

# COMPARISON OF MOURNING DOVE HARVEST DATA FROM WING COLLECTION AND MAIL SURVEY, VIRGINIA, 1968-1969 <sup>1</sup>

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## ABSTRACT

Hunters responding to a standard mail questionnaire reported more doves killed and more dove hunting trips than would be judged from the wings these same individuals submitted through the mail. A bare majority of these hunters stated that their questionnaire answers better represented their experience for the season than did their wing response. Those who sent in wings reported hunting more often and killing more doves than those who failed to send in wings.

For some time, wildlife biologists have examined parts of game animals to establish the age, sex or species composition in the hunter's bag. Often hunters are asked to submit wings, tails or other parts through the mail for examination. The method provides useful biological knowledge at relatively low cost. For at least some of the characteristics of some species it is doubtful that a hunter can recognize the subtle differences associated with age or sex, and therefore the bag information is probably unselected.

Lately, however, there has been an increasing use of these parts for information on hunting experience (daily bag, number of trips and success). In this form the method is, in fact, an unusually complex type of mail questionnaire. The number of wings per envelope, for example, is sometimes assumed to equal the bag for one trip, and the number of envelopes sent in, to equal the number of trips. Here questions must be raised as to how well these estimates represent the average hunter experience. Do hunters follow instructions that they submit one wing for every bird in a single day's personal bag, and that an envelope be mailed for each day's hunt? What is the effect of nonresponse to the request that parts be submitted? Are the most cooperative hunters also the most active and successful?

These questions are examined in the the present study. Responses of individual hunters to an appeal for submission of mourning dove wings sent before the season, have been compared with the responses of the same individuals to a postseason mail questionnaire about game kill. The primary objective is to compare the two sets of answers. A secondary aim is to seek information on reasons for the differences, and for this purpose, a third questionnaire was sent to cooperating hunters.

Results are limited to Virginia, to the 1968-1969 dove hunting season and by the modest sample size of about 100 hunters studied. It is also fully recognized that neither of these survey methods may arbitrarily be assumed to correctly estimate the average experience.

## METHODS

The wing collection was operated in Virginia in much the same way as in most of the Southeastern States during the current major cooperative study of the mourning dove. During the summer of 1968 a special mail survey was made with the primary purpose of obtaining a list of known dove hunters. A random sample was drawn from the game license file for the previous years. Information on dove hunting experience was requested in a questionnaire to be returned as a franked postcard. Names and addresses of 929 dove hunters were obtained.

<sup>1</sup> Paper presented at the 23rd Annual Conference of the Southeastern Association of Game and Fish Commissioners at Mobile, Alabama, 19-22 October 1969.

As a routine operation of the cooperative study, 534 of these names of known dove hunters were used by the Migratory Bird Populations Station of the Bureau to mail wing collection envelopes. This same mailing went to dove hunters in a number of states. An enclosed letter requested cooperation and carried the names of both the Southeastern Association and the Bureau. Explicit instructions were provided, both in the letter and on each envelope under these headings: (1) to use only one envelope for each day's hunt, and to enclose one wing for each dove bagged, (2) not to give envelopes to other hunters, or send in their birds, (3) not to wrap the wings, (4) shipping directions, (5) instructions on providing information on the envelope back, (6) request for wings during the entire season, and (7) instructions for obtaining more envelopes. Envelopes were addressed to one collection point in Georgia where the wings were stored for study at the "wing bee" in February.

A total of 118 of the 534 hunters who were sent envelopes responded by submitting wings and completing the information requested on the envelopes. One hunter not on the original list submitted wings, apparently in an envelope obtained from another man.

The standard Virginia mail game survey questionnaire was mailed to each of the 534 hunters in March, indistinguishable (except for a coded identity) from the regular game kill survey being conducted at the same time. Responses to this part of the mail survey were used only for the present study and only information on dove hunting was extracted. Two follow-up mailings were used for nonrespondents. Of the 534 hunters to whom questionnaires were mailed, 426 responded with information, though only 107 of these had responded by submitting wings in their envelopes. There were 11 who sent in wings but did not respond to the mail survey, 78 who responded to neither survey, and 19 names were returned by the postal system as nondeliverable.

Comparison of responses to the wing survey questionnaire and the mail survey was carried out in three different ways. First, the mean values were compared for days hunted and doves killed for hunters responding to both surveys. Second, for the same individuals, the linear regression of response to the wing collection on response to the mail survey was examined to explore the relationship between the two responses. Third, the average response to the wing collection was compared to the average report for all persons responding to the mail questionnaire.

Finally, the third questionnaire was mailed to each of the 107 hunters who had previously responded to both the wing collection request and the mail survey, except that no further questionnaire was sent to the six individuals whose report on the mail questionnaire was identical to the information furnished in the wing collection. The third questionnaire (Table 2) was directed at exploring possible reasons for the differences in responses. The covering letter (see Appendix) emphasized the need to understand the two surveys. With three follow-up mailings and a few telephone calls, responses were obtained from 99 of the 101 hunters in the group.

## RESULTS

Comparison of average values for the wing collection and the mail survey may be made on the basis of data in Table 1. The same hunters reported on the mail questionnaire survey a greater number of days hunted and greater total numbers of doves killed than would be inferred from their participation in the wing collection. However, they reported a lesser average daily success on the questionnaire survey than the value calculated from the wing collection.

For most hunters, the effort and kill reported on the mail questionnaire exceeded the corresponding information from the wing collection, as shown here in percentages:

	Days Hunted	Doves Killed
Mail report greater than Wing report .....	81%	79%
Mail report equal to Wing report .....	15%	9%
Mail report less than Wing report .....	4%	12%

Over the whole set of responses there is not a strong relationship between the number of wings a man sent in and what he said on the questionnaire. This relationship is measured by the linear regression of wing collection results on response to the mail questionnaire (Table 1). Even though the regressions are all statistically significant for combined mailings, they account (as  $r^2$ ) in days hunted for only 19 percent of the variability; in doves killed for 43 percent; and in success (as doves per day) for 26 percent. Regressions were examined separately for each of the three mailings for the mail questionnaire, as shown in Table 1. For days hunted, there are statistically significant differences among the regression for the three mailings, but there is no statistical evidence of differences among the regressions for separate mailings for doves killed or doves per day. It may be noted that for the first mailing mean values for days hunted and doves killed were greater than for the other 2 mailings (differences not tested statistically).

Hunters reacted favorably to the third questionnaire. Of the 101 to whom it was mailed, 98 percent responded even though they had previously answered two questionnaires on the same hunting experience (the two nonrespondents had moved). Cooperation was truly impressive, with 61 percent adding information beyond simply checking the questions, either by editing questions, or more often by adding comments, sometimes to the extent of a full-length letter typed on the back of the questionnaire. The attitude seemed sincere and constructive, an encouraging response to the appeal for help as expressed in the covering letter.

Responses to the third questionnaire are summarized in Table 2, where each answer is listed with the percentage selecting it, and in Table 3 where the percentage frequency of selecting pairs of answers is listed.

A majority (57 percent) of respondents agreed that the postal responses provided the best information on their hunting experience, even though a substantial minority (38 percent) favored the wing collection. While 43 percent of the respondents stated that they sent in one wing from every dove, 41 percent checked one or more statements that indicated failure to follow this practice. A reply indicating in one way or another that the respondents did not submit a wing for every bird killed was checked by 60 percent of the respondents, though almost half of these (28 percent) reported losing birds in the field, so not every answer of this nature is inconsistent with submitting a wing from every dove bagged.

Relatively few of the questionnaires contained pairs of contradictory responses; these have been noted in Table 3. One never knows whether these contradictions result from misunderstanding of the questionnaire or represent a deliberate attempt to frustrate the investigator. Along the latter line, there was no respondent who checked every response, a reaction which sometimes occurs with a mail questionnaire. It is possible that some confusion arose from use of the term "doves killed" instead of "doves bagged".

For those respondents to the third questionnaire who indicated that the wing survey represented their hunting experience better than did the mail survey, a separate examination was made of the regression of wing collection data on mail questionnaire report. The results are listed in Table 1 as "Selected, Combined Mailings". While this group exhibits

a slightly improved relationship as compared to the whole sample, the relationship still is not of high order.

These same selected respondents reported more days of hunting and more birds killed than did other hunters. Average values (Table 4) indicate a progressively greater amount of hunting and greater success, with increasing cooperation in responding to the series of questionnaires. Compared by pairs, the differences between nonrespondents to the wing collection, and the selected respondents is statistically significant ( $p < .05$ ) for both days hunted and doves killed, while the difference between nonrespondents and the rest of the respondents is significant for doves killed only. Such comparisons, however, do not take into account that the three categories fall into the same order for both characteristics. Therefore, there seems to be reasonably good evidence here of a relationship between amount and success in hunting, and degree of cooperation extended in responding to requests for information.

## DISCUSSION

Most of the responses to the third questionnaire appear to be the careful answers of highly cooperative hunters. This group was highly selected in that each member had responded to three different questionnaires during the same season. The fact that they were so cooperative suggests that they may not represent the average hunter very well.

Judging from these responses, a large number of hunters, perhaps the majority, do not submit wings from every bird bagged. More respondents indicated that the mail questionnaire best represented their hunting experience, than spoke for the wing collection, but the margin of difference does not represent a clear superiority even in the opinion of these hunters. It seems that hunters do not behave in a consistent manner, and although some may submit a wing from every bird, others send wings of an occasional bag or in some other manner. Therefore the average numbers of envelopes and wings submitted do not well represent the average experience of those who submit wings.

Further, those who do send in wings seem to be the more active and successful of hunters. Therefore their daily bag, even if it were recorded in the wing collection, probably does not represent the average of all hunters.

For those who submit wings, the relationship between number of envelopes and number of wings sent in, and total hunting as reported by the same hunters on a mail questionnaire, is surprisingly poor. The wide dispersion in the relationship may result from the variety of behavior of hunters, with some sending in many wings and others few, compared with their total bag. But limiting the data to a selected set of hunters produced only a minor improvement in the relationship.

A definitive comparison of the dove wing collection survey and the mail questionnaire survey is not possible from the results of this study because there is no true standard against which a comparison may be made. Although it seems from these results that the wing collection cannot be depended upon to furnish representative information on bag size or hunting experience, this finding carries no implication regarding the value of the mail questionnaire survey.

**TABLE 1.** Statistical constant = for regressions of  $y$  = response to wing collection on  $x$  = response on mail questionnaire

Characteristic and Mailing	Degrees of Freedom <sup>1</sup>	Mean Values Wing Survey	Mean Values Mail Survey	Intercept	Slope	$r^2$
<i>Days Hunted</i>						
1st Mailing	85	2.74	7.23	1.58	0.16	.20
2nd Mailing	10	2.33	5.58	0.22	0.38	.44
3rd Mailing	6	1.75	6.50	1.67	0.01	.01 <sup>3</sup>
Combined Mailings	105	2.62	6.99	1.54	0.15	.19
Selected, Combined Mailings <sup>2</sup>	35	3.83	7.83	1.95	0.23	.23
<i>Doves Killed</i>						
1st Mailing	85	19.75	33.93	3.68	0.47	.45
2nd Mailing	10	18.50	30.92	1.12	0.56	.76
3rd Mailing	7	13.89	30.78	8.17	0.19	.29 <sup>3</sup>
Combined Mailings	106	19.12	33.33	4.25	0.45	.43
Selected, Combined Mailings <sup>2</sup>	31	29.91	38.09	8.22	1.00	.66
<i>Doves per Days</i>						
1st Mailing	85	7.10	5.28	3.92	0.60	.30
2nd Mailing	10	9.20	5.95	3.98	0.88	.22 <sup>3</sup>
3rd Mailing	6	7.96	6.01	6.27	0.28	.11 <sup>3</sup>
Combined Mailings	105	7.40	5.41	4.15	0.60	.26
Selected, Combined Mailings <sup>2</sup>	31	7.43	5.20	2.16	0.41	.17

**TABLE 2.** Form of questionnaire sent to 101 hunters who both submitted wings and responded to the mail questionnaire, with percentage responses added (continued)

Postcard Questionnaire Survey	Percentage of respondents choosing the answer
Part I: Please check below the statement which best represents your views:	
1. I had trouble remembering my dove hunting activities for the Virginia Game Survey 1968-1969 postcard questionnaire so that I feel the dove wing envelope survey best estimates the days spent dove hunting and the number of doves killed	38%
2. The report I made on the postcard survey represents my best estimate of the days spent dove hunting and the numbers of doves killed during the 1968-69 season	57
3. I did not receive a postcard questionnaire, someone else must have received it in error and returned it	1
Dove Wing Envelope Survey	

<sup>1</sup> Do not agree exactly because one respondent did not indicate days hunted.

<sup>2</sup> Relationship for those hunters who stated that the wing collection provided the better information on hunting.

<sup>3</sup> All regressions except these four account for a statistically significant portion of the variability ( $p < 0.05$ ).

TABLE 2. Form of questionnaire sent to 101 hunters who both submitted wings and responded to the mail questionnaire, with percentage responses added

Postcard Questionnaire Survey		Percentage of respondents choosing the answer
<b>Part II: Please check below the statement which best expressed your view:</b>		
1.	To the best of my knowledge I sent in one wing from every dove I shot and any difference between my reported kill from the postcard questionnaire and the number of wings sent in must mean that I did not remember exactly or that not all the wings reached their destination through the mail	43
2.	As I recall, I sent in wings from every bird killed during the early part of the season, but later I only sent in wings from some of the birds killed	17
3.	I did not send in the wings from every hunt, but once in a while through the season I sent in a wing from every bird killed on a day's hunt	24
4.	Every time I went hunting, I picked the best looking wings from the birds and saved these up and sent them in when I had enough	2
<b>Part III: If you did not mail a wing from every bird you killed, will you check below the statements which best represents your view:</b>		
1.	I gave some of the birds away	24
2.	Some of the wings were too dirty, shot up, or wet to be useful	8
3.	I sent in enough wings to give a good idea what I was shooting	4
4.	It was not always possible to take the time to remove the wings, put them in the envelope, and mail them	17
5.	I ran out of envelopes or misplaced those that I had so that I had no way to send all the wings in	3
6.	Some of the birds I killed were lost in the field so that I could not send the wings in	28
7.	I don't always bring home all the birds I kill	9
Please include any additional comments on the back of this page and return this sheet to us. Thank you.		
(Total including multiple answers)		275%

TABLE 3. Percentage frequency in which 99 respondents checked pairs of answers to third questionnaire (values on diagonal are percentages for individual answers)

	Part I			Part II				Part III							
	1	2	3	1	2	3	4	1	2	3	4	5	6	7	
Part I	1	38													
	2	1*	57												
	3	0	1	1											
Part II	1	27	13*	1	43										
	2	4	12	1	1	17									
	3	3	21	1	2	2	24								
	4	1	1	1	2	1	1	2							
Part III	1	2*	21	1	4*	6*	11	1	24						
	2	1*	8	1	2*	5*	3	1	5	8					
	3	1*	4	0	1*	1*	2	0	0	0	4				
	4	3*	15	0	0	5*	9	0	6	3	0	17			
	5	1*	2	0	0	0	2	0	0	0	0	0	3		
	6	13	15	0	12	4	8	1	7	5	1	4	1	28	
	7	2*	7	1	4*	4*	5	1	3	3	0	3	0	3	9

\* These pairs of answers seem contradictory (see questions in Table 2).

TABLE 4. Average effort and doves killed ( $\pm$  standard error) as reported by different segments of successful dove hunting respondents to the Virginia mail survey of hunting

	No.	Days Hunted	Doves Killed
Selected respondents to wing collection <sup>1</sup> . . .	36	7.83 $\pm$ 1.90	36.42 $\pm$ 6.04
Rest of respondents to wing collection <sup>2</sup> . . .	72	6.56 $\pm$ 0.70	31.79 $\pm$ 3.13
Non-respondents to wing collection . . . . .	156	5.42 $\pm$ 0.40	22.22 $\pm$ 1.99

APPENDIX

(The following letter, on departmental letterhead, was sent with the questionnaire.)

COMMONWEALTH OF VIRGINIA  
 Commission of Game and Inland Fisheries  
 Box 11104  
 Richmond, 22330

P. O. Box 5471  
 Charlottesville, Va.  
 22903  
 June 11, 1969

(Name)

Dear \_\_\_\_\_:

We thank you for your help this last season with our Dove Hunting Surveys. Will you help us just once more?

During the 1968-69 dove season you and other Virginia dove hunters were involved in two different, but similar dove activity surveys. The first was the dove wing envelope survey. From inspection of the dove wings that you and others sent in, we measured breeding success for the 1968 hatching season. The second survey, the postcard questionnaire, was sent out after the dove season ended to determine if the dove wing envelope survey might be complete enough to be used to determine the daily and total dove kill of the cooperating hunters.

In analyzing the reports from the two surveys we found that often the reply to the postcard questionnaire reported more dove hunting done, and more doves than were recorded by the dove wings mailed in by the same hunters. Therefore, we request assistance to help us understand the weaknesses and strengths of the two surveys. We have devised the enclosed form to assist you in your replies and to keep the replies standard. Feel free to make any additional comments if some point is not fully covered by the form.

We are indebted to you for your cooperation, patience, and information thus far granted us. We assure you that the information from this final survey as with the others is kept in confidence. From the dove wing survey your envelopes show that you hunted \_\_\_\_\_ day and killed \_\_\_\_\_ doves. From the postcard questionnaire survey you reported hunting \_\_\_\_\_ days and killing \_\_\_\_\_ doves.

Sincerely,  
 Jack V. Gwynn  
 Game Research Biologist

JVG:pcf  
 Enclosures

<sup>1</sup> Hunters who stated that the wing collection provided the better information on hunting.  
<sup>2</sup> No. = 71 for Days Hunted.

**REPORT OF THE SOUTHEASTERN FOREIGN GAME  
COMMITTEE TO THE SOUTHEASTERN SECTION  
OF THE WILDLIFE SOCIETY**

**Mobile, Alabama—October 20, 1969**

The Southeastern Foreign Game Committee met in Montgomery and Mobile, Alabama, May 19-22. This meeting involved our biannual workshop.

James Keeler of the Alabama Department of Conservation put together a well organized program concerning the various aspects of nutrition, propagation, and success or failure of releases. Mr. Charles D. Kelley, Chief of the Alabama Game & Fish Division discussed the administrators views of the Foreign Game Committee. Other speakers included Dr. George J. Cottier, Auburn University, and Dr. R. D. Kealy of Ralston Purina.

Considerable routine committee business was transacted including the appointment of Ray Palermo—Louisiana (to replace Robert Murray) and Tommy Hines—Tennessee (to replace Joe Hardy) At the request of the president of the Southeastern Section of the Wildlife Society, Chairman, Glenn Chambers (Missouri) has consented to serve as chairman for another year.

A tentative program was established for the Committee meeting in conjunction with the Southeast Wildlife Conference in Mobile, Alabama. The field trips associated with our workshop were very profitable and well attended.

Reports from various states indicate that the black francolin is established in Florida and Louisiana. The hybrid Iranian pheasant now appears to be established in Virginia. Other promising species but not definite establishments include red junglefowl in Georgia and Alabama and the Korean pheasant in Missouri.

The committee voted to hold its next workshop meeting in Oklahoma in 1971.

Respectfully submitted,

GLENN D. CHAMBERS, *Chairman*  
Southeastern Foreign Game  
Committee.