

LONGEVITY IN RAPTORIAL BIRDS AS INDICATED BY BANDING RECORDS

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In the period from December 15, 1924, to June 1, 1929, the writer banded 143 raptorial birds of eight species in a region centering about Pomona, southern California. All but ten of these were juveniles. Eighteen additional individuals, of which all but three were juveniles, were banded between April 5, 1931, and February 8, 1933, in Merced and San Mateo counties. It appears now that sufficient time has elapsed to warrant the following tabulation of the returns, together with certain supplementary remarks covering each species.

SUMMARY OF RETURNS

Species	Total number banded	Number of returns	Percent- age of returns	Maximum age	Average age	Average distance (miles) from place of banding
Cooper Hawk	5	0	0	---
Western Red-tail	25	4	16	1 yr., 5 mos.	7 $\frac{3}{4}$ mos.	69
Golden Eagle	5	1	20	3 yrs., 10 mos. +	3 yrs., 10 mos. +	23
Sparrow Hawk	12	1	8	2 yrs., 7 mos.	2 yrs., 7 mos.	10
Barn Owl	55	11	20	10 yrs., 4 mos.	3 yrs., 2 mos.	21
Pasadena Screech Owl	38	5	13	13 yrs.	5 yrs.	1
Pacific Horned Owl	15	2	13	2 yrs., 7 mos.	2 yrs., 6 mos.	6
Long-eared Owl	5	1	20	9 mos.	9 mos.	49
Total	161	25	Av. 12		Av. age 3 yrs., 4 mos.	

Cooper Hawk. *Accipiter cooperii*. Although the number banded was small, it is not unlikely that the lack of returns is correlated with the fact that this species is much less often brought down by hunters than are less wary species such as the Western Red-tail or Barn Owl.

Western Red-tail. *Buteo borealis calurus*. As a result of their tendency to occupy prominent perches along highways, young red-tails fall prey to target shooters in greater numbers than almost any other hawk. All four returns were banded as juveniles. One was "shot," one "found" (shot?), one "captured" (trapped?) and one caught in a coyote trap.

As nearly as can be ascertained from the available data, one bird wandered eastward from the nest site ten or more miles, while the other three traveled due north 10, 20 and 235 miles, respectively.

Golden Eagle. *Aquila chrysaetos canadensis*. The single return was from an individual captured at the age of 3 years and 10 months, 23 miles southwest of the point where it had been banded as a juvenile. After being held in captivity for about a month the bird was released where caught, so that its life span may be regarded as in excess of the figure indicated.

Sparrow Hawk. *Falco sparverius*. Banded as a juvenile, the single bird furnishing a return was "found dead" (?), at the age of 2 years and 7 months, ten miles northeast of its birthplace.

Barn Owl. *Tyto alba pratincola*. Of the owls, this species seems to be the most vulnerable to depredations by man, unless we accept the mortality figure for the Long-eared Owl. It seems likely that the figure of 20 per cent for the latter is misleadingly high by reason of the small number of individuals involved, so that it may not be as trustworthy as the same figure for the Barn Owl. The habit of roosting in barns, churches and eucalyptus groves so commonly displayed by Barn Owls in southern California renders them particularly vulnerable to small boys with .22 rifles, as well as to others who are supposed to know better. All of the banded birds were juveniles.

The eleven returns are roughly divisible into two age classes. The younger group includes four birds shot, one "recovered" (shot?), one "found" (shot?) and one "captured." The greatest age in this group was 1 year and 2 months, while others ranged from three to ten months. The older group comprises three birds "found dead"; these were aged 4 years and 5 months, 6 years and 1 month and 10 years and 4 months, respectively. Of a fourth bird in this group, the band only, with no sign of the carcass, was picked up ten years after banding.

From the nature of the available data it is presumed that the birds of the long-lived group were not shot but met "natural" deaths. The records fail to indicate any correlation between longevity

and possible remoteness of individual territory from human depredations. Neither is there any discernible correlation between longevity and distance between birthplace and the territory of adulthood.

Five birds traveled less than four miles from their birthplaces. The others traveled $7\frac{1}{2}$ miles northwest, 12 miles west, 19 miles southwest, 29 miles west, 62 miles south, and 85 miles northwest, respectively. The lack of records of eastward travel may be due to chance and to the small numbers involved, since there is ample territory, combined with an abundance of owl shooters, to the east.

Pasadena Screech Owl. *Otus asio quercinus*. Without doubt the seclusive habits of Screech Owls have protected them from their human enemies. Apparently when once their territories have been established with a hollow tree as a basis, a placid existence extending over many years is to be expected, at least in areas close to human habitation where Horned Owls, racoons and similar natural enemies have been rendered scarce.

Of the five returns, none is definitely known to have lived less than three years. One adult female was banded while incubating, and her age could not be ascertained, although it was obvious that she must have been at least one year old at the time. Approximately a year later she was robbed of her eggs by small boys and although not killed by them, abandoned the nest site. In the longevity calculations the life span of this bird has been recorded as 2 years and 1 month because that was the only period covered by definite observations.

Regarding two other Screech Owls whose ages were accurately known, it is interesting to note that they were nestmates and that, after living almost exactly three years, they died within three days of one another. One was "found dead in a tank" three miles west of its birthplace, while the other apparently collided with an electric wire in the town of its birth.

A fourth bird also was banded as an adult of unknown age, and was still very much alive four years later. Every year she raised a brood of young in the same hollow sycamore, and annually the young were subjected to various growth studies. Termination of her record resulted when the writer, not the bird, moved away.

The Methuselah of the tribe was an offspring of the above-mentioned female. Banded as a juvenile on May 28, 1926 this bird, evidently not long dead, was brought to Mrs. Myrtle S. Edwards of Claremont, California, May 5, 1939. It was about one mile from its birthplace, and had attained the venerable old age of approximately 13 years.

Pacific Horned Owl. *Bubo virginianus pacificus*. Because of their secretiveness and the relative remoteness of their haunts, it is to be expected that the returns from banding activities would be fewer for Horned Owls than for some other raptorial species.

One bird banded as a juvenile was captured in a pole trap 2 years and 7 months later at a state game farm about four miles northeast of its place of birth. The other return was from an adult at least one year old which originally was captured by the writer in an experimental pole trap and was shot 18 months later within eight miles of the site of its first capture.

Long-eared Owl. *Asio wilsonianus*. This is a secretive species, not commonly encountered by hunters in southern California. One bird banded as a juvenile was shot at the age of 9 months. At the time of its death it was 49 miles north of its birthplace.

CONCLUSIONS

Although the number of returns is too small to warrant statistical analysis, a study of the age classes tempts one to infer that, as in the case of the California Quail and other bird species, individuals which manage to survive the initial wave of postjuvinal mortality tend to live relatively safe and uneventful lives. We can explain this in part upon the basis of the greater experience shown by the adult birds in coping with danger. In addition, it is probable that a bird which has acquired its life territory is less frequently beset with hazards requiring split-second reactions than is the younger individual which has not yet become thoroughly familiar through long association with the best roosting places, the most protective cover and the most favorable feeding grounds.

The records here cited also indicate that in general owls may live longer than hawks. If we include diurnal, predatory Man with the other enemies of raptorial birds, this inference no doubt is correct, but if only their *native* enemies are considered, this difference in longevity may be more apparent than real.

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