

## THE SUPPOSED MIGRATORY STATUS OF THE FLAMMULATED OWL

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AT the present time we have little information concerning the Flammulated Owl (*Otus flammeolus*), in spite of the fact that it is a rather common bird in certain mountainous areas of western North America. Most of our understanding of this species has resulted from the development of special nighttime hunting techniques, used first by E. C. Jacot (1931) and later by Joe T. Marshall (1939, 1957) and others, that enable the easy detection of males. The efforts of Marshall in particular have provided our best data on habitat distribution, vocal behavior, and food habits. One issue about which we still know very little, however, concerns the winter home of this owl, and the purpose of this paper is to discuss certain aspects of the life history that relate to this point. It will be soon apparent to the reader that the facts concerning the species are so meager that the discussion will be largely speculative.

Primarily on the basis of the discussion of Phillips (1942), the Flammulated Owl was reported by the Check-list Committee of the American Ornithologists' Union (1957) to be a migratory species that winters chiefly south of the United States. I wish to review the evidence offered by Phillips to support this statement and to discuss certain clues that suggest an alternative view, namely, that this species is a permanent resident on or near the breeding grounds. At the outset it must be stated that there are no banding returns or recoveries in the files of the United States Fish and Wildlife Service (according to records processed as of 30 June 1961—Allen J. Duvall, in litt., 17 July 1962) that either prove or refute the existence of seasonal migratory movements in this species. It is thus surprising that although we have no actual proof of migration, current literature treats the bird as a migrant.

The main evidence presented by Phillips (1942:133) in support of the migratory status was that at the time of his writing all but one of the definitely dated records for the United States and Canada fell between 11 April and 31 October. The exceptional record was that of a specimen taken near San Bernardino, California, on 18 January 1885 (Stephens, 1902). Since then, only two additional midwinter records for the United States have been published, one from along the Mississippi River near Baton Rouge, Louisiana, 2 January 1949 (Lowery, 1955:320), and the other from Phoenix, Arizona, 16 February 1949 (Simpson and Werner, 1958:69). It is now known that in the Santa Catalina Mountains of Arizona the Flammulated Owl "arrives at the end of March . . . and remains until well into October" (Marshall, 1957:7).

An important point to stress here is that the presence of this species is often determined on the basis of aggressive response by males in territorial behavior to imitated calls during the spring and summer seasons. The general lack of such response on breeding areas at other seasons does not necessarily indicate that the birds have migrated; instead, it may merely point to the fact that territorial behavior wanes during the nonbreeding period.

The literature contains a scattering of records made during the season of migration, from lowland or foothill localities, some at a considerable distance from pine-forest habitat that is favored for breeding. These records may be considered as evidence for either a continental migration or for an altitudinal migration from adjacent localities of summer residence. Examples of such records are as follows: Salt Lake City, Utah, 5 April 1959 (Scott, 1959:391) and 27 September 1960 (Scott, 1960:60); Roswell, New Mexico, 27 April 1955 (Baumgartner, 1955:341); Castle Dome Mountains, Yuma County, Arizona, 29 April 1959 (Monson, 1959:392); San Pedro River, 3,000 feet, 5 May, and Huachuca Mountains, 4,500 to 6,000 feet, 22 April to 12 May, both localities in Arizona (Swarth, 1904:9); and Davis, Yolo County, California, 31 October 1935 (Emlen, 1936). However, for such a common owl (Marshall, *op. cit.*), it is odd that there are no records from lowland or foothill areas in México along a possible "migratory route," if indeed the species migrates. To my knowledge all records from México verifiable as to locality are from or near pine forest, the habitat used for breeding.

The presence of Flammulated Owls on at least certain of their breeding grounds between late March and the end of October is of significance because it requires that this "summer resident" species migrate thousands of miles to and from unknown wintering quarters in a rather limited amount of time. Furthermore, the number of October records for the western United States (Phillips, *op. cit.*) is suspiciously large for a "migratory" insectivorous species and suggests that the bird is regularly present in that month in the western United States. Although Phillips (*loc. cit.*:133) states that the record of a dilapidated specimen found in November 1902, at Penticton, British Columbia (Brooks, 1909:61) "hardly constitutes a satisfactory date of occurrence," the original label of the specimen (Mus. Vert. Zool. No. 101700) bears both the notation "Probably killed 2 weeks before," as well as the date, "22 Octo. 01." The fact that it was possible to prepare the bird into a satisfactory study skin, considered together with the notations on the specimen label, suggests that the bird very likely died sometime in October, an unusually late seasonal occurrence at that latitude for a "summer resident" species.

Of the three midwinter records cited above, it is notable that those from southern California and Arizona were made at localities not far removed from known breeding areas. The specimen from near Baton Rouge, the only

definite vagrant known to me, at least did not occur along a hypothetical migration route.

When handling fresh specimens of the Flammulated Owl, I have been repeatedly impressed with the delicate build of this form when compared with fresh examples of the powerfully built Saw-whet Owl (*Aegolius acadicus*) and of the Pygmy Owl (*Glaucidium gnoma*). Miller (1936:229) has previously commented on the extreme general frailty and on the "slightly broader, much flatter, and . . . much less developed carina" of the Flammulated Owl in comparison with that of the strong-flying Pygmy Owl. One might justifiably wonder, then, if *O. flammeolus* is physically suited for long migrations, although thoroughgoing studies of comparative anatomy are needed to elucidate the meaning of structural differences in the small owls.

If the hypothesis of migration is rejected, an alternative must be provided that enables the Flammulated Owl to survive the winter on or near breeding areas in pine-oak regions at midlatitudes. It is a species that feeds almost entirely upon foliage and aerial insects, and largely upon those that fly at night (Marshall, 1957:75), to be sure an unpredictable food source even during the summer months in mountainous regions. A switch to a diet containing at least some birds or mammals during periods when insect food is scarce or lacking, a possibility open to the Screech Owl (*Otus asio*), a species that otherwise feeds predominantly on insects, is unlikely because there is no evidence that vertebrate prey items are ever taken by the Flammulated Owl, which is a species with relatively tiny, weak feet and legs (Miller, 1933:210 and 1936:229).

The ability to become torpid could serve as a mechanism by which this species might avoid environmental conditions unfavorable for foraging. Perhaps the Flammulated Owl, along with the Poor-will (*Phalaenoptilus nuttallii*), is a "stubborn homeotherm" as defined by Pearson (1960:93), capable of maintaining a warm body temperature over a wide range of environmental temperatures, but able also to drop the body temperature drastically under the "influence of excessive cold or of hunger." The suggestion that a species of Strigidae may possess the ability to become torpid is at least in keeping with the conclusions of Pearson (op. cit.:101) that the occurrence of torpidity is best documented for certain groups that are considered fairly closely related to one another (and to the owls as well), the goatsuckers, swifts, and hummingbirds.

The storage of fat during periods of food abundance could be a further adaptive means by which energy is available when food is scarce, even during the summer. As evidence for this, four of five males of this species I collected on 7 July 1962, in the Sierra Nevada Mountains of California ranged from moderately to excessively fat, even on this relatively early date. It is not

likely that this was premigratory fat, particularly if these individuals would have remained in the mountains until at least early October, as is probable.

In the absence of direct proof of the existence or lack of torpidity in this species, it is important that workers able to obtain live Flammulated Owls attempt experiments on the effects of reduced ambient temperature and fasting on body temperature. Also, ornithologists engaged in nighttime owl hunting should begin to record air temperatures in relation to general activity in this species. Perhaps some of the wide variation in response that one notes on successive nights of hunting in the same place can be more clearly explained on the basis of changes in activity correlated with ambient temperature fluctuations than on amount of moonlight or on the stage of the breeding cycle, factors that have been invoked previously to explain these response differences.

In conclusion, it can be stated that the few threads of available evidence, while not disproving either a partial or complete migration in the Flammulated Owl, also can be interpreted to mean that this species is a permanent resident on or near breeding areas in the western United States and México. Certain records in the spring and fall months for localities removed from preferred breeding habitat can be viewed as evidence for down-mountain movement, perhaps in response to unfavorable foraging conditions in pine forest. If migration does not occur, it is hypothesized that torpidity could be an adaptive mechanism whereby this insect forager could endure periods of food shortage on the wintering grounds.

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