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## LONGEVITY IN THE BANK SWALLOW

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ON account of its relative local abundance, its concentration in colonies during the breeding season and its custom of excavating in the soil nesting burrows which may be made to serve as traps, the Bank Swallow (*Riparia r. riparia*) offers advantageous possibilities for the bird bander. These characteristics of the species prompted the writer and Mrs. Stoner to institute banding activities at Lake Okoboji, Iowa, in the summer of 1923. Our work terminated there in 1927 after 2432 of the birds had been banded.

Opportune circumstances rendered feasible the continuation of our banding operations on this swallow near Oneida Lake, New York, in the summer of 1928. With the exception of 1930 we have, each season, captured at least a few Bank Swallows in this territory. To date 3090 individuals have been banded here.

At Albany, New York, beginning in 1933, we also have conducted banding work on a small but intensive scale in a few Bank Swallow colonies. Our records show that 382 individuals had been banded at the termination of the 1938 season.

A grand total of 5904 Bank Swallows, therefore, has been banded by us in the three localities mentioned. From an assumed total of 4555 birds available for returns at the time of our last field work—Lake Okoboji, 1927; Oneida Lake and Albany, 1938—169 individuals (3.7 per cent) actually have been recovered as such.

At least eight months must have intervened between the time of banding and subsequent recovery or between two or more successive recoveries for a bird to be included in the present category of returns. Presumably, in each elapsed eight-month period the swallow has made a round-trip journey between its nesting territory and its South American winter home.

Although the greatest possible length of time that could have elapsed between the banding and recovery as a return of any of the Bank Swallows banded by us is 10 years (Oneida Lake), a sufficient number of return captures have been made to substantiate an opinion regarding longevity in this species. Various types of associated records including mortality causes also have accumulated.

These data, we believe, show certain trends and they are herewith presented in the nature of a condensed progress report.

The following table summarizes in numerical form the information that we have on longevity in the Bank Swallow. The individuals indicated as "young" varied in age from about 5 days to 21 days at the time of banding. Since the "known age" of an adult at the time of recovery could be computed only upon the basis of our banding records, some of those individuals banded as adults may be older than our records indicate; just how much older of course we can not know. Each adult at the time of banding was, of course not less than one year old. To indicate this possibility the words "at least" are employed for the two, three, four and five year age groups. This descriptive phrase is not required for our one and six year age groups since all these return birds were banded as young in the nest and therefore, we know their exact age.

Tabular summary showing the number of Bank Swallows banded, also number and known age of the 169 individuals recovered as returns. Lake Okoboji, Iowa and Oneida Lake and Albany, New York, 1923-38, inclusive.

| Locality                         | No.<br>Banded | No.<br>Returns | Known Age at Time of Recovery as Returns |                    |                    |                    |                    |        |
|----------------------------------|---------------|----------------|--|--------------------|--------------------|--------------------|--------------------|--------|
|                                  |               |                | 1 Yr.                                    | At Least<br>2 Yrs. | At Least<br>3 Yrs. | At Least<br>4 Yrs. | At Least<br>5 Yrs. | 6 Yrs. |
| Lake Okoboji, Iowa,<br>(1923-27) | Adults 507    | 11             | 0  | 9                  | 1                  | 1                  | 0                  | 0      |
|                                  | Young 1925    | 18             | 11                                       | 6                  | 0                  | 1                  | 0                  | 0      |
| Oneida Lake, N. Y.<br>(1928-38)  | Adults 2120   | 116            | 0  | 78                 | 30                 | 6                  | 2                  | 0      |
|                                  | Young 970     | 15             | 4  | 5                  | 2                  | 2                  | 1                  | 1      |
| Albany, N. Y.<br>(1933-38)       | Adults 207    | 6              | 0  | 6                  | 0                  | 0                  | 0                  | 0      |
|                                  | Young 175     | 3              | 3  | 0                  | 0                  | 0                  | 0                  | 0      |
| Totals                           | 5904          | 169            | 18                                       | 104                | 33                 | 10                 | 3                  | 1      |

If, now, we analyze the above gross tabular data from the standpoint of age of the swallows at the time of banding as compared with their known age at the time of recovery as returns, some indication of the survival rate of the two major age groups—adults and young—is apparent. Of the 169 returns, 36 (21.3 per cent) were banded as young while 133 (78.6 per cent) were banded as adults. On the other hand, comparatively few (7.6 per cent) of the combined two and three year old return birds were banded as young. These figures suggest a very high mortality rate during the first three years of life. Once this critical period is passed the chances for survival seem to be considerably enhanced. For, while the combined actual number of four, five and six year old return individuals is small (14), the proportion of the number banded as young (35.7 per cent) is relatively high.

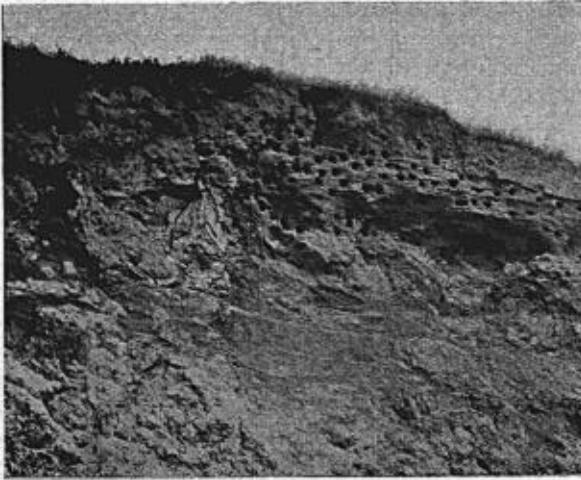


Figure 1.

Section of a Bank Swallow colony near Albany, New York.  
June, 1933.



Figure 2.

Adult banded Bank Swallows. The two at the left are returns.  
Oneida Lake, N. Y. May 27, 1936.

Several factors may or do modify the relative proportion of returns obtained from Bank Swallows banded as adults and those banded as young so that much speculation regarding results is unwise and far-reaching conclusions are unwarranted. Probably the most important factor for consideration is the habit of these birds of not returning to breed in the colony of their nativity. At the same time, once having nested in a certain colony, the bird is likely to return to that colony in succeeding seasons. Since our banding work in the localities mentioned has been confined largely to the same colonies, mostly within a linear distance of less than five miles from one another, this factor might account for some part of the disparity in number between the returns banded as young and those banded as adults.

Another possible factor which may influence results is the amount of suitable nesting territory in a given locality thus inhibiting or restricting or permitting latitude in the establishment and enlargement of colonies. The frequency, persistency and seasonal intensity of the banding operations themselves also have some part in the final reckoning.

Closely associated with longevity in the Bank Swallow are the factors which prevent its attainment. Certain of these factors are included in the known history of some of our returns.

Of the 169 returns obtained to date 6 (3.5 per cent) are known to have met violent deaths. The exact cause of death was not determined in three instances but evidence is at hand to show that three adults were killed and partly devoured in the nesting burrow by House Rats (*Rattus norvegicus*). We have found the remains of other unbanded Bank Swallows under circumstances that indicate the agencies of destruction to have been Skunks, Crows, slumping banks and the automobile. Circumstantial evidence against certain Hawks and Foxes also is at hand. Finally, the hazards, both known and unknown, associated with the annual migratory journey involving 6000 or more miles render all the more remarkable as high a survival rate as indicated and as substantial a return percentage as we have obtained.

From a consideration of the above discussion the following conclusions regarding longevity in the Bank Swallow appear to be justifiable:

1. The mortality rate of birds in their first year is high; only 1.7 per cent of the 3070 individuals banded as young have been recovered as returns while, on the other hand about 4.7 per cent of the 2834 individuals banded as adults have been recovered as returns. Moreover, of the 169 returns here reported only 21.3 per cent were banded as young.

2. Of 137 returns of the known ages of at least two or three years, only 9.4 per cent had been banded as young. This also suggests a comparatively high mortality rate during the first three years of life. However, our return captures indicate further that once this critical

period is passed the chances for survival are considerably greater. Of the combined total of 14 returns of a known age of four, five or six years a considerable proportion (35.7 per cent) were banded as young.

3. Only one return Bank Swallow had attained the age of six years; individuals of this age are patriarchs of the species.

4. The probable average life span of the Bank Swallow is from two to three years; only 5.9 per cent of 169 returns had attained a known age of as much as four years while 81 per cent of all our returns are for those birds of a known age of two and three years. The extreme preponderance of individuals of a known age of two years, the considerably reduced number of three year old captures and the comparatively small number of one year old returns obtained, all suggest that the prevailing average age of this species, at least in the territory under consideration, ordinarily does not exceed three years.

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## TRAPS FOR PINNATED AND SHARP-TAILED GROUSE

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THE trapping techniques used in banding songbirds and waterfowl are readily available in Lincoln and Baldwin's "Manual for Bird Banders" (U. S. D. A. Misc. Pub. No. 58; 1929). In the case of upland game bird trapping, publication has not equally kept pace with the development of methods. Information on traps for Pinnated and Prairie Sharp-tailed Grouse (*Tympanuchus cupido americanus* and *Pedioecetes phasianellus campestris*) is particularly lacking. The purpose of this paper is to describe five traps which have been used for those species in Wisconsin. All but one of these traps (No. 3) were used in our work on the Central Wisconsin Game Project<sup>1</sup> during the winter of 1936-37.

Grouse trapping offers particular difficulties. Pinnates, even

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