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A DETERMINATION OF THE EFFECTS OF AN EDUCATIONAL
PROGRAM FOR SPORTSMEN

by

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B. S. Montana State University, 1953

Presented in partial fulfillment of the requirements
for the degree of
Master of Arts

MONTANA STATE UNIVERSITY

1956

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May 29 1956
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CHAPTER I

THE PROBLEM AND METHOD OF STUDY

Wildlife conservation education programs for the public have become recognized as an integral part of wildlife management. The Wildlife Management Forum, in Montana, is designed to bring out the basic relationships between soil, water, vegetation and their effect on wildlife. It is based on the belief that when people have gained an understanding of the principles underlying sound wildlife management practices they will help establish and support the policies and regulations consistent with those principles.

THE PROBLEM

Statement of the problem. The problem for this study was to collect and analyze evidence of the effect of Wildlife Management Forums on beliefs of sportsmen regarding wildlife management practices. The purpose of the study was to compare the responses to selected problems of wildlife management on the part of four groups of sportsmen. Two of these groups had participated in the Wildlife Management Forums and two had not.

LIMITATIONS AND ASSUMPTIONS

Time. The methods used in this study were limited by the time factor. A better method of determining changes in attitude resulting from participation in the educational program would have been to compare the attitudes of the same group before and after presentation of the program. Since this was not possible, a comparison was made between participating and non-participating groups. Time also limited the number of groups that could be treated in this study.

In making a survey of this type it is generally felt that in the hands of a person skilled in the technique, the interview is superior to the questionnaire method. However, the interview method usually requires more time to administer and for this reason it could not be used in this study.

Method. Any survey in which attitudes toward a certain issue are to be measured is subject to certain limitations. Because time prohibited a study of the same group before and after the educational program, a comparison was made between participating and non-participating groups. Some question may arise as to the reliability of the comparison technique. Therefore it was necessary to make certain assumptions.

Assumptions. Frequently groups of people lacking sufficient information, will criticize a fish and game department for the manner in which it administers wildlife resources. Certain issues seeming to be most controversial were used in selecting criteria from the forum program. It was assumed that these criteria were valid for purposes of determining differences in attitudes between groups of sportsmen participating in this study.

The response to any one question is another factor requiring some consideration. Thurstone points out that the responses to a set of questions either represent what is actually believed by the subject, or at least what he wants the investigator to think he¹ believes.

The use of the comparison technique used in this study was based on the assumption that the basic thinking toward wildlife in similar communities is similar. The limitation of time made this assumption necessary even though factors may have been present that would void it.

¹
L. L. Thurstone and E. J. Chave, The Measurement of Attitude (Chicago: The University of Chicago Press, 1929), p. 5.

Area. This study was limited to a determination of the possible effects of the Wildlife Management Forums on the thinking of certain groups of sportsmen as compared to those groups that have not participated in the program.

BACKGROUND AND SETTING

The Wildlife Management Forum. Adjustments in wildlife management techniques are often indicated as research reveals new information. However, because the public so often lacks understanding, it has often been difficult or impossible for administrators to initiate necessary changes. The Education Committee of the Montana Wildlife Federation recognizing the fact that an educational program would help overcome much of this misunderstanding, requested that the Montana Fish and Game Commission assist in the support of a program already begun by the Federation.² The Commission, realizing the potential value of the program, set aside

\$15,000 per annum to be divided between Montana State College and Montana State University. This money was to be used to finance Wildlife Management Forums.

The purpose of the program was to develop understanding of wildlife in relation to the common goal of maintaining the proper balance between soil, vegetation, and water. This understanding was considered necessary to secure acceptance of new concepts in wildlife management, as well as support of wise legislation concerning the future of all natural resources.

Setting. For purposes of this study, four groups of sportsmen and persons interested in the problems of wildlife management were chosen. Criteria used in their selection were apparent similarity in size and economy, accessibility, and the fact that two groups were completing the Wildlife Management Forum, while the other two were nonparticipants.

3

J. W. Severy and E. L. Chestum, "Your Wildlife, Its Effective Management," (Subject matter for Montana Wildlife Federation Forum as proposed and presented at the first annual Cooperative Conservation Training School, USFS Remount Depot, Winemile, Montana) (Missoula: The Public Service Division, Montana State University, 1952). p. 85. (mimeographed.)

IMPORTANCE OF THE STUDY

Determine attitudes. Since the purpose of the Wildlife Management Forums was to foster more favorable and informed attitudes toward wildlife management and related problems, a study was needed to determine whether desired changes were associated with the program. According to Seth Gordon Jr., it is important to learn the attitudes of sportsmen so that more attention can be given to political and biological techniques while law enforcement and artificial programs are gradually minimized.⁴

DEFINITION OF TERMS

Attitude. Because attitude is a word that may be interpreted in several ways, and because attitude is either mentioned or implied throughout this study, a need for a definition was recognized. Therefore, the following meaning of attitude has been adopted:

The concept "attitude" will be used here to denote the sum-total of a man's inclinations and feelings, prejudice or bias, pre-conceived notions, ideas,

⁴ Seth Gordon Jr., "A Sampling Technique for the Determination of Hunters Activities and the Economics Thereof," Journal of Wildlife Management, 5:272, March, 1941.

fears, threats and convictions about any specific topic. 5

METHOD OF STUDY

The questionnaire. Criteria serving as a basis for the questionnaire were taken from an outline of the Wildlife Management Forum.⁶ From these criteria, consisting of eleven points, multiple choice questions were developed that would fit the conditions of a rating scale. To make arranging and adjusting easier, each question was written on a separate index card. As a question was developed, a test was made for the clarity of both the question and the choice of answers. Whenever indicated, additions and corrections were made until a question appeared to be useable. When this preliminary work was completed, the questions were assembled in a tentative form for pretesting. Several tests were made which resulted in some rewording to make questions easier to understand. A final test was made at a meeting of a local sportsmen's group to check for any other needed corrections. The results of this final test indicated that the questionnaire was ready for use.

5

Thurstone, op. cit., p. 6.

6

Severy and Chestum, op. cit., p. 5.

Treatment of data. A five point rating scale was devised for purposes of evaluating the responses obtained from the questionnaires. This scale was constructed so that it could be used on items having three, four, or five alternative choices. The intent of this scale was to give an indication of the total performance on an item by each of the groups participating in the study.

Review of the literature. This chapter has been divided into two separate sections because they are different in nature, yet both refer to integral parts of the problem. The first section is devoted to wildlife conservation education and how it affects attitudes of sportsmen toward the problems of conservation of natural resources.

The second part of the review is devoted to the techniques of the construction and use of survey instruments. This section also includes a review of work done by conservation agencies regarding questionnaire surveys relating to sportsmen's attitudes and activities.

A complete survey in either field was not possible because of the large amount of literature concerning them. However, all literature that is most closely associated with this study is thought to be included.

POSSIBLE OUTCOMES OF THE STUDY

Effectiveness of education. The first of these may have been an indication of the effectiveness of the Wildlife Management Forum in reorienting the thinking of sportsmen and creating more desirable attitudes toward wildlife management practices and problems.

Questionnaire. Another outcome of this study was the development of a set of questions that could be of some value to this program in the future. It is recognized that changes will be needed to improve upon the present questionnaire, but a nucleus is present upon which improvements can be built.

ORGANIZATION OF REMAINDER OF THE THESIS

The remainder of the thesis is composed of chapters dealing with a review of the literature pertinent to this study, a discussion of the methods used in the study, its results, and a chapter containing a summarization of the study with some conclusions based on its results.

CHAPTER II

REVIEW OF THE LITERATURE

Once neglected as a wildlife management tool, conservation education is gradually becoming accepted as a very important part of a resource management program. Increased use, new information, and economic progress all have made new wildlife management practices a necessity. Before new management programs can be instituted however, they must receive public acceptance which can be gained only through various educational programs. Clayton says that such conservation education programs must give man a new outlook on his place in nature. Pure science cannot make up for depleted resources, but that such knowledge should be used in planning the management of existing wildlife resources.¹

CONSERVATION EDUCATION AS RELATED TO SPORTSMEN

Orton, in discussing rural conservation education, said that:

There must be a common philosophy or concept regarding wildlife which can be understood by all men--farmers, nature lovers, tourists, scientists, sports-

¹
A. S. Clayton, "What Conservation Attitudes Should We Teach?" Progressive Education, 27:10-12, October, 1949.

men, and the general public.

Too often, well meaning people, have exerted pressure on fish and game departments to carry out expensive and unsound management practices in the honest belief that such programs are beneficial to game as well as to themselves. Such programs may include increases in predator controls, introduction of new species, feeding programs on winter ranges for big game, and reductions in bag limits. At certain times and places these practices may be desirable, but some people give little or no consideration to other possible outcomes of these programs. When speaking of a need for guides for sportsmen in their conservation efforts, Hargroves said that:

The average sportsman joins an organization because he has ideas and wants action. Unfortunately he usually lacks the knowledge of fundamental principles to go with his enthusiasm. Each in his own way is an amateur game manager. To reduce the amount of damage he can do and to multiply the potential good he could accomplish, workshops and short courses are a great boon.³

2

Clayton Roberts Orton, "Securing Cooperation Through Rural Conservation Education: Cooperating Agencies," Fourteenth North American Wildlife Conference (Washington, D. C.: American Wildlife Institute, 1949), p. 182.

3

Malcom M. Hargroves, "Better Guides for Conservation Efforts of Sportsmen," Nineteenth North American Wildlife Conference (Washington, D. C.: American Wildlife Institute, 1954), p. 571.

Steen feels that the modern wildlife manager can do very little in the management of land and water because the sportsmen themselves are more interested in their rights to exploit these lands and the wildlife within, than they are in conserving them.⁴

Probably one of the greatest obstacles today in the administration of fish and game departments, is lack of public understanding. Because of this lack of understanding, special interest groups are often able to distort issues arising over management of wildlife resources in such a manner as to gain public support for their own private interests.

Game department directors often are political appointees and have little understanding of conservation problems.⁵⁻⁶ Another situation still in existence is lack of job assurance in these fields. Thus many worthy administrators fail to remain in such positions for a

⁴ Melvin O. Steen, "Fish and Wildlife: Which Way Will We Go?" Sixteenth North American Wildlife Conference (Washington, D. C.: American Wildlife Institute, 1951), p. 72.

⁵ Personal Correspondence of the writer, letter from Juanita Mahaffey, Oklahoma Game and Fish Department, April 25, 1955.

⁶ Personal Correspondence of the writer, letter from Harry F. Lutz, Kansas Forestry, Fish and Game Commission, May 2, 1955.

reasonable length of time. These are the conditions that have created a necessity for expansion of public relations, informational services, and educational programs that are designed to reach all of the people, whether they are sportsmen or just occasional tourists. All play an important role in the ultimate fate of our natural resources.

A good educational program can do much to improve public understanding. An informed public can do much to improve wildlife management. Huber has said that:

Only those game departments that have good conservation education programs are successful in harvesting the maximum crops of wildlife that are being produced in their states.⁸

Trippensee, when writing about conservation education said that many of the policies and much of the legislation is in need of public support which can best be attained through public informations and educational services.⁹ He said:

Such a program can help sell the state's fish

7

William W. Huber, "Conservation Education - The Key to Resource Management," Eighteenth North American Wildlife Conference (Washington, D. C.: American Wildlife Institute, 1953), p. 631.

8

Ibid.

9

Reuben Edwin Trippensee, Wildlife Management, Vol. I (New York: McGraw-Hill Book Co., Inc., 1948), p. 435.

and game objectives, and, at the same time, make the sportsmen feel that they have a very real interest in the state's fish and game affairs. ¹⁰

While conservation education aims at increasing the public knowledge and understanding of the fundamental principles of wildlife management, the technical aspects should be left to the biologists. Such educational programs should also consider sportsmanship and respect for ¹¹ the rights of the landowners. Gabrielson has listed three separate parts of an educational program:

1. Information to acquaint the general public with basic problem of wildlife restoration and management.
2. Extension courses to reach directly both the adult and juvenile population living on the land.
3. Training technicians and teachers in the wildlife field. ¹²

Davison supports the views of other writers in the field when he acknowledges the fact that a public lacking the knowledge of the broad fundamental concepts of wildlife management, can do much to hinder progress ¹³ of wildlife management programs. Wilson places extreme

¹⁰

Ibid.

¹¹

Ira M. Gabrielson, Wildlife Management (New York: The Macmillan Company, 1951), p. 264.

¹²

Ibid., pp. 36-37.

¹³

Verne E. Davison, "False Principles Delay Advancement in Wildlife Techniques," Journal of Wildlife Management, 10:297, October, 1946.

importance on the problem when he says, "Education for conservation is just as vital as preparation for national defense, because the survival of the nation depends on it."¹⁴

SURVEY AND MEASUREMENT OF ATTITUDE

Measurement of attitude is a very complex and difficult type of measurement. Attitude may be expressed differently as the method of obtaining such data is varied. The use of a questionnaire based on an attitude scale method may reveal attitudes quite different from those obtained by use of an interview method. Also, the experienced and inexperienced interviewer may obtain different results from the same respondents. Thus method and experience are important factors in an investigation of opinion or attitude. A further complication may be encountered in question phrasing where the use of certain words may lead to a misunderstanding of the intended meaning. Other factors to be considered in designing and using a survey instrument are the social structure of communities, time and interest of participants, clarity

14

Chester S. Wilson, "All-Out Education for All-Conservation," Eighteenth North American Wildlife Conference (Washington, D. C.: American Wildlife Institute, 1953), p. 620.

of questions, and the type of response expected. Much has been written regarding attitude surveys and it seems generally accepted that such surveys are limited in nature. Thurstone said that:

The very fact that one offers a solution to a problem so complex as that of measuring differences of attitude on disputed social issues makes it evident from the start that the solution is more or less restricted in nature and that it applies only under certain assumptions. . . . 15

Edwards and Kilpatrick say that the investigator, in selecting a set of items from the large number of possible items, has no assurance that the items will meet the requirement of scale analysis. The selected items may limit the participants in such a manner that they cannot express the attitudes they possess toward a certain issue.¹⁶ This problem is further limited by the manner in which questions are phrased. Fogg and Gantрил say that:

It can easily be shown that two different phrasings of an issue yield different response distributions, but there is seldom any way of determining which presentation is the more valid, that

15

L. L. Thurstone and E. J. Chave, The Measurement of Attitude (Chicago: The University of Chicago Press, 1929), p. 5.

16

Allen L. Edwards and Franklin P. Kilpatrick, "A Technique for the Construction of Attitude Scales," Journal of Applied Psychology, 32:376, August, 1948.

is, which provides the more accurate index of the actual state of opinion on the issue. 17

Another limitation of attitude surveys may be found in the social structure of a community. Lasswell expressed the view that social structure has a profound effect on public opinion. Attitudes are not distributed in a community in any random manner, but they tend to follow the broad outlines of community structure. That is, different income groups usually will express different view points on any issue. 18 Mayhew and Hill support the views of Lasswell when they say that people respond to certain situations in terms of fundamental attitudes that they acquired through association with a certain group. 19 Although they admit that there are dangers in making such an assumption, Murphey and Likert feel that social structure is not an important factor when trends in attitude are being considered. They contend that attitudes may be distributed throughout a heterogeneous

17

Donald Rugg and Padley Cantril, "The Fording of Questions in Public Opinion Polls," Journal of Abnormal and Social Psychology, 37:470, 1942.

18

Harold D. Lasswell, Democracy Through Public Opinion (New York: George Santa Publishing Company, 1941), p. 29.

19

Lewis B. Mayhew and Walker H. Hill, "Attitude Inventories," Journal of Higher Education, 21:375, October, 1950.

group in a fairly normal manner. They say that, "This
assumption is made simply as part of an experimental
approach to attitude measurement."²¹ Other writers
generally disagree with this idea, however. Hyman agrees
with others when he says that, ". . . knowledge of the
social structure of the community is important in under-
standing the opinion results of many surveys."²²

If the investigator is experienced in the inter-
view method, the results of an attitude survey are
probably more reliable than the results of the question-
naire method. An interviewer is able to observe the re-
actions of his subject as well as ask further questions
on an issue if clarification of a response is indicated.
Bingham and Moore feel that interviews with as few as
sixty persons will reveal the attitudes of a large group
of persons.²³ They add further:

²⁰ Gardner Murphey and Rensis Likert, Public
Opinion and the Individual (New York: Harper and Bros.,
1938), pp. 39-40.

²¹ Ibid.

²² Herbert Hyman, "Community Background in Public
Opinion Research," (Paper read at the September, 1944
meetings of the Society for the Psychological Study of
Social Issues) Journal of Abnormal and Social Psychology,
40:412, 1945.

²³ Walter V. D. Bingham and Bruce V. Moore, How to
Interview (New York: Harper and Bros., 1934), p. 197.

The interview is most feasible for fact finding where the answer wanted is the mode or trend of opinion or the percentage of persons holding each kind of attitude or belief. ²⁴

Another problem associated with the interview method is the time factor. If a sample is composed of a fairly large group, a number of interviewers are required to complete the survey before too much time has elapsed. In some cases, because of changing situations, it may be necessary to obtain information in a short period of time. It is also sometimes difficult for interviewers to arrange suitable hours with their subjects. Hunter found, in making a survey of game and fish resources, that it was often difficult to contact people, and even when he did so, only about four or five interviews were possible in a days time. For this reason he ²⁵ changed his method and used the questionnaire.

Some persons believe that the questionnaire method used in an attitude survey will also give a fairly accurate picture of current thinking. This may be especially true when the multiple choice type of question

²⁴ Ibid., p. 23.

²⁵ Gilbert N. Hunter, "The Utility of Personal Interviews in Obtaining Information on Game and Fish Resources," Fourteenth North American Wildlife Conference (Washington, D. C.: American Wildlife Institute, 1943), p. 240.

is employed. Rugg feels that the multiple choice question is excellent where a gradation of attitude is desired because people are not limited to making a yes-

no type of answer.²⁶ It must be realized that in measuring gradations of attitude, participants may be²⁷ disguising true attitudes or reacting to social pressure.

Thurstone says that:

We shall assume that it is of interest to know what people say that they believe even if their conduct turns out to be inconsistent with their professed opinions. Even if they are intentionally distorting their attitudes, we are measuring at least the attitude which they are trying to make people believe that they have.²⁸

In summation, a survey instrument should be designed to obtain a maximum of reliability with a minimum²⁹ of time and cost. Barnes also adds that:

Regardless of the system of collection, criteria that should be considered are reliability, attitude of the sportsman regarding the report, time neces-

²⁶

Rugg and Cantril, op. cit., p. 240.

²⁷Thurstone, op. cit., p. 10.

²⁸Ibid., p. 9.

²⁹William B. Barnes, "The Sportsman's Questionnaire Method of Estimating the Game Kill in Indiana," Eleventh North American Wildlife Conference (Washington, D. C.: American Wildlife Institute, 1946), p. 346.

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30
sary for compilation, and cost.

30
ibid.

CHAPTER III

METHOD OF STUDY

This discussion includes two more-or-less distinct phases. The first part considers the techniques used in developing the questionnaire. The second part involves the methods used in treating the data obtained from the sportsmen's organizations.

DEVELOPING THE QUESTIONNAIRE

In developing the questionnaire, (see Appendix A) several factors were recognized as needing consideration; among these were: (1) establishing and documenting criteria against which measurement was to be made, (2) developing useable questions, including a selection of alternative responses that might measure degrees of attitude, and (3) selecting a scale that would be suitable for use in conjunction with these responses for measuring degrees of attitude among the various groups participating in this study.

Criteria. All criteria were selected from an outline of the educational program. This outline was composed of ten sections each concerning different phases of the principles of wildlife management. One or

more of the main topics were selected from each section of the outline in order to cover at least in part all major subjects in the program.

Is the importance of harvesting surplus animals understood? On most northern big game ranges, winter food is limited. Insufficient food may result in an increase in mortality and a decrease in the production of young. It is generally felt that a harvest of surplus animals tends to maintain the population in a better condition.

Do members understand that predator controls are not always a necessary management tool, that they are sometimes undesirable or do not actually result in larger population of fish and game? When a population of game is maintained at optimum numbers, and if the habitat is good, predator controls are thought to be a poor management tool. Usually no increase in game results and a decrease is a possibility. If the habitat is good and the population is low, temporary control measures will usually help the population to become established well enough so that further controls are not necessary.

Do members favor flexibility in seasons and limits? Wildlife populations are not static, therefore, the regulations controlling these populations should not be static. Regulations should vary with conditions.

Do the members understand the aspects of food relations in trout waters? Removal of "trash" fish from waters in which they are native does not always result in better fishing. Some of these fish are important in converting plant life into forms of energy that are available to game fish.

¹J. W. Severy and E. L. Cheatum, "Your Wildlife, Its Effective Management," (Subject matter for Montana Wildlife Federation Forums as proposed and presented at the first annual Cooperative Conservation Training School, USFS Remount Depot, Ninemile, Montana) (Missoula: The Public Service Division, Montana State University, 1952). p. 85. (Mimeographed.)

Do the members know the significance of refuges to various species? Most common species do not need the protection of permanent refuges. Temporary closures may. Do the members know the significance of refuges to various species? Most common species do not need the protection of permanent refuges. Temporary refuges, however, a more important function is to protect rare and migratory species of wildlife.

Do the members think that public education is a necessary part of a good wildlife management program? An understanding public is essential to a good wildlife management program. An informed public is needed to establish policies and back good legislation.

Do the members understand the importance of agricultural practices to wildlife? Good farming practices are probably one of the most important factors in maintaining farm game species. Such farming tends to provide better wildlife habitat.

Do the members understand the importance of habitat to a population of game animals? Each species of wildlife has specific requirements for food and cover. Habitat acts as a factor tending to limit a population.

Do the members understand that promiscuous stocking is an undesirable wildlife management practice? Promiscuous stocking of both fish and game is not only a costly practice, but frequently gives undesired results. However, there are times and places where stocking is necessary and desirable if the sportsman is to have his hunting and fishing.

Do the members understand the importance of forest land to good fishing? The manner in which forest land is managed has a direct influence on water velocity, amount of run-off, water temperature, food and cover, all of which are important to fish and fishing.

Do the members understand the implications of laws and regulations? Most wildlife is owned by the state, but when on forest service lands, it may be regulated in a manner that will help maintain the land in good condition. Game policies are set by the people of the state.

Item design. Each item was designed to fit the conditions of the criterion for that particular subject or principle. Included in each item was the statement of the question and either three, four, or five alternative responses. The alternative responses provided each respondent an opportunity to select the best answer possible on the basis of the information he possessed on this particular subject. An attempt was made to make the responses, in random order, range from a sound, logical answer to answers less sound. Unsound answers were similar in nature to many of the popular concepts that sportsmen have toward wildlife in general.

Pretesting. This was the next stage involved in the designing of the instrument. In the preliminary work, each item was placed on a separate card to facilitate the process of making needed corrections. First pretests involved faculty, biologists, and students because it was felt that they were the best sources for constructive criticism. As a result of these early tests and criticism, questions were revised both in wording and in meaning. When this work was completed, a preliminary draft of the questionnaire was printed and the testing procedure repeated. Pretesting of the revised form was continued until no further alterations seemed

necessary. This resulted in a new revision of the instrument which incorporated all needed changes. Again the pretesting procedure was followed except that the subjects were twenty-five members of a local sportsmens club. The object of this final test was to determine the answering time as well as to see if the questions would evoke any new comments regarding word meaning or meaning of the questions. Since no new changes seemed necessary after this test, it was assumed that the questionnaire was ready for use in the investigation.

Weighting responses. Each alternative response for an item was weighted on a five point scale. Using this system (see Appendix A), the preferred response was given a weight of five while the least preferred response was given a weight of one. A participant answering "no opinion" was given more credit than the one indicating a least preferred response.

Administration. The questionnaire was administered, in each case, at a meeting of participating groups. A brief introduction was made explaining the purpose of the investigation and the selection of responses on the questionnaire. The instrument was distributed and pencils supplied where needed. When the allotted time

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had elapsed, the materials were collected. Some of the issues involved were discussed.

EVALUATION OF DATA

In order to determine the possible effectiveness of the Wildlife Management Forum in reorienting the thinking of sportsmen, several comparisons were made. These include comparisons of total scores, per cent of preferred answers, and weighted percentage scores. For actual summary of responses, see Appendixes B and C.

Total scores. Questionnaires were first scored on the basis of the rating scale established for this purpose. Any item having more than one response was discarded. From this data, a frequency table (see Table V) was constructed showing the relationship of oriented and non-oriented groups. Using this table as a basis, mean scores were computed for each of the four groups as well as for the groups combined in oriented and non-oriented categories. From this latter category, standard deviations and the standard deviation of the difference of these two means were computed.

Per cent of preferred responses. Since there were three to five alternative responses for each item,

it was necessary to tabulate the frequency of responses for each alternative. These data were needed to calculate the per cent of responses for each alternative which in turn indicated the per cent of preferred responses for each item. This information was then transferred to Appendixes B and C, and to Table III.

Weighted percentage score. This score was used to determine the overall differences of oriented and non-oriented groups. Consideration was given by this method not only to the referred response, but also to next best responses on each item. The rating scale, previously mentioned, served as a basis for this score, and the following procedure was used in its computation: (1) the number of responses for any alternative was first multiplied by the scale value assigned to that particular alternative; (2) when this procedure was completed for an item, the products of step 1 were totaled; (3) the number of participants of the group was then multiplied by the number five, the upper limit of the rating scale; (4) this value was then divided into the sum obtained in step 2. The resultant figures are presented in Table IV.

Graphical presentation. In Figure 1, oriented and non-oriented groups are compared item by item on the

basis of weighted percentage scores while in Figure 2, they are compared on the basis of the percent of preferred responses.

CHAPTER IV

ANALYSIS OF THE QUESTIONNAIRE

It was noted in the first chapter that two outcomes might result from this study. These were: (1) a determination of the relative effectiveness of the Wildlife Management Forum in reorienting the thinking of sportsmen and (2) an evaluation of the individual items making up the questionnaire.

ITEM ANALYSIS

Factors affecting the results of the questionnaire. In making an analysis of individual items, several factors should be recognized that might have affected the responses of oriented and non-oriented groups. Previous educational programs, other than the one involved in this study, might have been responsible for the non-oriented groups obtaining higher scores on certain items than the oriented groups. Also, special problems peculiar to these areas might have influenced responses given on certain items. Another factor influencing the results of this study was the selection of some point above which a question may be considered useable and below which it should either be restated or discarded entirely.

In selecting this point, it was assumed that when oriented and non-oriented groups indicated a ten point or less difference on the weighted percentage score, the question did not satisfactorily discriminate between these two groups. Similarly, when these differences ranged from ten to nineteen points, the question was considered suitable, but possibly in need of improvement. Questions displaying a twenty point or more difference were considered satisfactory. Questions on which the non-oriented groups obtained higher scores than the oriented groups probably should be disregarded.

Distribution of Items. Table I, based on percentage score differences, shows how individual items were distributed in the four categories selected for item analysis. Items 1, 3, 14, 15, 17, and 19 are found in the category having the highest percentage point differences. This would indicate that these questions were most satisfactory for their intended use. The next lower category includes items 2, 5, 9, 10, and 16a. A relatively high degree of discrimination is exhibited by these questions. However, by some rewording, these questions might be improved. Items 4, 11, 13, 16b, 18, 20, and 21 lacked ability to differentiate between groups appreciably. A restatement of questions is

TABLE I

RELATIVE DISCRIMINATORY VALUE OF THE ITEMS
USED IN THE QUESTIONNAIRE SURVEY BASED
ON PERCENTAGE SCORE DIFFERENCES

Item numbers	Oriented groups exceeded non oriented		Non oriented exceeded oriented
	20 Points plus	10-19 Points	10 Points or less
1		2	
3			4
		5	
6			7
			8
		9	
		10	
			11
			12
			13
14			
15			
		16a	
			16b
17			18
19			20
			21

probably indicated in these cases. The possibility also exists that both oriented and non-oriented groups possessed about the same amount of information regarding these particular items. The lowest category includes items 7, 8, and 12. These items have been discarded as unsuitable for use in further study. Differences, both in percentage of preferred answers and weighted percentage scores, are shown in Table II. This shows that the difference in percent of preferred answers ranged from 59.4 percent to minus 17 percent. The difference in weighted percentage scores ranged from 30 percent to a minus 17 percent. The negative percentages represent those items on which the non-oriented groups obtained higher scores than the oriented groups. Although the information possessed by each group may have been responsible for this situation, the explanation probably lies in faulty question construction.

Effectiveness of the Wildlife Management Forum.

The effectiveness of this program in reorienting the thinking of sportsmen can only be expressed as a relationship between oriented and non-oriented groups. In the following paragraphs, this relationship between groups is discussed in terms of the criteria previously selected

TABLE II

DIFFERENCES IN FAVOR OF ORIENTED OVER NON-ORIENTED ON
PREFERRED ANSWERS AND WEIGHTED PERCENTAGE SCORES

Question	Preferred score difference	Weighted percentage score difference
1	31.2	22.0
2	3.5	13.6
3	47.0	34.0
4	11.3	5.5
5	17.0	16.5
6	18.4	24.8
7	-8.1	-6.7
8	3.2	-1.9
9	25.1	14.5
10	30.1	16.0
11	7.2	4.4
12	-17.0	-17.0
13	13.8	6.9
14	59.4	30.0
15	27.5	28.0
16	a. 16.2	12.5
	b. 12.3	7.7
17	30.1	20.7
18	28.9	9.8
19	37.8	28.3
20	5.9	9.4
21	6.8	1.3

NOTE: Negative differences indicate higher scores
for non oriented groups.

for this purpose. Figure I which is based on weighted percentage scores for each group on each item is the basis for this discussion.

Harvesting surplus animals. (Items 1-16a,b.)

Oriented groups seemed to be more in accord with the principles of harvesting surpluses of game than were non-oriented groups. This fact is particularly demonstrated by item 1. While items 16a and b also indicate this tendency, they do not show as high a degree of discrimination.

Predator controls. (Items 6-15). Both items con-

cerning the question of predator controls indicate that oriented groups did not feel that such controls were as important to game management as were non-oriented groups.

Seasons and limits. (Items 7-19). Item 7 was

discarded as being unable to discriminate between groups. Item 19, however, again shows that oriented groups realize the importance of adjusting seasons and limits with changes in existing conditions. Non-oriented groups were less inclined to prefer changes.

Food relations in trout waters. (Items 2-9).

Non-oriented groups were in favor of rough fish control,

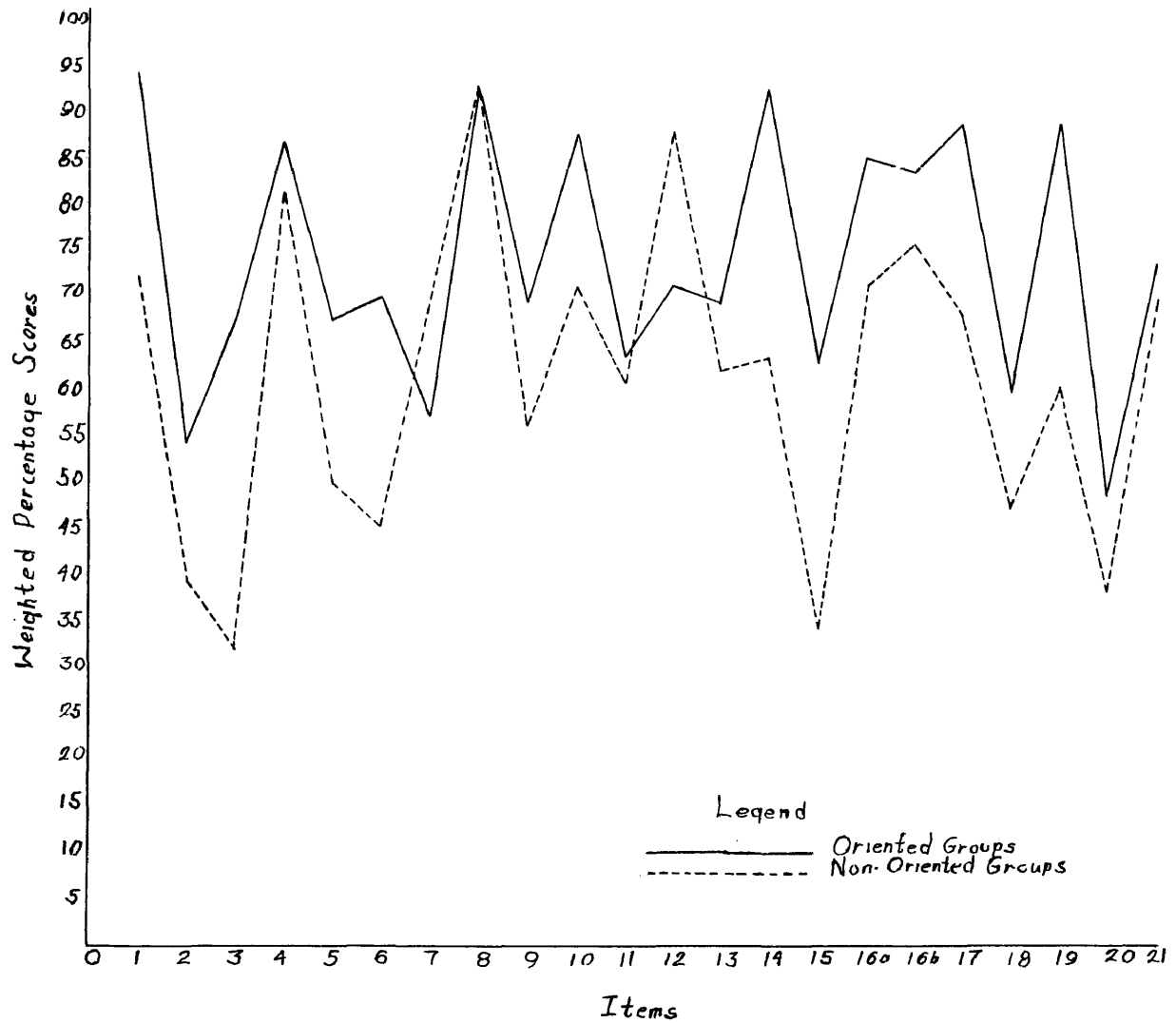


FIGURE 1
RELATIONSHIP OF ORIENTED AND NON-ORIENTED GROUPS ON BASIS
OF WEIGHTED PERCENTAGE SCORES

while oriented groups apparently realized that such controls were not always of prime importance.

Refuges. (Items 3-20). Although neither item showed a very high degree of discrimination, oriented groups obtained slightly higher weighted percentage scores on this subject.

Conservation education. (Items 8-14). Item 8 was discarded as being unable to discriminate between groups on this subject. However, Figure 2 based on percent of preferred responses shows oriented groups slightly higher on this item. The oriented group, in Figure 1 item 14, was very much in favor of conservation education while non-oriented groups were not.

Agricultural practices. (Item 17). Oriented groups again obtained the highest scores, indicating a better understanding of the relationships of agriculture and wildlife.

Habitat. (Items 4-10). These two items show that non-oriented groups do not have a desirable understanding of the importance of habitat to wildlife. Oriented groups showed that they had some understanding of the habitat requirements of wildlife as presented to them in these two items.

Stocking. (Items 11-18). Although neither question discriminated to a great extent, oriented groups obtained the highest scores.

Forest management and fishing. (Items 12-21). Both items regarding this subject should probably be disregarded. Item 21 did not discriminate between groups and item 12 discriminated in favor of the non-oriented groups.

Regulations. (Items 5-13). Highest scores on this subject were obtained by oriented groups, which would indicate that they had a better understanding of some of the implications of laws and regulations than did non-oriented groups.

Discussion of data. An analysis of the percent of preferred responses in Table III indicates that the oriented groups selected a greater number of preferred responses than did the non-oriented group. The only exceptions to this were items 7 and 12, on which the non-oriented groups chose the preferred responses more often. However, since this occurred on only two items, the items may be at fault. This table also indicates similarities and differences between groups in choosing

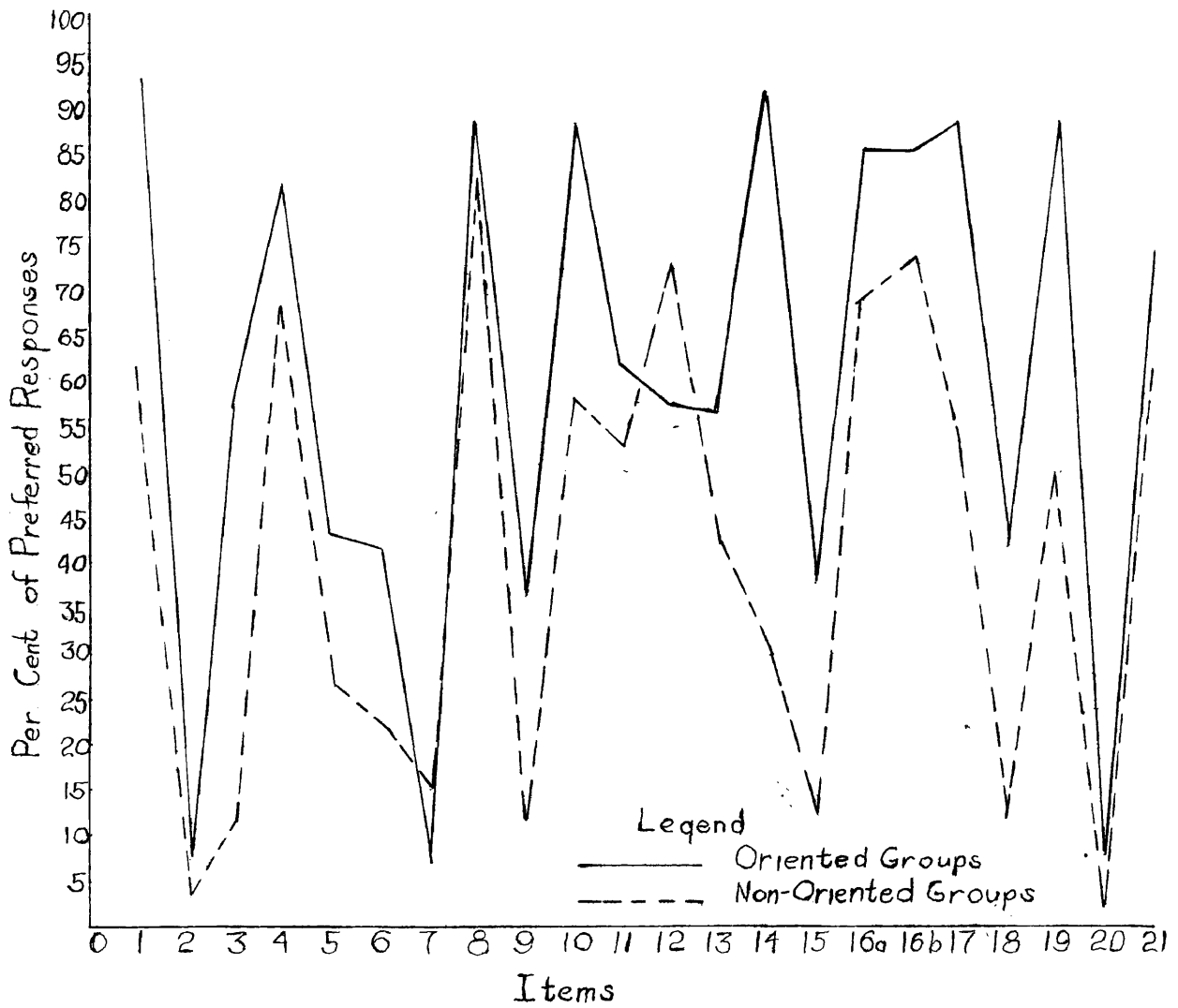


FIGURE 2

RELATIONSHIP OF ORIENTED AND NON-ORIENTED GROUPS ON BASIS
OF PER CENT OF PREFERRED RESPONSES

preferred responses. Figure 2 also points out, on the basis of percent of preferred responses, the relationship of oriented and non-oriented groups. It serves to clarify the relative position of the oriented and non-oriented groups, and to show those items that did not discriminate satisfactorily between groups.

In Table IV weighted percentage scores show the relationship of oriented and non-oriented groups and indicate the total performance on each item for each of the sub groups. Data in this table point even more strongly to the fact that oriented groups had a better understanding of the principles of wildlife management than did the non-oriented groups. The method of computing this score was discussed earlier, so it should suffice to say that the greatest number of desirable responses were obtained by the oriented group. Figure 1, as mentioned earlier, shows this relationship and serves as a basis for evaluating attitudes toward the principles as stated in the criteria.

Table V shows the number of cases and distribution of total scores obtained by each group on the questionnaire. The mean scores computed for oriented and non-oriented groups again show a marked difference.

TABLE III

PER CENT OF PRE-TESTED ANSWERS FOR ORIENTED
AND NON ORIENTED GROUPS BY ITEM

Question	ORIENTED			NON ORIENTED		
			Noxon & Polson			Superior & Noxon
	Polson	Darby	Polson	Noxon	Superior	Noxon
1	92.8	92.6	92.7	88.9	47.1	61.5
2	7.2	7.4	7.3	0	5.9	3.8
3	64.3	55.5	58.5	22.2	5.9	11.5
4	64.3	88.9	80.5	77.8	64.7	69.2
5	50.0	40.7	43.9	22.2	29.4	26.9
6	35.7	44.4	41.5	11.1	29.4	23.1
7	0	11.1	7.3	0	23.5	15.4
8	71.4	96.3	87.8	77.8	88.2	84.6
9	14.3	48.1	36.6	0	17.6	11.5
10	78.6	92.6	87.8	55.5	58.8	57.7
11	64.3	59.3	61.0	66.6	47.1	53.8
12	71.4	48.1	56.1	66.6	76.5	73.1
13	64.3	51.8	56.1	44.4	41.2	42.3
14	92.8	88.9	90.2	44.4	29.4	30.8
15	50.0	33.3	39.0	11.1	11.8	11.5
16	a. 71.4	92.6	85.4	77.8	64.7	69.2
	b. 71.4	92.6	85.4	77.8	70.6	73.1
17	85.7	88.9	87.8	77.8	47.1	57.7
18	35.7	37.0	36.6	0	11.8	7.7
19	71.4	96.3	87.8	77.7	35.3	50.0
20	14.3	7.4	9.7	0	5.9	3.8
21	64.3	70.4	68.3	77.8	52.9	61.5

TABLE IV

RIGHTED P. CONTACT SCORES FOR ORIENTED
AND NON ORIENTED TESTS BASED
ON TOTAL PERFORMANCE
OF EACH ITEM

		ORIENTED			NON ORIENTED	
		Darby & Polson			Superior & Noxon	
Question		Polson	Darby	Polson	Noxon	Superior
1		94.3	95.6	95.1	91.1	57.6
2		54.3	56.3	55.1	42.2	41.2
3		74.3	64.4	67.8	42.2	29.4
4		74.3	94.8	87.8	91.1	77.6
5		68.6	66.6	67.3	46.7	52.9
6		72.9	71.9	71.7	28.9	56.5
7		50.0	64.4	59.5	60.0	69.4
8		85.1	97.0	92.7	95.6	82.4
9		54.3	79.3	70.7	62.2	52.9
10		85.7	94.1	89.8	73.3	74.1
11		75.7	65.2	65.9	71.1	56.5
12		80.0	68.1	72.2	86.7	90.6
13		82.9	64.4	70.7	68.9	61.2
14		95.7	94.1	94.6	73.3	60.0
15		64.2	63.0	63.4	42.2	31.8
16	a.	81.4	93.3	86.3	82.2	69.4
	b.	72.9	92.6	85.4	82.2	71.8
17		85.7	93.3	90.7	84.4	62.4
18		57.1	67.4	59.0	37.8	55.3
19		75.7	97.0	89.8	82.2	50.6
20		46.9	51.9	50.2	46.7	37.6
21		72.9	77.0	75.1	84.4	69.9

While the oriented group had a mean score of 82.97, the non-oriented had a mean score of only 67.96. A computation of the standard deviation of the distribution showed that the oriented groups were more variable than the non-oriented groups.

These data indicate that, as measured by the questionnaire, the oriented groups were better informed on the principles underlying a sound wildlife management program than were the non-oriented groups.

TABLE V

NUMBER OF CASES AND DISTRIBUTION OF TOTAL SCORES BASED ON
RELATIONSHIP OF ORIENTED AND NON-ORIENTED GROUPS

Score	ORIENTED			NON-ORIENTED		
	Polson	Farby	Farby & Polson	Noxon	Superior	Superior & Noxon
105-109		1	1			
100-104		2	2			
95-99	4	2	6			
90-94	2	5	7			
85-89	1	4	5	1		1
80-84	2	7	9	1	1	2
75-79		1	1	3	1	4
70-74	1	1	2	1	3	4
65-69		2	2	3	6	9
60-64	2		2		2	2
55-59	1	1	2		1	1
50-54		1	1		1	1
45-49	1		1		1	1
40-44						
35-39					1	1
Total	14	27	41	9	17	26
Mean	80.25	84.40	82.97	74.77	65.52	67.96
Standard Deviation of the Distribution			10.9			6.3
Standard Deviation of the Means			1.8			1.3
Standard Deviation of the Difference of Means						2.06

CHAPTER V

SUMMARY AND CONCLUSIONS

A cooperative agreement between the Montana Fish and Game Department, Montana State College, and Montana State University, effective in August, 1954, allotted a sum of \$15,000 to be equally divided between the two institutions to provide educational programs for sportsmen. The aim of these programs was to give the public a better understanding of the principles underlying the management of soil, water, vegetation, and their relationship to wildlife. This educational program was presented with the expectation that the public would exhibit more desirable behavior toward problems arising from the management of wildlife and related resources.

SUMMARY

The problem. The purpose of this study was to determine the effectiveness of the Wildlife Management Forum in reorienting the thinking of sportsmen by comparing two groups of sportsmen that had participated in this program with two groups that had not.

In making this study, several limitations were

recognized. Time limited the study in three ways. The first of these limitations was that previous knowledge possessed by the groups participating in the study could not be ascertained. The time factor also limited the number of groups that could be surveyed. The third factor that was somewhat limited by time was the method. The interview is considered a better method of determining attitudes than the questionnaire survey, but this method is also a time consuming one and requires considerable skill.

A further limitation in technique involves the comparison of one group with another for the purpose of determining the effect of the educational program. The most desirable method of making this study would have been to survey the same group before and after it had participated in the educational program. Because of time limitations, two groups who had participated in the program were compared with two who had not.

Importance of the problem. The importance of the problem was mentioned as being twofold. Primarily the study had as its objective to determine if oriented groups of sportsmen would, on the basis of the information they had attained as result of participating in the educational program, indicate a more favorable

attitude toward the problems of wildlife management than would groups that had not participated in this program.

Secondly, as a result of this study the nucleus of a set of questions was developed that may have some future value in analyzing the effectiveness of this program. Much work is yet to be done, however, to bring the questionnaire up to a level entirely satisfactory for this purpose.

Review of the literature. Literature concerning this study was divided into two sections. Conservation education as related to the sportsmen was the first subject to be considered. This section was devoted to the importance of, and the need for conservation education programs to bring about desirable changes in present management programs.

The second part of the review concerned the complexities encountered in attitude surveys. The difficulty of phrasing questions, selecting criteria, the influence of social structure of various communities on responses, limitations and advantages of the questionnaire and interview methods, and the difficulties of measuring attitudes were discussed in this section.

METHOD OF STUDY

In this chapter, a discussion of the development of the questionnaire was first considered. This discussion first mentioned that the criteria, against which, measurement was to be made were selected from an outline of the Wildlife Management Forum. The main topics were selected from each section to serve as a basis for these criteria. The criteria, in turn, served as the basis from which the individual items were developed.

This section also mentions procedures used in the pretesting of the questionnaire and the changes made resulting from each of these tests until a satisfactory instrument was developed. Consideration was then given to the scoring of the responses and the actual administration of the questionnaire.

Methods of evaluation of the data include the use of total scores, construction of a frequency table based on this data as well as the computation of mean scores and standard deviations for oriented and non-oriented groups. The computation of weighted percentage scores and their use in evaluating the response patterns on the questionnaires was described. The weighted percentage scores gave an indication of total performance on the items by each of the groups.

ANALYSIS OF THE QUESTIONNAIRE

Item analysis. Several factors were recognized as possibly influencing participants in answering various parts of the questionnaire. Previous educational programs, other than the one involved in this study, was the first of these factors, and special community problems was mentioned as another.

To establish a reference point on which to judge the useability of a question, weighted percentage score differences were used. It was assumed that any question showing a difference of ten weighted percentage points or less between oriented and non-oriented groups was unsatisfactory and should be restated. Table I indicates the four categories into which the various items fell.

Following this, was a discussion of the possible effectiveness of the program in reorienting the thinking of sportsmen. Tables and figures presented various relationships of the two groups both on individual items and on total performance. Generally speaking, there were noticeable differences between groups which probably indicates that the program was effective in attaining its desired goals.

CONCLUSIONS

Success of the program. The data revealed in this study indicate some marked differences between oriented and non-oriented groups. These differences are apparent in each of the several methods used to compare the performance of the two groups. A frequency table shows that oriented groups obtained a much greater number of high scores than did the non-oriented groups, and a computation of the mean scores and of the standard error of the difference of means only served to emphasize this. While the oriented group had a mean score of only 82.97, the non-oriented group had a mean score of 67.96, a difference of 15.01 points. This difference is more than seven times the standard error of the difference of means. The standard deviation of the distribution for the oriented group was 10.9 and for the non-oriented group, it was 6.3. A study of the weighted percentages scores also shows the oriented group higher in total performance than the non-oriented group. The consistency of the oriented group in obtaining higher scores than the non-oriented groups definitely indicates that the Wildlife Management Forum may have influenced the thinking of sportsmen as measured by the questionnaire.

Validity of questions. With the exception of questions 7, 8, and 12, the questionnaire discriminated between those people who had participated in the educational program and those who had not. This ability to discriminate between oriented and non-oriented groups suggests that the questionnaire is valid for measuring some of the attitudes toward wildlife management that are entertained by sportsmen.

RECOMMENDATIONS

Item improvement. The discussion of validity points out the need for improvement in some of the questions. Particular attention should be given to questions 7, 8, and 12. Because each of these items was associated with another item that did discriminate between groups and because none of these items was concerned with the same criterion, it seems very probable that these items were not properly designed. As stated earlier, these questions are but a nucleus upon which a more useful set of questions may be developed.

Suggested use. Perhaps a better method of using the questionnaire would be to administer it to a group at the beginning and at the end of the program. Information regarding scores on individual items would be useful in determining the phases of the instructional pro-

grams needing the most emphasis. The questionnaire could also be administered after the course was completed as a check on its effectiveness in bringing about desired changes in attitudes.

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Letter from Juanita Mahaffey, Chief of the Information-Education Division, State of Oklahoma Game and Fish Department. April, 1955.

APPENDIXES

APPENDIX A

QUESTIONNAIRE SHOWING SCALE VALUES OF THE RESPONSES

On the following pages you will find a list of questions and statements having several choices of answers. Please check the one statement which you think is the best answer.

1. Because a certain deer range is in the "back country," only a few deer are killed by hunters each fall. This has resulted in a badly overcrowded range. Do you think hunters should be allowed to kill two deer here?

- 5 a. Yes
3 b. No opinion
1 c. No

2. If the squawfish and suckers were removed from waters in which they were native, the fisherman would have more trout.

- 1 a. Strongly agree
2 b. Agree
3 c. No opinion
4 d. Disagree
5 e. Strongly disagree

3. A certain area contains excellent pheasant habitat, winters are not severe, but the area is heavily hunted. Should a refuge be established in a part of the area to supply breeding stock for the next spring?

- 1 a. Yes
3 b. No opinion
5 c. No

*Numbers indicate how each response was scored.

APPENDIX A (Continued)

4. What method do you think might be best if it is desired to increase the numbers of migratory waterfowl?

- 2 a. Reduce seasons and limits
- 1 b. Increase predator controls
- 5 c. Improve breeding and nesting areas
- 4 d. Establish more refuges

5. If it has been found by the U.S. Forest Service that there are too many deer on a certain national forest, and many trees and shrubs have died as a result of overbrowsing; and if the State Fish and Game Commission has not made provisions allowing for removal of surplus deer, what action can be taken by the forest service?

- 1 a. Game animals such as deer are property of the state, therefore the forest service can do nothing to change this situation.
- 5 b. The forest service is responsible for the management of national forests, therefore it can regulate wildlife in the same manner in which it can regulate livestock.
- 3 c. No opinion

6. In a recent two year period, the State Fish and Game Commission spent \$78,000 for controls on predatory wild animals. In which of the following situations do you think that predator controls might be necessary?

- 4 a. On a range where the surplus deer are removed by hunters
- 5 b. On a good deer range where the population is low
- 2 c. Predator controls are not needed
- 3 d. On a range where the deer harvest is light
- 1 e. All of these areas

APPENDIX A (Continued)

7. A management plan for a population of deer should include provisions for harvesting both bucks and does.

- 3 a. Almost always
- 5 b. Not enough information given
- 1 c. Almost never

8. Which one of the following statements expresses your attitude toward wildlife conservation education?

- 5 a. It is a vital part of a sound wildlife management program
- 4 b. It is very important but not vital to a sound wildlife management program
- 2 c. It may be important but not necessary for a sound wildlife management program
- 1 d. It is not at all important to a sound wildlife management program

9. From an economic point of view, in which of the following areas do you think that the removal of squawfish would be most practical?

- 3 a. Flathead Lake
- 5 b. Any isolated mountain lake
- 2 c. Swan River
- 1 d. All of these areas
- 4 e. None of these areas

10. Deer Range A is a timbered area that has never been logged or burned, while deer range B has been logged by the block cutting system. The deer harvest has been the same in both areas. Under these conditions, where would you expect to find the most deer in the next few years?

- 5 a. More deer would be found in the logged area, B
- 3 b. Both areas would have about the same number of deer
- 2 c. More deer would be found in Area A which has not been logged
- 1 d. The conditions mentioned make no difference to deer

APPENDIX A (Continued)

11. A large number of legal sized trout were planted in a trout stream after the fishing season closed in the fall. Do you think fishing in that stream will improve a great deal during the next season?

- 1 a. Yes
- 3 b. No opinion
- 5 c. No

12. A logging road was built along a certain stream causing the stream channel to be straightened in many places. What would likely be the effect on fishing?

- 1 a. The fishing would very likely improve
- 5 b. This condition probably would result in poor fishing
- 3 c. Conditions for fishing are more closely related to other factors such as food and cover, therefore, fishing would remain about the same

13. If a hunter is standing on public land, does he have the right to shoot at a pheasant that is in the air over private land?

- 1 a. Yes
- 3 b. No opinion
- 5 c. No

14. Sound wildlife management includes a number of different practices. Which one of the following do you think is most important?

- 2 a. Improve law enforcement methods
- 1 b. Increase planting of fish and game
- 3 c. No opinion
- 4 d. Increase the number of restoration projects
- 5 e. Make provisions for more public understanding

APPENDIX A (Continued)

15. On an experimental area containing two similar grouse ranges, A and B, the population of grouse was found to be about the same. Then, on area A, predator controls were used which greatly reduced nest losses, while on B, no controls were used. In the fall, area A was found to have 25 per cent more grouse than it had the previous year. What conditions would you expect to find on area B?

- 2 a. Probably B had fewer birds than A where predators were removed
- 5 b. Area B probably had as many birds as A regardless of predators
- 1 c. Usually predator control results in population increases
- 4 d. Other factors probably accounted for the increase in area A

16. In two similar northern deer ranges, A and B, winter food is limited. The deer harvest on area A is heavy, while on area B the deer harvest is light.

- a. Winter kill would likely be highest in:
 - 1 1. Area A where deer harvest was heavy
 - 3 2. Probably both area alike
 - 5 3. Area B where deer harvest was light
- b. The best production of fawns would be in?
 - 5 1. Area A where deer harvest was heavy
 - 3 2. Probably both areas alike
 - 1 3. Area B where deer harvest was light

17. Of the several methods used to maintain farm-game species, which do you feel produce the best results?

- 2 a. Do more planting of game birds
- 1 b. Increase predator controls
- 3 c. No opinion
- 4 d. Law enforcement
- 5 e. Improve habitat

APPENDIX A (Continued)

18. The state is going to plant a large number of cock pheasants sometime before the hunting season opens. In order that the hunters and the state "get their money's worth," when and where do you think it would be best to plant them?

- 2 a. During the summer in a rural area where hunting will be light
- 3 b. During the summer in a rural area where hunting will be heavy
- 4 c. No opinion
- 1 d. In both areas regardless of the hunting
- 5 e. Near a large city just before the hunting season opens

19. The general deer and elk season always starts October 15th and ends November 15th. Would you be in favor of changing the length and time of the season each year according to conditions

- 5 a. Yes
- 3 b. No opinion
- 1 c. No

20. Which one of the following types of refuges do you think is most important?

- 4 a. Waterfowl
- 2 b. Deer
- 3 c. Elk
- 5 d. Bison
- 1 e. All are equally important

APPENDIX A (Continued)

21. Two similar trout streams are located in areas A and B. However, there has been a bad burn along stream B. Which one of the following conditions would you expect to find?

- 1 a. More food organisms would be in and along B where it has burned
- 4 b. Spring runoff would be highest in A
- 5 c. Fishing would be best in stream A
- 3 d. Water temperature would be highest in A
- 2 e. Conditions would be the same in both streams some distance downstream

IN ORDER TO COMPLETE THIS STUDY, ANSWERS TO THE FOLLOWING QUESTIONS ARE ALSO IMPORTANT

1. Please write in the names of three sportsmen's magazines you read most regularly.

- a. _____
- b. _____
- c. _____

2. What is your occupation?

- a. Business
- b. Agriculture
- c. Skilled labor
- d. Other

3. Educational background

- a. Less than high school
- b. High school graduate
- c. Some college
- d. College graduate

APPENDIX A (Continued)

4. What is your age? _____

5. How many meetings of your sportsmen's club
have you attended in the past six months? _____

APPENDIX B

NUMBER OF CASES AND DISTRIBUTION OF SCORES OF ORIENTED
AND NON-ORIENTED GROUPS PARTICIPATING IN THIS STUDY

		ORIENTED			NON-ORIENTED		
				Farby & Polson	Superior & Noxon		
Question		Polson	Farby	Polson	Noxon	Superior	Noxon
1.	a	13/14	25/27	38/41	8/9	8/17	16/26
	b	0	1/27	1/41	0	0	0
	c	1/14	1/27	2/41	1/9	9/17	10/26
2.	a	4/14	3/27	7/41	4/9	8/17	12/26
	b	3/14	6/27	9/41	2/9	4/17	6/26
	c	1/14	5/27	6/41	1/9	2/17	3/26
	d	5/14	9/27	14/41	2/9	2/17	4/26
	e	1/14	2/27	3/41	0	1/17	1/26
3.	a	4/14	12/27	16/41	6/9	14/17	20/26
	b	1/14	0	1/41	1/9	2/17	3/26
	c	9/14	15/27	24/41	2/9	1/17	3/26
4.	a	2/14	0	2/41	1/9	1/17	2/26
	b	3/14	0	3/41	0	1/17	1/26
	c	9/14	24/27	33/41	7/9	11/17	18/26
	d	0	2/27	2/41	1/9	2/17	3/26
5.	a	4/14	5/27	9/41	5/9	8/17	13/26
	b	7/14	11/27	18/41	2/9	5/17	7/26
	c	3/14	10/27	13/41	2/9	4/17	6/26
6.	a	2/14	3/27	5/41	0	2/17	2/26
	b	5/14	12/27	17/41	1/9	5/17	6/26
	c	4/14	6/27	10/41	0	2/17	2/26
	d	3/14	4/27	7/41	0	2/17	2/26
	e	0	1/27	1/41	8/9	5/17	13/26
7.	a	11/14	24/27	35/41	8/9	13/17	22/26
	b	0	3/27	3/41	0	4/17	4/26
	c	2/14	0	2/41	0	0	0

APPENDIX B (Continued)

		ORIENTED			NON ORIENTED		
				Barby & Polson			Superior & Noxon
Question		Polson	Barby	Polson	Noxon	Superior	Noxon
8.	a	10/14	26/27	36/41	7/9	15/17	22/26
	b	2/14	0	2/41	2/9	1/17	3/26
	c	1/14	0	1/41	0	0	0
	d	0	1/27	1/41	0	1/17	1/26
9.	a	5/14	1/27	6/41	1/9	1/17	2/26
	b	2/14	13/27	15/41	0	3/17	3/26
	c	1/14	1/27	2/41	1/9	5/17	6/26
	d	0	1/27	1/41	2/9	3/17	5/26
	e	3/14	9/27	12/41	5/9	4/17	3/26
10.	a	11/14	25/27	36/41	5/9	10/17	15/26
	b	1/14	0	1/41	1/9	2/17	3/26
	c	1/14	1/27	2/41	2/9	3/17	5/26
	d	0	0	0	1/9	1/17	2/26
11.	a	2/14	8/27	10/41	2/9	8/17	10/26
	b	2/14	0	2/41	0	0	0
	c	9/14	16/27	25/41	6/9	8/17	14/26
12.	a	0	0	0	0	0	0
	b	10/14	13/27	23/41	6/9	13/17	19/26
	c	2/14	9/27	11/41	3/9	4/17	7/26
13.	a	1/14	8/27	9/41	2/9	5/17	7/26
	b	4/14	3/27	7/41	3/9	4/17	7/26
	c	9/14	14/27	23/41	4/9	7/17	11/26
14.	a	1/14	1/27	2/41	1/9	1/17	2/26
	b	0	1/27	1/41	0	6/17	6/26
	c	0	0	0	0	2/17	2/26
	d	0	1/27	1/41	4/9	3/17	7/26
	e	13/14	24/27	37/41	3/9	5/17	8/26
15.	a	2/14	8/27	10/41	5/9	3/17	8/26
	b	7/14	9/27	16/41	1/9	2/17	3/26
	c	2/14	4/27	6/41	4/9	11/17	15/26
	d	1/14	5/27	6/41	0	0	0

APPENDIX B (Continued)

		ORIENTED			NON ORIENTED	
		Darby & Polson			Superior & Noxon	
Question		Polson	Darby	Noxon	Superior	Noxon
16.	a					
	1	1/14	1/27	2/41	2/9	4/17
	2	2/14	0	2/41	0	0
	3	10/14	25/27	35/41	7/9	11/17
	b					
	1	10/14	25/27	35/41	7/9	12/17
	2	0	0	0	1/17	1/26
	3	1/14	0	1/41	1/17	3/26
17.	a	0	1/27	1/41	1/9	2/17
	b	0	1/27	1/41	1/9	3/17
	c	0	1/27	1/41	0	2/17
	d	0	0	0	0	0
	e	12/14	24/27	36/41	7/9	8/17
18.	a	1/14	3/27	4/41	4/9	2/17
	b	3/14	9/27	12/41	2/9	7/17
	c	0	1/27	1/41	0	2/17
	d	4/14	4/27	8/41	3/9	4/17
	e	5/14	10/27	15/41	0	2/17
19.	a	10/14	26/27	36/41	7/9	6/17
	b	0	0	0	0	1/17
	c	3/14	1/27	4/41	2/9	10/17
20.	a	4/14	12/27	16/41	4/9	4/17
	b	0	0	0	0	0
	c	0	1/27	1/41	0	0
	d	2/14	2/27	4/41	0	1/17
	e	7/14	9/27	16/41	5/9	11/17
21.	a	3/14	2/27	5/41	0	2/17
	b	0	0	0	0	1/17
	c	3/14	19/27	28/41	7/9	9/17
	d	1/14	2/27	3/41	1/9	1/17
	e	0	0	0	0	2/17

APPENDIX C

PERCENTAGE OF RESPONSES ON INDIVIDUAL ITEMS SHOWING RELATIONSHIP OF ORIENTED AND NON ORIENTED GROUPS

		ORIENTED			NON ORIENTED		
			Barby &			Superior &	
Question		Polson	Barby	Polson	Noxon	Superior	Noxon
1.	a	92.8	92.6	92.7	88.9	47.1	61.5
	b	0	3.7	2.4	0	0	0
	c	7.2	3.7	4.9	11.1	52.9	38.5
2.	a	28.6	15.0	17.1	44.4	47.1	46.2
	b	21.4	22.0	21.9	22.2	23.5	23.1
	c	7.2	18.5	14.6	11.1	11.8	11.5
	d	35.7	45.0	34.1	22.2	11.8	15.4
	e	7.2	7.4	7.3	0	5.9	3.8
3.	a	28.6	44.4	39.0	66.6	82.4	76.9
	b	7.2	0	2.4	11.1	11.8	11.5
	c	64.3	55.5	58.5	22.2	5.9	11.5
4.	a	14.3	0	4.9	11.1	5.9	7.7
	b	21.4	0	7.3	0	5.9	3.8
	c	64.3	88.9	80.5	77.8	64.7	69.2
	d	0	7.4	4.9	11.1	11.8	11.5
5.	a	28.6	18.5	21.9	55.5	47.1	50.0
	b	50.0	40.7	43.9	22.2	29.4	26.9
	c	21.4	37.0	31.7	22.2	23.5	23.1
6.	a	14.3	11.1	12.2	0	11.8	7.7
	b	35.7	44.4	41.5	11.1	29.4	23.1
	c	28.6	22.2	24.4	0	11.8	7.7
	d	21.4	14.8	17.1	0	11.8	7.7
	e	0	3.7	2.4	88.9	29.4	50.0
7.	a	78.6	88.9	85.4	100.0	76.5	84.6
	b	0	11.1	7.3	0	23.5	15.4
	c	14.3	0	4.9	0	0	0

APPENDIX C (Continued)

		ORIENTED			NON ORIENTED		
				Derby & Polson	Noxon	Superior & Noxon	
Question		Polson	Derby	Polson	Noxon	Superior	Noxon
8.	a	71.4	96.3	87.8	77.8	88.2	84.6
	b	14.3	0	4.9	22.2	5.9	11.5
	c	7.2	0	2.4	0	0	0
	d	0	3.7	2.4	0	5.9	3.8
9.	a	35.7	3.7	14.6	11.1	5.9	7.7
	b	14.3	48.1	36.6	0	17.6	11.5
	c	7.2	3.7	4.9	11.1	27.4	23.1
	d	0	3.7	2.4	22.2	17.6	19.2
	e	21.4	33.3	26.3	55.5	23.5	34.6
10.	a	78.6	92.6	87.8	55.5	58.8	57.7
	b	7.2	0	2.4	11.1	11.8	11.5
	c	7.2	3.7	4.9	22.2	17.6	19.2
	d	0	0	0	11.1	5.9	7.7
11.	a	14.3	29.6	24.4	22.2	47.1	38.5
	b	14.3	0	4.9	0	0	0
	c	64.3	59.3	61.0	66.6	47.1	53.8
12.	a	0	0	0	0	0	0
	b	71.4	48.1	56.1	66.6	76.5	73.1
	c	14.3	33.3	26.8	33.3	23.5	26.9
13.	a	7.2	29.6	21.9	22.2	29.4	26.9
	b	27.6	11.1	17.1	33.3	23.5	26.9
	c	64.3	51.8	56.1	44.4	41.2	42.3
14.	a	7.2	3.7	4.9	11.1	5.9	7.7
	b	0	3.7	2.4	0	60.0	23.1
	c	0	0	0	0	11.8	7.7
	d	0	3.7	2.4	44.4	17.6	26.9
	e	92.8	88.9	90.2	44.4	29.4	30.8
15.	a	14.3	29.6	24.4	55.5	17.6	30.8
	b	50.0	33.3	39.0	11.1	11.8	11.5
	c	14.3	14.8	14.6	44.4	64.7	57.7
	d	7.2	18.5	14.6	0	0	0

APPENDIX C (Continued)

		ORIENTED			NON ORIENTED		
Question		Polson	Farby	Farby +		Superior +	
				Polson	Noxon	Superior	Noxon
16.	a						
	1	7.2	3.7	4.9	22.2	23.5	23.1
	2	14.3	0	4.9	0	0	0
	3	71.4	92.6	85.4	77.8	64.7	69.2
	b						
	1	71.4	92.6	85.4	77.8	70.6	73.1
17.	2	0	0	0	0	5.9	3.8
	3	7.2	0	2.4	22.2	5.9	11.5
	a	0	3.7	2.4	11.1	11.8	11.5
	b	0	3.7	2.4	11.1	17.6	15.4
	c	0	3.7	2.4	0	11.8	7.7
	d	0	0	0	0	0	0
18.	e	85.7	88.9	87.8	77.8	47.1	57.7
	a	7.2	11.1	9.7	44.4	11.8	23.1
	b	21.4	33.3	29.3	22.2	17.6	34.8
	c	0	3.7	2.4	0	11.8	7.7
	d	28.6	14.8	19.5	33.3	23.5	26.9
	e	35.7	37.0	36.8	0	11.8	7.7
19.	a	71.4	96.3	87.8	77.7	35.3	50.0
	b	0	0	0	0	5.9	3.8
	c	21.4	3.7	9.7	22.2	58.8	46.2
20.	a	28.6	44.4	39.0	44.4	23.5	30.8
	b	0	0	0	0	0	0
	c	0	3.7	2.4	0	0	0
	d	14.3	7.4	9.7	0	5.9	3.8
	e	50.0	33.3	39.0	55.5	64.7	61.5
21.	a	21.4	7.4	12.2	0	11.8	7.7
	b	0	0	0	0	5.9	3.8
	c	64.3	70.4	69.3	77.8	52.9	61.5
	d	7.2	7.4	7.3	11.1	5.9	7.7
	e	0	0	0	0	11.8	7.7

APPENDIX D

OCCUPATIONS AND EDUCATIONAL STATUS OF GROUPS
PARTICIPATING IN THE QUESTIONNAIRE SURVEY

	Polson & Polson Darby Darby Noxon				Superior & Superior Noxon		Total
OCCUPATION							
Business	5	5	10	4	4	8	18
Agriculture	2	9	11	0	3	3	14
Skilled							
Labor	3	2	5	3	4	7	12
Other	3	10	13	2	6	8	21
EDUCATION							
Less than							
High School	5	2	7	3	2	5	12
High School	3	12	15	4	8	12	27
Some College	1	7	8	0	5	5	13
College Grad.	3	5	8	2	2	4	12