MIGRATORY STATUS OF FLAMMULATED OWLS IN CALIFORNIA, WITH RECENT RECORDS FROM THE CALIFORNIA CHANNEL ISLANDS

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The Flammulated Owl (*Otus flammeolus*) is a widespread migratory species which breeds in mountains west of the Great Plains from southern British Columbia (Godfrey 1966, Cannings 1982) south to Vera Cruz, Mexico (AOU 1983). A number of recent papers provide a review of the distribution, habitat affinities and seasonal occurrences of Flammulated Owls in California (Johnson and Russell 1962; Winter 1974, 1979; Marcot and Hill 1980; Bloom 1983); however, there is still much to be learned about the migratory habits of this species. In this paper we discuss the migratory habits of the Flammulated Owl and provide data on the first records of the species on the California Channel Islands.

Flammulated Owls have not been recorded previously on any of the islands off the coast of southern California or Baja California, Mexico, despite recent surveys of island avifaunas (Johnson 1972, Hunt and Hunt 1974, Lynch and Johnson 1974, Jones and Diamond 1976, Jehl 1977, Boswall 1978, Diamond and Jones 1980, Jorgensen and Ferguson 1984, Jehl and Everett 1985, Jones et al. 1985) and incidental observations we made while conducting research on the Channel Islands during the last decade. Intensive long-term surveys of the avifauna on the Farallon Islands off the coast of central California have not recorded Flammulated Owls there either (DeSante and Ainley 1980).

RESULTS

Santa Barbara Island is one of the eight Channel Islands located off the coast of southern California (32°28'30"N, 119°02'00"W). Santa Barbara Island is 2.64 km² in size and 61 km from the nearest mainland. The topography of the island consists of gently sloping marine terraces which are dissected by several canyons. There are no trees and the dominant vegetation is annual grassland. In several scattered areas, notably the canyons, Giant Coreopsis (*Coreopsis gigantea*) and other coastal sage scrub species form a dense shrub cover.

On 16 October 1981 at 1415, Charles Drost flushed a Flammulated Owl in Graveyard Canyon on Santa Barbara Island. The bird flew low across the canyon and landed on a low vertical dirt bank where it sat motionless. Drost approached to within 10 m of the bird and photographed it (Figure 1).

The owl was gray-brown and finely barred on its upperparts, similar to the intermediate phase of the Western Screech-Owl (*Otus kennicottii*). It was about two-thirds the length of a Burrowing Owl (*Athene cunicularia*) and had gray-brown primaries and tail feathers which were barred with buff. There was a buff-colored row of round spots on the scapulars with a parallel row of narrower run-together black spots. The facial disk was buff with narrow black lines framing it on the side. Gray feathers formed a "V" outlining the disk from just above the eyes to the bill. The eyes were black. No ear tufts were seen, although there did appear to be a pair of small bumps on the top of the head where the ear tuft feathers should be.

The owl was observed continuously from 1415 until 1450 and was last seen at 1515. During this time it responded only by opening its eyes or turning its head to sudden low-pitched noises such as hissing or falling rocks. Following its initial flight, the owl made no further attempt to fly. The apparent tameness of this bird may have been a result of its being exhausted from its flight across the water barrier which separates Santa Barbara Island from the mainland. Although the minimum distance between Santa Barbara Island and the mainland is 61 km, it is likely that this particular bird could have crossed 80 to 100 km of open water if it left the mainland in the vicinity of Santa Barbara during its southward fall migration.

In spite of repeated surveys of Graveyard Canyon and surrounding areas in the following days the owl was not seen again. Drost spent an average of 20 days per month on Santa Barbara Island from 1981 through 1984, including an average of five days per month in Graveyard Canyon. Part of his fieldwork during this time involved searching for and making population counts of the owls, as well as systematically searching for the remains of birds which had died or been killed by avian predators.

On 26 May 1984 Gary Fellers found an intact, partially feathered, dried-out carcass (Santa Barbara Museum of Natural History 3141) of a diminutive owl in Graveyard Canyon on Santa Barbara Island. Comparison of the skeletal elements and wing feathers of this specimen with other members of the genus *Otus* revealed that it was definitely a Flammulated Owl. The smooth surface texture of the bones and the complete fusion of epiphyses suggested that this specimen was an adult. Measurements were as follows: wing chord 139 mm; exposed culmen 11.4 mm; and tarsometatarsus lengths 23.7 mm (right) and 23.5 mm (left). The tarsometatarsus lengths are within the 21.9 to 24.3 mm range recorded for Flammulated Owls (Woolfenden 1970).

The condition of the carcass suggests that it probably died 1 or 2 months prior to its discovery. This estimate is based on our studies of owl predation on Santa Barbara Island, in which we have tagged approximately 150 carcasses of owl-killed Xantus' Murrelets (*Synthliboramphus hypoleucus*), and observed how long it takes for such specimens to fade and weather. The lack of weathering and insect damage on the feathers of the owl, coupled with its intact condition, suggests that it had not died the previous fall and thus been exposed to weathering from winter storms. The specimen was on top of the previous winter's vegetation, and was not found during a search of the canyon in December 1983, nor in six additional trips into the canyon during the winter, even though it was in a relatively conspicuous location. The flight

feathers were slightly worn, but showed no sign of having been recently molted. Although the rectrices and body contour feathers had been badly damaged by the leakage of body fluids during the decomposition process, none of these feathers were ensheathed, or growing in, thus suggesting that the owl was not in an active molt at the time of its death. Adult Flammulated Owls are known to go through a complete body and wing molt in the late summer and early fall (Winter 1974, Bloom 1983). The condition of the wing feathers on this specimen suggests that this bird was probably a spring migrant.

Though it is a coincidence that both of these owls were in the same canyon on Santa Barbara Island, the evidence indicates it is highly unlikely that these observations were of the same bird. Our observations of decomposition rates for bird carcasses on Santa Barbara Island, and failure to find the carcass before May, both indicate that the second owl had not been dead for more than 2 months. If it was the same bird, one would have to assume that this owl survived on a small, treeless island for 2½ years without being detected in spite of ongoing research on owls and other terrestrial vertebrates. The research involved more than 750 days in the field by four biologists and included field work on all parts of the island, both during the day and at night.

Figure 1. Flammulated Owl (*Otus flammeolus*) photographed in Graveyard Canyon, Santa Barbara Island, Santa Barbara Co., California, on 16 October 1981.
Photo by Charles Drost

DISCUSSION

The Flammulated Owl is considered a common to locally very common breeding summer resident in California (Grinnell and Miller 1944; Winter 1974, 1979). It nests in areas of broken or open Transition and Canadian Zone montane forests where yellow pine (*Pinus ponderosa* or *P. jeffreyi*) or California Black Oak (*Quercus kelloggii*) are present along with some understory brush (Marshall 1939, 1967; Grinnell and Miller 1944; Winter 1974, 1979; Marcot and Hill 1980). In southern California, Flammulated Owls are known to nest in the San Gabriel, San Bernardino and San Jacinto mountains (Grinnell and Miller 1944, Winter 1974, Garrett and Dunn 1981) as well as on Mt. Pinos in Ventura County (Miller 1936) and Mt. Palomar in the Laguna Mountains of San Diego County (McCaskie 1971, Unitt 1984).

Records of transient Flammulated Owls away from their breeding habitat are uncommon for most of California, and coastal records of migrants are extremely rare (Winter 1974). At present there are only 13 known occurrences in California of Flammulated Owls recorded away from their preferred breeding habitats (Table 1). Seven of these records are fall migrants whereas five are spring migrants. Until now, the three specimen records from San Diego County represented the only known lowland coastal occurrences of this species in California.

The major fall migration of Flammulated Owls in western North America occurs from early September through late October (Phillips 1942, Winter 1974, Balda et al. 1975). The fall migration may continue until late November as evidenced by the occurrence of at least 12 November records from throughout the geographic range of this owl (Table 2). The fact that 8 of the 12 November records of this owl in North America are represented by specimens suggests that this species is not adapted to withstand the more severe weather of the late fall. Of the seven previous fall records of migrant Flammulated Owls in California all but one are from October (Table 1). The earliest fall record is 23 September 1974 and the latest is 31 October 1935. The 16 October sighting of a Flammulated Owl on Santa Barbara Island is only the third fall record of a migrant Flammulated Owl in coastal southern California (Banks 1964, Winter 1974).

Flammulated Owls occasionally become disoriented on long fall migratory flights and wander well outside their normal range. Most of the records of vagrants come from the late fall or winter (see Table 2). Glasgow et al. (1950) reported the capture of a Flammulated Owl on 2 January 1949 in Louisiana and Woolfenden (1970) reported a November specimen recorded from Shelby County, Alabama. The sighting of a Flammulated Owl at Reddington (=Redington) Beach, Florida, on 3 November 1976 (Edscorn 1979) represents the farthest that a Flammulated Owl has wandered from its normal range. There are numerous fall records of migrant Flammulated Owls from lowland habitats throughout the Southwest. For example, there are seven fall records of migrant Flammulated Owls from lowland habitats in Texas (Sutton 1960; Hubbard 1972; Oberholser 1974; Williams 1981, 1982, 1983; Webster 1981).

The major spring migratory movement of Flammulated Owls in the Southwest occurs from mid-April through mid-May (Balda et al. 1975).

Table 1. Records of migrant Flammulated Owls in California away from their breeding habitat. Each record represents one bird. C = caught, S = sighting only, Sp = specimen, P = photographed, H = heard only.

DATE	LOCATION	COUNTY	OBSERVER	STATUS	SOURCE
18 Jan 1885	Foothills NE of San Bernardino	San Bernardino	F. Ball	Sp	Stephens (1902)
Early Mar 1979	Tecopa	Inyo	?	H	Garrett & Dunn (1981)
28 Apr 1973	Pippit Flat, San Jacinto Mtns.	Riverside	?	S	Garrett & Dunn (1981)
18 May 1977	Deep Springs	Inyo	K. Garrett	S	Garrett & Dunn (1981), McCaskie (1977:1048)
26-27 May 1977	Base of Cottonwood Creek near Oasis	Inyo	P. Unitt	S	Garrett & Dunn (1981), McCaskie (1977:1048)
26 May 1984	Santa Barbara Isl., Graveyard Cyn.	Santa Barbara	G. Fellers	Sp	This study
1 Jul 1974	On beach 1 km N Santa Margarita River mouth	San Diego	P.H. Bloom	Sp	Bloom (1983)
23 Sep 1977	2 mi. SW Monticello Dam	Yolo	B. Boekelheide	S	Erickson & Morlan (1978:253)
4 Oct 1977	Near Westmorland	Imperial	D. Delaney	S	Garrett & Dunn (1981), McCaskie (1978:259)
10 Oct 1962	San Diego Bay on USS Tulare	San Diego	D.B. Ramage & D.R. Timm	C,Sp	Banks (1964)
16 Oct 1979	Near Woodland	Yolo	?	C, P	Laymon & Shuford (1980:197)
16 Oct 1981	Santa Barbara Isl., Graveyard Cyn.	Santa Barbara	C. Drost	S, P	This study
19-24 Oct 1981	Furnace Creek Ranch	Inyo	L.L. Norris	S, P	McCaskie (1982:218)
21 Oct 1971	San Diego area	San Diego	Ca. Fish & Game	C, Sp	Unitt (1984), Winter (1974)
31 Oct 1935	Univ. Farm at Davis	Yolo	J.T. Emlen	Sp	Emlen (1936)

Table 2. Late fall and winter records for Flammulated Owls in North America. See Table 1 for status codes.

STATE/PROVINCE	COUNTY	LOCALITY	DATE	OBSERVER	STATUS	SOURCE
Alabama	Shelby	(Montevallo?)	Nov 1953	G.E. Nelson	Sp	Woolfenden (1970)
Arizona	Maricopa	Sun City near Phoenix	4 Nov 1971	R. Herr	Sp	Monson (1972:639)
Arizona	Maricopa	Phoenix	16 Feb 1949	C. Stannard	Sp	Simpson and Werner (1958)
Arizona	Apache	Concho	13 Nov 1972	G. Israel	Sp	Monson (1973:98)
Arizona	Gila	Pinal Mtns. near Globe	22 Nov 1965	B. Jackson and S. Cook	S	Snider (1966:79)
Arizona	Yavapai	Lowland mesquite along Santa Maria River	22-24 Jan 1980	B. Millsap	H	Monson and Phillips (1981)
California	Tehama	Valentine Ridge	18 Nov 1984	Clark Blake	S	Sterling and Campbell (1985:98)
California	San Bernardino	Foothills NE of San Bernardino	18 Jan 1885	Forest Ball	Sp	Stephens (1902)
Colorado	Fremont	Penrose	10 Nov 1982	J.R. Watts	Sp	Kingery (1983:206)
Florida	Pinellas	Reddington Beach	4 Nov 1978	E. Hodgins	C, P	Edscorn (1979:170)
Gulf of Mexico		120 km SE Galveston, Texas	3 Nov 1976	J.B. Ortego	S	Purrington (1977:187)
Louisiana	West Baton Rouge	Sardine Point, Mississippi River below Baton Rouge	2 Jan 1949	L.L. Glasgow	Sp	Glasgow et al. (1950)
Texas	Lubbock	Lubbock	Early Nov 1950	M.F. Landwer	Sp	Sutton (1960)
Washington	Walla Walla	Between Walla Walla and Dixie	17 Nov 1979	G.W. Anderson	Sp	Rogers (1980:183)
Washington	Lincoln	Sprague Lake	20 Nov 1953	?	Sp	LaFave (1954)
British Columbia		S. shore Lake Okanagan at Penticton	Nov 1902*	A. Brooks	Sp	Brooks (1909)
British Columbia		At Penticton	24 Dec 1965	S.R. Cannings	S	Rogers (1966:443)

*Johnson (1963) suggests that this specimen represents a late October record rather than a November record.

Flammulated Owls arrive in southern California by the second week of April (Winter 1974). Until recently the earliest spring records were 18 April 1974 at Henness Ridge in Mariposa County (Winter 1979) and 19 April 1972 at China Camp in Monterey County (Winter 1974). The recordings of Flammulated Owls calling in early March 1979 at Tecopa in Inyo County (Garrett and Dunn 1981) and on the night of 23 March 1978 along Bluff Creek in Humboldt County (Marcot and Hill 1980) indicate that a few Flammulated Owls may arrive in California as early as March. There are a number of additional March records of Flammulated Owls from other states. Wauer (1973) reported that this species reaches Big Bend National Park in Texas as early as 30 March, and Rosenberg et al. (1981) reported the occurrence of a Flammulated Owl in the Zuni Mountains of west-central New Mexico on 15 March 1981. Flammulated Owls have been recorded as early as 9 March 1979 at the Bill Williams River Delta in Yuma County, Arizona (Monson and Phillips 1981), and on 26 March 1953 in the Catalina Mountains of southeastern Arizona (Monson and Phillips 1964, Phillips et al. 1964). The sighting of a Flammulated Owl north of Boulder, Colorado, from 5-28 March 1966 (Williams 1966) represents the earliest spring record of a Flammulated Owl north of Mexico.

The Santa Barbara Island specimen found on 26 May 1984 is only the second spring record of a migrant Flammulated Owl in lowland coastal southern California. Bloom (1983) documented finding the carcass of a Flammulated Owl on a beach in northern San Diego County on 1 July 1974. He suggested that this bird was an extremely late spring migrant. As discussed earlier, the Santa Barbara Island specimen probably represents a spring migrant which died on Santa Barbara Island in late March or April. This timing seems to fit with what we know about the condition of the carcass at the time of its discovery and the timing of the spring migration of Flammulated Owls in the Southwest.

The accumulation of records of Flammulated Owls in lowland areas away from their known breeding grounds, during the appropriate seasons for migration, has been used as evidence to suggest that this species exhibits a long-distance continental migration pattern (Phillips 1942, Winter 1974, Balda et al. 1975). In addition, the virtual absence of Flammulated Owls in known breeding areas from mid-November until early March, along with records of vagrant Flammulated Owls from Louisiana, Alabama, Florida and Texas, provide evidence that the majority of Flammulated Owls are probably long-distance migrants. If this owl were non-migratory, then it seems questionable that it could stray more than 1600 km from its known breeding range. It has been shown in other landbird migrants such as vireos and warblers that long-distance migrants are subject to larger navigational errors than short-distance migrants (DeBenedictis 1971).

Johnson (1963) has argued that Flammulated Owls do not make long-distance migrations to neotropical climates, but rather make a limited vertical migration and undergo periodic torpor during the winter. The accumulated evidence does not support this hypothesis. There are only five winter records of Flammulated Owls in all of North America (Table 2) in spite of efforts to locate wintering Flammulated Owls (Winter 1974, Marcot and Hill 1980). One would expect that if a substantial proportion of the population of such a

common owl (Marshall 1939, Winter 1974, Marcot and Hill 1980) was making only a vertical migration to lowland habitats, there should be a larger number of winter records from those areas. Furthermore, physiological work done by Banks (1964) and Ligon (see Winter 1974) demonstrate that Flammulated Owls do not have the ability to undergo periodic torpidity. The fact that 11 of the 17 late fall and winter records are represented by specimens (Table 2) further suggests that this owl is incapable of surviving the harsh weather which is found in its nesting habitat during the winter. In light of the above and the accumulation of records more than 1600 km from Flammulated Owl breeding grounds it is reasonable to conclude that the majority of Flammulated Owls are not spending the winter in the United States.

There are very few records of Flammulated Owls crossing water barriers. The sighting of a Flammulated Owl on an oil production platform located in the Gulf of Mexico off the coast of Louisiana approximately 120 km southeast of Galveston, Texas (Purrington 1977) represents the farthest that a Flammulated Owl has been recorded from the mainland. The Flammulated Owls on Santa Barbara Island were 61 km from the mainland. There are four additional records of Flammulated Owls crossing water barriers of less than 10 km. Hunn and Mattocks (1981) recorded a Flammulated Owl on 2 October 1980 on Mercer Island in Washington and Flammulated Owls were found on 5 October 1982 on Antelope Island in the Great Salt Lake, Utah (Kingery 1983), on 30 October 1980 on Padre Island, at Port Aransas, Texas (Webster 1981), and on 4 November 1978 on Sand Key, at Redington Beach, Pinellas County, Florida (Edscorn 1979). In addition, two of the three coastal records of Flammulated Owls in southern California may be the result of birds wandering over water. Bloom (1983) suggested that the Flammulated Owl he found on a beach in northern San Diego County may have wandered out to sea and died before washing ashore. It is also possible that the Flammulated Owl reported aboard a vessel in San Diego Bay, on 10 October 1962 (Banks 1964), may have landed on the vessel while it was on maneuvers 50 km west of San Diego the day before and not during the night when the ship was back in port as purported by Banks (1964). It is always possible that any of the owls reported offshore could have covered all or part of the distance on a boat.

In summary, the two sightings reported here of Flammulated Owls on Santa Barbara Island represent: 1) the first records for the California Channel Islands, 2) two additional migrant records for California, and 3) two additional records indicating that this species occasionally wanders over water during its migratory movements.

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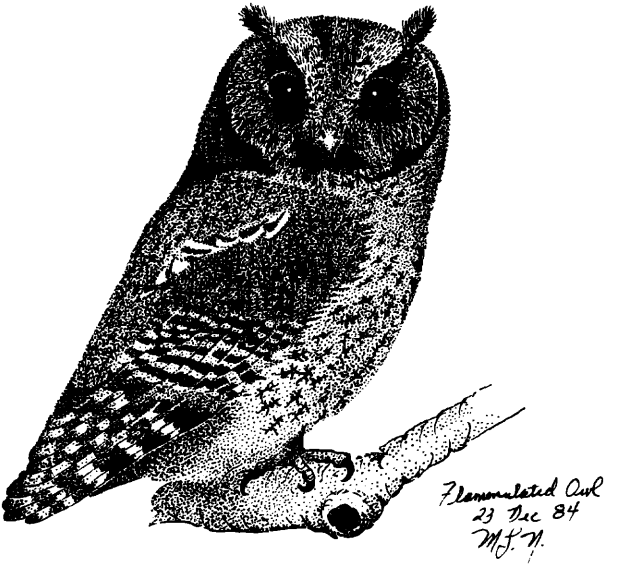

Flammulated Owl *Drawing by Matthew L. Nixon*

American Kestrel *(Falco sparverius)* perched at entrance to nest site in a 12-m high fan palm *(Washingtonia* sp.*)* in Hemet, Riverside Co., California. As of 25 April 1985, when this photo was taken, five kestrel eggs had been laid in a finely woven nest of another species. The nest was situated behind the palm leaves about 0.5 m to the left of this opening and about 3 m above the ground. The kestrels typically left the nest by dropping down behind the leaves about 2 m before flying out of the tree.

Photo by Raymond J. Quigley