

BIRD-BANDING; ITS FIRST DECADE UNDER THE BIOLOGICAL SURVEY

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At the New York (1925) meeting of the A. O. U., I presented a paper entitled "Bird Banding: In Progress and Prospect." This was published in *The Auk* for April, 1926. That report covered the first six years of this method as a governmental activity, and it now seems fitting to present briefly a résumé of the accomplishments of the first decade.

This retrospect is viewed with pardonable pride by those charged with the direction of the work, and, it is believed, by every one who has actively participated. As was stated in the earlier report, "Bird Banding as a method in ornithology has come to stay," and while no one seriously thinks that it will supplant any other method, we do consider it the most important tool that has been placed in the hands of the ornithological craftsman since the art of taxidermy enabled him to preserve specimens for future study. Banding data may be little used by the majority of the professional ornithologists of the present day, as most of them already have more work outlined than they may be reasonably expected to complete in the normal span of years allotted to productivity. We would not urge that these specialists add to their other work by "taking on" further investigations to be conducted by this method, but their advice is invaluable, and it is with a feeling of sincere gratitude that I record the many valued suggestions that have come from ornithologists who are not themselves enrolled under the banner of Bird-Banding.

There is, however, a growing generation of ornithological students constituting what may be termed the "new school." These, fearing lest the science may reach a stage of stagnation under the methods of the "old school," are casting about for new lines of research. They find much that is still unknown, unknown because the methods formerly in vogue have not permitted precise investigation in all possible fields. To these, systematic banding is hailed as a means of solution for interesting and important problems.

As in all other innovations, difficulties both real and fancied had to be overcome, and for fear of burdensome repetition, I hesitate to recapitulate the trials and tribulations of the first two or three years. Usually, however, they had interest or humor, and so in a measure lightened their own weight.

Paramount among them was the struggle to obtain a source of supply for the necessary bands. Practically every manufacturer of aluminum smallware in the country was approached, either by letter or by personal visit, and finally in desperation the first Biological Survey bands were ordered from England. This resulted in the curious error where, through a transposition of two letters, the address, "Biol. Surv., Wash., D. C." was transformed into apparent cooking instructions, the finder of a banded bird being admonished to Wash, Boil, and Surv.

At this point a word of commendation is due to Mr. Theo. A. Gey, of Norristown, Pennsylvania, who for the last eight years has made practically all of the bands issued by the Survey. Not only did he invent and build the ingenious machine that produces the bands, but he has consistently shown an interest in the work that is far above mere commercialism. Each year has seen a reduction in his price quotation, thus enabling the Bureau to purchase additional bands with the limited funds available, and in addition his interest has extended to active support of one of the regional associations, of which he is a sustaining member.

Opposition to banding work upon humanitarian grounds by well-meaning but uninformed persons caused a little anxiety, as data were then lacking for refutation of all charges made that banding would result in wholesale destruction of bird-life. Any investigations of wild life that involve actual handling by man result in some mortality among the subjects, but with the years of experience back of us, and the carefully accumulated data bearing upon causes of avian mortality, it is a cause for much satisfaction to record that bird deaths directly traceable to the operator, his traps, or the bands, are so few as to represent a negligible quantity. Firearms excepted, the so-called "domestic cat" is a greater menace to our avifauna than all other causes put together.

In some quarters this opposition continues to smoulder, showing a tendency to flare up when some new means for the capture of birds is advocated. To these opponents I may say that there is no organization more concerned for the welfare of the wild life of North America, including its birds, than the Biological Survey, and personal contact with a great many banders at their trapping stations has demonstrated that the Bureau's coöperators are almost without exception worthy champions of the highest conservation principles. Accordingly, the bird-students of America may be assured that no trap or other device will be recommended for general use until

it has been carefully tested to learn that it will not have an objectionable effect upon our birds. Some methods that are efficient means for the capture of birds by the poacher may when properly used prove of great value to the bird-bander.

At one time, during the development period, it was contended that the rapid increase in feeding and trapping stations would destroy the economic value of insectivorous birds. I should like to be so sanguine that we shall ever have such a vast percentage of the bird population of America under our control, but study of the facts thus far made available leads me to believe that, no matter how greatly our banding stations are increased in number, or how efficient and energetic our operators may become, the sum total of the birds banded in any single year will be but "a drop in the bucket" of the total avian population. Occasionally individual birds act almost human and develop insatiable appetites for certain types of bait. Ordinarily, however, station operators have learned to their cost, that when natural food is abundant, it is very difficult to entice birds to the traps. Nevertheless, we are improving in our ability to furnish "appetizers," so this utopian idea may yet come to pass.

Now as to the work we have done:

First, a tabulation of the gross results, which will show also the growth of the project, will be of interest. The table presented is arranged according to the fiscal years of the Federal Government, that is, from July 1 to June 30 next ensuing. For the last two years the numbers of returns listed are merely estimates. They are, however, extremely conservative, as it is believed that the total number of return records in the files is close to 50,000.

<i>Fiscal Year</i>	<i>Co-operators</i>	<i>No. of Birds Banded</i>	<i>Returns</i>
1921	135	2,845
1922	...	6,000*
1923	851	25,068
1924	...	40,432	2,000†
1925	1,100	64,253	3,187
1926	1,134	68,418	3,351
1927	1,296	91,848	4,445
1928	1,400*	127,105	7,222
1929	1,500*	133,931	8,500*
1930	1,750*	182,263	10,000*
Grand Total		742,163	38,705

*Approximate.

†Includes those of previous years.

It may be properly asked: What do these data show? The answer is, that for the first time in the history of American ornithology there is assembled a mass of definite, precise information illustrative of the complicated individual movements of our birds that go to make up bird migration. Heretofore, the study of this subject involved the use of material that was obviously incomplete, being nothing more than the records of arrival and departure of the different species in various localities. The actual movements of the individual birds that made up the flocks of aerial travelers could be only surmised, and one man's guess was as good as that of another.

We have also for the first time a great mass of information showing the development of the individual bird, the transition of its plumages, its identification with the same or different mates in successive seasons, and a host of other subjects that formerly were but imperfectly known.

From the viewpoint of the Biological Survey and those interested in its work, the subject of distribution and migration is of first importance, for the reason that interpretation of the data assembled from points over the entire hemisphere can be properly handled only at the central office. Obviously to the individual station operators their contributions to this subject have only local significance, while the Washington office is able to view the assembled results of local activities in the light of continental problems, and draw conclusions accordingly.

Ornithologists, therefore, may look with confidence to the Bureau for detailed reports on this subject, reports that will be based for the most part upon evidence obtained from banded birds. There are already at our command sufficient data to warrant the preparation of such a report upon the Mallard ducks, and it is hoped that this may be issued in the near future. The banding data used in this connection will throw great light on problems in the administration of these important game species. They will show not only the seasonal movements but the extent of the area that is affected by certain concentration and breeding grounds, the artificial mortality rate, and many other factors that are of the utmost concern to naturalists, sportsmen, and conservation officials. Because of the rapidity with which data are assembled for the game species, other waterfowl groups will probably receive similar treatment before an adequate accumulation of data will justify conclusions with regard to other species, particularly the smaller non-game birds. Exceptions may be noted in the case of some of the herons, gulls, terns, and blackbirds,

which for one reason or another, yield large numbers of return records.

I have stated that the individual banding stations are not in themselves in a position to make important contributions to the study of migration. There are exceptions, however, and mention should be made of the experimental work that is being conducted by Professor William Rowan, of the University of Alberta, work that should do much to prove or disprove the theory of photoperiodism as a cause of migration.

We come now to the investigations made by banding stations that can be carried to logical conclusions. Outstanding among these are the researches into the temperature-control and the local distribution of the House Wren made by the personnel of the Baldwin Research Laboratory, at Gates Mills, Ohio. These studies should light the way for similar investigations with the same or other species elsewhere. It is appreciated that very few banding stations will be able to install the elaborate and highly technical equipment that has been an important feature in the work of Mr. Baldwin and his associates, but among the multitude of problems awaiting solution there are many that can be conducted with practically no increase in the ordinary station equipment.

An excellent example of this is found in the study of the Chickadee and the White-breasted Nuthatch made near the campus of Cornell University by Dr. Wilbur K. Butts. The only additional equipment used was a series of celluloid bands of different colors made by the operator.

The bird laboratory, however, affords a means for determining some of the more intricate and complicated factors that enter into the lives of our birds. It is, therefore, a pleasure to refer to the O. L. Austin Ornithological Laboratory at North Eastham, on Cape Cod, Massachusetts, where recently I had the pleasure of spending a few days, and was afforded opportunity to see the excellent facilities that exist there for important work.

The study of the changes of plumages constitutes a vast field for original endeavor. Already two studies on this subject are well under way. Probably the best known is that of Mr. M. J. Magee, of Sault Ste. Marie, Michigan. Mr. Magee has banded well over ten thousand Purple Finches, and when it is remembered that for all of these birds he has detailed notes of the plumages, not only taken at the time of original capture, but followed up with additional comment when the birds have repeated and returned, the vast amount of data available will be better appreciated. It probably would not

be possible to assemble such a series of specimens from all the museum collections of the world, and here the material desired has been obtained without the necessity of transforming the birds into museum specimens. A similar study of the plumage of the Evening Grosbeak also has been undertaken by Mr. Magee, and while the quantity of data thus far obtained is much less than for the Purple Finch, it is nevertheless believed that he has more information on the subject than any other investigator.

Another plumage study that will be of the greatest interest because the information to be obtained will be directly comparable to that in the case of the Purple Finch has been carried on for several years by Mr. Harold Michener, of Pasadena, California. I have recently been advised that his first report on the study of the House Finch, has been accepted for publication in *The Condor*, and so should appear in the near future.

In conclusion it is proper to mention the fact that bird-banding as a means of obtaining original information has been adopted by fourteen colleges and universities, including Cornell University, American University, Michigan State College, Notre Dame University, University of Chattanooga, University of Missouri, North Dakota State College, and Leland Stanford Junior University. At these institutions, under the direction and guidance of professors of biology and zoölogy, graduate students are conducting investigations that should yield new and interesting information.

Bird-banding as a method in ornithological science has demonstrated its worth and has passed through the experimental stages during the past ten years. The next decade should witness the appearance of ornithological reports that would not be possible by any means other than through study of material obtained in bird-banding operations.

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