

SOME CAUSES OF MORTALITY AMONG BIRDS.<sup>1</sup>

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THE causes of bird mortality are of interest to every student of ornithology. That there is a large death rate from natural causes, such as predatory animals, storms, disease, etc., is axiomatic, and indeed, this must be so if the so-called "balance of nature" is to be maintained anywhere near its normal state. If every pair of breeding birds brought two nestlings to maturity, and there were no losses the avian population of the country would show each year a one hundred per cent increase. We know that this is not the case, as avian groups tend to remain fairly stationary or to increase very slowly. The reason is, of course, the control put by Nature upon undue increase.

The entrance of civilized man into the picture, with his far-reaching activities, adds still further hazards to the lives of birds, and at the same time removes or lessens others. Generally speaking it is believed that the existence of small birds in contact with the forces of civilization are fraught with fewer dangers than was the case when the entire country was in a state of primeval wildness. For example, very few species are denizens of the heavily forested regions, the preference of most being for the edges of clearings which man has vastly increased. Also man-made opportunities for the increase in numbers of the small species are many, while through intensive educational work and protective legislation man has done much to insure their safety. The widespread practice of feeding, particularly during winter or other periods of inclement weather, is likewise an important factor in preserving the lives of many feathered denizens of the wild. And finally, although indirectly, by the extensive destruction of fur-bearing mammals and other predacious animals, man has greatly reduced another natural cause of avian mortality.

On the other hand, many of the works of man or of domestic animals are agencies of destruction (although this is sometimes unintentional on his part), and it is interesting to ascertain, if

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possible, their relative status. Recently, upon examination of the data on banded birds received by the Biological Survey, it seemed desirable to prepare an analysis of the information there available that might throw light upon some death-causative agencies.

No attempt has been made to tabulate or analyze the mortality records that seem in any way traceable to the banding itself. These obviously are due to more or less abnormal conditions in the lives of our birds and so have no bearing upon the present report. It is gratifying, however, to record the fact that there are very few fatalities for which the banding work must assume responsibility. The only feature under this heading that has been at all troublesome has to do with the depredations of squirrels, shrikes, rats, and some of the smaller Hawks. Sometimes the Shrikes and Hawks (chiefly the Sparrow Hawk), apparently sensing the helpless condition of small birds in a trap, will enter and kill all the birds that it holds, at the same time becoming prisoners of the bander. Under such circumstances, the Biological Survey has recommended that the captives be banded and carried a mile or more from the station before release. Usually this action eliminates the annoyance from the individual offender. Occasionally, however, these birds will evade capture alive, and the use of a shotgun is necessary for the protection of the other birds. Under an order of the Secretary of Agriculture, every holder of a Federal banding permit is authorized to destroy Shrikes when in his judgment such action is necessary for the successful operation of his station.

The rodents taken in bird traps are undoubtedly attracted by the bait put in them for the birds, but when caught in the trap chambers they either kill birds deliberately or by trampling. Wherever, possible, "deportation" is recommended for squirrels and chipmunks.

The figures used in this report are as of November 1, 1928. During the period in which the banding work has been directed by the Survey more than 431,000 birds have been banded, which, with the addition of 22,500 marked with the bands of the old American Bird Banding Association, give a grand total of more than 453,000. From this record of nearly half a million banded birds, returns are available to the number of more than 24,500.<sup>1</sup>

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<sup>1</sup> Since the above was written the grand total has grown to more than 900,000 birds banded, with about 52,000 return records. F. C. L. July, 1931.

In the present study it has seemed desirable to limit the research to the smaller land species, and accordingly the data for banded Quail, Doves, Hawks, Owls, Crows, Herons, Gulls, Terns, Ducks, Geese, and all other water birds, have been ignored. The balance, making up what we may term the "small land bird group," has a total of more than 304,200, with returns to the number of about 16,800. Of these returns, 2,426 represent birds found dead, and it is with these that we are now concerned.

In Table I, it will be noticed that there are listed thirteen causes of death, in addition to "Miscellaneous" and "Unknown" items.

TABLE I  
*Causes of Death*

Shooting.....	561
Cats.....	245
Flying into windows, wires, etc.....	67
Storms.....	70
Boys (airguns, slingshots, etc.).....	60
Automobiles, trains, etc.....	55
Traps set for other animals.....	52
Starvation.....	26
Drowning.....	19
Entanglements (strings, etc.).....	11
Freezing.....	9
Poison.....	8
Scientific Collecting.....	7
Miscellaneous.....	100
Unknown.....	1,136

It should be borne in mind that the evidence used to classify these data, in some cases at least, represents merely the opinion of the person responsible for the report, while in others it is of a circumstantial nature.

At first glance the number of fatalities due to shooting (561) seems to be deplorably large. Possibly it is, but a further inquiry into the species represented reveals the astonishing fact that it is actually quite low. In almost all parts of the country Blackbirds, Starlings, and Jays are considered, if not game, at least as legitimate targets, and in some of the southern states the Robin must be added to this list, despite its protection under the Federal law. Some state laws provide a regular shooting season on Blackbirds.

If, therefore, the returns for all species of Blackbirds, Starlings, Jays, and Robins in this class (504) are subtracted from the list, we have the insignificant remainder of 57.

Leaving now the top of the list and taking up for consideration the "Unknowns," it again seems desirable to eliminate the species just mentioned, which are found to total 617, leaving 519 cases to be scattered through the balance of the "Check-list of North American Birds." In deducting the Blackbirds, Jays, Starlings, and Robins from this group, it would appear reasonable to concede that while they were mostly "found dead," many had been wounded by shot, or in the case of the Blackbirds, poisoned. In examining further the balance of the group of "Unknown," it is found that it includes 280 cases of fledglings that died in the nest. Admittedly, the death of some of these birds may have been due to improper handling or other malpractice upon the part of the operator, but since in a great many instances supplementary evidence shows that the casualties represent only one or two from a brood of four or five, it seems fairly obvious that the banding operation was responsible for very few deaths.

The second item on the list in the opinion of the author is so serious that it far overshadows all other known cases of bird mortality. It is true that the evidence against the so-called "domestic" cat is largely circumstantial, but it is also overwhelming. I have personally skinned several birds recovered from cats and found in *every* instance that the cat was the actual killer and that it was not merely playing with a bird that it found already dead. Except for those highly bred animals that are valuable and are kept closely confined, *any and all cats* permitted to run at large, particularly at night, are hunters by instinct, and with regard to native birds are fully as inimical as the mongoose, against the importation of which we so carefully guard our ports. It would seem that nothing more need be said concerning this arch-destroyer, as the evidence is in, and but one verdict is possible.

The destruction of birds through impact with various objects is, of course, a well-known cause, and while the total shown in the table is not impressive, it is interesting to note the distribution by species. See Table II.

TABLE II

*Banded Birds Killed Against Windows, Wires, Etc.*

Purple Finch.....	19
Robin.....	9
Chickadee.....	6
Catbird.....	4
Junco.....	4
Chimney Swift.....	3
House Finch.....	3
Song Sparrow.....	2
Brewer's Blackbird.....	2
Starling.....	2
13 other species.....	1 each

The Purple Finch, which leads with 19 fatalities, has been banded in very large numbers and the casualties have generally occurred at or near the trapping stations. Windows have been responsible for the largest number, with transmission wires of all kinds a close second. In the case of window fatalities, observation has shown that these are most frequent in homes where two large windows are directly across from each other on opposite sides of the house. It is worthy of note that two of the Chimney Swifts were killed by flying against automobile windshields, while a banded Catbird flew through an open window of an automobile and was killed upon striking the closed window on the opposite side.

The item "Storms" may be passed over with little comment. Each year large numbers of small birds meet death in this way at the hands of Nature. Some are fledglings, killed in the nest by hail, sleet, or heavy rains, but adults are frequent victims. Some of the most interesting return records for small banded birds have been reported after a severe storm. In the autumn of 1926 several important recoveries of Song Sparrows, White-throated Sparrows, and Juncos were reported in the wake of a storm that caught the feathered travelers in southern Virginia and North Carolina. The birds had been banded mostly in New Jersey and the New England states. Heavy snows, long persisting, have caused the death of others through starvation.

Among unusual cases attributable to storms may be mentioned a Chimney Swift found badly burned at the base of a chimney, in Quincy, Illinois, that had been struck by lightning, and a Blue-

bird that had both wings broken in a terrific hail storm at Sioux City, Iowa.

Under the heading of "Boys" have been grouped those banded birds killed through the instrumentality of those time-honored weapons of youth, the sling-shot and the air-rifle. The score is not a particularly heavy one, and although all such acts are to be discouraged, it seems well to recognize this "reversal to type" that prompts the American boy to hunt. The list of victims includes 26 species and ranges in size from Chickadees to Black-crowned Night Herons. Here again, we find that Blackbirds and Jays constitute the bulk of the "game," the data showing 20 individuals of the former and 9 of the latter. Robins rank third with four specimens. Other species are represented usually by a single individual each, and include two Northern Flickers, one Red-bellied Woodpecker, one Red-headed Woodpecker, one Downy Woodpecker; two Purple Finches, one House Finch, one Junco, one Chipping Sparrow, one Tufted Titmouse, one Black-capped Chickadee, one Sparrow Hawk, two Mourning Doves, one Hermit Thrush, one Phoebe, three Brown Thrashers, two Catbirds, one Mockingbird, one Chimney Swift, and one Bank Swallow.

The latest hazard for birds, as well as for men, appears in the automobile. Fifty-five small banded birds have been reported as killed by cars on the highways or as being struck by railway trains. The Blue Jay heads this list with eight fatalities, followed by the Robin with six, and the Song Sparrow with five. The Chipping Sparrow and the Catbird are represented by three individuals each, seven other species by two each, and sixteen species by a single specimen. In examining these data it is noteworthy that the dates of recovery are mostly in the period from late spring through the summer season to October. It is in the early part of this period that birds lose much of their customary caution and in their fervid pursuit of one another dash back and forth across the highways, while later on the newly fledged young frequently congregate along the roads, where, lacking the skill and experience of their elders, they are not able to avoid the swift-moving traffic.

Traps set for other animals also have taken their toll of banded birds; traps set for rats accounted for 18, while mouse traps have been responsible for killing 12 others. Other traps have ranged all

the way from the rabbit box-trap of an old colored woman in Mississippi, through the small steel traps of the professional trapper set for weasels, minks, and muskrats, to the larger and more powerful wolf and coyote traps. The atrocious "pole-trap," set for Hawks and Owls, also has figured in this part of the picture. This is one instance where our "humanitarian laws" are sadly lacking, as this device should be generally prohibited by statute, as it is in New Jersey and in England. The species affected are chiefly those that are either noted for their curiosity or are terrestrial and more or less secretive in their feeding habits. The list is again headed by Jays (Blue, Steller's, and Canada), with 12 individuals, followed by Grackles with 8. The Song Sparrow is represented by 6 individuals; Anthony Towhee, two; Brown Thrasher, three; White-throated Sparrow, House Wren, and Blackcapped Chickadee, by 2 each; and the Magpie, Starling, Junco, Golden-crowned Sparrow, Towhee, Catbird, California Thrasher, Carolina Wren, and Robin, by single specimens.

The other causes of death noted in the list may be passed over briefly. "Starvation" has, in almost every case, represented birds that gained access to buildings from which they were unable to escape. Weather conditions, as previously mentioned, also have figured in the deaths of birds from lack of food. "Drowning" includes birds that have fallen into horse troughs, open cisterns, and in a few cases into bird baths improperly constructed. As one ornithologist has facetiously remarked: "They probably were drowned because of the weight of the bands." Drinking troughs for livestock have figured in the largest number of cases, and in at least one case the victim, a House Wren, was credited in the local press with a most remarkable flight. The accident occurred in eastern Washington and in announcing the fact, a local paper naïvely informed its readers that the bird had been released in Washington, D. C. Actually the bird was banded in the town where it died.

"Entanglements" include birds caught in strings or other nesting material, but it is proper to say that in only one case, that of a Purple Martin, was the band at all responsible. "Freezing" might properly be considered as a reasonable subdivision under "storms" as death usually has been the result of a sleet storm that later

changed to snow or ice. "Poison" is occasionally used by farmers to protect their crops from depredations of Blackbirds and others. The cases here considered are mostly Bronzed Grackles and usually may be traced to this cause.

Scientific collecting exacts a most insignificant toll if the records of banded birds offer a proper criterion. Only seven banded birds have fallen into the hands of collectors. Figured in terms of percentage, the collections of science from the ranks of the banded birds here considered (453,000) amount to 0.000015 of 1 per cent, or a little less than 0.0029 of 1 per cent of the total number of dead birds here considered. This record to be charged against the collecting permit should go far toward quieting the fears of the extreme protectionists who claim such great destruction of birds by collectors. The first specimen of a banded bird to be taken under a scientific collecting permit was a Piping Plover, banded at Chat-ham, Mass., by Charles B. Floyd, and collected near Charleston, S. C., by Arthur T. Wayne.

Turning now to the "Miscellaneous" item, we find a strange collection of death-dealing agencies. This list is headed by "Grackles," which are charged with the killing of six birds, mostly fledglings, although of equal rank is the farmyard "biddy," as domestic poultry also is credited with the death of six birds, these also being fledglings. Snakes have accounted for five birds, the tree-climbing black snake being the most frequent killer. Jays are credited with four deaths and lawn mowers for two. Two birds were reported as asphyxiated by gas or smoke, one a Grackle that was killed during the fumigation of a corn crib, while a Bluebird that perched on a chimney coping was overcome by the fumes. Chimney Swifts that came down chimneys in homes in Plymouth, N. C., and Warrenton, Va., were mistaken for bats by the terrified occupants of the rooms and were killed by them to prevent the supposed bats from getting "entangled in their hair." A banded Red-winged Blackbird became caught in a seine, while a Robin died from overindulgence in China berries. A California Gull (which is included in this report merely because of the exceptionally unique way in which it was killed) was hit in flight by a golf ball, and a Chipping Sparrow was caught and killed by a patient at a state hospital for mental diseases.



In conclusion it seems proper to add a word relative to reports of banded birds. It should be borne in mind that a banded bird is literally a "marked bird," particularly when in the vicinity of a trapping station, as the neighbors of such a station will almost unconsciously coöperate with the operator in maintaining contact with birds that wear bands. For this reason a dead bird, found on the lawn or in the yard of the average home that is ordinarily considered merely a bit of rubbish to be disposed of as promptly as possible, becomes an object that demands attention, and if found to be banded, for report to the station operator or the Biological Survey.

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