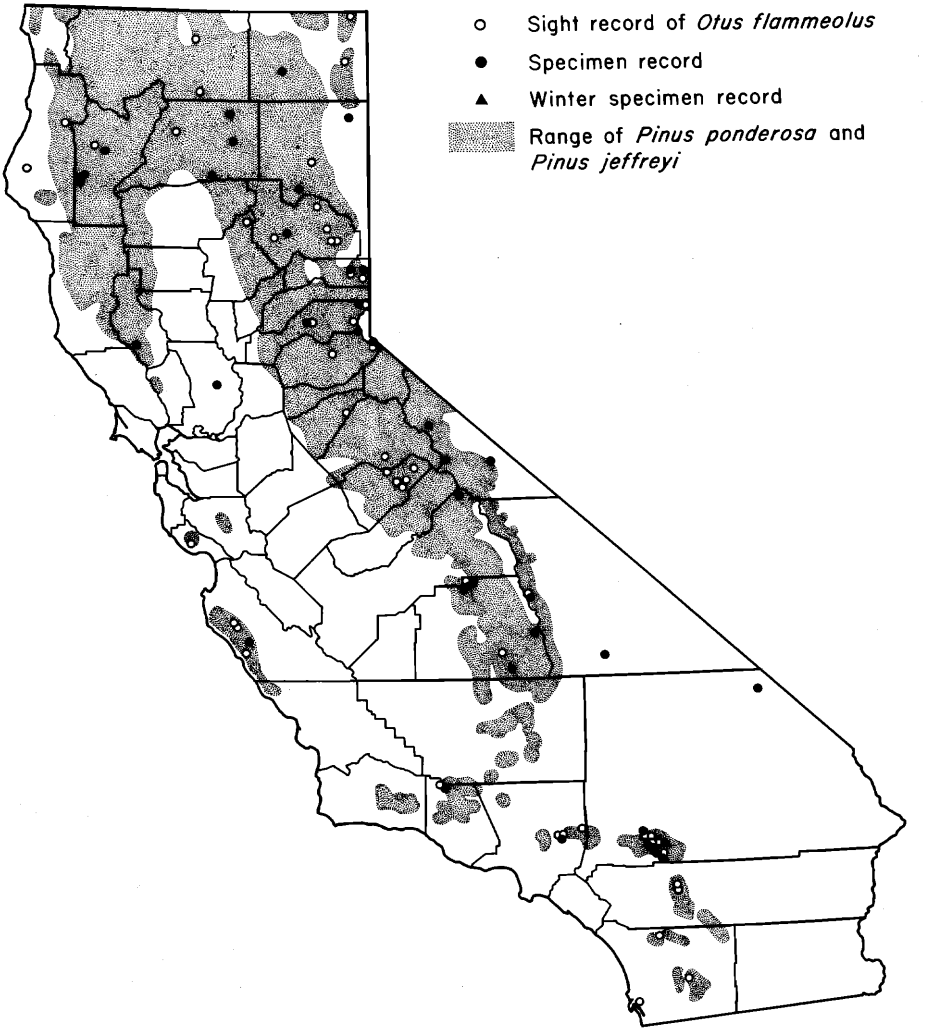

Figure 1. The distribution of the Flammulated Owl (*Otus flammeolus*) in California. The stippled areas show the distribution of yellow pine.

Seasons are defined as follows: winter—1 December to 15 March, spring—16 March to 31 May, summer—1 June to 31 August, fall—1 September to 30 November. In mapping the current distributional range, sight and specimen records were treated separately (Figure 1). In the seasonal distribution (Figure 2) both types of records were utilized to give a fuller understanding of the owl's status.

RESULTS AND DISCUSSION

HABITAT

As a breeding species the Flammulated Owl is mainly limited to the higher parts of the Transition Zone yellow pine belt throughout its range in California. Principal forest dominants of this habitat in the Sierra Nevada include Ponderosa Pine (*Pinus ponderosa*), Sugar Pine (*Pinus lambertiana*), Douglas Fir (*Pseudotsuga menziesii*), White Fir (*Abies concolor*), Incense Cedar (*Libocedrus decurrens*) and Black Oak (*Quercus kelloggii*). Throughout California the owl's breeding range is closely associated with the presence of yellow pine (*P. ponderosa* and *P. jeffreyi*) (Figure 1). The yellow pine belt, especially well developed in the

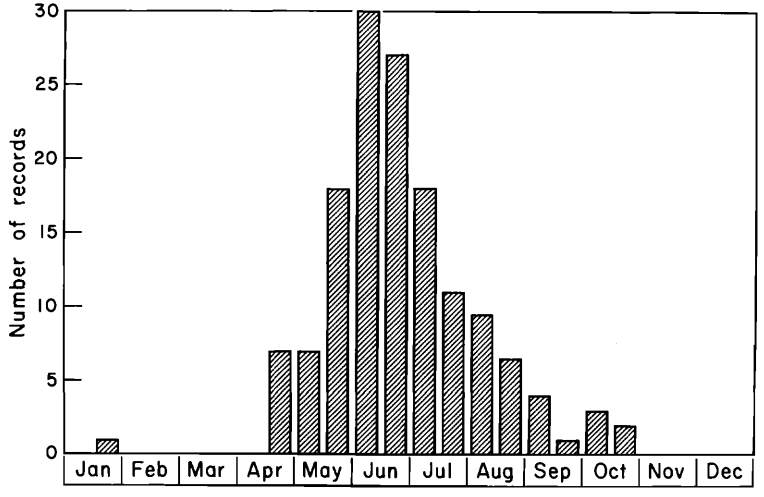

Figure 2. The seasonal occurrence of the Flammulated Owl in California. Both sight and specimen records have been utilized.

Sierra Nevada, is characterized by warm dry summers (average maximum temperature 80°-93° F), with an annual precipitation of 25-80 inches. It ranges vertically from 1200 feet to 5500 feet in the north, 2000 feet to 6500 feet in the central portions and from 2500 feet to 9000 feet in the southern end of the range (Storer and Usinger 1963). Since this habitat contains several species of timber highly desirable for lumber, little of the yellow pine belt remains undisturbed by lumbering activity. Whether this disturbance affects numbers, reproductive success or habitat selection of this species is unknown. However, the bird appears to be very common in second-growth yellow pine habitats I have visited.

This species appears to be less common above the yellow pine belt. Specimens have been taken up to 9500 feet in the Lodgepole Pine-Red Fir belt of the southern Sierra Nevada (Kenyon 1947) where limited breeding takes place. The principle forest dominants of this habitat are Lodgepole Pine (*Pinus murrayana*), Western White Pine (*Pinus monitcola*), Red Fir (*Abies magnifica*) and Jeffrey Pine. The specimen found by Kenyon had died as a result of having a large grasshopper lodged in its throat. This may reflect occasional sub-optimum foraging conditions in the upper parts of the Lodgepole Pine-Red Fir belt. I could find only one instance in which breeding had probably taken place outside the yellow pine belt. A dead juvenile found in the Piñon Pine (*Pinus monophylla*) belt (Upper Sonoran Zone—Miller 1951) of the Argus Mountains, Inyo County (Huey 1932), remains the only record of breeding recorded outside of the yellow pine belt. Although the nest was not actually found it is unlikely the bird was long out of the nest. I have examined the specimen (SDNHM 14919; see Appendix A) and it has about 80-85% of the underparts in barred plumage typical of juvenile *Otus* owls at an age when they are probably still dependent on their parents for food. To my knowledge there is no yellow pine habitat in the Argus Mountains; therefore it is probable the bird fledged from a nest in the Upper Sonoran Piñon Pine belt.

Miller (1951) has indicated that Screech Owls (*Otus asio*) reach the upper limit of their vertical breeding range in the yellow pine belt. I have found Flammulated and Screech Owls together in the yellow pine belt of the central Sierra Nevada and in the Santa Lucia Mountains of Monterey County. However, in all instances the Screech Owl was the rarer of the two congeners.

MIGRATION AND SEASONAL STATUS

Flammulated Owls are migratory in California. The earliest spring record is 19 April at China Camp, Santa Lucia Mountains, Monterey County (Appendix B). The latest fall record is 31 October at Davis,

Yolo County (Emlen 1936). Bailey and Niedrach (1965) reported Flammulated Owls in Colorado as early as 16 April, and Phillips et al. (1964) noted records as early as 26 March in southeastern Arizona. These records suggest that Flammulated Owls may arrive in the southern portions of the state as early as the second week in April, but have escaped detection because calling may not be very frequent at that time of year. The known breeding distribution of Flammulated Owls is just beginning to show definite patterns, but migration patterns are virtually unknown in the state. The October specimen from Davis is the only migrant recorded from the Sacramento Valley.

A specimen from Fresno (AMNH 753957) taken by G. F. Breninger in 1899 is not included in this analysis because Phillips (1942) has cast doubt on the collecting locality of the specimen. The specimen agrees well with a series from the Huachuca Mountains of Arizona to which Phillips compared it. Since Breninger is known to have collected in the Huachuca Mountains, and because the original label is missing, the specimen is best regarded as hypothetical.

The only other migrant was found aboard a naval vessel in San Diego Bay on 10 October 1962 (Banks 1964). This record is the only actual coastal occurrence for the owl in California.

Since Flammulated Owls are strictly nocturnal, their presence is normally revealed by their calls. The seasonal summary of records in Figure 2 indicates the birds are fairly quiet from mid-April to mid-May. Calling sharply increases in the latter half of May and peaks in June. The absence of records in the latter half of September probably indicates a period of quiet during fall molt. A captive juvenile from the central Sierra Nevada whose molt I recorded (photoperiod unaltered) was in very heavy body molt in mid-September. Marshall (Phillips et al. 1964) noted that in the fall after molting there is a resumption of calling. This is indicated by at least five October records.

A winter record of a specimen taken from the San Bernardino Mountains on 18 January 1885 (Stephens 1902) remains unique. The label has been checked three times, twice by Phillips (1942) and again in the current study. No error was made in transcribing the label data. In addition to this record, there are only two substantiated winter records for North America (Simpson and Werner 1958; Glasgow, Gresham and Hall 1950). If Flammulated Owls winter in California they must be extremely rare. Since nearly all resident North American owls will call sometime during the winter, it is especially significant that no Flammulated Owls have been heard in California at that time of year.

For a small insectivorous owl to survive the rigors of winter at temperate zone latitudes, Johnson (1963) has suggested partial vertical migration and torpor as alternatives to normal trans-latitude migration to neo-tropical climates. He asserts (p. 176) that "the ability to become

torpid could serve as a mechanism by which this species might avoid environmental conditions unfavorable for foraging". While this intriguing hypothesis remains to be proved, there is evidence that strongly suggests trans-latitude migration is normal for this species throughout its temperate zone range.

The earliest spring record of a Flammulated Owl north of Mexico appears to be the 26 March sighting in Arizona (Phillips et al. 1964). The bird reported by Emlen (1936) at Davis, California on 31 October is the latest satisfactory fall record. However, Brooks (1909) reported a November specimen from Penticton, British Columbia that had probably died two weeks before. Johnson (1963:175) states that late fall records are significant "because it requires that this...species migrate thousands of miles to and from an unknown wintering quarters in a rather limited amount of time", and that they consitute "an unusually late seasonal occurrence...for a summer resident species". I maintain that this seasonal pattern is normal and not at all unseasonal. Such patterns are known to occur in a number of other species of birds to even greater extremes. McCaskie (1971a) pointed out that the Rusty Blackbird (*Euphagus carolinus*), a smaller bird than the Flammulated Owl, breeds at high latitudes in western Alaska and often remains on its breeding grounds until October. It is not common on its wintering grounds in the southeastern United States until November and departs in spring by the first week of April to return to its breeding grounds. The relative airline distances traveled by both the Rusty Blackbird and the Flammulated Owl from the northern extremes of their breeding to wintering grounds is nearly the same. As for the specimen picked up by Brooks (1909) it should be stressed that the bird was dead when found, which could attest to the inhospitable climate at those latitudes in late fall. An alternative possibility is that this bird came from a more southerly population, was 180° out of phase with its normal fall migration route and went north instead of south. The phenomenon of reverse migration is well documented and occurs regularly, for example, in the Tropical Kingbird (*Tyrannus melancholicus*) along the coast of California in fall (McCaskie 1970).

The two vagrant records of Flammulated Owls reported by Glasgow et al. (1950) and Woolfenden (1970), from Louisiana and Alabama respectively, are particularly noteworthy. If this owl is non-migratory it is indeed remarkable that it could "wander" some 800 to 1000 miles outside its known range. In all instances known to me vagrancy in birds is a very strong indication of highly developed migratory behavior. Furthermore, De Benedictis (1971) has shown that in Vireonidae and Parulidae, long-distance migrants may be subject to greater navigational error than short-distance migrants. If Flammulated Owls are long-distance migrants, occurrences in the southeastern United States would be much more understandable.

Marshall has indicated (Phillips et al. 1964) that there is little geographic variation in the Flammulated Owl in comparison with a highly variable non-migratory congener such as the Screech Owl. Geographic differences among Flammulated Owls appear so weak and exceptional that Grinnell and Miller (1944) and Marshall (1967) do not recognize any subspecies for the bird. Since it is well known that sedentary species of birds usually show a great deal of geographic variation, the absence of such variation would indicate that gene mixing of various populations is common. This lack of variation is probably brought about by the exchange of individuals from one population to another through migratory mixing.

As an alternative to migration, Flammulated Owls might survive periods of food stress through an ability to undergo torpor (Johnson 1963). Experimental evidence substantiating this ability is still lacking. Banks (1964) subjected a captive Flammulated Owl to cold stress conditions by placing it in a refrigerator at 40°F after food had been withheld for 48 hours. The bird failed to show any sign of torpor after 48 hours of refrigeration. It appears that torpor in the Poor-will (*Phalaenoptilus nuttallii*) and the Lesser Nighthawk (*Chordeiles acutipennis*), close relatives of Strigiformes, is essentially a food stress-induced phenomenon (Marshall 1955). Ligon (1968), during a spring freeze in the Chiricahua Mountains of southeastern Arizona in mid-May 1967, found starvation to be common among three species of insectivorous migrants. During this freeze Ligon found an exhausted and emaciated female Flammulated Owl that weighed 39.8 g. Of 12 spring and summer specimens of female Flammulated Owls ranging from Trinity County, California to Coahuila, Mexico, for which I have data, the mean weight was 58.5 g (range 51.5 g - 63.6 g, SD± 3.94 g), indicating that Ligon's bird was in a severely starved condition. Ligon did not report any species known to be capable of torpor as being affected by the spring freeze. Since Flammulated Owls are known to feed extensively on flying insects (Marshall 1957), freezing conditions such as those reported by Ligon would surely limit food availability. Even by the standards outlined by Pearson (1960:93) in which some species might undergo torpor only under the "influence of excessive cold or of hunger", the conditions under which Ligon found this owl should be more than drastic enough to induce torpor if indeed the owls are capable of such behavior. When Ligon found the bird it was still capable of weak flight, showed no sign of a torpid condition, and in spite of attempts to save the bird it died the following day. Furthermore, Ligon (pers. comm. 1972) recently attempted to induce torpor in two captive Flammulated Owls under controlled conditions (which resulted in the death of both birds) and found "no evidence that Flammulated Owls can enter torpor". In view of this, Johnson's (1963) ideas involving torpor and non-migration in this species are best considered hypothetical.

RELATIVE NUMBERS

Quantitative analysis of numbers of birds in any single habitat or geographic location could not withstand critical statistical examination because the data are too fragmented. Although this owl was for many years considered rare (L. Miller 1933, Willett 1912, Grinnell 1915), the development of techniques for finding the birds (Marshall 1939) has contributed greatly to the proliferation of records. The bird's unpredictable behavior, irregular calling, its restricted habitat and habit of remaining concealed have all contributed to its supposed rarity (Winter 1971).

In optimum habitat the Flammulated Owl is probably the most common owl in the Sierra Nevada. Marshall (1939) in two localities only five miles apart at Whitaker's Forest and Big Meadow, Tulare County, collected 11 specimens and heard 18 other birds during the summer of 1938. The Whitaker's Forest location, where Marshall found 24 males, is an area of about 2 square miles, indicating an approximate density of 1.9 males/100 acres. On 30 June 1971 I censused an area 10 miles northeast of Foresthill, Placer County, on Big Oak Flat in habitat very similar to the area in which Marshall worked, and found a density of approximately 2.1 males/100 acres. There were at least 10 males calling on the night of 30 June at the Placer County location. Between 22 May and 1 June 1972 in a rather small area 20 miles northeast of Chico, Butte County, Manolis and Webb (pers. comm. 1972) found 14 male Flammulated Owls. The habitat was in the yellow pine belt at an elevation of about 3200 feet. However, in several transects that I have made across what appeared to be optimum habitat in the late spring, I have often failed to find the owl present. The rather high densities mentioned above might suggest that this species may be "loosely" colonial, congregating in small, rather dense, discrete populations for the purposes of breeding. The Flammulated Owl appears to be a common (to very common in the yellow pine belt of the Sierra Nevada) breeding resident throughout the state wherever suitable habitat exists, from mid-April to October.

CURRENT DISTRIBUTION

The first specimen of this species for California, as well as for North America, was taken at Fort Crook near Cayton, Shasta County on 23 August 1860 (Cooper 1870). Since this specimen, 58 more have been collected in California mainly through the efforts of Joe T. Marshall Jr., Alden Miller, Ned K. Johnson and Ward Russell.

The faunal districts outlined by Miller (1951) for breeding species in California are a convenient breakdown of the general biotic provinces in the state, and will be utilized in this study (Figure 3). It is hoped that use of these faunal districts will lend some ecological understanding to Flammulated Owl distribution.

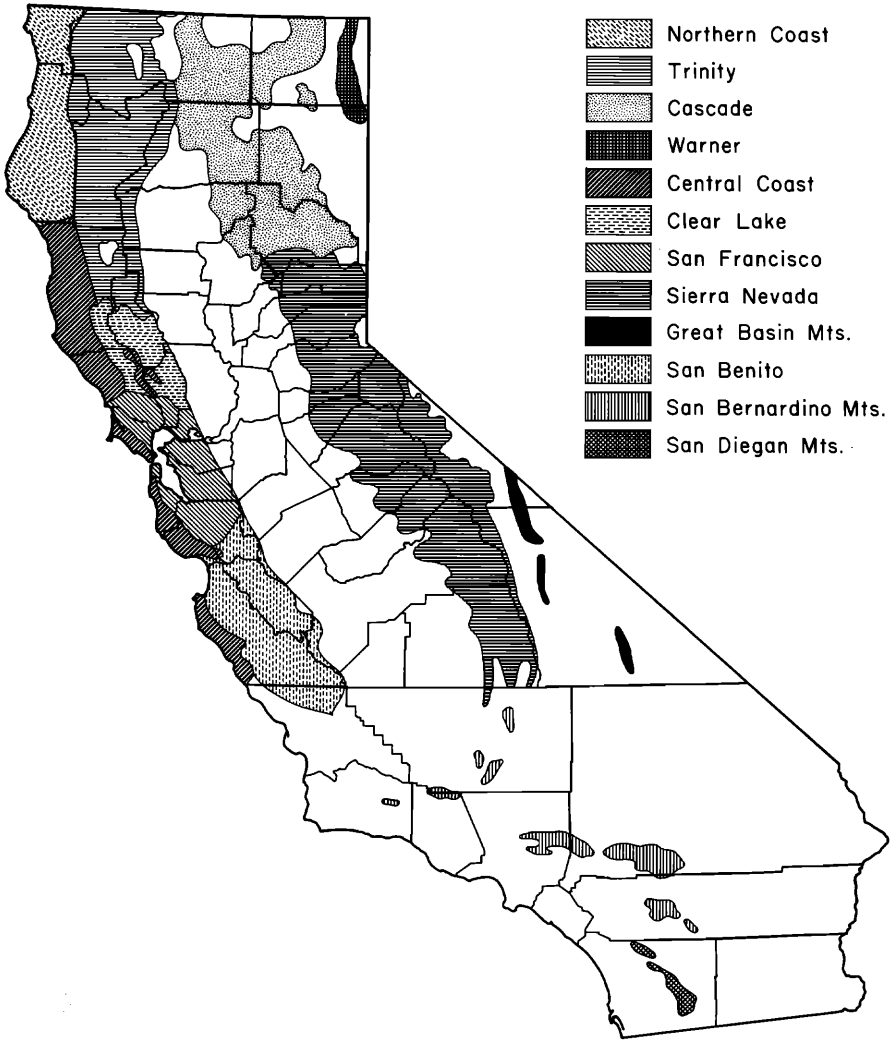

Figure 3. Faunal districts of California redrawn from Miller (1951).

North Coast District

This district includes the coastal fog belt of the Pacific slope from Del Norte County south to southern Humboldt County. The area is characterized by heavy annual rainfall, high atmospheric humidity and lush fern understory. The dominant forest vegetation consists mainly of Grand Fir (*Abies grandis*), Sitka Spruce (*Picea sitchensis*), Redwood (*Sequoia sempervirens*) and Douglas Fir and is atypical habitat for Flammulated Owls. The excessive dampness of this habitat and the lack of yellow pine may be a limiting factor that excludes the owls from this district. There are two records from Humboldt County; one on the Eel River at Alder Point and one at Salmon Mountain on the eastern border of the county. Both locations are within the influence of the Trinity District biotic province.

Central Coast District

This district includes the Pacific slope in northern Mendocino, Sonoma, Marin, San Mateo, Santa Cruz and Monterey counties. The district is similar to the north coast district in high atmospheric humidity from coastal fog and a liberal annual rainfall. With the exception of a local area of Santa Cruz County (which appears to fall more under the influence of San Benito and San Francisco Districts), Flammulated Owls, as well as suitable habitat, are absent throughout the district.

Trinity, Cascade and Clear Lake Districts

Suitable habitat is well developed throughout these districts. There are several sight and specimen records from Trinity County (including the ones mentioned from Humboldt County) in the Trinity District. The reddest specimens that I have seen from California are from Trinity and Modoc counties of the Trinity and Cascade Districts respectively. The grayish morphs are the dominant phenotype in the California specimens while the red morphs are local and exceptional. Examination of a series (n=88) ranging from British Columbia to Guerrero, Mexico in the Museum of Vertebrate Zoology, shows a weak north-south cline of increasing redness to the south. However, some of the exceptions are outstanding. A very red male taken near Canby, Modoc County in June is nearly identical to a very red female labeled *O. f. rarus* (Griscom) taken in August in Guerrero. Such exceptions weaken the validity of *rarus* as described by Griscom (1935).

I was unable to find records from the interior coast ranges of Siskiyou, Mendocino, western Glenn and Tehama counties, but where suitable habitat occurs in these areas the bird should be present. Flammulated Owls are undoubtedly more common in Lake County than the single record reflects. Suitable habitat extends as far south as Mount Saint

Helena in the Clear Lake District in eastern Sonoma County and to Howell Mountain near Angwin in northwestern Napa County. The paucity of records from Siskiyou, Modoc, Shasta and Lassen counties reflects the lack of field work rather than the scarcity of the owl in the Cascade District. In the Warner Mountains Johnson (1970) found several calling males in two different locations in 1964. These are the only records from the Warner Mountains.

San Benito District and the San Francisco District

In the interior portions of Santa Cruz (Ben Lomond) in the Santa Cruz Mountains and in the Santa Lucia Mountains of Monterey County, Flammulated Owls reappear near the coast. The bird appears to be quite common in the latter location. A single record for Santa Cruz County at Ben Lomond is noteworthy because the location is strikingly correlated with the reappearance of Ponderosa Pine in coastal areas south of Napa County. Thomas (1961:62) indicates that Ponderosa Pine is "known locally from the vicinity of Bonny Doon and Ben Lomond". There are several records from the Santa Lucia Mountains at Chews Ridge, Cone Peak and Junipero Serra Peak in a region which harbors large areas of yellow pine habitat.

Sierra Nevada District

Flammulated Owls appear to be most common in this district (Figure 1). The lack of records for eastern Nevada, Amador, Madera and western Alpine counties undoubtedly reflects the lack of field work. The owl is also probably more common in eastern Fresno County than the single record indicates. Yosemite National Park is frequented regularly by field observers and accounts for the several sight records from Mariposa County. A September specimen taken at Hospital Rock (LMC 1892) in Sequoia National Park was apparently overlooked by Sumner and Dixon (1953), who indicated no records of Flammulated Owls within the boundaries of either Kings Canyon or Sequoia National Parks. With more regular field work records of this owl will surely increase in other Sierra Nevada counties.

San Bernardino Mountains District

Flammulated Owls are common in the San Bernardino Mountains (vicinity of Big Bear and Dry Lakes), San Gabriel Mountains, and on Mount Pinos, but oddly enough the bird is recorded only twice from the San Jacinto Mountains and not at all from the Santa Rosa Mountains, where suitable habitat occurs. In the latter area the bird has been overlooked. Habitat is also present in the Tehachapi and Piute systems, but records are lacking.

San Diegan Mountain District

Flammulated Owls have been recently discovered in the Laguna Mountains of San Diego County on Mount Palomar (McCaskie 1971b). Birds have also been heard in the vicinity of Cuyamaca Rancho State Park. Since suitable habitat occurs in the higher parts of the Sierra Juarez of Baja California, Mexico, I suspect that the owl is present there as well.

Great Basin Mountain District

With the exception of a single breeding female taken by Miller (1940) on Clark Mountain in northeastern San Bernardino County and a dead juvenile found in the Argus Mountains (Huey 1932), the owl is unrecorded in the Panamint, Inyo and White Mountains of this district. Clark Mountain harbors a small patch of White Fir some 50 miles southwest of the Charleston Mountains of southern Nevada where the owl is known to breed (Banks and Hansen 1970, Johnson 1965). Colonization of such a remote little pocket of habitat attests to the adaptability of this remarkable little owl if not to its migratory ability. Flammulated Owls have also been recorded in the Sheep Mountains of southern Nevada (Johnson 1965) and in the Hualapai Mountains of northeastern Arizona (Phillips et al. 1964), both of which harbor yellow pine habitat.

SUMMARY

Analysis of 59 specimen and 89 sight records of Flammulated Owl since 1860 reveals the bird to be a common to locally very common breeding summer resident in California from mid-April to October. The bird's supposed rarity is mainly behavioral, and development of techniques for finding this species has greatly increased the number of records. The preferred habitat appears to be Transition to Canadian Zone montane forests where yellow pine (*P. ponderosa* or *P. jeffreyi*) is present. The bird's distribution is analyzed by the faunal districts outlined by Miller (1951). Partial vertical migration and torpor suggested by Johnson (1963) is discussed, and it is concluded that, on the basis of the evidence available, the Flammulated Owl is a trans-latitude migrant that normally winters in Central America from Jalisco, Mexico to Guatemala.

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APPENDIX A. Specimen records of Flammulated Owl in California.

COUNTY	LOCATION	DATE	SEX, SPECIMEN NO.
El Dorado	Meeks Bay, Lake Tahoe	10 Sep 1937	F MVZ 72523
"	0.5 mi SE Al Tahoe	2 Jun 1941	F? CAS 57975
Fresno	Near Jackson Lake	8 Sep 1946	*see Kenyon (1947)
Inyo	Shepard Canyon Argus Mts.	11 Aug 1931	F juv. SDNHM 14919
"	9.5 mi W, 1.25 mi S. Lone Pine	24 May 1942	M MVZ 84822
Lake	NE slope of Mt. Hanna	8 Jul 1940	M MVZ 79271
Lassen	1 mi E Fredonyer Summit; 3 mi N, 8 mi E of Westwood	18 Jun 1959	M MVZ 140106
"	Coyote Flat	8 Jul 1961	M MVZ 142634
Los Angeles	4.5 mi E Chilao, San Gabriel Mts.	17 Jun 1947	M UCLA 34478
"	"	16 Jun 1947	M UCLA 34477
Modoc	10 mi W of Canby	9 Jun 1958	M MVZ 136796
"	"	10 Jun 1958	M MVZ 136795
Mono	9 mi W Benton	22 Jun 1942	M MVZ 84824
"	Twin Lakes SW of Bridgeport	early June 1942	? MVZ 53837
"	Near Parker Lake (on trail)	Aug 1958	**SBNHM catalog
Monterey	Top of Junipero Serra Pk.	20 Jul 1966	? PGNHM 2329
Placer	Big Oak Flat 10 mi NE of Foresthill	8 Aug 1967	F juv. CAS 67069
"	1 mi W Martis Pk.	30 Jun 1960	M MVZ 140530
Plumas	Quincy	1907	*see Bryant (1920)
San Bernardino	6 mi NW of Fawnskin, San Bernardino Mts.	11 Jun 1952	F SBCM 1814
"	Raywood Flat, San Gorgonio Pk.	3 Jun 1884	*see Gilman (1902)
"	Running Springs San Bernardino Mts.	5 Oct 1962	F SBCM 3410
"	NW side Clark Mt.	20 May 1939	F MVZ 77347
"	San Bernardino Mts.	26 May 1893	*see Palmer (1894)
"	"	18 Jan 1885	M MCZ 210149
"	Bluff Lake, San Bernardino Mts.	15 Jul 1905	M MVZ 32350
Shasta	Burney Springs, 1.75 mi S of Burney Mt. LO	24 Jul 1955	F CSUS 967
"	Fort Crook, near Cayton	23 Aug 1860	M USNM 24172
"	2 mi S of Shingletown	20 Sep 1972	captive pet

COUNTY	LOCATION	DATE	SEX, SPECIMEN NO.
Sierra	1.5 mi W Sardine Pk.	2 Jun 1959	F MVZ 140107
"	1.75 mi E, 0.5 mi S Babbitt Pk.	7 Jul 1962	M MVZ 148235
"	"	"	M MVZ 148233
"	"	"	M MVZ 148234
"	"	"	M MVZ 148232
"	"	"	M MVZ 148231
"	"	22 May 1963	F MVZ 149877
"	"	"	F MVZ 149876
Trinity	1 mi N, 0.5 mi W Norse Butte	31 Aug 1942	M MVZ 87454
"	4 mi N, 1 mi W Norse Butte	30 Aug 1942	M MVZ 87453
"	"	28 Aug 1942	F juv. MVZ 87452
"	"	"	F juv. MVZ 87451
"	Mad River	12 Jun 1930	M MVZ 56283
"	SE side of Hayfork Bally	9 Jun 1946	M MVZ 95530
"	"	"	M MVZ 95531
Tulare	Hospital Rock, Sequoia Natl. Park	8 Sep 1901	M LMC 1892 (UCLA)
"	Monache Meadows	4 Aug 1911	M MVZ 19808
"	"	"	M juv. MVZ 19809
"	Meadows Flat, W base of Redwood Mt.	12 Jun 1938	M MVZ 74633
"	"	"	M MVZ 74632
"	"	"	M MVZ 74634
"	Whitaker's Forest, 10 mi NE of Badger	3 Jun 1938	M MVZ 74630
"	"	7 Jun 1938	M MVZ 74631
"	"	21 May 1938	M MVZ 74629
"	Big Meadow, Sequoia Natl. Forest	10 Jul 1938	M MVZ 74635
"	"	"	M MVZ 74637
"	"	"	M MVZ 74636
"	14 mi E Calif. Hot Springs	24 Jun 1938	F LSU 39813
Ventura	Chula Vista Campground, Mt. Pinos	24 Jul 1936	F *see L. Miller (1936)
Yolo	Davis (U.C. Davis Campus)	31 Oct 1935	F UCD 922

CAS-California Academy of Sciences
CSUS-Calif. State Univ., Sacramento
LMC-Loye Miller Collection
LSU-Louisiana State Univ.
MCZ-Mus. of Comparative Zool., Harvard
MVZ-Mus. of Vertebrate Zool., Berkeley
PGNHM-Pacific Grove Nat. Hist. Mus.
SBCM-San Bernardino Co. Museum
SBNHM-Santa Barbara Nat. Hist. Mus.
SDNHM-San Diego Nat. Hist. Museum
UCD-Univ. of California at Davis
UCLA-Univ. of Calif. at Los Angeles
USNM-U. S. National Museum

*Unable to locate specimen
**Destroyed by fire

APPENDIX B. Sight records of Flammulated Owl in California.

COUNTY	LOCATION	DATE	NO. BIRDS	OBSERVER
Butte	20 mi NE Chico	22 May-17 Jul 1972	14	T. Manolis, B. Webb
Calaveras	Big Trees	30 Jun 1882	1	L. Belding
"	"	16 Aug 1880	1	"
El Dorado	No. Fork of Silver Cr., S of Robbs Pk.	29 Jun 1947	1	J. T. Marshall Jr.
"	1.5 mi E Bijou, Lake Tahoe	4 Jun 1936	1	"
Humboldt	Top of Salmon Mt.	27 May 1973	1	T. Schulenberg
"	Alder Point	3 Jun 1973	1	"
Inyo	Lone Pine Creek	23 Jun 1934	2	D. McLean
Lassen	0.5 mi E Eagle Lake Biology Sta. T32N, R11E, SE ¼ Sec 22	8 Jun 1973	1	T. Manolis, R. Lederer
Los Angeles	NW side of Mt. Waterman, San Gabriel Mts.	16 Jun 1946	3	J. T. Marshall Jr.
"	Big Pines Playground	10-11 May 1934	Several	see L. Miller (1952)
"	Buckhorn Flats, 2 mi NE Mt. Waterman, San Gabriel Mts.	20 May 1973	Nesting pr. w/3 young	J. Norton
Mariposa	Peregoy Meadows, Yosemite Natl. Park	10 Jun 1961	1	W. J. Fitzpatrick
"	"	2 Aug. 1969	1	G. McCaskie
"	Between Chinquapin and Wawona, Yosemite Natl. Park	25 May 1969	1	G. Bolander
"	"	21 May 1966	1	"
"	Henness Ridge	11 Jun 1964	2	G. McCaskie
"	"	late May 1966	4	many observers
"	"	4 Jun 1962	1	G. McCaskie
"	"	22 May 1965	1	T. Chandik
"	"	25 May 1968	2	P. Devillers
"	"	30 Oct 1967	2-3	D. DeSante
"	Tenaya Lake to Mirror Lake Trail, Yosemite Natl. Park	20 Jul 1939	5	J. T. Marshall Jr.
"	Merced Grove, Big Trees Yosemite Natl. Park	7 Jul 1925	1 (nest)	D. McLean
Modoc	Thomas Creek, Warner Mts.	11-14 Jun 1964	2-3	N. K. Johnson, W. Russell
"	New Pine Creek, Warner Mts.	17 Jun 1964	Several	"

COUNTY	LOCATION	DATE	NO. BIRDS	OBSERVER
Monterey	China Camp, Los Padres Natl. Forest	19 Apr 1972	1	R. Stallcup
"	"	28 Apr 1971	1	V. Yadon
"	"	30 Apr 1966	2-3	R. Branson, W. Reese
"	"	1 May 1971	2	R. Stallcup, R. LeValley
"	"	10 May 1969	3	T. Chandik
"	"	8-13 May 1967	Several	W. Reese, T. Chandik, A. Baldridge, D. DeSante
"	"	12 May 1966	3-4	R. Branson, A. Baldridge, W. Reese
"	"	13 May 1967	5	T. Chandik
"	"	20 May 1967	4	"
"	"	25 May 1968	1	"
"	"	2 Jun 1966	1	A. Baldridge, W. Reese
"	"	6 Jun 1971	1	T. Chandik
"	"	8 Jul 1968	2	"
"	Cone Pk., Los Padres Natl. Forest	18 May 1968	Several	R. Branson, V. Yadon
"	Chews Ridge, Los Padres Natl. Forest	15 Sep 1967	1	R. Branson, W. Reese
Placer	Big Oak Flat, 10 mi NE of Foresthill	12 Jun 1968	3	J. Winter
"	"	17 Jun 1968	1	"
"	"	18 Jun 1970	8	"
"	"	19 Jun 1969	1	"
"	"	30 Jun 1971	10	"
"	"	22 Jun 1968	2	"
"	"	6 Jul 1968	6	"
"	"	10 Jul 1970	3-4	"
"	"	6 Jul 1971	3	"
"	"	19 Jul 1970	3-4	"
"	"	24 Jul 1971	1	"
"	"	25 Jul 1970	3	"
"	"	26 Jul 1970	1	"
"	"	8 Aug 1970	4	"
"	"	9 Aug 1970	1	"
"	1 mi W Martis Pk.	30 Jun 1960	4	N. K. Johnson
"	Tahoe City	30 Jun 1963	1	G. McCaskie
Plumas	3.5 mi N, 1.5 mi W of Beckwourth	16 Jun 1971	1	N. K. Johnson
"	Crocker Meadow, 3.5 mi N, 3 mi W of Beckwourth	"	4	"
"	Poco Cabin, 6.5 mi E, 1 mi S of Mt. Ingalls	18 Jun 1971	1	"
"	Buck's Lk. & Haskins Mdw.	17 Jul 1938	3	J. T. Marshall Jr.
"	West slope of Thompson Pk.	15 Oct 1937	1	D. McLean

FLAMMULATED OWL

COUNTY	LOCATION	DATE	NO. BIRDS	OBSERVER
Riverside	Tahquitz Valley, San Jacinto Mts.	13 Jul 1972	1	J. Fairchild
"	Little Round Valley, 1 mi SW San Jacinto Pk.	28 Apr 1969	1	"
San Bernardino	Dry Lake, N Base of Mt. San Gorgonio	29 Jun 1935	1	J. T. Marshall Jr.
"	"	21 Jun 1905	1	J. Dixon, J Grinnell
"	Hanna Flats, San Bernardino Mts.	15 Jun 1968	1	R. Mancke
"	Big Bear Lake near Fawnskin	30 Apr 1966	1	G. S. Suffel
"	San Bernardino Mts. (Hanna 1941)	1-7 Jun 1941	Nesting pair	W. Hanna, J. Fairchild
"	Base of Sugar Loaf Mt. near Big Bear Lake	19 Jul 1921	1	J. McB. Robertson
"	Near IS Ranch, Big Bear Lake	17 Jul 1921	1	"
San Diego	Mt. Palomar	29 Apr 1972	2	J. Winter, C. Lyons, S. Terrill
"	"	13 Jun 1971	2	A. Morley
"	"	16 Jun 1971	2	P. Devillers
"	Cuyamaca Rancho State Park	27 Apr 1972	1	S. Terrill
"	San Diego Harbor	10 Oct 1962	1	see Banks (1964)
Santa Cruz	Ben Lomond	4 Aug 1962	1	R. Stallcup
Shasta	5 mi SE Lakehead between Fall Creek and Coal Creek	18 Jun 1972	1	T. Manolis, B. Webb
Sierra	1.5 mi W Sardine Pk.	14 May 1959	3	N. K. Johnson
"	Dog Valley Campground, 11 mi NE Truckee, T19N, R17E, Sec 3	15 Jun 1974	1	G. Zamzow, B. Principe
Siskiyou	4 mi E McCloud	3 Jun 1930	3	D. McLean
"	6 mi S, 5.25 mi W of Macdoel	25 Jun 1967	1	N. K. Johnson
Trinity	20 mi W Weaverville	20 Jun 1931	1 (dead)	D. McLean No specimen
Tulare	S side Park Ridge on trail from Park Ridge LO	10 Aug 1935	1	J. T. Marshall Jr.
"	Foot of Solo Pk.	9 Jul 1963	1	M. Mires
Tuolumne	Carnegie Institute Station near Mather	19 May 1970	2	M. Perone
"	"	21 May 1970	2	"
Ventura	Mt. Pinos Campground, Mt. Pinos	June-July 1950	1	H. Clarke

Sketch by Tim Manolis