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COLLECTION OF BIOLOGICAL MATERIAL FROM HUNTERS

BY USE OF POSTPAID ENVELOPES

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The purpose of this paper is to describe a sampling method which the Game Division of the Conservation Department has developed for obtaining game bird population data. The method consists simply of distributing prepared, postpaid envelopes to hunters and requesting them to mail in for sex and age determination certain parts of game bagged. We make no claim to the originality of the idea of collecting specimens in this way; neither do we describe herein any new technique of age or sex determination. It is our intention merely to explain the system as it has evolved with use and to suggest its wider application in population studies.

Each year the hunting season affords the game biologist an excellent opportunity for examining cross sections of the populations he studies. He not only can measure the harvest quantitatively, in addition, by handling and observing individual animals, he can learn a great deal of information which will permit detailed analysis of population mechanics. While it is obviously preferable to handle or examine whole animals, a great deal can be learned from certain detached parts of their anatomy. Numerous techniques have been developed recently which enable the game biologist to determine with accuracy the sex or age of many game species by examining or measuring portions of specimens which require little preparation and can be easily mailed.

There are several advantages to using these techniques. Observations can be made in the laboratory away from the hazards and variables of field conditions; a large number of specimens can be examined by one or a few specially trained technicians thus eliminating the personal error likely to be encountered with a large staff of men working afield; and, of most importance, it is possible in this way to treat a larger and more representative sample of the season's bag, and at a lower cost, than if the work were all done in the field.

We are at present using the mail-in system of specimen collection with four species of game birds. One type of envelope is used for wings and tail feathers of ruffed grouse, sharptails, and prairie chickens, another for wings and feet of pheasants. The sex of a ruffed grouse can be told with a high degree of accuracy by the length of its central tail feathers, males having longer feathers than females. With sharptails and prairie chickens the color pattern of the tail feathers reveals the sex of the bird. From these sex determinations of a kill sample are derived the season sex ratios of the species, a requisite for all population analyses.

Wing tips of the grouse, or actually the relative degree of wear and the shape of the tips of the outer primary feathers, tell the technicians the relative age of the individuals - that is, whether they are adult or juvenile. Age ratios, derived from these determinations, are used by the population analyst in gauging annual reproductive success and in estimating other population characteristics or relationships.

With cock pheasants, adult-juvenile determinations can be satisfactorily made by measuring spur lengths, there being a sharp enough dividing line between the shorter juvenile spurs and longer one of the adults to permit accurate separation. The lengths of developing primaries provide an accurate guide to the exact age of young pheasants up to 22 or 23 weeks old. Most juveniles are under this age during the open season in Michigan, and measurements of their wing feathers by reference to tables can be converted to hatching dates. This information for a large enough sample can be used to reconstruct breeding season histories for the statewide population and for smaller areas.

Mail-in envelopes were first tried in Michigan in 1941. They were used on a Pittman-Robertson prairie grouse research project to supplement a hunting season bag check. A few hundred stamped, return-addressed envelopes were passed out to resorts in grouse country and to a number of individual hunters who had previously cooperated with the Department in turning in hunting records. After the war, in 1945, and for the next five years several thousand envelopes were distributed to an expanding list of cooperators and resorts. Returns were ample, averaging over 30 percent of the distribution, and a large quantity of valuable data was accumulated.

In 1950, following the development of the primary feather aging method for pheasants, the Department's Pittman-Robertson pheasant research project designed and prepared an envelope suitable for collecting pheasant feet and wings. Included on this envelope were instructions and a diagram explaining what parts were wanted. Forty thousand of these were distributed during the 1950 season. Returns totaled 4,150, just over 10 percent. In 1951, 40,000 were again sent out and 4,170 specimens were returned, again, 10 percent. This sample has proved to be large enough and well enough distributed over the pheasant range to provide adequate coverage for aging studies. However, it is possible that returns will improve with continued use of the method. Such has been the case with the grouse envelopes.

The grouse envelopes used until last year were five inches by eleven inches in size. They bore no printed directions but were accompanied by handbills at a ratio of one per ten envelopes. The size of this envelope proved to be too narrow and too deep. Specimens often stuck and there wasn't enough room to reach in to pull them out. For the 1951 season a seven by ten inch envelope was designed bearing diagrams and instructions similar to the pheasant envelope. Approximately 20,000 were passed out, and returns have amounted to about one-half of the distribution.

The first two slides will show the design of the envelopes currently being used. They are 7" x 10" sleep type, gummed, manila envelopes with instructions and diagrams on one side and the postal permit and return address on the other. The aim of the instructions is to be simple, eye-catching and explanatory, with fool-proof diagrams showing which parts of the anatomy are to be removed. The information spaces call for only a minimum of filling in - date of the kill, location as briefly as possible, and name of donor. On the pheasant envelope the name is called for merely to add the prestige of identification to the donor. No use is made of the names. On the grouse envelopes name and address both are used because of a different system of distribution.

The next two slides show samples of parts sent in with both types of envelopes. The printed instructions request the use of separate envelopes for each different specimen or to fasten part of each individual together. This is carefully followed in most cases. Of the 4,170 pheasant returns last fall only 60 were un-usable because of improper identification or lack of information.

Methods of distributing the two types of envelopes are quite different. From the first year the system was tried, the major distribution of the grouse envelopes has been directed to individual cooperators or hunting camps or resorts. With larger daily and seasonal bag limits and because of the more specialized type of hunting practiced by "pat" hunters, a high return from individuals has been possible. A mailing list used each year is continually being enlarged as new cooperators volunteer their aid. In 1951, 900 cooperators were each sent 5 envelopes, and 100 more received from 10 to 25 each. In addition, a considerable effort was made by district game managers and other field workers to put envelopes in the hands of known grouse hunters. The very high returns (50 percent or more) reflect the advantages of this system and the interest and sportsmanship of the grouse hunters.

Pheasant hunters as a group probably compare to "pat" hunters about as do blue-gill fishermen to dry fly trout men. However, what they may lack in quality, pheasant hunters more than make up for in quantity. Distribution of the pheasant envelopes differs accordingly. A larger number is sent out, and group rather than individual distributions are made. Supplies of envelopes are mailed to each of 200 MFCO affiliated clubs in southern Michigan just before their October meetings. Club officers pass them out to members or make them available for picking up at the meetings. In addition, district game managers distribute small quantities to selected license dealers in their areas, and Conservation officers pass them out during their pheasant season patrolling. The very similar percentage of return obtained from this method of distribution for two successive years probably indicates its maximum efficiency.

Rather wide publicity has been given to both pheasant and grouse collections in news releases, over the radio, and on television. It is believed that these forms of advertising have paid off rather well, not only by letting people know what we want but also by letting them in on why we want the data and what we do with it.

The cost of this method of obtaining data is extremely low. The price of the printed envelopes is one cent apiece. Distribution costs add only a fraction of a cent. Return postage is paid at the first class rate of three cents an ounce, plus one cent for the permit. An envelope containing parts of one bird, either pheasant or grouse, weighs just under an ounce and therefore costs four cents to receive. Applying these costs to the total distribution and receipts of pheasant envelopes, a return of 4,100 specimens costs about \$600, or fifteen cents for each specimen received. For comparative purposes, the cost of examining and measuring the specimens must be added. This at the most would be about five cents each, bringing the total cost of aging one pheasant to twenty cents. Compared to turning up the same information by field checking of hunters, this is very economical. In a very good day a field worker might examine and age 50 specimens. At ten dollars or more a day for salary plus as much for transportation and expenses, it is likely that the cost of aging pheasants in this way would easily be double that of the mailed-in specimens. The comparison, of course, is not really a fair one, since information of other types is obtained from the hunter contacts along with the field aging.

The hunter mail-in method of specimen collection should be adaptable to other game and fur species. We now have new techniques of annual age determination

based on skeletal development as revealed by X-ray examination of appendages. Well designed, properly distributed and publicized envelopes would bring in large numbers of rabbit, squirrel or muskrat feet and furnish a more than adequate sample for detailed population study. Conceivably, other easily detached and available parts of various game or fur animals or samples of their plumage or pelage could be used for sex and age determination. Many hunters or trappers will cooperate in such projects. Fulllest use should be made of this sampling method.