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A STUDY OF EDUCATIONAL FOREST FIRE PREVENTION MEDIA
IN
WESTERN MONTANA

by

RICHARD JOSHEL BARNEY

B.S. Montana State University, 1958

Presented in partial fulfillment of the requirements for the

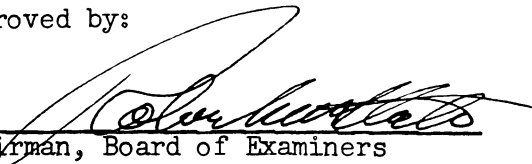
degree of

Master of Science in Forestry

MONTANA STATE UNIVERSITY

1961

Approved by:


Chairman, Board of Examiners


Dean, Graduate School

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"How much better and more useful it is to meet the trouble in time, rather than to seek a remedy after the damage has been done. (Cum melius et utilius sit in tempore occurrere quam post causam vulneratam quaerere remedium.)"

Henry De Bracton

De Legibus

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R. J. B.

TABLE OF CONTENTS

	PAGE
ACKNOWLEDGMENTS	ii
LIST OF TABLES	vi
LIST OF GRAPHS	viii
LIST OF ILLUSTRATIONS	ix
LIST OF FIGURES	xi
INTRODUCTION	1
REVIEW OF LITERATURE	6
METHOD OF PROCEDURE	10
Selection of Area	10
Method of Contact	10
Questionnaire Form A	10
Questionnaire Form B	13
Radio and Television	14
Newspaper	15
Books	16
General	17
PRESENTATION AND ANALYSIS OF DATA	18
Questionnaire Form A	18
Question 1	18
Question 2	19
Question 3	21
Question 4	23

	PAGE
Question 5	26
Question 8	27
Question 11	28
Question 12	30
Question 13	31
Question 14	33
Question 17	34
Question 18	36
Question 19	39
Question 20	50
Interrelationships	50
Questionnaire Form B	56
Radio and Television	58
Newspaper	61
Books	62
General	63
DISCUSSION OF RESULTS	64
CONCLUSIONS	72
SUGGESTIONS	74
SUMMARY	76
LITERATURE CITED	78
BIBLIOGRAPHY	83

	PAGE
APPENDIX	87
I. Forms	89
II. Coding Procedure Form A	97
III. Coding Procedure Form B	111
IV. Interviewing Procedure	115

LIST OF TABLES

TABLE	PAGE
I. Ten Year Summary of Man-Caused Fires in Region One	3
II. Respondents Reasons for Area Use	19
III. Duration of Stay Distribution of Forest Users	21
IV. Residence of Respondents	23
V. Occupational Distribution of Respondents	24
VI. Action to be Taken by Respondents if an Unattended Fire is Seen in the Woods	26
VII. Ratings of Respondents on Knowledge of Campfire Care . . .	28
VIII. Knowledge of Respondents on the Shovel, Axe and Bucket Regulation	30
IX. Distribution of Media Involved in Education of the Shovel, Axe and Bucket Regulation	31
X. Relative Compliance with the Shovel, Axe and Bucket Regulation	33
XI. Rating of Respondents on Cigarette and Match Care	34
XII. Opinion of Respondents on the Best Method to Get Fire Prevention Across to the People	36
XIII. Opinion of Respondents on the Best Reminder of Fire Prevention	39
XV. Comparison of Occupation to Rating on Knowledge of Campfire Care	51

TABLE	PAGE
XVI. Comparison of Occupation to Rating on Cigarette and Match Care	52
XVII. Comparison of Out-of-State to Resident Respondents on Knowledge of Campfire	53
XVIII. Comparison of Out-of-State to Resident Respondents on Knowledge of the Shovel, Axe and Bucket Regulation	55
XIX. Comparison of In-State to Out-of-State Residents on Knowledge of Proper Care with Matches and Cigarettes	56
XX. Summary of Answers on the Question of Where Forest Fire Prevention was Last Heard of	58
XXI. Column Inches Summary of Forest Fire Material in Newspapers	62

LIST OF GRAPHS

GRAPH	PAGE
1 Number of Man-Caused Fires by Years	4
2 Reasons for Area Use by Category and Per cent	20
3 Duration of Stay Distribution of Forest Users	22
4 Occupational Distribution of Respondents	25
5 Rating of Respondents on Knowledge of Campfire Care	29
6 Frequency Distribution of Media Involved in Education of the Shovel, Axe and Bucket Regulation	32
7 Rating of Respondents on Cigarette and Match Care	35
8 Opinions of Respondents on the Best Method to Get Fire Prevention Across to the People	37
9 Opinions of Respondents on the Best Reminder of Fire Prevention	40
10 Effectiveness of Signs by Types as Judged by Respondents	49
11 Comparison of Out-of-State to Resident Respondents on Knowledge of Campfire Care	54
12 Comparison of In-State to Out-of-State Residents on Knowledge of Proper Care with Matches and Cigarettes	57
13 Summary of Where the Forest Fire Prevention Message was Last Heard	59

LIST OF ILLUSTRATIONS

PLATE		PAGE
1	Picture 1 An Example of a Port-of-Entry Sign	42
	Picture 2 Another Example of a Port-of-Entry Sign	42
2	Picture 1 "Smokey Bear" Posters	43
	Picture 2 Informational Campground Sign	43
3	Picture 1 Picture Type Poster	44
	Picture 2 Picture Type Posters	44
4	Picture 1 One of a Series of Four	45
	Picture 2 Two of a Series of Four	45
	Picture 3 Three of a Series of Four	45
	Picture 4 Four of a Series of Four	45
5	Picture 1 The Display Type Sign	46
	Picture 2 and 3 Fire Danger or Burning Index Sign	46
6	Picture 1 Sign in the Category of <u>Other</u>	47
	Picture 2 Signs in the Category of <u>Other</u>	47
7	Picture 1 A Torn Sign Loses its Effectiveness and May Have Negative Results	68
	Picture 2 Signs Cannot be Effective if They Cannot be Seen	68
8	Picture 1 Signs Nailed to Trees Give Poor Impressions and Results	69
	Picture 2 and 3 Signs Improperly Displayed Are Not Effective	69

PLATE		PAGE
9	Picture 1 A Local Artist Produces an Effective Sign . . .	71
	Picture 2 and 3 Ingenuity Brightens up the Back of Standard Signs with a Fire Pre- vention Message	71

LIST OF FIGURES

FIGURE		PAGE
1	Map of West Half of Montana Showing Major Cities and Study Area	11

INTRODUCTION

DOLLARS BURN -- In 1959 there were 104,622 forest fires in the United States. These same fires burned a total of 4,155,591 acres of timber and range land. The major cause of this waste was man and his carelessness. Over 90 per cent of all forest fires that year were attributed to the general classification of man-caused fires (53). Davis pointed out recently at a fire research meeting that people cause 98 percent of the fires in the Lake States (24). To bring this picture down to a local level, the United States Forest Service in Region One spent \$5,319,785 putting out forest fires during the 1960 season. This sum of money was distributed among 1,389 fires of which 28 per cent or 386 were man-caused. Region One now has over 35,000 burned and blackened acres to rehabilitate from these fires, primarily because of carelessness.¹

To some people numbers are not interesting, but the fact that every pocketbook is being affected by forest fire losses may help bring corrective results (23). We spend about fifty cents per person to put out fires but only about five cents per person to prevent them (34). Barrows pointed out that the average size of man-caused fires is over three times greater than that of lightning-caused fires (6). These facts of dollars spent and acres burned are intended to point out the necessity of forest fire prevention.

Historically, fire prevention is nothing new in the United States.

¹U. S. Forest Service statistics, Region One.

The need for fire prevention in the forests really antedates the term "forestry" in America by some 200 years. Early colonists legislated against setting fires in the seventeenth century. Until the 1870's there was relatively little fire prevention activity of any form. On the other side of the globe, however, Napoleon I was ordering people shot if they were found starting fires on his land. The establishment of the Federal Forest Reserves in 1891 appeared to be the turning point. The burns of 1910 aroused the public and fire prevention could no longer be put off (39).

The scare approach was first used, followed by improved legislation on restricting people from burning indiscriminately. From the time of the "Weeks Law" passage, fire prevention developed under the growth of a fire control organization. The Western Forestry and Conservation Association played an important part in the promotion of fire prevention. By the twenties there was greater access into the wilderness and modes of transportation had improved. These factors rapidly increased forest use and in turn the need for fire prevention work (39). In the 1940's the advertising agency of Foote, Cone and Belding came up with the now famous character of "Smokey-the-Bear" (48). It wasn't too long before a live symbol was found in the form of an orphaned and singed cub bear rescued from a New Mexico fire (20). From then until today this bear has remained the nationally recognized symbol of forest fire prevention. The only major developments since this time are in the media and techniques for selling fire prevention to the public. A concentrated and cooperative program directed at incendiary fires in the South pointed out quite effectively that prevention efforts can pay off. There has

also been a limited amount of research into this problem in an attempt to get to the bottom of man-caused fires, and improve distribution of educational material.

As Gustafson pointed out, the most successful fire control job that can be accomplished is the prevention of fires. Although some fires are not preventable--lightning, plane crashes, etc.--the vast majority of man-caused fires are susceptible to fire prevention (30). It is important to note that the Scandinavian countries have no man-caused fire problem (7). Many people realize and point out the need for critical and directed evaluations along the lines of forest fire prevention research (29, 42, 45). From an article in Fire Control Notes the following quotation was taken (49).

Analysis of the media being employed by the Forest Service indicates a real need for research in several of the fields. For example the present policy on the prevention sign. No real satisfactory answers are given to questions concerning their value. There seems to be little real enthusiasm for them among most field officers. One gains the impression that they are placed more from habit than from factual analysis of their value.

This statement seems to emphasize the general attitudes and needs of fire prevention. Ten year fire statistics for Region One, as shown in Table I, illustrate the occurrence of man-caused fires. The trends of this same period are shown by Graph I.

TABLE I

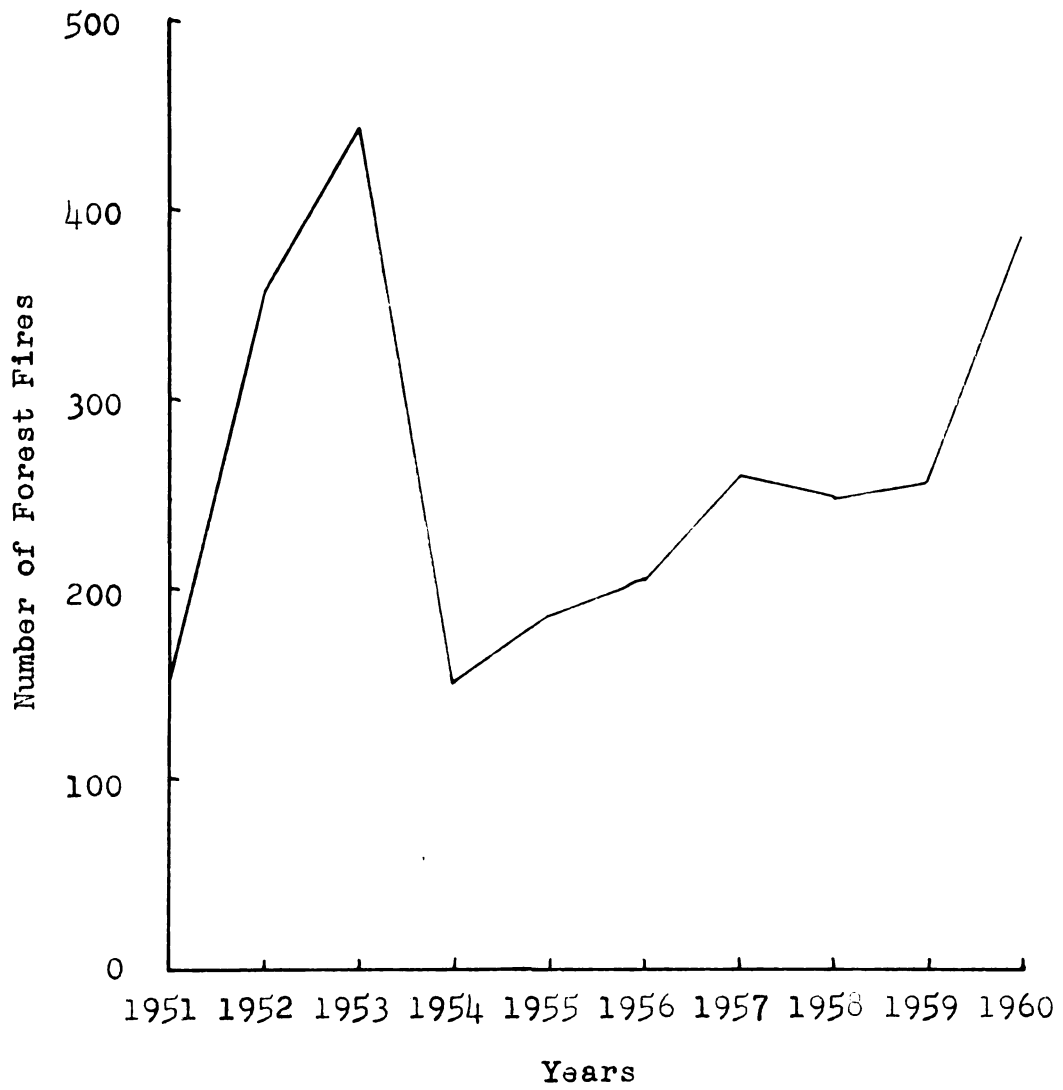
TEN YEAR SUMMARY OF MAN-CAUSED FIRES IN REGION ONE

Year	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960
Man-Caused	158	357	444	151	186	205	259	248	256	386

GRAPH 1

Number of Man-Caused Fires by Years in
Region One

1951 - 1960



Fire prevention includes education, law enforcement, and hazard reduction. As the title of this paper suggests, this study deals primarily with fire prevention education. The term media means the method-- signs, radio, television, newspaper, etc.-- that carries the fire prevention message. The primary objective of this study is to evaluate the various educational fire prevention media being used in respect to their effectiveness in reaching the public with the desired message. Secondly, it is intended to evaluate the general fire prevention knowledge of the forest users. With this information evaluation, suggestions and an attempt to improve the efficiency of fire prevention will follow. Review and study of the individual media and interviews of forest users will constitute the general manner of investigation.

From all indications the most significant information derived from this study is the present lack of personal contact is not promoting the fire prevention campaigns. All the national, regional, and local efforts appear to lose impact, effectiveness and meaning when they are not closely followed by direct contact at the local level.

REVIEW OF LITERATURE

Most phases of forestry have volumes of material concerning them, whereas the amount of literature pertaining to forest fire prevention is limited. In searching for detailed studies concerned with educational fire prevention media, little was found. Some of the work observed was allied to the area of prevention media but much more was not. The following material is a brief resume of the previous studies in this field. These studies point out the progression of thought and methodology throughout the years.

The Massachusetts Forestry Association carried out an experiment on Cape Cod in the 1920's. The purpose of the work was to determine the value of public education and patrols in prevention of forest fires.

Conclusions drawn from the experiment were as follows (40):

1. The forest fire losses on Cape Cod can be reduced to the point where growing forests would be a good insurable risk.
2. Each town in the experimental area should employ two or more patrolmen during the dangerous fire season only.
3. Patrolmen should be used only when actually needed, thereby lowering the cost of patrol work.
4. Under similar conditions more patrolmen should be engaged during dangerous fire weather than were used in the experiment.
5. Under conditions similar to those on Cape Cod it is more effective to spend money for the prevention, than for the suppression of forest fires, although adequate equipment for fire fighting must be maintained by the town.
6. If a policy of prevention is consistently followed a reduction in the average forest fire loss will result and in certain localities a reduction in the average cost as well.

7. The opening of woods roads is of practical value in the fighting of forest fires, where large areas of forest land are not now accessible.
8. The formation of Forest Wardens Associations is a prime factor in solving the forest fire problem.
9. Public education and patrol should be combined in any system of fire prevention.

In 1938 Homer E. Anderson (2) conducted a study in Montana on the subject of fire prevention. Although hired by the Forest Service, he entered the areas as a private citizen with no government connections. For all outward purposes he was just a fisherman on vacation. His study was primarily directed to observations of what people did, felt and said while in the woods. The findings were varied but useful, even today. It was decided that the "Shovel, Axe and Bucket" poster regulation has little effect on the forest users--probably because they are not checked closely enough by the contact men or others working for the Forest Service. He also mentioned the absence of this equipment in many cases. Anderson went on to say that since the summer employee is usually the contact man and considered the "Ranger" he should have more experience and training to meet the public. The schedule of this contact (or clean-up) man should be staggered so campers can expect him to arrive at any moment. The actual district ranger doesn't get to meet the public enough. He pointed out that the United States National Park Service has shown what can be done with public relations. People are impressed by the neat uniform, western hat, and pleasing personality. Through occasional appearances in various areas the district ranger could impress upon the public his responsibilities and their obligations.

The late 1930's appear to be an era when much of the early fire

prevention work occurred. At the same time that Anderson was probing and questioning in Montana the South was an area of intensive study. Three separate projects along the same general design, of a psychological approach, were being conducted (13, 36, 46). These studies followed similar patterns of investigation. All the researchers were psychologists, remaining as inconspicuous as possible. Their main idea was to mingle with the native population, gaining as much information on attitudes towards fire as possible. These studies brought out the necessity of bringing the forest fire prevention material down to the local level. In this way the public could be more effectively educated and taught why prevention was necessary.

During this same period, work was going on in California on a much smaller scale. A check was made later in the year on the people who had been fined for violations during the fire season. It was found that a majority understood the necessity of law enforcement. The people objected, however, to an excessive fine for the first offense. This work also pointed out the position of education and its need in matters of a similar nature (26).

Doyle (25) surveyed causes of forest fires in Canada. One of the main suggestions evolving was that more and better education was needed.

Until this point a majority of these past studies and experiments were of a general nature. Several attempts at working with small segments of the overall fire prevention problem were conducted at Montana State University and the University of Southern California (4, 5, 27, 32, 33, 50, 54). With advancements in other areas of forestry came progress in this specialized field. Chandler points out that there are

three approaches to studying fire prevention (14):

1. Statistical analysis
2. Public opinion survey
3. Controlled experiment

The University of Southern California began work on fire prevention research in the mid-1950's (27). The University pointed out that relatively little is known at present concerning the effectiveness of various kinds of media in transmitting the fire prevention message (54). The most recent approach is concerned with the human behavioral aspects of forest fire prevention (32, 33). This work at California had opened new avenues in the field of prevention research. There is a need for more work on who, what, when, where, why and the use of less generalization. In essence the University points out the need to do basic research on the problem.

It is a difficult task to place a value on any program of a preventive nature. This difficulty arises because there is no adequate method of telling what might have happened in the event that no prevention efforts had been applied. This problem confronts the individual attempting to evaluate any fire prevention program. Therefore, a yardstick or measuring method must be developed to evaluate fire prevention efficiency (11, 12, 13, 17, 37, 38, 51, 55). These tests and methods range from relating burning index to possible fire, to probability based on past occurrence, risk factors, and to the effects of population. These methods may evaluate the prevention problem as a whole but they fail to tell where the programs are succeeding or failing and what to do in either case.

METHOD OF PROCEDURE

Selection of Area

This study was conducted in the Swan Valley, located sixty miles northeast of Missoula, Montana. The limits of area were defined on the north by the north end of Swan Lake and on the south by the junction of the Seeley Lake road and Montana Highway 20. The east and west boundaries were the Swan range of mountains and the Mission Range respectively.

This area was chosen for numerous reasons, primarily because of the ease with which it is reached as well as the diversity of recreational activities available. The Swan Valley has everything from water skiing, fishing, hunting, and swimming to miles of forest trails. A scenic and hard surfaced road bisects the entire valley. This road provides easy access to the local people as well as to the tourists. People from all over Montana and the United States use this area freely. There are several improved campgrounds, motels and guest ranches to provide a variety of accommodations. Many protection agencies are in charge of the area and a majority of the educational forest fire prevention media reach into or are used in the valley. It was felt that the Swan Valley was a representative example of multiple use and forest management in Western Montana. The map in Figure 1 shows the location of the study as well as the location and proximity of major cities.

Methods of Contact

Questionnaire Form A.- As mentioned earlier, personal contacts

FIGURE 1

MAP OF WEST HALF OF MONTANA SHOWING MAJOR CITIES AND
STUDY AREA



Scale 1 inch = Approx. 60 Miles

WESTERN HALF OF MONTANA

of all forest users available were made in the test area. In an attempt to treat each party with a degree of similarity a check list of information in the form of a questionnaire was developed. After several attempts and revisions, Form A, as seen in the Appendix, was adopted and used throughout the field season. In looking at this form it will be noticed that the first few questions, although obtaining useful information, were designed to place the individual in a receptive mood. The purpose of Form A was twofold: (1) to determine what media are best for educating the public and (2) to evaluate the knowledge of the forest user on two basic questions concerning forest fire prevention.

The administrator of this questionnaire identified himself as a graduate student at Montana State University. He avoided connection even with the School of Forestry. It was the definite intention to avoid any association with the Forest Service, State Forestry Department, or other government agencies. This precaution was to prevent possible bias occurring from fallacious association with those organizations. This approach was similar to that of early fire prevention research mentioned in the review of literature. By further inspection of the questionnaire it will be noted that there is a section for comments. In this space much additional and useful information was obtained.

It should be mentioned that several questions were deleted. The reasons for the deletion were simple. In questions number 6, 7, 9, 10, 15, and 16 there was repetition. The original intention was to gain the "what and where" knowledge on the question preceding each pair. The concept was sound, however not practical. People would answer the first pair to the best of their ability but upon reaching the same pair

later in the interview, would reply "same as the other time." It was felt by this author that these were not valid statements, hence the withdrawal of the question. After this minor adjustment the form remained the same.

The method of recording on the form can be best understood by looking at the coding procedures in the Appendix. All entries were handled, as near as possible, according to the instructions. Conversation before and after the completion of the form was encouraged in an attempt to draw more thought, opinion, and ideas from the respondent.

Questionnaire Form B.- Because individual interviews are time-consuming and costly--although quite productive--another approach in determining what is an effective fire prevention medium was undertaken. One of the questions previously used on Form A was used here. Several possible answers were placed on a small form (see Appendix). This form was a self explanatory, self answering type. All an individual had to do was check a box or two and if necessary write down one or more words.

The same question was placed on five different forms. The only difference between these forms was in the arrangement of the answers. Form B was numbered from one to five in the upper right hand corner, for identification of answer arrangement. Arrangement changes were intended to avoid bias by people checking first and last boxes without thought.

These varieties of the form were shuffled to mix them. Hunter checking stations in two locations were selected for dissemination of the material. The operators of the stations were given a minimum of instruction and were asked to hand out and collect as many forms as possible.

The information collected was taken directly from the forms and

placed on punch cards for sorting (see coding procedure of Form B).

Several references were found invaluable and used extensively for reference and background in the planning of interviews and construction of the questionnaires (1, 28, 43). Also the suggestions of Dr. Burgess were found to be of great help (10).

Radio and Television

In a society where there are over fifteen million radio sets of all types, it seems a safe assumption would be that everyone in the United States has access to a radio. This fact points out the scope of radio as a potential medium. About 90 per cent of cars owned in 1959 were equipped with radios. That same year over 35 per cent of all radios produced were for automobiles and over 20 per cent were of the portable battery type (3). What does all this mean? It means that here is a highly satisfactory medium that is readily available at home, on the road, and in all forms of recreation. The potential in radio, if it is used in the proper manner, is infinite.

A general evaluation of radio was attempted in this study. The majority of the radio stations in cities surrounding the field study area were contacted. Here again an attempt at uniformity was made by using a standard form (see Form C in the Appendix). This form was designed to record only the spot and special announcements concerning forest fires and fire prevention. Material was taken directly from the station logs for the months of July and August 1960. The times or duration of the announcements were recorded in seconds.

Because of the difficulty in ascertaining the amount of fire prevention material in news and similar broadcasts, time of this type was

not considered. It was the intention of this portion of the study to determine a total time devoted to forest fire prevention and a frequency of announcements for each station checked.

Further information was obtained from the station personnel by general questioning and interviews. Questions on their feelings toward fire prevention as well as improvement needs were brought up. Suggestions on the existing methods were solicited.

Television is a relatively young medium compared to radio. There is not the coverage of the population by television in the study area due to technical and economic limitations. Because of the growing potential, this medium could not be ignored. The approach to this phase of the study is parallel to that of radio. The intention was the same as far as information desired and methods of data collection.

Newspaper

Newspaper is an item common to nearly everyone in America. The front page, the women's page, the sports section, and, last but not least, the comics, all have a part in our routines and our lives. Because this is true an evaluation of newspapers was attempted. This evaluation, however, was only along the lines of forest fires and fire prevention.

Papers were scanned page by page in four of the major cities surrounding the study area. Here as before a form was set up to standardize methods and results (see Form D in the Appendix). All issues of these various papers were checked from July 1, 1960, through September 15, 1960. In order to obtain a standard value which would be easily understood, a column inch was used. For all practical purposes a column inch is a unit of space in magazines or newspapers one inch deep and the

width of one column. It is realized that column width varies with the publication, but for the papers studied the variation was only from two inches to $2\frac{1}{4}$ inches. By use of this measurement a better concept as to the amount of space used in relation to the known quantity can be visualized. The amount of material printed in a given space can vary with the size of type used. The major intent here was to have an easily applied standard method of measurement.

After material was measured it was grouped into three categories: news, interest, and pictures. Any item falling into the class of news had to be of current and newsworthy material. The interest and information category covered such articles as what goes on in a fire camp, historical background, etc. The division on pictures should be self-explanatory. Any picture dealing with forest fire or prevention activities was measured. Not only was the article grouped as to type but located as to position in the paper and on a page. A page was divided into imaginary quadrants. For example, 3UR would place the information in the upper right quadrant of page 3.

Books

Many authors stress the need for education in forest fire prevention and refer to the effectiveness of this approach, especially in schools (8, 31, 35, 41, 44, 56). With this in mind an evaluation of text books used in the schools was undertaken. In an earlier study by this author (5) it was found that the age group which started the most fires was of the fifth grade level. Because of this fact the textbooks used in the Missoula County schools for the fifth grade were checked (4). Each book used was screened for material on fire prevention. The number of

pages and illustrations were noted if they contained material on fire. The content was also evaluated as to completeness and accuracy.

General

Local plans and procedures in all phases of fire prevention were observed in the study area. Several administrators were interviewed for opinions and suggestions concerning forest fire prevention, past, present, and future. The interviews were conducted on a regional, district and local level. General observations were made while in the field covering the proposed activities as outlined in protection agencies' prevention plans.

PRESENTATION AND ANALYSIS OF DATA

Questionnaire Form A

In the analysis of these data a separation of results was felt to be an advantage to the reader. Each question will, therefore, be treated as a separate entity. A brief explanation is given in the way of introduction and this will be followed by the results and comments. During the test period 182 interviews were completed. One of the difficulties was that most of the interviews were not with individuals but with parties. Another problem was that some of the interviews took two hours or more because of very talkative individuals. Census figures that were available yielded a value that the average party was composed of 3.75 people. Applying this to the overall number of questionnaires completed results in a total of approximately 700 people contacted. A summary of results and conclusions will follow this section.

Question 1 - "What brings you into this area?" This question was intended as an opener for the interview to follow, acting as an introduction. It should not be misunderstood that the information obtained from the question is useless. On the contrary, it gives a good impression of the reasons for use of an area and the type of people that can be expected. All the information that can be gathered as to the population using an area helps in planning the fire prevention campaigns for the future. The following table and graph show the relationships of the reasons of use.

TABLE II
RESPONDENTS REASONS FOR AREA USE

Reasons for Use	Number of Users	Per Cent
Camping	153	60.0
Boating	36	14.1
Fishing	31	12.2
Swimming	13	5.1
Picnicking	12	4.7
Water Skiing	7	2.7
Work	2	.8
Other	1	.4
Total	255	100.0

It should be pointed out that the total number of answers here is 255. This difference from the total number of forms completed is due to the fact that respondents gave multiple answers.

Question 2 - "How many days do you plan to stay here?" This was another introductory question. It is realized that there are many implications possible from the relationships here to other questions. However, they will not be explored in this study. Here again a further knowledge of the population using the forest area is obtained. The duration of stay may have an effect on the attitudes of the campers. The person staying only one hour in an area has a different feeling than the individual who stays for a week. Table III gives a breakdown on duration of stay and Graph 3 presents a more visual picture.

GRAPH 2

Reasons for Area Use by Category and Percent

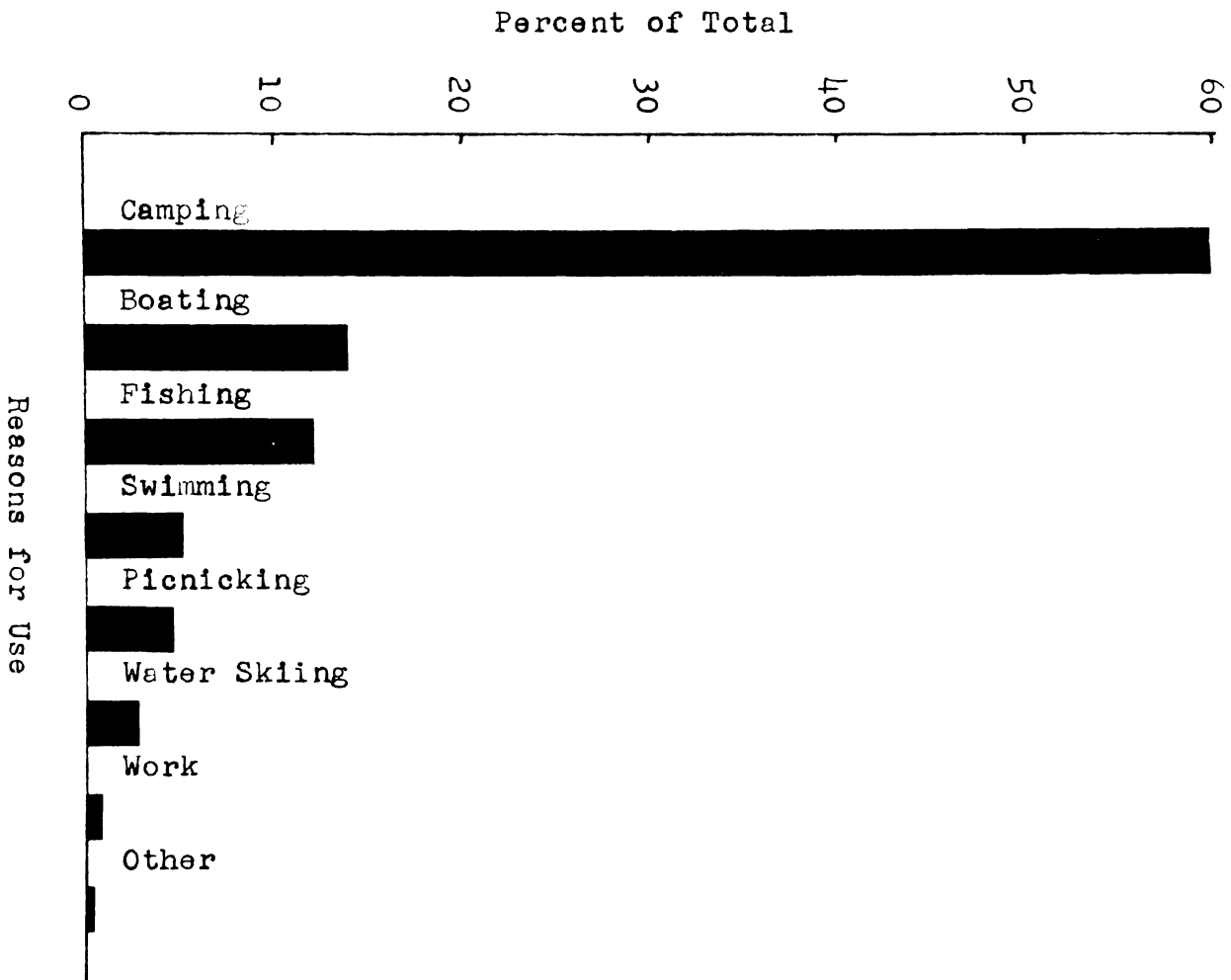


TABLE III
DURATION OF STAY DISTRIBUTION OF FOREST USERS

Number of Days	Number of Responses	Per Cent
1	31	17.0
2	36	19.8
3	23	12.6
4	20	11.0
5	14	7.7
6	2	1.1
7	38	20.9
8-14	15	8.3
15-21	1	0.5
22+	2	1.0
Total	182	100.0

It can readily be seen that the greatest number of people stay one week or less. The week-end people take up over one third of the total. Approximately 90 per cent of the people sampled fall into the one-to-seven-day category. All the above is pointed out in Graph 3.

Question 3 - "Where are you from?" Again as in the first two questions, the intent here was of introduction. Also a distribution of residents to non-residents was desired. The knowledge of where the respondents were from allowed a comparison on several points between Montanans and out-of-state people. The following table gives the distribution of residence as found in the test area and sample.

GRAPH 3

Duration of Stay Distribution
of Forest Users

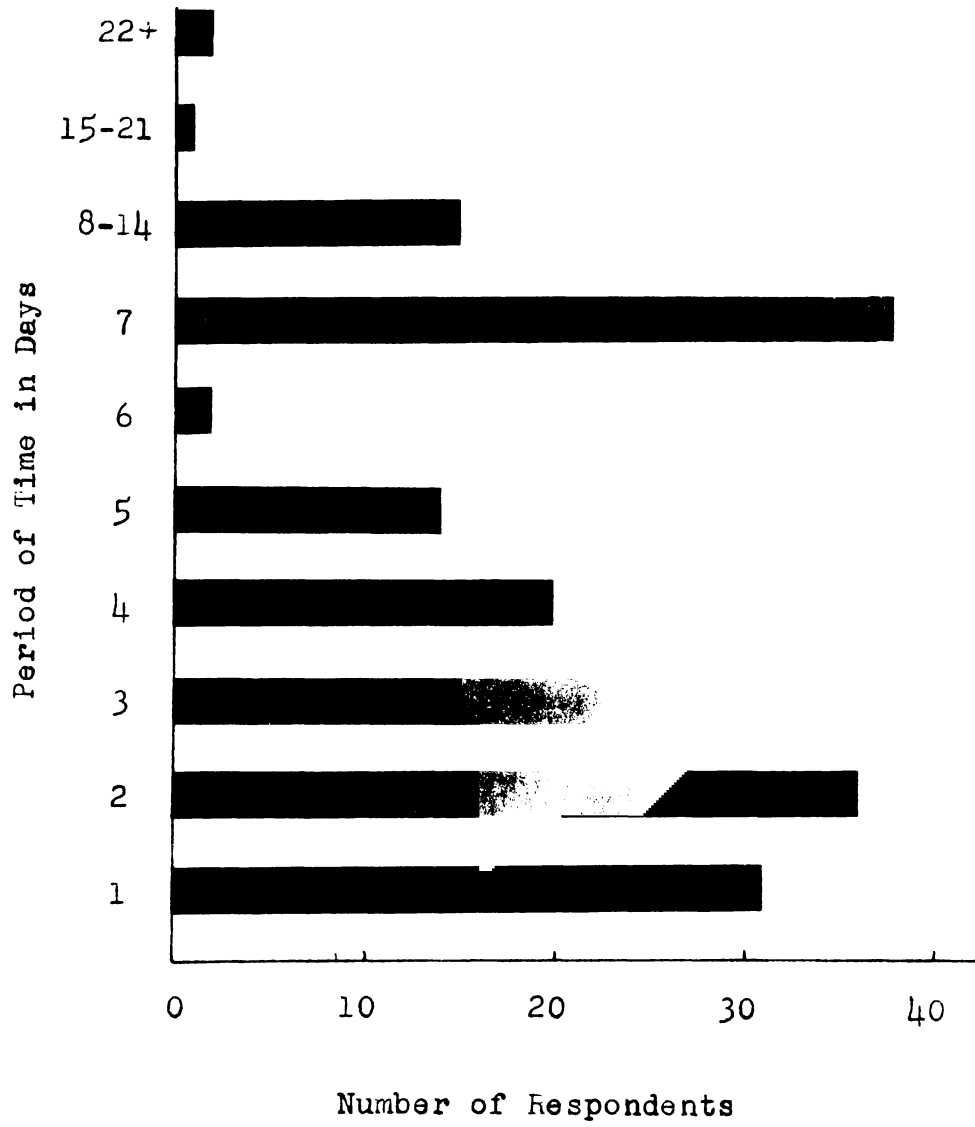


TABLE IV
RESIDENCE OF RESPONDENTS

Residence	Number of Respondents	Per Cent
Montana	157	86.0
Out-of-State	25	14.0
Total	182	100.0

The ratio here is better than six to one favoring Montana. Some of the comparisons of answers and residence are brought out later in this paper.

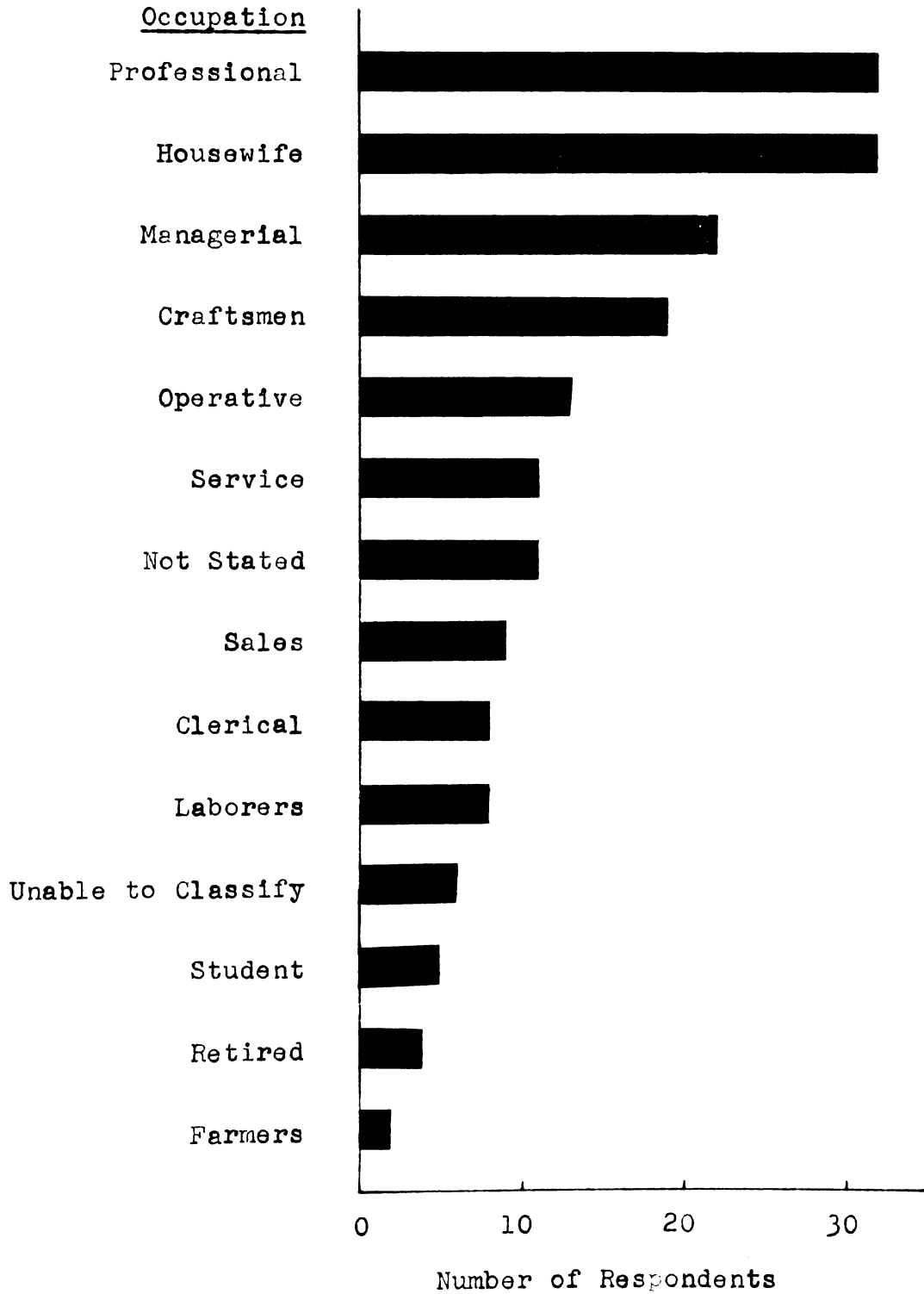
Question 4 - "What do you do for a living?" Another multiple purpose question comes into use here. The population analysis would not be complete without knowing what the people using the woods do for a living. It is desirable to have a good distribution of the different occupations. There are also various correlations possible as to job and relative knowledge about forest fire prevention. For ease of recording, the various occupations have been grouped and set up into categories. A detailed explanation of the type of people and jobs that make up the occupational titles can be found in the coding procedure in the Appendix. Table IV and Graph 4 show the distribution of occupations of the respondents who were using the facilities or were contacted in the study area.

TABLE V
OCCUPATIONAL DISTRIBUTION OF RESPONDENTS

Occupation	Number of Respondents	Per Cent
Professional and Technical	32	17.6
Housewife	32	17.6
Manager, Officials and Proprietors	22	12.1
Craftsmen and Foremen	19	10.4
Operative Workers	13	7.1
Service Workers	11	6.1
Not Stated	11	6.1
Sales Workers	9	4.9
Clerical Workers	8	4.4
Laborers	8	4.4
Unable to Classify	6	3.3
Students	5	2.7
Retired	4	2.2
Farmers and Farm Workers	2	1.1
Unemployed	0	0.0
Total	182	100.0

GRAPH 4

Occupational Distribution of Respondents



Question 5 - "What would you do if you saw a small unattended fire in the woods?" Since there has been education on what to do when a forest fire is seen, an evaluation of this education and the knowledge of respondents was attempted. Today there are signs, literature, and announcements telling the public what to do in this situation. The question of the efficiency of the educational job accomplished has arisen. This portion of the study is an attempt to evaluate the knowledge of the public and indirectly the educational job being produced. Table VI tabulates the results for comparison.

TABLE VI
ACTION TO BE TAKEN BY RESPONDENTS
IF AN UNATTENDED FIRE IS SEEN IN THE WOODS

Action to be Taken	Number of Respondents	Per Cent
Put it out or try	130	71.5
Report it and try to put it out	40	22.0
Report it only	10	5.5
Put it out or report it	1	0.5
Nothing	1	0.5
Total	182	100.0

From all appearances 93 per cent of the people will put out a fire they observe in the woods. The actuality of such a thing happening would be difficult to determine. Only 27 per cent of the sample would bother to report the fire even though they would put it out. In the

opinion of this author, reporting is as important as putting the fire out. This is true for several reasons. If fires are reported a check can be made in extreme weather to be sure they do not rekindle. Also it can be entered on the records, cause determined, etc.

Question 8 - "What care should be taken when building or putting out a campfire?" In order to avoid any doubts it is pointed out that questions 6 and 7 have been omitted and not inadvertently left out of the text. The sole purpose of question 8 was an attempt at evaluating the knowledge of the forest user. Even the early signs and campaigns were directed at campfire care. Present day slogan, "Be Sure Its Out..." as well as similar phrases are supposed to be on the lips and in the minds of everyone using the forests. Because many fires are caused by campfires--in one way or another--it was felt that this was an opportunity to investigate an important area. A rating system was devised (see coding procedure) and used in conjunction with this question throughout the survey. Tabulation of the results can be seen in Table VII. The reader will notice that over 40 per cent of the respondents fell into the Fair category. Further inspection of the table, Graph 5, and the coding procedure will show more clearly the lack of overall knowledge and understanding.

It is quite possible that the reader may not agree with this rating system. The application of certain criteria to standardize the procedure was necessary. A personal evaluation may be made if desired.

TABLE VII
RATING OF RESPONDENTS ON KNOWLEDGE OF CAMPFIRE CARE

Rating	Number of Respondents	Per Cent
Excellent	10	5.5
Good	68	37.4
Fair	85	46.7
Poor	18	9.9
No answer	1	0.5
Total	182	100.0

Question 11 - "What is the regulation on the shovel, axe and bucket?" The required answers to this question were simply an expression by the person being interviewed that he knew about the regulation. Because it is a Montana regulation, determination of the awareness of the forest users concerned was believed to be desirable. As pointed out in Table VIII, over 90 per cent of the respondents expressed knowledge of the law. It is felt that the knowledge that the people do have is limited to the fact that they are supposed to carry these certain tools during the fire season. When several of the people confronted were asked about the suggested sizes of tools to be carried as stated in the regulation, they were at a loss for a description. People who did give some indication as to possible size limitations admitted they were guessing.

GRAPH 5

Rating of Respondents on Knowledge
of Campfire Care

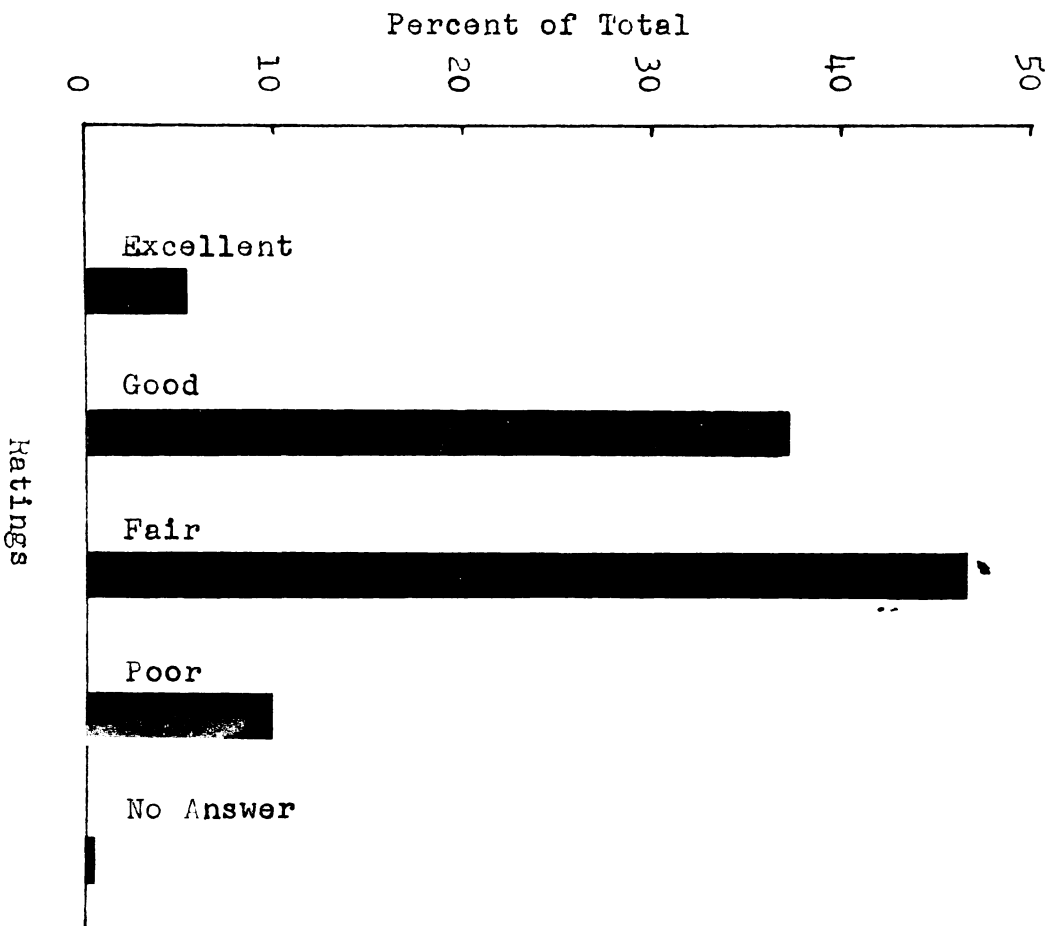


TABLE VIII
KNOWLEDGE OF THE RESPONDENT ON THE SHOVEL, AXE
AND BUCKET REGULATION

Answer	Number of Respondents	Per Cent
Knows of the regulation	169	92.9
No knowledge of regulation	10	5.5
No Answer	3	1.6
Total	182	100.0

Question 12 - "Where did you learn about this regulation?" One of the purposes of the survey was to determine where people are getting their knowledge. This question is the first one of the interview directed at this goal. Other attempts are made later in the questionnaire. The author realizes that the answer given might not be the place where the regulation was learned. The medium mentioned, however, certainly sticks in the minds of the individuals enough to answer mentioning them. The repetition of one certain medium might indicate that it has more impact upon the public than others. This question could be answered by several choices. If more than one medium was mentioned, all were recorded. Table IX as well as the following graph, number 6, will help to visualize these relationships.

TABLE IX

DISTRIBUTION OF MEDIA INVOLVED IN EDUCATION OF THE SHOVEL, AXE AND BUCKET REGULATION

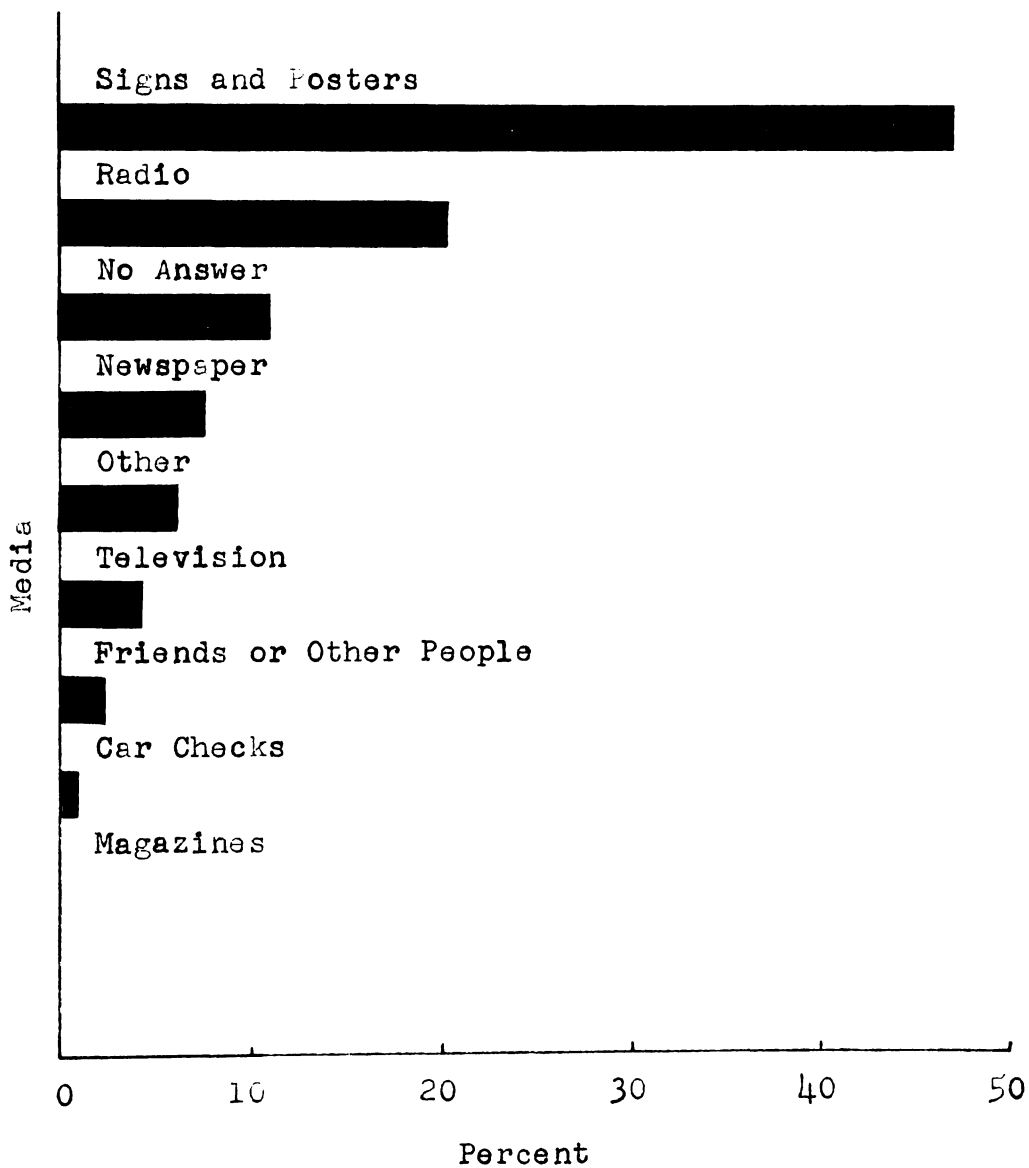
Media	Number of Respondents	Per Cent
Signs and Posters	99	47.2
Radio	42	20.3
No Answer	23	11.0
Newspaper	16	7.6
Other	13	6.2
Television	9	4.3
Friends or other people	5	2.4
Car Check	2	1.0
Magazines	0	0.0
Total	209	100.0

Question 13 - "Do you have a shovel, axe and bucket with you?"

In light of the supposed knowledge concerning this regulation, a survey of the possession of such equipment was initiated. The word of each respondent was taken as no actual search was made. Several individuals offered to show their equipment. In Table X the results are compiled on the question. The combination categories including people who admitted non-compliance with the regulation was about 10 per cent. The remaining 90 per cent of the sample said they had the proper equipment; this is felt not to be representative. Knowledge of previous car checks has brought out the point that people say they have the equipment when they do not. This was not because people are dishonest, but because they

GRAPH 6

Frequency Distribution of Media Involved in Education
of the Shovel, Axe and Bucket Regulation



feared such possible retribution as terminating their planned holiday. It is significant, however, that approximately 10 per cent admitted inadequacies and non-compliance with the regulation when asked.

TABLE X
RELATIVE COMPLIANCE WITH THE SHOVEL, AXE
AND BUCKET REGULATION

Equipment	Number of Respondents	Per Cent
Shovel, Axe and Bucket	164	90.2
Partially Equipped	11	6.0
Nothing	7	3.8
Total	182	100.0

Question 14 - "What care should be taken with cigarettes and matches?" Here, as in question eight, is an attempt to evaluate knowledge of forest users in the test area. The match and the cigarette have played an important part in past forest fire prevention. These two items have also been the cause of many fires in recent decades. The rating applied here may not be in agreement with many people; however, it has provided a basis from which to draw conclusions. The following table shows the results and ratings of the 182 respondents. A complete breakdown and criteria for the ratings are found in the Appendix. The large frequency in the category of No Answer is very probably due to sampling techniques (see Table XI, Graph 7). This group includes non-smokers who were not asked to elaborate on this point. Their knowledge or lack of same was not tested here.

TABLE XI
RATING OF RESPONDENTS ON CIGARETTES AND MATCH CARE

Rating	Number of Respondents	Per Cent
Excellent	5	2.7
Good	11	6.5
Fair	55	30.1
Poor	43	23.5
No Answer	68	37.2
Total	182	100.0

Question 17 - "In your opinion, what is the best way to get fire prevention across to the people?" The words of the question explain the purpose of this portion of the form. Because the people on the receiving end of this prevention campaign are of prime importance, their opinions as to methods were solicited. Table XII points out the results as determined from the interviews. Graph 8 gives a more vivid visual interpretation of this material. This question was another where multiple answers were accepted, thus accounting for the 239 responses from 182 respondents. A lack of responses under the heading of magazines seems to substantiate the findings of Gerletti (27).

GRAPH 7

Rating of Respondents on Cigarette and Match Care

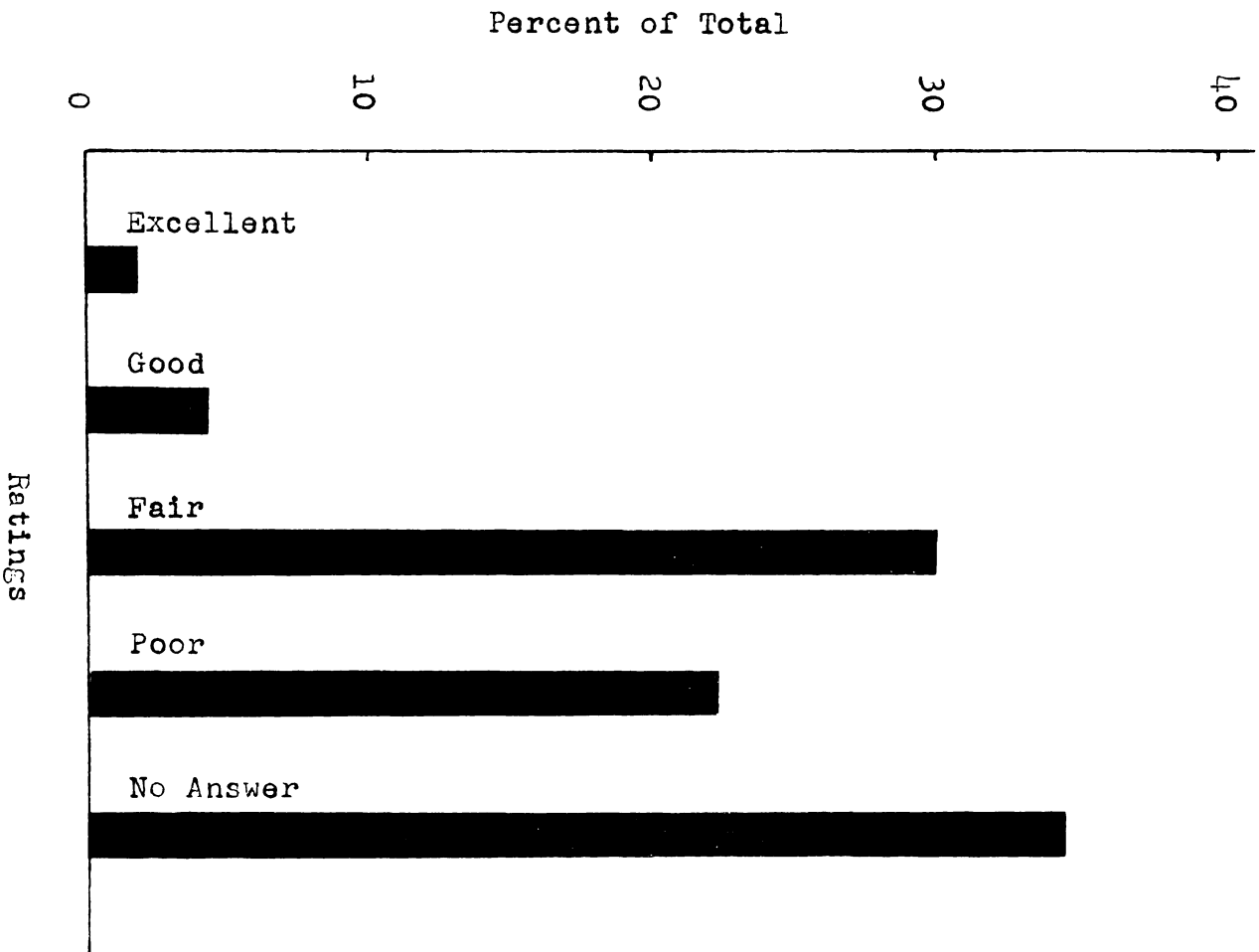


TABLE XII
 OPINIONS OF RESPONDENTS ON THE BEST METHOD TO GET
 FIRE PREVENTION ACROSS TO THE PEOPLE

Answer	Number of Respondents	Per Cent
Other	45	18.8
Signs and Posters	43	18.0
Television	43	18.0
Radio	36	15.0
Smokey Bear	21	8.8
See a fire or results	18	7.5
Put on a fire line	17	7.1
Newspapers	10	4.3
No answer or doesn't know	6	2.5
Magazines	0	0.0
Total	239	100.0

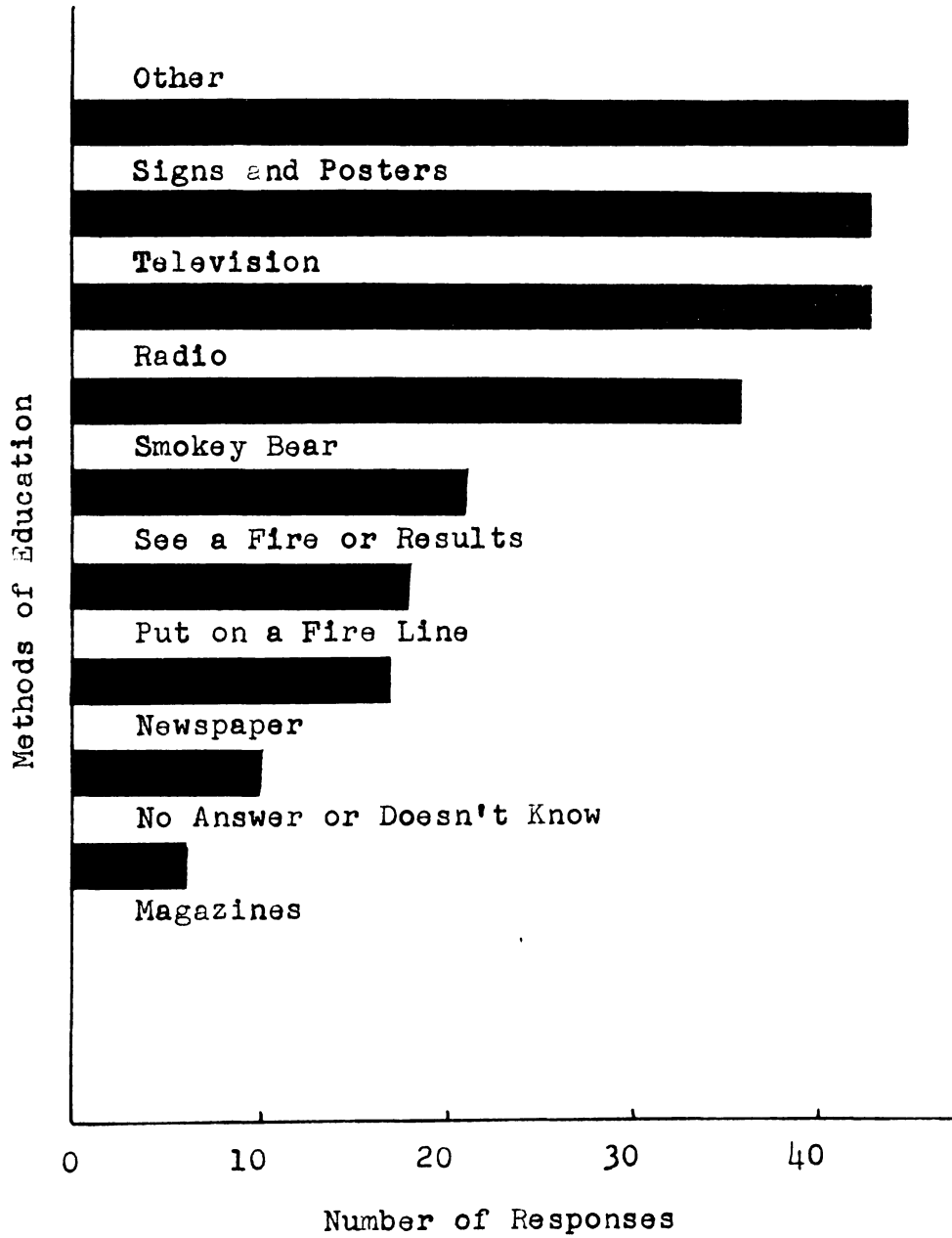
Here he found only one reference on fire prevention in a year's issues of a national sporting magazine. This same magazine averaged 150 pages per issue.

Under the heading of Other come such reasons as youth education, schools, constant repetition, scouting, personal contact, show-me-trips, and heavy fines or other forms of law enforcement. The greatest emphasis was on education, working through children, and constant repetition.

Question 18 - "What do you think is the best reminder of fire prevention?" Although similar to the preceding question this one was

GRAPH 8

Opinions of Respondents on the Best Method to Get
Fire Prevention Across to the People



designed to find out what to use in reminding the public, assuming that they were already educated. The answer categories and coding procedure were similar to Question 17. Answers to this question are recorded in Table XIII and Graph 9.

It can be seen by referring to the tables and graphs that there is a different feeling of the respondents for use of the various media in each question. For example, there is a definite reversal in the mention of signs and posters and seeing a fire. Here again there were multiple answers given, increasing the total number from 182 to 212. Answers under the heading of Other were similar to the answers given in Question 17.

TABLE XIII
 OPINION OF RESPONDENTS ON THE BEST REMINDER OF
 FIRE PREVENTION

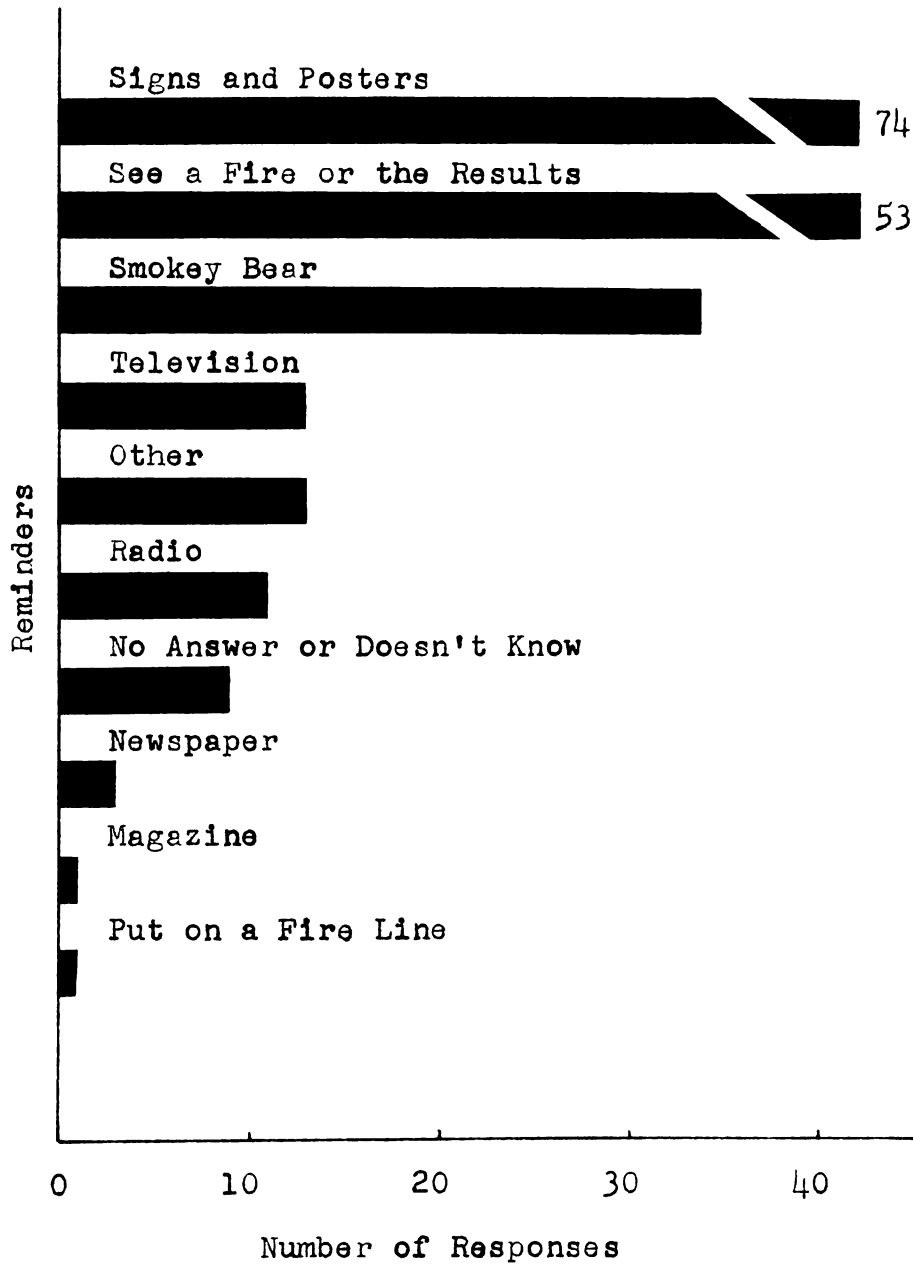
Answer	Number of Respondents	Per Cent
Signs and Posters	74	35.0
See a fire or the results	53	25.0
Smokey Bear	34	16.0
Television	13	6.1
Other	13	6.1
Radio	11	5.2
No Answer or doesn't know	9	4.2
Newspaper	3	1.4
Magazine	1	0.5
Put on a fire line	1	0.5
Total	212	100.0

Question 19 - "What fire prevention signs do you think are most effective?" This question was intended to find out what signs the public felt were getting the job of fire prevention across. It was set up with the premise that the sign making the biggest impression on the individual would be the one mentioned. Whether this is an accurate assumption or not remains to be proved or disproved.

Before going any further it would seem advisable to place everyone on a common ground. The coding procedure has the signs sorted into types.

GRAPH 9

Opinions of Respondents on the Best Reminder of
Fire Prevention



These types or categories are for the sake of convenience only. The following pictures are examples of signs as interpreted by the author.

Pictures 1 and 2 in Plate 1 are examples of the sign referred to as Port-of-Entry. This same sign is also called a portal sign. There are many different messages for this sign since it has a changeable face. The Smokey Bear poster is shown in Picture 1 of Plate 2. This poster is one in which the bear is the primary subject, as opposed to the picture type poster shown later. The informational campground sign is shown in Picture 2 of Plate 2. Here the sign is primarily concerned with a written message, either rules, instructions or educational material. The picture type poster as opposed to Smokey Bear has other animals or different scenes without the bear in prominence. Pictures 1 and 2, Plate 3, are examples of this type of sign. Plate 4, Pictures 1 through 4, are examples of the sequence or "Burma Shave" type sign. No examples of the sign painted on the highway were available. This sign is merely the message of "HELP PREVENT FOREST FIRES - KEEP MONTANA GREEN" which is painted on the surface of the road. It is read as you progress down the highway.

The display sign is one in which the actual article being discussed is attached to the sign. The classic example is the Shovel, Axe and Bucket sign shown in Picture 1, Plate 5. Those signs referred to as fire danger or burning index signs are seen in Pictures 2 and 3 of Plate 5. Last, but not least, are those signs which do not fit into any of the previous categories. For convenience sake, those are grouped under the heading called Other. Examples of these signs are depicted by the two photographs in Plate 6.

PLATE 1



Picture 1 - An example of a Port-of-Entry sign

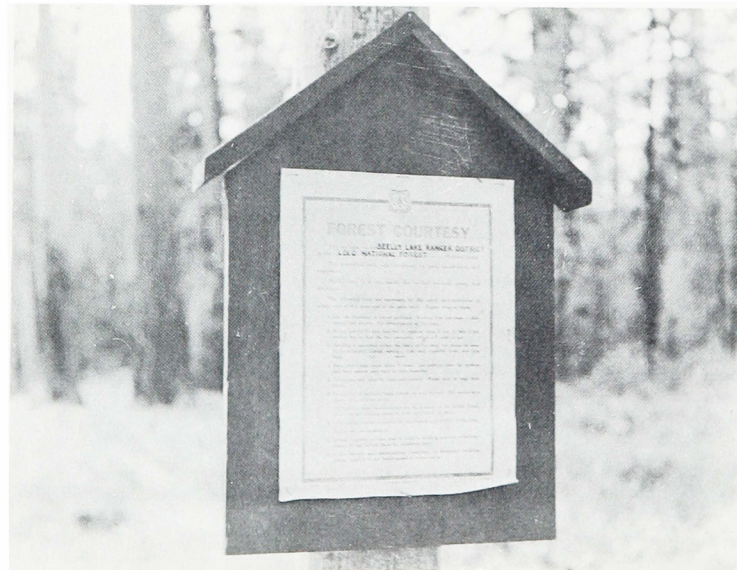


Picture 2 - Another example of a Port-of-Entry sign

PLATE 2



Picture 1 - "Smokey Bear" posters

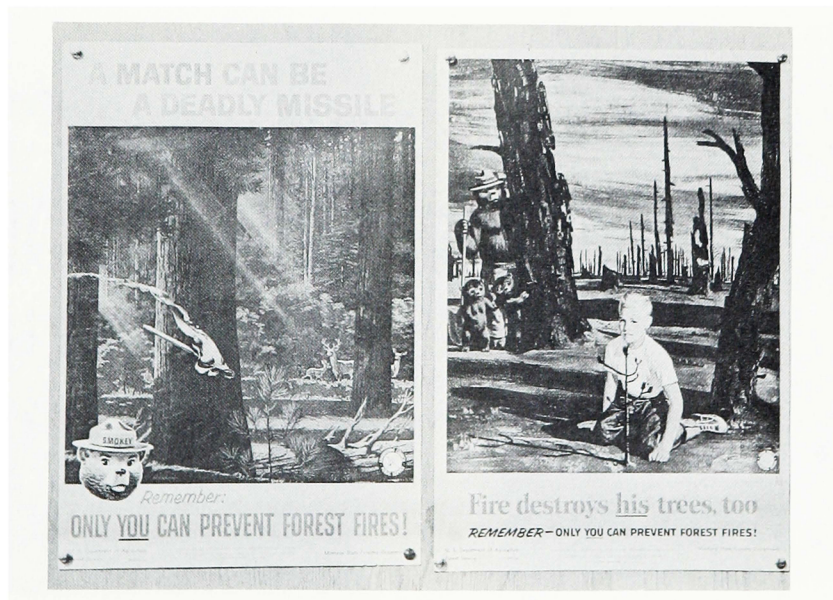


Picture 2 - Informational Campground Sign

PLATE 3



Picture 1 - Picture type poster



Picture 2 - Picture type posters

PLATE 4

Sequence Sign



Picture 1 - One of a series of four Picture 2 - Two of a series of four

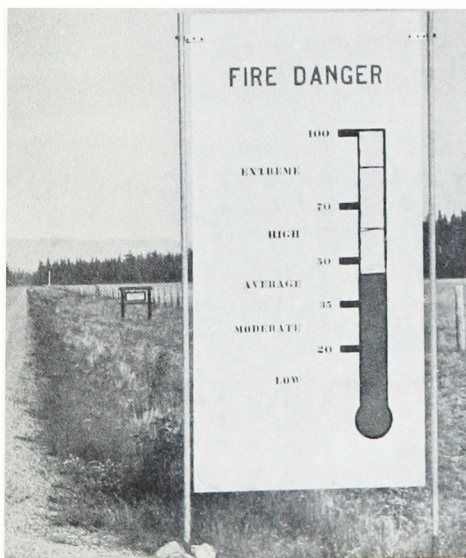


Picture 3 - Three of a series of four Picture 4 - Four of a series of four

PLATE 5



Picture 1 - The display type sign



Pictures 2 and 3 - Fire Danger or Burning Index Signs

PLATE 6



Picture 1 - Sign in category of Other



Picture 2 - Signs in category of Other

To return to the original intention, the summary of results to Question 19 are shown in Table XIV and Graph 10. It is certainly obvious that Smokey Bear is out ahead. The Port-of-Entry is well rated along with those signs which are painted on the highway. Although the burning index or fire danger sign and the display signs did not rate too well, it is felt that their impact is much greater than indicated.

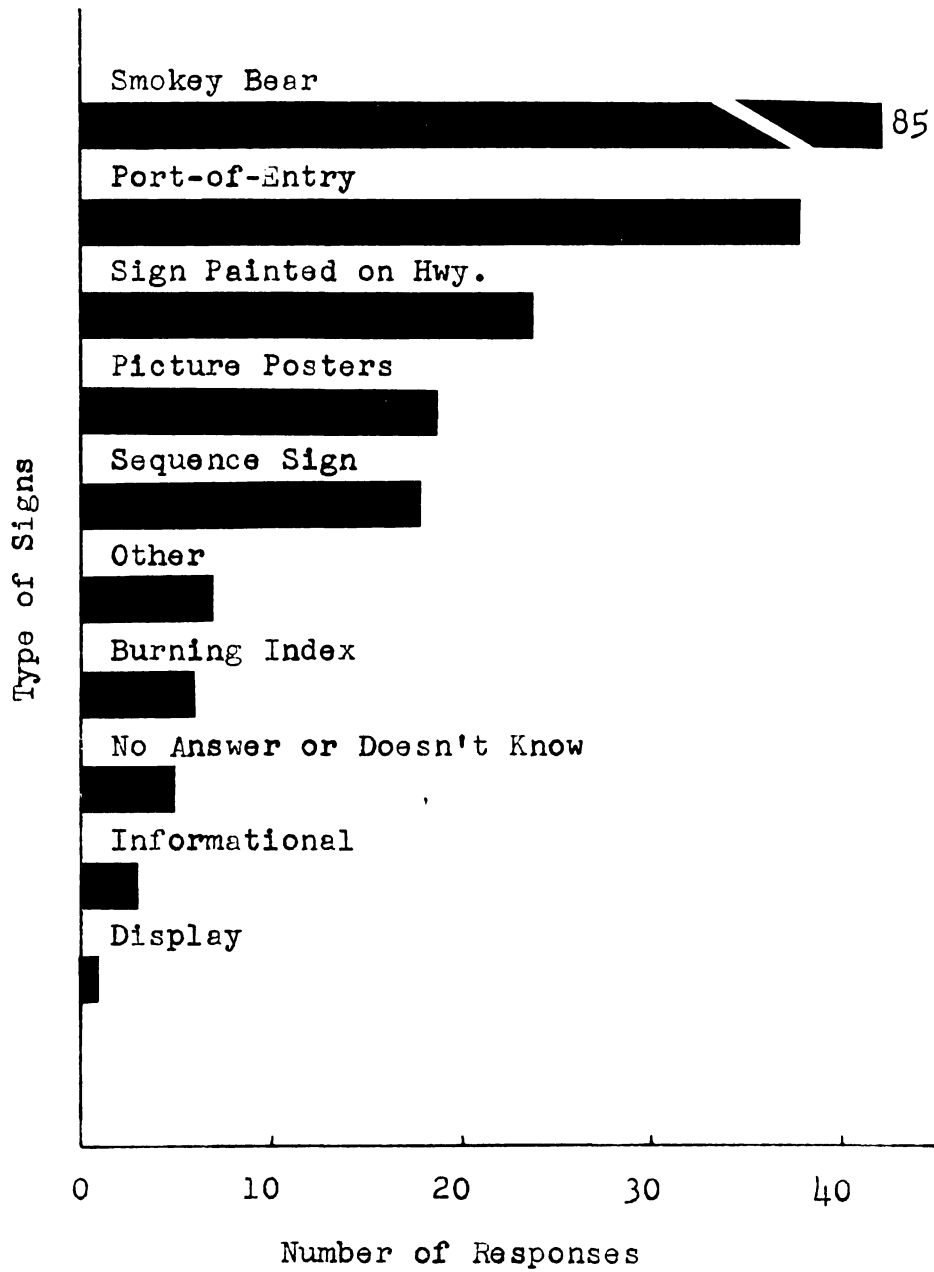
TABLE XIV
EFFECTIVENESS OF SIGNS BY TYPE AS JUDGED BY RESPONDENTS

Signs	Number of Respondents	Per Cent
Smokey Bear	85	41.3
Port-of-Entry	38	18.4
Signs painted on Highway	24	11.7
Picture Posters	19	9.2
Sequence Sign	18	8.7
Other	7	3.4
Burning Index	6	2.9
No Answer or doesn't know	5	2.4
Informational Campground	3	1.5
Display Sign	1	0.5
Total	206	100.0

After the interviews were completed the discussion that followed brought out more information. In these discussions the fact that Burning Index and Display signs were very effective was brought out. One reason that

GRAPH 10

Effectiveness of Signs by Type as Judged by Respondents



they may not have been mentioned is that they are not displayed as prominently as other signs.

Question 20 - It was the general consensus of opinion that more personal contact was needed. In fact, 154 respondents said yes to the question "Do you think that more personal contact is needed in fire prevention education?" Of the remainder, 16 said no and 12 didn't know or did not answer. It was apparent from talking to the people that they didn't mind, in fact welcomed for the most part, comments from fire guards and forest rangers of the area.

Over 95 per cent of all people interviewed were cooperative and most were quite interested in the survey. Surprising as it may seem, there were no refusals. All the people gave the general impression of being truthful throughout their interview.

Interrelationships

As was mentioned earlier, several interrelations were possible using the data that have been collected. Tables XV and XVI show the relationship of occupation to ratings received on Questions 8 and 14 respectively. By grouping these data and applying a Chi Square analysis the following information was determined. In Question 8 there was not any significance, meaning the differences observed were due to chance rather than occupations. The analysis on Question 14 showed different results, however. The difference between occupations and ratings in this question was significant or due to something other than chance. In other words, there was a real difference here. As was mentioned in the explanation of procedure this might well be attributed to sampling techniques. Both these analyses were carried out to the 95 per cent

TABLE XV
COMPARISON OF OCCUPATION TO RATING ON KNOWLEDGE OF
CAMPFIRE CARE

Occupation	R A T I N G					Total
	Excellent	Good	Fair	Poor	No Answer	
Professional and Technical	0	11	18	3	0	32
Manager etc.	3	6	12	1	0	22
Clerical	0	4	2	2	0	8
Sales	0	3	4	2	0	9
Craftsmen	1	12	2	4	0	19
Operative	0	2	9	2	0	13
Service	1	7	3	0	0	11
Farmer	1	1	0	0	0	2
Laborers	1	3	4	0	0	8
Housewife	1	11	18	2	0	32
Student	0	0	5	0	0	5
Retired	0	2	2	0	0	4
Not Stated	1	3	5	1	1	11
Unable to Classify	1	3	1	1	0	6
Unemployed	0	0	0	0	0	0
Total	10	68	85	18	1	182

TABLE XVI
 COMPARISON OF OCCUPATION TO RATING ON CIGARETTE
 AND MATCH CARE

Occupation	R A T I N G					Total
	Excellent	Good	Fair	Poor	No Answer	
Professional and Technical	3	0	12	10	7	32
Manager	2	4	6	4	6	22
Clerical	0	1	3	2	2	8
Sales	0	1	2	2	4	9
Craftsmen	0	0	3	7	9	19
Operative	0	1	4	3	5	13
Service	0	1	5	1	4	11
Farmer	0	0	2	0	0	2
Laborers	0	2	3	1	2	8
Housewife	0	1	6	7	18	32
Student	0	0	2	0	3	5
Retired	0	0	1	1	2	4
Not Stated	0	0	5	2	4	11
Unable to Classify	0	0	1	3	2	6
Unemployed	0	0	0	0	0	0
Total	5	11	55	43	68	182

level of confidence.

In further attempts to show interrelationships, a comparison of Montana residents to out-of-state residents was made in three different areas. Because the people coming to Montana from other states are not subjected to the same fire prevention education, it was felt necessary that a preliminary comparison between these classes be made. The comparisons were made on the subjects of knowledge of campfire care, care of cigarettes and matches and cognizance of the shovel, axe and bucket regulation. The following tables and graphs show the relationship.

TABLE XVII
COMPARISON OF OUT-OF-STATE TO RESIDENT RESPONDENTS ON
KNOWLEDGE OF CAMPFIRE CARE

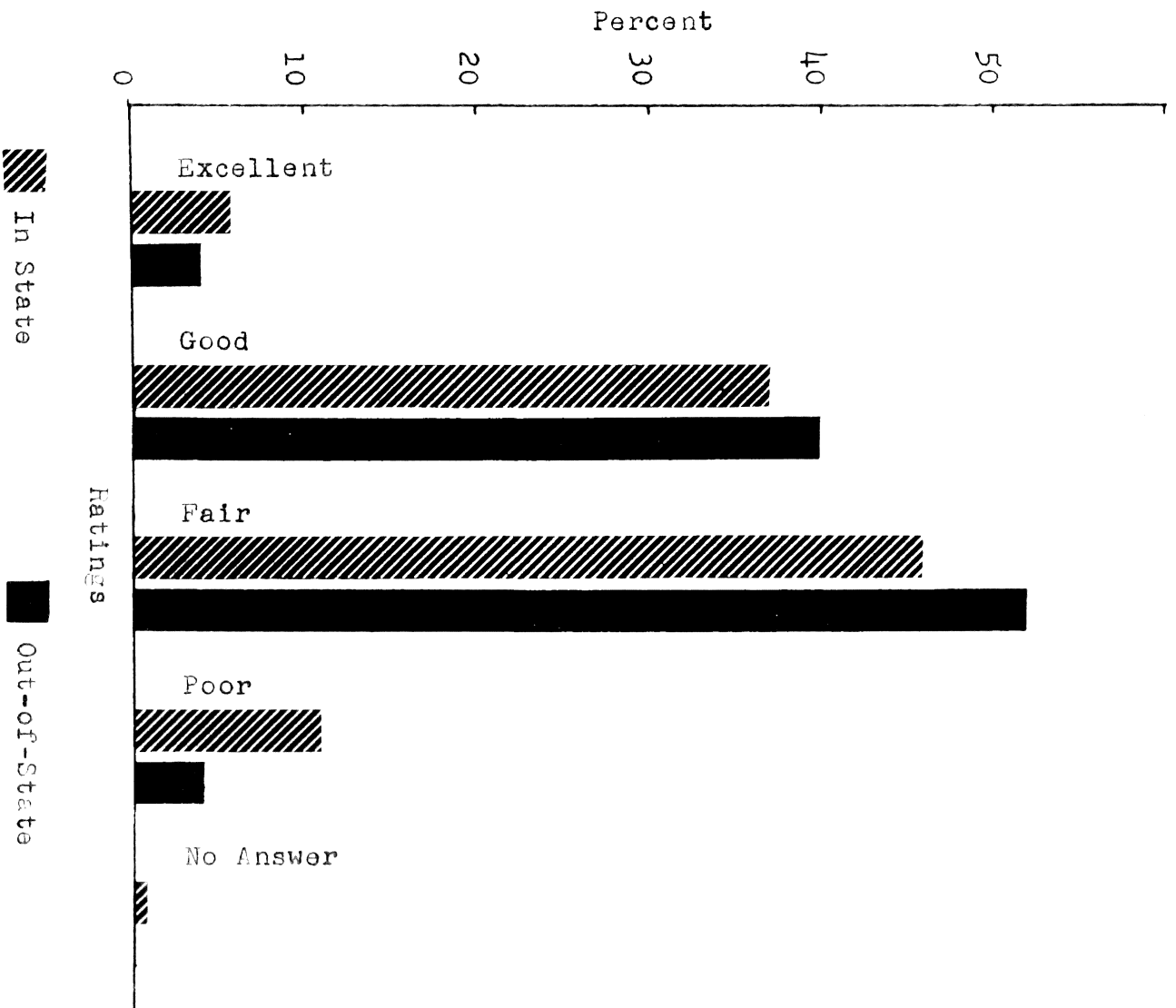
Rating	In State		Out-of-State		Total Number
	No.	Per Cent	No.	Per cent	
Excellent	9	5.7	1	4.0	10
Good	58	37.0	10	40.0	68
Fair	72	45.9	13	52.0	85
Poor	17	10.8	1	4.0	18
No Answer	1	0.6	0	0.0	1
Total	157	100.0	25	100.0	182

As the preceding table points out, there is no apparent difference on this question between residents. It is possible, however, that a much larger sample would show a different relationship. A number of the non-residents came from the western United States and the province of Alberta in Canada.

In comparing these same groups on knowledge of the shovel, axe

GRAPH 11

Comparison of Out-of-State to Resident Respondents
on Knowledge of Campfire Care



and bucket regulation, a significant number of those from out-of-state did not know of the rule. About one-third of those sampled had no knowledge concerning the possession of such equipment. The following table shows the actual comparison.

TABLE XVIII
COMPARISON OF OUT-OF-STATE TO RESIDENT RESPONDENTS ON
KNOWLEDGE OF THE SHOVEL, AXE AND BUCKET REGULATION

Answer	In State		Out-of-State		Total Number
	No.	Per Cent	No.	Per Cent	
Knows of the Regulation	153	97.5	16	64.0	169
No Knowledge of Regulation	3	1.9	7	28.0	10
No Answer	1	0.6	2	8.0	3
Total	157	100.0	25	100.0	182

The comparison of knowledge on match and cigarette care of both groups showed that they were fairly well matched. In per cent figures the out-of-state people are slightly above Montanans in the excellent and good categories. The results shown in Table XIX show the relationship quite well. Also inspection of Graph 12 will aid in an evaluation and comparison. For general purposes the results here do not indicate an extreme difference. It would be unwise to draw any conclusions from these figures as a final word. A larger sample might substantiate or reverse this trend.

TABLE XIX

COMPARISON OF IN-STATE TO OUT-OF-STATE RESIDENTS ON
KNOWLEDGE OF PROPER CARE WITH MATCHES AND CIGARETTES

Rating	In State		Out-of-State		Total Number
	No.	Per Cent	No.	Per Cent	
Excellent	3	1.9	2	8.0	5
Good	10	6.4	1	4.0	11
Fair	48	30.5	7	28.0	55
Poor	38	24.2	5	20.0	43
No Answer	58	37.0	10	40.0	68
Total	157	100.0	25	100.0	182

Questionnaire Form B.- The five different forms of this questionnaire were tabulated and put through a Chi Square analysis. Upon doing so it was decided that the difference recorded was due to chance at the 95 per cent level of confidence. Therefore, the results of the five forms were combined. The answers to the question "Where did you last hear about forest fire prevention?" are presented in Table XX. Multiple answers were obtained on the 146 questionnaire forms that were completed. Because there were only seven out-of-state forms recorded they were not separated for any comparisons. Government employees connected with protection duties seemed to be the outstanding reason given under the heading of Other. It is obvious that signs and television are well ahead of the other media. These forms were quite easy to code and no judgment was involved.

GRAPH 12

Comparison of In-State to Out-of-State Residents on Knowledge of Proper Care with Matches and Cigarettes

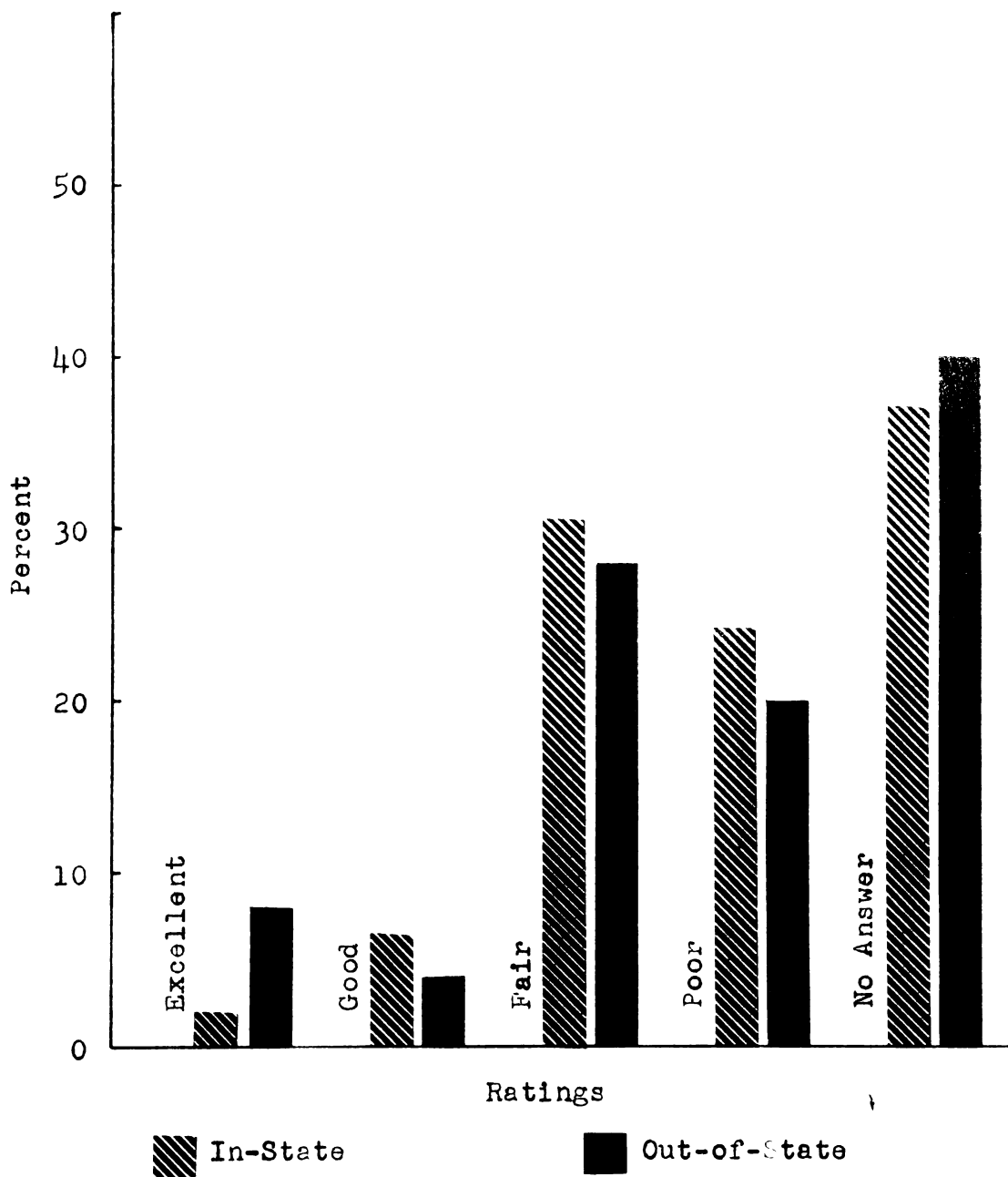


TABLE XX

SUMMARY OF ANSWERS ON THE QUESTION OF WHERE FOREST
FIRE PREVENTION WAS LAST HEARD OF

Answer	Number of Respondents	Per Cent
Signs	68	43.6
Television	45	23.0
Radio	30	15.3
Newspapers	28	14.3
Other	16	8.2
Magazines	9	4.6
Total	196	100.0

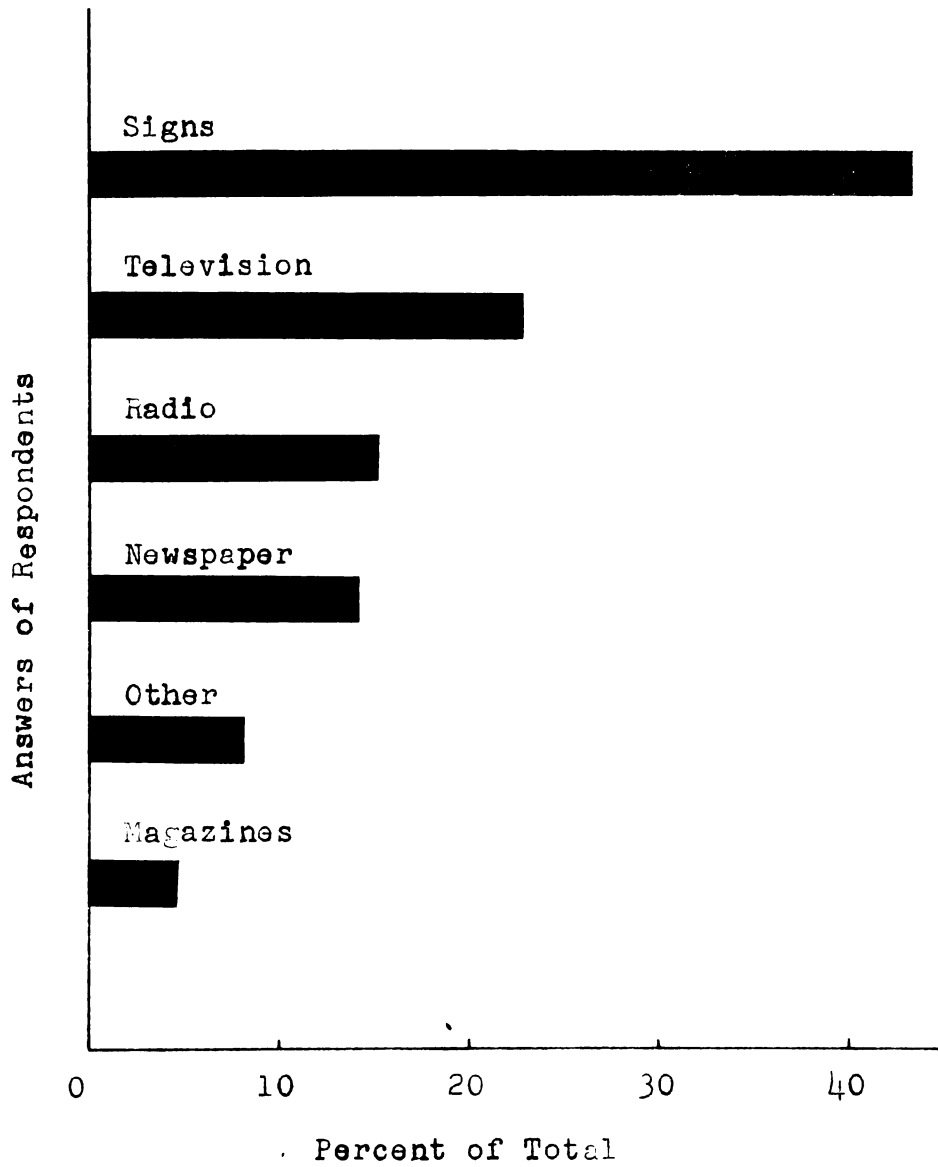
Radio and Television

Several complications arose in the portion of this study devoted to radio and television. It was found that there was a wide variety of recording procedures as well as degrees of completeness in radio station "Logs." Not only were there differences here, but several stations refused permission to secure the desired data by examining their logs. At the stations where observation of the logs was permitted the lack of uniformity and notation of fire prevention material and announcements made it necessary to qualify the results. In all the stations, however, an average of time was determined or an estimate was obtained on the amount of time devoted to fire.

The range of coverage was quite varied in radio. One station reported that they carried no announcements on fire prevention. They claimed that no electrical transcriptions or fire prevention copy had

GRAPH 13

Summary of Where the Forest Fire Prevention
Message was Last Heard



been sent to them. They went on to report that when such material was requested they were unable to get any reply. At the other extreme one station made over fifteen announcements per day, had all the transcriptions and was very cooperative.

The announcements were usually thirty or sixty second spots. The majority of the stations contacted placed about five announcements on the air per day. This is both an estimated and calculated figure. The material used for the most part was electrical transcriptions (E. T.s). Some of the spots were live and originated at the station. Those stations located in fire areas promoted "on-the-spot" coverage if possible. Generally, stations schedule this type of fire prevention material for use. In many instances, however, prevention messages are used as a filler to kill time. When this was done there was seldom a record of the number of announcements or their length. Depending on the announcer's likes and dislikes there would be more or less fire prevention material used.

This portion of the study was not a total waste of time as interviews did bring out suggestions for future work in the field of radio. Most of the stations expressed a desire for current information on conditions, closures, and information for use in the off season. Also they requested one or two line copy which would take about ten seconds to read. This would be used between records, between news spots and similar situations where a minimum of copy was desired. Another need that was expressed was that more of the prevention material should be placed on the local level.

The television stations made the same general comments. No television station logs were observed due to the reluctance of the companies

to allow it. As best as could be ascertained the majority of forest fire prevention material used by this medium was done so primarily as a filler. Not too much cooperation was received from the people in this area. All the figures obtained on television time devoted to forest fire prevention were estimated by station personnel. This estimation was felt to be inadequate; therefore, the results are not presented. There presently appears to be a definite lack of cooperation between the station operators and the agencies interested in fire prevention.

Newspaper

The newspaper industry was very cooperative. All the papers contacted allowed the use of their past issues and in most cases offered assistance. There was no deviation in working up the material from the plan as expressed earlier. The material has been summarized for the period from July 1, 1960 to September 15, 1961. Newspapers have been designated by a letter rather than naming them. This is not a study in which names are to be compared. The amount of all the material, news, information and pictures that appeared on the front pages was about 40 per cent of the total.

TABLE XXI

COLUMN INCHES SUMMARY OF FOREST FIRE MATERIAL IN NEWSPAPERS

Newspaper	News	Information	Pictures	Total
A	560.25	120.75	59.00	740.00
B	795.00	699.75	330.00	1824.00
C	413.75	93.00	216.00	722.75
D	446.25	65.50	91.50	603.25
Total	2215.25	979.00	696.50	3890.75

The coverage, as expected, was directly related to the news value of the situation. Also the amount of space devoted to the various categories was pretty much dependent upon the paper's editorial policy.

Books

Textbooks are certainly a far cry from what they were fifteen years ago. There are many good illustrations and material is presented in a much more pleasing manner. Eight textbooks were observed in this portion of the study. Out of these, three contained no mention of fire whatsoever. The remaining five contained a variety of material. In all these books there were 2364 pages combined. Fire and fire prevention were mentioned on fifty of the pages. These pages were found in spelling, science, social studies and reading books of the fifth grade. The pages mentioning fire prevention amount to about 2.1 per cent of the total. Generally the information was complete and technically correct.

General

All of the administrators in the area had well organized fire prevention plans. They were, for the most part, inclusive of all material that might be used in prevention work. All were well defined and spelled out the jobs to be done and when they were to be accomplished. Sign plans were included which told what signs to place where and when. Contact and plans for education were similar to the sign plan in detail. On paper it all looked quite workable and efficient.

The interviews pointed out the lack of real imagination on the part of many individuals. Many had pre-conceived ideas about prevention. There were others who were quite interested and receptive to knowledge which might improve and simplify the prevention job. More of the actual comments and attitudes will appear in the discussion and conclusion.

DISCUSSION OF RESULTS

When working on any problems connected with fire prevention, one of the first tasks is looking over the statistics. Statistics, as used here, are the numerical facts or data themselves. It has been pointed out that prevention efforts can be directed best when the cause of fires is established (11). There is a necessity then to have good, accurate and dependable statistics (9, 15, 22, 30). In preparing the data for this paper the lack of good classification as to causes of fires was apparent. Too much is left to the individual reporting as far as making a decision. Because of the lack of definitive terms and criteria for classification of fires, often the wrong cause gets the blame. If results of studies such as this are to be useful, the existing situation must be rectified.

The findings of Form A are felt to be a definite contribution to a better understanding of fire prevention media. Questions 1, 2, 3, and 4 point out that the sample at least appears to be a cross section of forest users. The variety of reasons for area use and duration of stay substantiate the fact that no one special group received any preferential treatment. The ratios of residents to non-residents and the variety of occupations represented point out further the diversity of the sample.

After the first four questions are dispensed with, the remainder of the material obtained is or might well be of interest to the individual connected with fire prevention. These remaining questions were concerned with the relative knowledge of the forest user, the importance

and effectiveness of the various media.

Several interesting points were disclosed in questions involved with the knowledge determination. In the question on what to do if a fire were seen, it is the opinion of this author that too many of the people would not have reported the fire. Though it is commendable that fires are extinguished, it is important that the location be known. This reporting would also allow the fire to be counted. The questions on fire, match and cigarette care also pointed out what was thought to be interesting if not significant. Generally, people knew what to do; however, their knowledge was limited or at least expressed in such a manner as to give that indication. This lack of knowledge is a reflection of the prevention or educational efforts in the past.

The three questions on the shovel, axe and bucket regulations brought out information that should be helpful in the future. Knowledge of the regulation was general for Montana residents whereas the out-of-state people were not so well informed. The possession of the required tools is another matter. The feelings here were brought out earlier. The results are an indication of some knowledge but not an adequate amount. Findings of other sources point out that many people don't have enough information concerning fire laws. In spite of increased fire prevention activity there is a lack of success in bringing fire laws to the attention of the people (21). The fact that signs were the most frequently mentioned medium contributing to the education of the public on this subject may be the problem. All that signs say is that the tools must be carried. There is no why or what in regard to the specifications of the tools.

The findings of this study directly connected with media as the title indicates were quite varied but nevertheless useful. A different approach was taken in this work. The public was asked to help solve the problem they were causing. The answers may not meet with unanimous agreement but these results are much better than the opinion or so-called educated guess. Here actual numbers and percentages are available for comparison.

Because of the changes in position of the various media and the different attitudes as pointed out by the various tables, no specific one can be classed as the answer to the problem. All seem to have a necessary place. One might well do one part of the job better than others, however. It seems to be the combination that counts.

The interview as used in part of this study is an excellent method of obtaining information. It is also a form of direct education. The major problem here is the training of interviewers. Training would be necessary to get standardized results. It would also be necessary to see that everyone understood the objectives and to avoid bias.

Another portion of the work yielded a different type but useful information. Here a self-answering form was used. Use of this type of form would solve the problem of training. The results obtained from this attempt appear quite usable. A larger sample would accept or reject this assumption, however. With seasonal positions where students are utilized, as in the campgrounds, this would be a very useful tool, aiding with the prevention planning. No errors in judgment would arise here since no interpretation is necessary.

The results obtained in the radio and television portion were not at all what was expected. It was pointed out that it is imperative that

if any correlation or evaluation is desired accurate records must be kept and be accessible. The results obtained here in this portion were of a quantitative value only.

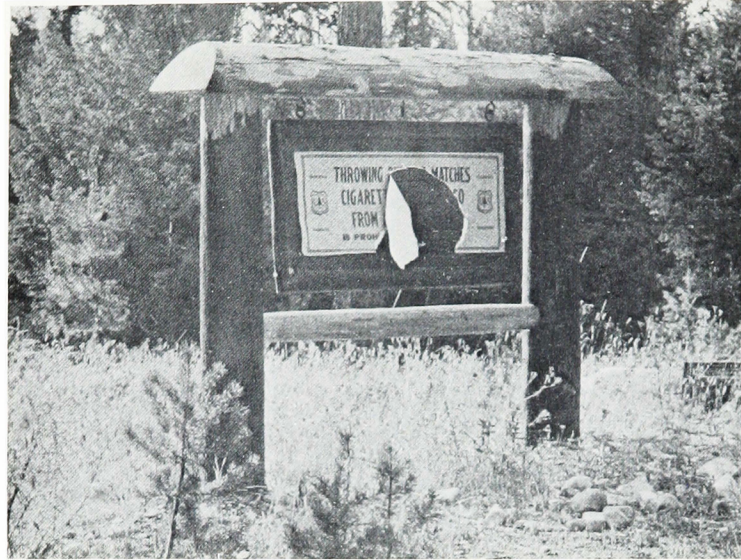
In newspapers more quantitative information was found. The amount of coverage being as great as it was proved interesting. Because of the elapsed time, no correlation of persons mentioning newspapers and dates on which increased fire prevention material was used were made.

Fifth grade texts were much more interesting than anticipated. As pointed out in the section on results, much is very likely being omitted which could be used in textbooks. It would appear that in a portion of the country where so much depends on the forest product industries, more use of the educational facilities in the field of conservation would be made. Much information concerning forestry could be integrated into books. Also outside pressures to teach this material could be brought to bear.

Reviews of plans and interviews gave the outward impression that fire prevention in this part of Montana is on top of the situation. After a season of field observation and a close look at the results, it is felt that this is not a valid assumption. In the previously mentioned field plans the same attitude pointed out by Stathem exists. He stated the philosophy of "once the signs are up the job is done" (49). Comments from the respondents substantiate that this is exactly what is happening. This is also brought out by the results of the study.

The pictures in Plates 7 and 8 point out some of the common practices of our western forests. The picture caption should clearly point out the deficiencies. Several of the people commented about the Forest Service and the state nailing signs to trees when they weren't supposed

PLATE 7

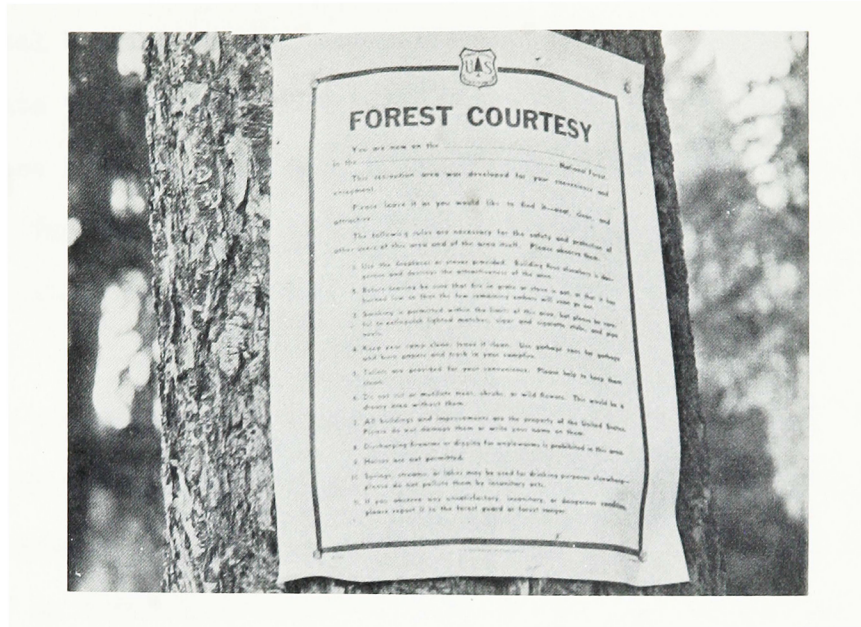


Picture 1 - A torn sign loses its effectiveness and may have negative results



Picture 2 - Signs cannot be effective if they cannot be seen

PLATE 8



Picture 1 - Signs nailed to trees give poor impressions and results



Pictures 2 and 3 - Signs improperly displayed are not effective

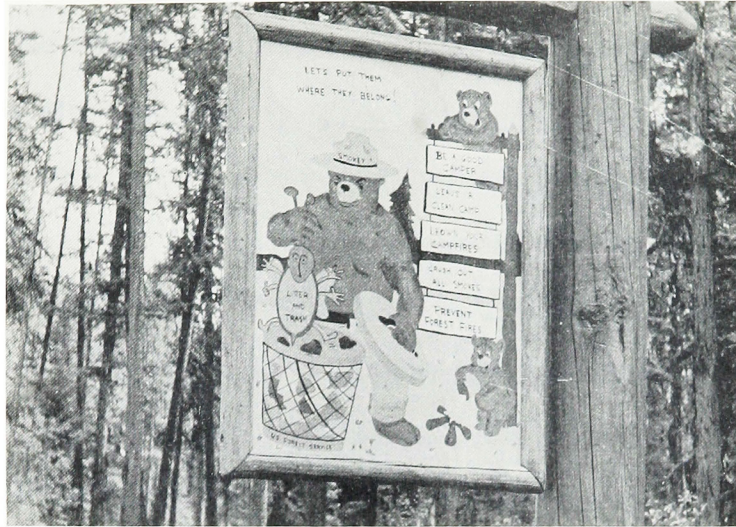
to deface the trees. There was often no continuity of the message to the area. For example, the "prevent range fires" signs in forest areas have no real bearing on the immediate situation.

Plate 9 shows what a little ingenuity and local talent can produce. These homemade--but well done--signs received many favorable comments. The change from the routine obtained much attention from forest users. It should be remembered that the signs must be in good taste and well done.

The comment section brought out much good information. Some individuals felt that the use of strict law enforcement would help solve many of the problems. As it is today, one seldom hears of someone in trouble because of an infraction of a fire regulation. One author felt that law enforcement was an important part of fire prevention (47).

The results of the question on whether more personal contact was needed, coupled with further remarks from the comment section, pointed out the need for contact work. The questions asked this author during the interviews pointed out that people are generally interested in fire prevention but need the type of information obtained in personal contact. They also want to talk to the ranger for many reasons. This education and prevention may not be of great importance on the district of low man-caused fire incidence, but it should be looked upon as a conditioning for people going into other areas where it is dangerous (19).

PLATE 9



Picture 1 - A local artist produces an effective sign



Pictures 2 and 3 - Ingenuity brightens up the backs of standard signs with a fire prevention message

CONCLUSIONS

From the results of this study come the following conclusions:

1. No single medium is sufficiently more efficient than the others to warrant their exclusion from use.
2. The majority of the forest users have insufficient knowledge of the necessary fire prevention precautions.
3. Generally, the forest users have insufficient knowledge of laws and regulations pertaining to fire in the forests.
4. The increased use of personal contact will improve the efficiency of the fire prevention campaigns.
5. It appears that there is no significant difference between occupations and knowledge of fire prevention.
6. More coordination between the administrating agencies and the radio, television and newspaper people is necessary.
7. More fire prevention material can and should be used in the schools and in textbooks.
8. The use of imagination and care in the placement of one sign is worth more than placing ten or more indiscriminately around the woods.
9. Law enforcement should be used more effectively and more often.
10. The media that appear to be the best for use in placing the fire prevention message before the public are signs and

posters, television, radio and newspapers. This is in the general order of effectiveness as determined in the study.

SUGGESTIONS

The following are suggestions relating to future work which should be done along similar lines. Suggestions are also made here on possible methods of improvement of the existing forest fire prevention programs.

1. Entire questionnaires should be made up on single portions of the form used in this study. For example, an entire questionnaire should be constructed on the shovel, axe and bucket regulation. Several of these forms would be used in a similar manner to this study.
2. A continuation of forms similar to Form B, used in this study, with possible revisions, would be useful in obtaining additional information.
3. Individual studies pertaining to each medium dealing with forest fire prevention are needed and should be conducted.
4. Training of seasonal personnel who are in contact with the public is necessary. The present guard school training is inadequate for public relations work.
5. Change the signs constantly during the summer, making sure they are appropriate and well displayed.
6. Educate the public on all phases of forestry so they can see the importance of fire prevention and its relationship to the whole picture.

7. Use of a uniform by fireguards might well pay dividends and should be explored.
8. Meet with people connected with the various media and work up material felt to be of the most value, including information on the local level.
9. All personnel connected with fire prevention campaigns should familiarize themselves with the material in Fire Control Notes and similar publications.

SUMMARY

An evaluation of educational fire prevention media was attempted by interviews of forest users and by examination of each educational medium in Western Montana. A checklist in the form of a questionnaire was used to standardize results. From the 182 parties contacted almost every type of forest use was encountered and numerous fields of endeavor were reported. Out-of-state respondents made up 14 per cent of the total sample. From this same sample it was ascertained that 90 per cent of the respondents stayed in the area from one to seven days.

The study results brought out the point that forest users lack knowledge of basic campfire, cigarette and match care, as well as regulations. The results also pointed out that there is no correlation between occupation and knowledge concerning fire prevention. The only possible correlation found was that the out-of-state respondents have a poorer knowledge of the shovel, axe and bucket law than Montanans.

No one medium proved to be sufficiently more effective than another to warrant the exclusion of any other. According to the responses, signs and posters rated first while radio, television, and Smokey Bear follow. Observing actual burns or their results as well as placing people on fire lines was felt by many to be the solution to the problem.

Results of a previous study were upheld when magazines received little or no mention by the respondents. Newspapers were mentioned by the people but were not outstanding in their effectiveness as a fire

prevention medium. Investigation into the radio and television field yielded a minimum of information because of poor records and a lack of cooperation. Textbooks used in the grade schools had a surprising amount of material on fire prevention but more could be integrated into them.

Personal contact is the most neglected portion of fire prevention and is necessary if all media are to be effective. There is a general lack of imagination and initiative throughout the fire prevention program. The prevailing attitude is once the signs are put up the job is done.

This study is by no means conclusive, but it should provide background and impetus for further work. It is a beginning in a needed area and should point out some of the inadequacies with more authority than the educated guess.

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APPENDIX

APPENDIX I

FORMS

Form A

FIRE PREVENTION SURVEY
QUESTION SHEET

Code	Location	Date	Number
			1. What brings you into this area?
			2. How many days do you plan to stay here?
			3. Where are you from?
			4. What do you do for a living?
			5. What would you do if you saw a small unattended fire in the woods?
			6. Where did you first learn to do this?
			7. What was your most recent reminder of what to do?
			8. What care should be taken when building or putting out a campfire?
			9. Where did you first learn to do this?
			10. What was your most recent reminder of what to do?
			11. What is the regulation on shovel, axe and bucket?
			12. Where did you learn about this regulation?
			13. Do you have a shovel, axe and bucket with you?
			14. What care should be taken with cigarettes and matches?
			15. Where did you first learn about this?
			16. What was your most recent reminder concerning this?
			17. In your opinion, what is the best way to get fire prevention across to people?
			18. What do you think is the best reminder of fire prevention?
			19. What fire prevention signs do you think are most effective?

Form A (Continued)

Code	
	20. Do you think more personal contact is needed in fire prevention education?
	21. A. O. I.
	22. V. O. A.
	23. Comments

Form B

MONTANA STATE UNIVERSITY

1

School of Forestry
Forest and Conservation Experiment Station

We are conducting research in forest fire prevention and would like your cooperation in answering the following questions.

1. Where did you last year about forest fire prevention?

(Check one or more)

- | | |
|--|--|
| <input type="checkbox"/> Signs and posters | <input type="checkbox"/> Magazine |
| <input type="checkbox"/> Radio | <input type="checkbox"/> Newspaper |
| <input type="checkbox"/> T. V. | <input type="checkbox"/> Other _____
(Please specify) |

2. Where do you live?

- | | |
|-----------------------------------|--|
| <input type="checkbox"/> Montana? | <input type="checkbox"/> Out of State _____
(Specify) |
|-----------------------------------|--|

MONTANA STATE UNIVERSITY

2

School of Forestry
Forest and Conservation Experiment Station

We are conducting research in forest fire prevention and would like your cooperation in answering the following questions.

1. Where did you last hear about forest fire prevention?

(Check one or more)

- | | |
|--|--|
| <input type="checkbox"/> Radio | <input type="checkbox"/> Newspaper |
| <input type="checkbox"/> T. V. | <input type="checkbox"/> Magazine |
| <input type="checkbox"/> Signs and posters | <input type="checkbox"/> Other _____
(Please specify) |

2. Where do you live?

- | | |
|----------------------------------|--|
| <input type="checkbox"/> Montana | <input type="checkbox"/> Out of State _____
(Specify) |
|----------------------------------|--|

Form B

MONTANA STATE UNIVERSITY

3

School of Forestry
Forest and Conservation Experiment Station

We are conducting research in forest fire prevention and would like your cooperation in answering the following questions.

1. Where did you last hear about forest fire prevention?
(Check one or more)

<input type="checkbox"/> T. V.	<input type="checkbox"/> Newspaper
<input type="checkbox"/> Magazine	<input type="checkbox"/> Signs and Posters
<input type="checkbox"/> Radio	<input type="checkbox"/> Other _____ (Please specify)

2. Where do you live?

<input type="checkbox"/> Montana	<input type="checkbox"/> Out of State _____ (Specify)
----------------------------------	--

MONTANA STATE UNIVERSITY

4

School of Forestry
Forest and Conservation Experiment Station

We are conducting research in forest fire prevention and would like your cooperation in answering the following questions.

1. Where did you last hear about forest fire prevention?
(Check one or more)

<input type="checkbox"/> Newspaper	<input type="checkbox"/> T. V.
<input type="checkbox"/> Radio	<input type="checkbox"/> Signs and Posters
<input type="checkbox"/> Magazine	<input type="checkbox"/> Other _____ (Please specify)

2. Where do you live?

<input type="checkbox"/> Montana	<input type="checkbox"/> Out of State _____ (Specify)
----------------------------------	--

Form B

MONTANA STATE UNIVERSITY

5

School of Forestry
Forest and Conservation Experiment Station

We are conducting research in forest fire prevention and would like your cooperation in answering the following questions.

1. Where did you last hear about forest fire prevention?
(Check one or more)

Magazine

Radio

T. V.

Newspaper

Signs and Posters

Other _____
(Please specify)

2. Where do you live?

Montana

Out of State _____

APPENDIX II
PROCEDURE FOR CODING
FIRE PREVENTION QUESTIONNAIRE
FORM A

The following procedure is to be used in coding all the question sheets (Form A) used on the fire prevention media study during the summer of 1960.

General

1. If any answer on the form does not agree with the possible choice on the key it should be placed under the heading of "OTHER."
2. Questions numbered 6, 7, 9, 10, 15, and 16 have been omitted and should be disregarded.
3. Be consistent throughout the entire coding procedure.
4. When the term "OTHER" is used it should be explained on the question sheet for future reference.
5. The coding is necessary to facilitate the transfer of information from the question sheets to tables, punch cards or automatic data processing cards.

Location

The blank labeled "LOCATION" will be coded as follows:

<u>Code</u>	<u>Location</u>
01	Seeley Lake Campground
02	Lake Inez Campground
03	Lake Alva Campground
04	Holland Lake Campground
05	Lindberg Lake Campground
06	Goat Creek Campground

<u>Code</u>	<u>Location</u>
07	Swan Lake Campground
08	
09	
10	Other

Date

The blank headed "DATE" will be coded as to month and day. A four (4) digit number will be used, giving first the month and second the day. Ex: July 21st would be coded as 0721.

The months will be coded as follows:

<u>Code</u>	<u>Month</u>
07	July
08	August
09	September

The day will be designated as follows:

<u>Code</u>	<u>Day of the Month</u>
01	July
10	10th
etc.	etc.

Number

The blank labeled "NUMBER" will be a four (4) digit figure numbered consecutively as the question sheets are used. Ex: sheet number one - 0001, sheet number one-hundred and three - 0103.

Question #1

What brings you into this area?

<u>Code</u>	<u>Answer</u>
01	Camping
02	Fishing
03	Boating
04	Picnicking
05	Swimming
06	Water Skiing
07	Work
08	
09	
10	Other

Question #2

How many days do you plan to stay here?

<u>Code</u>	<u>Number of Days</u>
01	1 day
02	2 days
03	3 days
04	4 days
05	5 days
06	6 days
07	7 days
08	8 to 14 days
09	15 to 21 days
10	22 days and longer

Question #3

Where are you from?

<u>Code</u>	<u>Residence</u>
01	Montana
02	Out-of-State

Question #4

What do you do for a living?

<u>Code</u>	<u>Occupation</u>
01	Professional, technical and kindred workers Accountants and auditors Airplane pilots and navigators Architects Artist and art teachers Athletes Chemists Clergymen College presidents, professors and instructors Dentists Engineers Foresters and conservationists Funeral directors and embalmers Lawyers and judges Librarians Musicians and music teachers Natural scientists Nurses Pharmacists Photographers Physicians and surgeons Public relations men Radio operators Recreation workers Social and welfare workers Teacher Technician Veterinarians

<u>Code</u>	<u>Occupation</u>
02	Managers, officials and proprietors Buyers Conductors Managers Officials and administrators Postmaster Purchasing agent
03	Clerical and kindred workers Attendants Bank teller Bookkeeper Cashiers Dispatchers File clerks Mail carriers Postal clerks Receptionists Secretaries Telegraph operators and messengers Ticket, station, and express agents Typists
04	Sales workers Advertising agents and salesmen Auctioneers Demonstrators Insurance agents, brokers, and underwriters Newsboys Real estate agents and brokers Stock and bonds men Salesmen and sales clerks
05	Craftsmen, foremen, and kindred workers Bakers Blacksmiths Cabinet makers Carpenters Cement and concrete finishers Electricians Foremen Glaziers Jewelers Linemen and servicemen Locomotive engineers and firemen

Occupation continued

<u>Code</u>	<u>Occupation</u>
	Craftsmen, foremen, and kindred workers (Continued)
	Machinists
	Mechanics
	Millwrights
	Painter
	Paperhangers
	Plasterers
	Plumbers
	Tinsmiths, coppersmiths and sheet metal workers
	Tool maker
	Member of the Armed Forces
06	Operative and kindred workers
	Apprentices
	Attendants, auto service and parking
	Brakemen, railroad
	Bus driver
	Conductors, bus and street railway
	Deliverymen and routemen
	Laundry and dry cleaning establishment operators
	Meat cutter
	Sawyers
	Truck and tractor driver
	Welders
07	Service workers
	Attendants, hospital and other institutions
	Barbers
	Bartenders
	Chambermaids
	Cooks
	Counter and fountain workers
	Hairdresser
	Janitor and sextons
	Protective service workers
	Firemen, watchmen and doorkeepers
	Marshalls and constables
	Policemen and detectives
	Sheriffs and bailiffs
	Waiters and waitresses

Occupation continued

<u>Code</u>	<u>Occupation</u>
08	Farmers and farm workers Farmers Farm managers Farm foremen Farm workers Farm hands
09	Laborers Carpenters helper Garage laborer Gardners Lumbermen, raftsmen, and woodchoppers Teamsters Truck drivers' helper Warehousemen Laborers
10	Housewife Any person who is primarily engaged in keeping house for herself and her family
11	Student Any person whose primary job is going to school, regardless of age
12	Retired Any individual who considers himself retired
13	Occupation not stated
14	Unable to classify
15	Unemployed

Note. The following sources were used in determining the preceding occupation classifications..

U. S. Bureau of the Census. Alphabetical Index of Occupation and Industries: 1961. Census of Population, revised edition.

U. S. Department of Labor. Dictionary of Occupational Titles Part I, Definitions of Titles, 1939.

Question #5

What would you do if you saw a small unattended fire in the woods?

<u>Code</u>	<u>Answers</u>
01	Report it
02	Put it out or try
03	Report it and try to put it out
04	Put out or report
05	
06	
07	
08	
09	Nothing
10	Other (specify)

Question #8

What care should be taken when building or putting out a camp-fire?

<u>Code</u>	<u>Rating</u>
01	Excellent - 5 or more of the choices below
02	Good - 3 to 4 of the choices below
03	Fair - 2 of the choices below
04	Poor - 1 of the choices below
05	No answer

Question #8 continued

Choices for ratings above:

1. Use fireplace if available
2. Never leave fires unattended
3. Clear the area
4. Have water and a shovel handy
5. Keep fire small
6. Mix with mineral soil and/or water
7. Be sure it is dead out
8. Feel with your hands
9. Build up around fire with rocks
10. Other points not mentioned above that are fitting

The interviewer will make notes as to the answers given so a rating as indicated above can be applied to the questionnaire form when coded.

Question #11

What is the regulation on the shovel, axe, and bucket?

<u>Code</u>	<u>Answer</u>
01	Has knowledge of the regulation
02	Has no knowledge of the regulation
03	No answer

Question #12

Where did you learn about this regulation?

<u>Code</u>	<u>Answer</u>
01	Signs and posters
02	Radio
03	Television
04	Newspaper
05	Magazines
06	Car check by Forest Service or State

Question #12 continued

<u>Code</u>	<u>Answer</u>
07	Friends or other people
08	
09	No answer or doesn't know
10	Other

Question #13

Do you have a shovel, axe, and bucket with you?

<u>Code</u>	<u>Answer</u>
01	Shovel, axe, and bucket
02	Nothing
03	Shovel only
04	Axe only
05	Bucket only
06	Axe and bucket
07	Shovel and axe
08	Shovel and bucket
09	
10	Other

Question #14

What care should be taken with cigarettes and matches?

<u>Code</u>	<u>Rating</u>
01	Excellent - 4 or more of the choices below
02	Good - 3 of the choices below
03	Fair - 2 of the choices below

Question #14 continued

<u>Code</u>	<u>Rating</u>
04	Poor - 1 of the choices below
05	No answer*

Choice for ratings above

1. Use your ashtray
2. Don't be a flipper
3. Break your matches
4. Be sure your cigarette or match is out
5. Don't smoke while walking or riding in the woods
6. Other answers that are appropriate

Question #17

In your opinion, what is the best way to get fire prevention across to the people?

<u>Code</u>	<u>Answer</u>
01	Signs and posters
02	Radio
03	Television
04	Newspapers
05	Magazines
06	Put on a fire line
07	See a fire or the results (going fire)
08	Smokey Bear
09	No answer or doesn't know
10	Other

*This category also includes those people who don't smoke and were not interested in answering the question.

Question #18

What do you think is the best reminder of fire prevention?

Code this the same as #17

Question #19

What fire prevention signs do you think are most effective?

<u>Code</u>	<u>Answer</u>
01	Port-of-entry
02	"Smokey Bear" posters
03	Informational campground signs
04	Picture type posters
05	Sequence or Burma Shave type signs
06	Signs painted on the highway
07	Display signs
08	Burning Index Sign
09	No answer or doesn't know
10	Other

Question #20

Do you think more personal contact is needed in fire prevention education?

<u>Code</u>	<u>Answer</u>
01	Yes
02	No
03	No answer or doesn't know

Question #21

A. O. I. (Attitude of Interview)

<u>Code</u>	<u>Answer</u>
01	Very cooperative
02	Cooperative
03	Reluctant
04	Refused
05	Other

Question #22

V. O. A. (Validity of Answer)

<u>Code</u>	<u>Answer</u>
01	Truthful
02	Not truthful

Question #23

Comments

<u>Code</u>	<u>Answer</u>
01	Yes
02	No

APPENDIX III
PROCEDURE FOR CODING
FIRE PREVENTION QUESTIONNAIRE
FORM B

The following procedure will be used in coding questionnaire Form B. Since there are relatively few answers on this form, it will be coded directly to the punch cards. The cards that will be used are Key-Sort #371, made by the Royal McBee Company.

Questionnaire Number

Since this form has five variations it will be necessary to separate them. In the upper right-hand corner of the form is a number which is the number corresponding to the specific arrangement of answers. This number will be called the questionnaire number. To code the card, place it so that the bevel is in the upper right position. Holes 5 - 8 will be used to record the number. To designate the form the following procedure will be used:

<u>Form No.</u>	<u>Notch</u>
1	hole 5
2	hole 6
3	hole 5 and 6
4	hole 7
5	hole 5 and 7

The next group of answers will be coded by notching the number indicated in each case. For more detailed information see the Code Key card.

Television

Notch number 9

Radio

Notch number 10

Signs and Posters

Notch number 11

Magazines

Notch number 12

Newspaper

Notch number 13

Other

Notch number 14

Montana

Notch number 17

Out-of-State

Notch number 19

Number of Answers Marked

This portion is similar to the form number. Use the following procedure:

<u>Number of Answers</u>	<u>Notch</u>
1	hole 21
2	hole 22
3	hole 21 and 22
4	hole 23
5	hole 21 and 23
6	hole 22 and 23

Bonner

Questionnaires filled out at the Bonner station will be notched 25.

Frenchtown

Questionnaires filled out at Frenchtown will be notched 26.

APPENDIX IV
INTERVIEWING PROCEDURE

The following material is to be used for a guideline when interviewing persons using the questionnaire Form A. The material here is outlined from the following source:

Adams, J. Stacey, 1958. Interviewing Procedures, A Manual for Survey Interviewers, The University of North Carolina Press, Chapel Hill, North Carolina.

A. Introducing the Survey and Establishing Rapport

1. The interviewer must introduce himself and state the purpose of his call.
 - a. Who is conducting the survey
 - b. The subject and purpose of the survey
 - c. How the respondent happened to be chosen
 - d. The interview is confidential
2. The interviewer must make the respondent feel that the interview is permissive.
3. The interviewer must make the respondent feel that the interview or survey is important.
4. The interviewer must make the respondent feel that his answers are important.
5. The interviewer's appearance must be neutral.
 - a. Clothing should be average
 - b. The personal appearance should be average
 - c. Speech should be carefully controlled.
6. The interviewer must make an attempt to obtain an interview at the time of his first contact, or if this is not possible, make definite arrangements to obtain the interview at a later time.

7. The interviewer's approach must be flexible.

B. Choosing the Setting for the Interview

1. The interview must be conducted in a quiet and comfortable place.
2. The respondent should be interviewed alone.

C. Using Questionnaires

1. The question must be asked precisely as on the questionnaire.
2. The question must be asked in the order presented on the questionnaire.
3. Every question must be asked.
4. When a question is not understood or is misinterpreted it must be repeated in the same words and not paraphrased.
5. Questions which respondents hesitate or refuse to answer initially must be handled tactfully in order not to destroy rapport.
6. Instructions to the interviewer on the questionnaire must be carefully followed.
 - a. Instructions on when, how and what to probe for
 - b. Instructions on decisions about what to ask
 - c. Instructions on additional things to do in conjunction with certain questions
7. The questionnaire must be used with ease and informally.
8. Rapport must be maintained throughout the interview.

D. Using Probes

1. Types of probes
 - a. Completion probe
 - b. Clarity probe
 - c. Channel probe
 - d. Hypothetical probe
 - e. Reactive probe
 - f. High pressure probe
2. Probes must be used:
 - a. When the response is irrelevant to the question asked
 - b. When the answer is unclear
 - c. When an answer seems incomplete
 - d. When an answer is suspected of being untrue
3. Probes must not suggest responses
4. The use of probes presumes good rapport and requires tact

E. Closing the Interview

1. The respondent must be thanked for his participation in the survey and be left with the feeling that the interview has been a pleasant and interesting experience.

F. Recording Responses

1. Responses must be recorded at the time they are made.
2. A respondent's own words must be recorded.
3. Non-responses must be accounted for in detail.
4. All interviewer probes must be recorded and noted as such or in parentheses.

5. Significant events during the course of the interview must be recorded.
6. Recorded responses must be clearly legible.
7. Before a questionnaire is returned to the supervisor it must be checked for completeness, understanding, and legibility.

G. Common Sources for Interviewer Bias

1. Failure to list completely.
2. Failure to get designated locations and individuals.
3. Suggesting responses.
4. Failure to discriminate acceptable from unacceptable responses.
5. Failure to record responses adequately.