

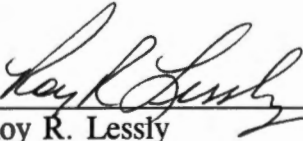
To the Graduate Council:

I am submitting herewith a thesis written by Bonita B. Sparks entitled "Perceived Benefits of the National 4-H Forestry Invitational and the Differences in Attitude and Forestry Knowledge Between 4-H Invitational Participants and Other 4-H Members." I have examined the final copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural and Extension Education.



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We have read this thesis
and recommend its acceptance:



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Accepted for the Council:



Associate Vice Chancellor and
Dean of The Graduate School

**PERCEIVED BENEFITS OF THE NATIONAL 4-H FORESTRY INVITATIONAL
AND THE DIFFERENCES IN ATTITUDE AND FORESTRY KNOWLEDGE
BETWEEN 4-H INVITATIONAL PARTICIPANTS AND OTHER 4-H MEMBERS**

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Bonita B. Sparks

May 1995

AO-VET-MED.
Thesis
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S6

ACKNOWLEDGEMENT

I would like to express my most sincere appreciation to those who have helped me realize the completion of this study. Dr. Randol G. Waters has been a great inspiration through his continued enthusiasm, interest, and leadership as the chair of my graduate committee. Without his guidance and direction, this study would not have been realized. Appreciation is also expressed to the other members of my committee, Dr. Roy R. Lessly, and Dr. J. Mark Fly for their time and energy. A special thanks to Larry Tankersley for presenting this idea of study. I'd also like to thank Dr. John D. Todd, Professor of Agricultural and Extension Education, for his support and encouragement. A special thanks to Mioko Oliver and Sherri Byrd in the Department of Agricultural and Extension Education for their help.

Thankfulness is extended to the agriculture extension leaders who dealt with the Invitational for their cooperation and good will in helping with the study. Gratitude is also extended to my mother, Ruth M. Baker, and other members of my family for their prayers, support, and encouragement. I would especially like to express my appreciation to my daughter, Marilyn, for her patience, encouragement, and sacrifice. I hope one day to return her the favor.

ABSTRACT

Statement of the Problem

The National 4-H Forestry Invitational has been in existence for 14 years. During that time, the International Paper Foundation, not to be confused with the International Paper Company, has supported and contributed to the Invitational. There is a need to determine and characterize the benefits of participants of the Invitational. There is also a need to know whether 4-H members who participated in the National 4-H Forestry Invitational have attitudes toward forestry and knowledge of forest practices of a different perspective than other 4-H members who have not participated in the Invitational.

Purpose of the Study

The purpose of this study involved five objectives. First, the study identified the demographics of three groups which included participants of the National 4-H Forestry Invitational for the years 1991 through 1993, 4-H members who were involved in the forestry education program but did not attend the Invitational, and 4-H members who were not involved in the forestry education program in any way. The study investigated the perceived benefits participants received from the National 4-H Forestry Invitational, and determined the differences between Invitational participants and non-participants regarding their knowledge of forestry practices and attitudes about forestry issues. Lastly, the study investigated the relationship between the three groups with regard to their planned career choice.

Methodology

A questionnaire was developed to answer the research objectives of the study. Data gathered for the study were analyzed using The University of Tennessee Computing Center IBM 3081 mainframe computer and the Statistical Package for the Social Sciences (SPSS) release 4.1. Descriptive statistics and appropriate inferential tests were used in the analysis.

Findings

1. There were more females than males who responded to the study, and there were more respondents who had a farm or rural background than from a city. The greatest number of respondents planned to go to college or graduate school, and there were more respondents who had been in the 4-H Club five years or more than any other length of time.
2. There was an overall positive attitude regarding the Invitational by participants. Perceptions of Invitational participants regarding how young people benefit from the National 4-H Forestry Invitational were very positive.
3. Respondents' scores for a general forestry knowledge test indicated that Invitational participants had a greater knowledge of general forestry practices than did those who did not participate in the Invitational. Further, those who participated in the 4-H forestry education program had a greater general knowledge of forestry practices than did 4-H members who did not participate in the 4-H forestry education program in any way.
4. Responses given to seven statements regarding general forest issues were consistent with the idea that all 4-H members are concerned about the environment. Although Invitational participants indicated that they perceive the contest helps young people recognize the importance of the environment, other 4-H member appear to share in this understanding. There were also seven statements regarding forest practices. Respondents had a positive attitude toward the use of

prescribed burning, a negative attitude toward the use of chemical weed control, and were somewhat "uncommitted" toward the use of clearcutting. All respondents appeared to have a perception that there needs to be a proper balance between the protection of the environment and the economy.

5. Most respondents planned a career not related to forestry. However, participants in the Invitational were more likely to choose to enter forestry related careers than were members who did not participate in the Invitational.

Recommendations

1. Participants in the Invitational were primarily rural youth with farming backgrounds. Perhaps program planners may consider to increase participation of non-traditional youth in an effort to have more impact upon the "general public".
2. The Invitational should continue to be a part of the 4-H forestry education program as it appears to be positively impacting upon participants' general knowledge of forestry practices.
3. The perception by all 4-H youth, including Invitational participants, that there is less forest land today than 50 years ago and that there are more pine forests than hardwood forests, suggest that educational program planners need to focus attention upon these incorrect perceptions.
4. The use of common forest management practices such as chemical weed control and clearcutting are not perceived positively by 4-H members. Program planners should consider the implications of this finding and adjust the educational program as appropriate, if this attitude is to be changed.
5. Additional study needs to be conducted to understand 4-H members' attitudes toward the practice of selective tree cutting.
6. Finally, this study should be replicated periodically in an effort to continually assess the benefits of participation in the National 4-H Forestry Invitational.

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CHAPTER I

INTRODUCTION

The emblem for the 4-H Club, a four leaf clover with an "H" on each leaf, represents head, heart, hand, and health. The wording adopted in 1927 to describe this clover reads: I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, and my country (Reck, 1951, p. 217). This is the basis for the philosophy of the 4-H Club - to supplement formal education with real life, hands-on situations.

The 4-H Club is the informal youth education program of the Cooperative Extension Service and is conducted by the U.S. Department of Agriculture, State Land-Grant Universities, county governments and combines the work of federal, state and local Extension staff and volunteer leaders. Participation in the 4-H program is open to all interested youth, regardless of race, color, sex, creed, national origin, or handicap. Participants are primarily between the ages 9 and 19 and reside in every demographic area; farm, city and in between (Wessel and Wessel, 1982 p. 331).

Some examples of ways to participate in the 4-H program include organized 4-H Clubs, 4-H special interest or short-term groups, 4-H school enrichment programs, 4-H camping, and individual 4-H projects. One of these programs, the 4-H forestry program, is a learn-by-doing educational process to encourage and promote better forestry knowledge and practice.

The mission of 4-H is to "assist youth in acquiring knowledge, developing life skills, and forming attitudes that will enable them to become self-directing, productive and contributing members of society" (Wessel and Wessel, 1982).

As part of this innovative thinking, to meet the desires of its members, camps were introduced into the 4-H Clubs shortly after the 4-H forestry program was formed in the early 1920's to give 4-H members of the program the opportunity to acquire forestry knowledge and skills. Since that time, there have been forestry contests at the county, district, state, and national levels. The National 4-H Forestry Invitational was introduced in 1980 and is an annual event as an incentive for students to do well in competition.

For the culmination of the work done by students in 4-H forestry programs, the National 4-H Forestry Invitational is held at the Jackson's Mill State 4-H Camp in West Virginia. It is a competitive event for forestry knowledge and skills in seven contest areas: 1) Tree Identification; 2) Forest Evaluation; 3) Tree Measurement; 4) Compass Orienteering; 5) Forestry Bowl; 6) Insect and Disease Identification; and 7) Forestry Written Examination (Roth, 1993, p. 1).

Teams of four individuals from each state gather to participate. These teams have been selected after competing at county, district, and state competitions.

The goals outlined for the National 4-H Forestry Invitational for the 4-H Forestry members from all states are for each member to have the opportunity to: A) Develop leadership talents and to work toward achieving character development and effective citizenship; B) Develop appreciation for the need and importance of conserving woodland as a source of products and services necessary for quality living; C) Acquire information and understanding of practical forestry skills in forest management and utilization of forest products (Roth, 1993, p.2).

This study identifies some of the benefits derived from the National 4-H Forestry Invitational participants of 1991 to 1993 and measures their attitude and knowledge of forest practices compared with those students involved in 4-H who have not participated in the Invitational.

Statement of the Problem

Educators often assume that all education is good or worthwhile. They also assume that others believe education is valuable and worthy of public support. For 14 years, the International Paper Foundation, not to be confused with the International Paper Company, has supported and contributed to the National 4-H Forestry Invitational. The coaches who participate with students across our nation will agree that the students have benefitted from participation. How can these benefits be measured, and how can the International Paper Company Foundation justify the amount of money contributed each year to such a "worthy" cause? This study is aimed at answering these questions.

There is a need to characterize the benefits of participants. There is also a need to know if the attitudes toward forestry and the knowledge of forest practices provide a different perspective for analyzing forest issues to 4-H members who participated in the National 4-H Forestry Invitational than other 4-H members who have not participated.

Purpose of the Study

The purpose of this study was five fold. This study identified demographic data pertaining to three sampled groups. These three groups included participants of the National 4-H Forestry Invitational for the years 1991 through 1993, 4-H members who were involved in the forestry education program but did not attend the Invitational, and 4-H members who were not involved in the forestry education program in any way. The benefits perceived by participants of the National 4-H Forestry Invitational were also identified. Thirdly, this study explored the attitudes of 4-H Invitational participants toward forest management practices compared with the other two sampled groups of 4-H members identified. The fourth part of the study evaluated the knowledge of participants regarding forestry compared with the other two groups of sampled 4-H members. The last part of the study investigated the differences between the participants and non-participants regarding career choice.

The purpose of the study is not only to assess the participants views, but also to use the data to provide information about the nature and worth of the program.

Research Objectives

The following objectives were developed to accomplish the overall purpose of the study:

1. to describe the three respondent groups regarding demographic characteristics.
2. to determine the perception of participants regarding benefits received from the National 4-H Forestry Invitational.

3. to study the difference between the three respondent groups regarding the knowledge of forest practices.
4. to investigate the differences between the three respondent groups regarding attitudes about forest issues.
5. to investigate the differences between the three respondent groups regarding planned career choice.

Definitions

The following definitions are included to give a better understanding of the terms discussed.

Attitude

The meaning of attitude has changed over the years. At one time it was a state of posture, now it is considered a state of the mind. " Most researchers seem to agree that an attitude is a state of readiness, a tendency to respond in a certain manner when confronted with certain stimuli" (Oppenheim, 1992, p. 175). A person's attitude about a particular subject may not be known until that subject has been perceived. Until a subject is brought to the attention of a person, that person may not realize what kind of attitude is held toward that subject. As a rule, attitudes are acquired or modified by absorbing, or reacting to, the attitudes of others.

"An attitude statement is a single sentence that expresses a point of view, a belief, a preference, a judgment, an emotional feeling, a position for or against something" (Oppenheim, 1992, p. 174). There is more to attitude than what it is about. Attitudes have intensity. One person may feel very strong about the need for

conservation, while another person may be passive. Then, some attitudes go through several changes during one's lifetime while others are more enduring. A man's attitude toward politics may remain constant through his life, whereas his attitude toward sports may change.

Benefits

Merriam-Webster's Collegiate Dictionary (1993) describes a benefit as something that promotes well being, a useful aid or an advantage. A benefit of the 4-H Forestry program may be an increase in knowledge, an appreciation for nature, an awareness of conservation management. There are many benefits that can be perceived by an individual participating in the program that may not be perceived by someone not closely related with 4-H Forestry.

CHAPTER II

REVIEW OF RELATED LITERATURE

This review of literature addresses the history and identifies the purposes of Youth Organizations as a general category and proceeds to define the role of the 4-H program within this realm, specifically the 4-H Forestry program. The 4-H Forestry program evolved out of the environmental programs for youth developed at the turn of the century (Organizations for Children and Youth, 1972).

Increased industrialization in the United States during the second half of the nineteenth century resulted in the growth of large cities and decline of rural living. "The period was marked by serious slum conditions, child labor, long working hours, poor health, and high rates of crime and delinquency" (Hansen & Carlson, 1972, p. 1). To counteract these unpleasant conditions of crowded city life, many organizations were established to allow youth to look past their unpleasant surroundings to the worth and dignity of every individual.

The latter half of the nineteenth century and first quarter of the twentieth century marked the establishment of most organizations in existence today. The major youth agencies, YMCA, YWCA, Boys' Clubs, Girl Scouts, Boy Scouts, Camp Fire Girls, and 4-H were all established by 1916. Although they have progressed to meet changing interests of young people, they still strive to instill in young people the characteristics of leadership, character development and personality development.

Common characteristics of most non-profit organizations designed to meet the needs of youth are volunteer membership, low membership fees, support by public contributions and adult leaders. Each organization has its own objectives and ways to reach the needs of youth.

Objectives shared by national youth agencies include social integration to get along with others, developing democratic leadership, personality development, character development, constructive use of leisure time and realization of spiritual meanings and values (Organizations for Children and Youth, 1972, pp. 36-39).

Some organizations were developed to emphasize a close working relationship between home and school, while others may stress discussion of common problems. Some organizations combine resources and skills of education, health, social work, and recreation. The purpose of many national organizations is to meet the special needs of certain children. Health groups, educational groups, welfare organizations, religious and community organizations are all designed to meet special needs of the youth of today, as are 4-H Clubs.

A report based on the Children and Youth at the Midcentury. Midcentury White House Conference of Children and Youth (1950), reports that youth agencies "agree that in general, children need and should have opportunities for their fullest development, growing toward maturity through physical, mental, emotional, spiritual, social and environmental well being" (p. 29). An emphasis is placed on leadership and citizenship training, on respecting and understanding people of different racial, cultural, and religious backgrounds, and on the dignity and worth of every individual.

Some identify the beginning of 4-H Club work with the passage of the Smith-Lever Act in 1914, which made Cooperative Extension Work nationwide. However, the 4-H idea germinated around 1900 to 1910 to a concern for the needs of adolescents (Reck, 1951). Unlike most other youth organizations, the 4-H Clubs were first designed for rural youth. Although there was a need at the time for practical education in agriculture, the type of education offered did not relate to farm living, the manual arts, or homemaking. The youth within the agriculture community needed an outlet for their talents to gain respect. Club work began wherever a public-spirited man or woman did something to give rural boys and girls respect for themselves and their way of life (Reck, 1951).

Nature study clubs existed as early as 1896 (Reck, 1951). They were started to help rural young people appreciate their environment. Nature study leaflets were very popular in New York at the time.

The 4-H Club provided colleges with an outlet to pass on new techniques to the farm community. The 4-H Club has helped farm youth realize agriculture as a science that is written down in books just as the "3 R's". With the emphasis on education, it has been the answer to a need of rural boys and girls for encouragement in the performance of those worthwhile everyday tasks that make for better living and richer personalities.

Many communities simultaneously began home projects for rural youth. Thinking themselves the only pioneers in this endeavor, all over the nation rural youth work programs were being created between 1900 and 1910 (Reck, 1951).

In the 1920's conservation work became prevalent among 4-H Club members. "New York state's Conservation Department began offering trees to club members for planting on hillsides and in abandoned fields" (Reck, 1951, p. 256). Wisconsin established school forests where youth could participate in annual plantings, nature hikes, map drawings, building trails, establishing bird sanctuaries, the study of forest protection, and the study of laboratory plots.

Throughout the 1920's 4-H camps were established across the nation. The camps were an outgrowth of the desires of the clubs (Reck, 1951). This is an example of the change made in 4-H Clubs to be current with demands of skills needed to survive in our society. The camps are offered as an incentive for youth in 4-H. Leadership training, conservation camps, and outdoor recreation camps on county, district, and state levels are a valued part of the 4-H program.

In the 1930's Wisconsin 4-H Clubs started their Junior Forest Ranger program; in 1935 Wildlife Conservation and Reforestation was organized; and in 1945 the Soil Conservation program was founded (Reck, 1951). All of these programs were the result of the emphasis placed on the need for conservation management in the United States. Over the years, 4-H Clubs have changed to meet the challenge of diversity in industry. New techniques are introduced to keep abreast of the changes in agriculture and homemaking. Activities still include crops and gardening, baking, sewing and canning, woodworking and animal care, as well as spelling and essay contests. There is still an emphasis placed on leadership, citizenship, and academic courses to prepare youth for our ever changing world.

Summary of Review of Related Literature

Although the organizations established at the turn of the century have changed to meet the needs of youth, the desire to make a diversified club member and diversified individual have not changed. Leadership, character development and good citizenship are still qualities that clubs strive to instill in youth. As a result, there are many areas of interest the 4-H Club has designed to attract young people. The forestry education program is designed to develop leadership skills for those interested in forestry.

CHAPTER III

METHODOLOGY

Population and Sample

Senior 4-H members, grades 10 through 12, make up the majority of the list of participants for the National 4-H Forestry Invitational. The sample for this study was taken from the population of typical 4-H members involved in past and future 4-H Forestry programs. There were 55 teams that participated in the Invitational from 1991 to 1993. The number of states that participate each year varied. In 1991 there were 19 states, in 1992 there were 16 states, and in 1993 there were 20 states participating in the Invitational. At times there were fewer than four members on a team, but the majority of teams consisted of 4 participants.

A random sample of team participants was chosen by numbering each team that participated in the last three years and entering their team ID numbers in a computer program which generated random numbers. There were 18 teams sampled for the study. Once the teams were identified, the extension 4-H leaders were contacted and asked to participate in the study. The 4-H leaders were also asked to help identify two comparison groups to participate in the study. These two comparison groups consisted of a random selection of 4-H members not involved in the forestry education program and those involved, but not participating in the Invitational. There were a total of three groups of similar size involved in the study. To adjust for the possibility of a higher response rate from participants in the

Invitational, a slightly larger number of individuals was requested for the two comparison groups. Using the sampling procedures described, the resulting sample size was 69 participants in the National 4-H Forestry Invitational, 89 4-H members who participated in a forestry educational program but not in the Invitational, and 93 4-H members who had not participated in the 4-H forestry education program, for a total sample size of 251.

Instrumentation

After an analysis of studies regarding attitude measurement and questionnaire design, the survey instrument was designed from the set of objectives outlined by the National 4-H Forestry Invitational (Appendix A). There was a questionnaire for the Invitational participants and a separate questionnaire for the 4-H forestry education program participants and 4-H members not involved in forestry. Questions were developed to study the Invitational respondents' attitudes about the National 4-H Forestry Invitational. Questions were also developed to study the Invitational participants, 4-H members not involved in the forestry program, and those involved but not participating in the Invitational, to measure their attitudes and knowledge regarding forestry issues, and to obtain general background and demographic information.

The background questions were developed after reviewing a previous study of personal attitudes of Invitational participants by Kay Dickie of the International Paper Foundation (Dickie, K., 1990). Another study conducted by the Tennessee Valley

Authority, Auburn University, and Gallop Organization, Inc., (Attitudes in the Tennessee Valley Region Toward Forest Practices and Policies, 1993) was the basis for developing statements to measure attitudes regarding forest management practices.

There were eight parts of the questionnaire for Invitational participants. The first part consisted of demographic and personal data. The second section contained a semantic differential scale indicating extreme opinions about the Invitational to measure participants' attitude. Extremely positive responses were listed on the left while extremely negative responses were listed on the right. The third section of the questionnaire contained a Likert-type scale developed to measure the respondents' perceptions of benefits derived from participating in the National 4-H Forestry Invitational. This part of the questionnaire was developed from objectives outlined in the National 4-H Forestry Invitational Handbook (1993). This scale includes "life skills" designed by the 4-H Clubs as they have been incorporated into the Handbook:

"The objectives of this National 4-H Invitational Forestry Event are to provide the opportunity and atmosphere for 4-H forestry members from all states to: (1) develop leadership talents and to work toward achieving character development and effective citizenship; (2) develop an appreciation of the importance of conserving forests as a source of income, raw materials, and enjoyment necessary for quality living; and (3) acquire information and understanding of practical forestry skills in forest management and the use of forest and wood products." (1993, p.2)

The fourth section contained a Likert-type scale developed to measure how the Invitational gave participants' incentive to be involved in the 4-H Club. The fifth section contained a Likert-type scale developed to measure the respondents' attitudes regarding incentives to be involved in the 4-H Club. The sixth section contained a

Likert-type scale developed to measure the respondents' attitudes regarding forest management practices. The seventh section contained a series of multiple choice questions to measure knowledge about forestry, and the eighth section requested additional comments that may be helpful to improve the National 4-H Invitational Program.

The questionnaire for the two comparison groups was similar to the one developed for the Invitational participants, with the exception of the exclusion of any items relating to participation in the Invitational itself.

Description of Variables Studied

Following is a description of the descriptive, independent, and dependent variables studied in an effort to accomplish the objectives:

Descriptive Variables

Included in the instrument were several items used to describe the respondent groups such as gender, place of residence, state of residence, education (planned), and length of time in the 4-H Club. There were also items to determine participants' overall attitude about the Invitational and their perception of how the Invitational benefits young people. The instrument included items to measure attitudes relating to how the Invitational gave participants incentive to be involved in the 4-H Club and items to measure participants' perception of how the National 4-H Forestry Invitational helps young people. The attitudinal descriptive variables were used to measure the attitudes within the group that attended the Invitational.

Independent Variable

The independent variable had three levels, or groups. The first group was the participants in the National 4-H Forestry Invitational. The second group was the 4-H members who participated in the 4-H forestry program, but did not attend the Invitational; and, the third group was the 4-H members who did not participate in the 4-H forestry program in any way.

Dependent Variables

The first dependent variable was forestry knowledge measured by way of a general forestry knowledge test which contained 21 multiple-choice questions regarding general forestry. Other dependent variables included attitudes related to forestry issues and practices, such as prescribed burning, chemical weed control, clearcutting, and tree cutting. There were items to measure attitudes toward the balance between the environment and the economy, and to measure attitudes toward the general public's knowledge of forestry practices. There was also a variable to determine planned career choice. Each of these dependent variables was analyzed regarding differences in the three levels of the independent variable.

Pilot Study Procedures

This research was conducted by means of a mailed questionnaire. It was presented to a panel of experts to determine content validity and reliability before being pilot tested. After minor changes, the research proposal and questionnaire were

approved by the researcher's graduate committee. A proposal to conduct the study was then sent to the Human Subjects Committee at the University of Tennessee, Knoxville. After approval was granted from the Human Subjects Committee, a pilot test was conducted to determine face validity and reliability of the survey instrument.

The pilot test was conducted by mailing the questionnaire to a small subset from the entire sampling frame. Five teams were randomly selected for the pilot study. The extension 4-H leaders from the five states were contacted for approval to conduct the study and to determine the correct person to contact to confirm the names and addresses for each individual team. Each contact person was called first and asked to participate, and then each was mailed a letter and instructions. That contact person, usually a 4-H extension agent, was sent a letter requesting his/her participation in the study, to verify names and addresses of those individuals who participated in the National 4-H Forestry Invitational, to identify the names and addresses of 4-H forestry education program members that had not attended the National Invitational, and to identify 4-H members who had not participated in the 4-H forestry education program in any way. There were names received for 74 individuals. This included 19 4-H members that participated in the National 4-H Forestry Invitational, 26 4-H members who had participated in the 4-H program but did not participate in the Invitational, and 29 4-H members who did not participate in the forestry program in any way. Each individual was mailed a questionnaire with a cover letter and a self-addressed stamped envelope for return of the questionnaire. Instructions were included in the questionnaire and telephone numbers were provided

to the respondents in case there were any unforeseen situations that arose. A response date was established in the letter. Each questionnaire was numbered to ensure that each individual selected had every opportunity of participation.

For each stage of the pilot test, a schedule of follow-up procedures was developed to remind those not returning information or data by the response date requested. A reminder letter was mailed with an additional questionnaire and return envelope to the respondent, three days after the requested response date. In addition to being numbered, the questionnaires were color coded to differentiate between early and late respondents. All measures were taken to assure a high response rate.

To determine reliability of the knowledge test, a Kuder Richardson score (KR_{20}) was calculated in the pilot study. A KR_{20} reliability coefficient of .86 was calculated for the knowledge test. This was considered adequate internal consistency for the knowledge test and it was not changed further.

Cronbach's Alpha Coefficient was used to check the internal consistency of attitudinal scales scores. Acceptable reliability coefficients were calculated at .87 for the attitude toward prescribed burning, .86 for the attitude toward the use of chemical weed control, .87 for the attitude toward the use of clearcutting, and .78 for tree cutting. Although the internal consistency could have been improved by the removal of a few statements, all questions were included because these coefficients were considered acceptable.

Results of the pilot test indicated that the attitudinal scales and the knowledge test were acceptable regarding internal consistency. Therefore, scales and the

questionnaire were not modified prior to the actual study. The pilot test did identify some minor inconsistencies between the questionnaire designed for the participants and the one designed for the comparison groups. There were minor editorial changes made to each one in an effort increase comprehension of the questionnaire and to make data coding easier for the study.

Data Collection Procedures

After conducting the pilot study, the researcher randomly selected 18 more teams to participate in the final study. Calls were made to 4-H leaders within the states of those teams randomly selected, an explanatory cover letter was mailed to the extension personnel requesting verification of Invitational participants and assistance in identifying the two comparison groups. A self-addressed return envelope was provided for return of the names and addresses of students (Appendix B). Additional calls were made to those who did not respond, to ensure that all randomly selected individuals were given a chance to participate. There were 18 teams randomly selected for the study that participated in the National 4-H Forestry Invitational. This included 69 4-H members. Additionally, there were 89 4-H members who had participated in the forestry program but did not participate in the Invitational and 93 4-H members who did not participate in the forestry program in any way, for a total sample size of 251. Each respondent was assigned a number to correspond with the appropriately numbered questionnaire. The questionnaires were mailed with a cover letter.

As in the pilot test, two weeks after the initial mailing, another questionnaire and envelope with a different cover letter (Appendix B) was mailed to those who had not responded. From the 251 identified participants in the survey, 147 questionnaires were returned. There were four of the returned questionnaires that were not completed and could not be used. The 143 useable questionnaires represented a usable response rate of 57 percent. There were 105 questionnaires returned by the deadline which included 29 from Invitational participants, 40 from 4-H members participating in the 4-H forestry program but not attending the Invitational, and 36 returned from 4-H members not involved in the 4-H forestry program in any way. There were 38 questionnaires returned as the result of the follow up including 8 questionnaires from the National 4-H Invitational participants, 15 questionnaires from 4-H members who participated in the 4-H forestry program but did not attend the Invitational, and 15 returned from 4-H members who did not participate in the 4-H forestry program in any way. Of the 143 total useable questionnaires returned, there were 37 (26 percent) from National 4-H Invitational participants, 55 (38 percent) from 4-H members who participated in the 4-H forestry program but did not attend the Invitational, and 51 (36 percent) from 4-H members who did not participate in the 4-H forestry program in any way.

Response Bias Study

In an effort to study potential response bias, 17 key variables were selected for analysis regarding differences between early and late responders. Of those 17

variables, only four produced statistically significant differences between the two groups. Early responders had a slightly more negative attitude toward the Invitational than did late responders (even though both groups had very positive attitudes toward the Invitational overall). Early responders also tended to agree slightly more with the statement, "The amount of forests in the United States is less than 50 years ago", than did late responders. Further, early responders differed slightly with late responders regarding their agreement with the statement, "There are fewer hardwood trees grown in the United States today than 50 years ago" and they differed slightly in their agreement with the statement, "There should be a balance between the protection of the environment and the importance of the economy". Although early and late responders differed statistically on four of the 18 variables, these differences were not substantive. Overall, the researchers concluded that early responders were not substantively different from late responders. Since late responders are similar to non-responders (Miller and Smith, 1983), researchers concluded that there was no substantive response bias in the sample. Findings from this sample study were considered to be generalizable to the larger population from which the sample was drawn.

Data Analysis Procedures

Data were analyzed using the Statistical Package for the Social Sciences (SPSS Release 4.1) on the IBM 3081 mainframe computer at The University of Tennessee Computing Center, Knoxville. The Analysis of Variance procedure and Chi-Square

tests were used to determine if statistically significant differences existed between groups regarding the dependent variables studied. The alpha level for rejection of the null hypothesis was set at .05 a priori. When appropriate, the Duncan's Multiple Range Test was used to identify statistically significant differences between specific groups. Frequencies, percentages, and other appropriate descriptive statistics were used to describe the respondents demographically. Finally, appropriate reliability coefficients were calculated in an attempt to study the research instrument itself.

CHAPTER IV

PRESENTATION OF DATA AND FINDINGS

The purpose of this chapter is to present findings as related to the objectives of the study. The chapter is divided into 5 sections, one for each objective of the study.

Demographic Characteristics of Respondents

Demographic data are reported in Table I. Demographic data include gender, place of residence, state of residence, education plans and length of membership in 4-H.

Gender

Out of the 143 respondents, there were 61 males (42.7 percent) and 82 females (57.3 percent).

Place of Residence

There were 45 respondents (31.7 percent) who lived on farms, 60 respondents (42.3 percent) who lived in a rural non-farm area, 21 respondents (14.8 percent) who lived in a town with a population of less than 10,000, 8 respondents (5.6 percent) who lived in a small city with a population of 10,000 to 50,000, 5 respondents (3.5 percent) who lived in a medium city of 50, to 100,000 population, and 3 respondents (2.1 percent) who lived in a large city or metropolis with over 100,000 population.

TABLE I. Demographic Characteristics of Questionnaire Participants

Characteristic	Respondents	
	Number*	Percent
Gender		
Male	61	42.7
Female	<u>82</u>	<u>57.3</u>
Total	143	100.0
Where do you live?		
Farm	45	31.7
Rural area, but not a farm	60	42.3
Town (under 10,000)	21	14.8
Small city (10,000 to 50,000 population)	8	5.6
Medium city (50,000 to 100,000 population)	5	3.5
Large city or metropolis (over 100,000 population)	<u>3</u>	<u>2.1</u>
Total	142	100.0
Which state do you live in?		
Alabama	25	17.5
Florida	11	7.7
Georgia	10	6.9
Idaho	9	6.3
Illinois	10	7.0
Kentucky	7	4.9
Mississippi	8	5.6
Missouri	9	6.3
New Hampshire	11	7.7
Oklahoma	6	4.2
Tennessee	10	7.0
Texas	9	6.3
Virginia	9	6.3
Washington	<u>9</u>	<u>6.3</u>
Total	143	100.0

*Some totals may not equal 143 as the question was not answered.

TABLE I. (continued)

Characteristic	Respondents	
	Number*	Percent
Education (Plan to go to)		
High School	4	2.8
Vocational School	5	3.5
College	77	53.8
Graduate School	<u>57</u>	<u>39.9</u>
Total	143	100.0
How long participated in 4-H?		
0 Years	2	1.4
1 Years	5	3.5
2 Years	8	5.6
3 Years	10	7.0
4 Years	18	12.6
5 Years or Longer	<u>100</u>	<u>69.9</u>
Total	143	100.0

*Some totals may not equal 143 as the question was not answered.

State of Residence

From the 18 teams who were mailed questionnaires, there were 14 states represented. There were 25 respondents (17.5 percent) from Alabama, 11 respondents (7.7 percent) from Florida, 10 respondents (6.9 percent) from Georgia, 9 respondents (6.3 percent) from Idaho, 10 respondents (7.0 percent) from Illinois, 7 respondents (4.9 percent) from Kentucky, 8 respondents (5.6 percent) from Mississippi, 9 respondents (6.3 percent) from Missouri, 11 respondents (7.7 percent) from New Hampshire, 6 respondents (4.2 percent) from Oklahoma, 10 respondents (7.0 percent) from Tennessee, 9 respondents (6.3 percent) from Texas, 9 respondents (6.3 percent) from Virginia, and 9 respondents (6.3 percent) from Washington.

Education (Planned)

Only 4 respondents (2.8 percent) indicated they planned to go no further than high school with their education. Five respondents (3.5 percent) planned to attend a vocational school after high school. There were 77 respondents (53.8 percent) who planned to complete college, and 57 respondents (39.9 percent) who planned to continue their education in graduate school.

Length of Time in 4-H

Two respondents (1.4 percent) had been 4-H members for less than one year. There were 5 respondents (3.5 percent) who had been 4-H members for one year. Eight respondents (5.6 percent) had been 4-H members for two years and 10 respondents (7.0 percent) had been members for three years. There were 18 respondents (12.6 percent) who had participated in 4-H for four years and 100 respondents (69.9 percent) who had participated in 4-H for five years or longer.

**Participant's Perceptions Regarding Benefits Received from the
National 4-H Forestry Invitational*****Overall Attitude about the National 4-H Forestry Invitational***

Data in Table II describe the overall attitude score of only respondents who participated in the Invitational. A semantic differential scale was used to measure their attitude. Scores on the scale could range from 6 to 42, with a 6 being the most positive and 42 being the most negative attitude. The midpoint of the scale was 30.

TABLE II. Participants' Overall Attitude about The National 4-H Forestry Invitational

Variable	Respondents	
	(n = 143)	
	$\bar{x}^*$	s.d.
Overall attitude score regarding the National 4-H Forestry Invitational	10.43	4.15

*Range = 6 to 42; 6 = most positive, 42 = most negative

The overall attitude score of 10.43 indicated that those who participated in the Invitational had a very positive or favorable opinion of the National 4-H Forestry Invitational. The relatively low standard deviation (4.15) indicated most participants agree in their attitudes.

How Young People Benefit from the National 4-H Forestry Invitational

Objectives outlined in the National 4-H Forestry Invitational Handbook (1993) and "life skills" identified by the 4-H Club as they have been incorporated into the Handbook were used to develop the items in this section of the survey. There were 10 Likert-type statements pertaining to possible benefits derived by participants. Scores were calculated based on the following scale: 1 = strongly agree, 2 = agree, 3 = undecided, 4 = disagree, and 5 = strongly disagree.

As reported in Table III, average scores for the perceived benefits derived from participating in the Invitational ranged from 1.35 to 1.84. The lower the score

TABLE III. Participants' Perceptions Regarding How Young People Benefit from the National 4-H Forestry Invitational

Variable	Respondents	
	(n = 143)	
	$\bar{x}^*$	s.d.
The National 4-H Forestry Invitational Helps Young People:		
. Gain new knowledge, skills, and attitudes through "real life experiences"	1.57	.56
. Develop leadership talents and abilities	1.84	.96
. Become better stewards of the earth	1.60	.73
. Recognize the value of the environment	1.35	.48
. Learn techniques concerning land use management	1.41	.60
. Understand how forest management contributes to the economy and human welfare	1.49	.61
. Appreciate nature for enjoyment	1.49	.69
. Apply conservation principles	1.57	.56
. Strengthen personal standards and citizenship ideals	1.81	.78
. Cultivate desire and ability to cooperate with others	1.51	.69

*1=Strongly Agree; 2=Agree; 3=Undecided; 4=Disagree; 5=Strongly Disagree

the more respondents perceived this to be a benefit derived from the Invitational. The perceived benefit which received the most favorable average rating was, "The National 4-H Forestry Invitational Helps Young People: Recognize the value of the environment". The least favorable perceived benefit was, "The National 4-H Forestry Invitational Helps Young People: Develop leadership talents and abilities". It should be noted, however, that even the lowest rated item was still perceived as a favorable benefit by respondents.

Low standard deviation scores on the individual perception statements regarding the benefits of the Invitational indicated that respondents were in agreement with regard to the perceived benefits.

How the National 4-H Forestry Invitational Gave Participants Incentive to be Involved in the 4-H Club

The data in Table IV describe the opinion of participants with regard to their perception of how the Invitational affected their involvement in the 4-H Club. The range of 1 to 5 was used with the following scale: 1 = no incentive, 2 = very little incentive, 3 = some incentive, 4 = much incentive, and 5 = very much incentive. As reported in Table IV, participants perceived that the Invitational gave them some incentive to be involved in the 4-H Club ($\bar{x} = 3.46$, s.d. = 1.37); and it also provided them incentive to be involved in the 4-H forestry education program ($\bar{x} = 3.54$, s.d. = 1.39). It should be noted however that there was less agreement among respondents regarding these incentives as reflected by slightly higher standard deviation scores.

TABLE IV. Participants' Perceptions of How the National 4-H Forestry Invitational Gave Them Incentive to be Involved in the 4-H Club

Variable	Respondents	
	(n = 143)	
	$\bar{x}^*$	s.d.
The National 4-H Forestry Invitational Gave Me a Reason to Be Involved In:		
. The 4-H Club	3.46	1.37
. The 4-H Forestry Education Program	3.54	1.39

- * 1 = No incentive provided
 2 = Very little incentive provided
 3 = Some incentive provided
 4 = Much incentive provided
 5 = Very much incentive provided

Relationship Between Respondent Groups and Scores on the General Forestry Knowledge Test

All three groups of respondents completed the forestry general knowledge test. Out of the total 143 respondents, there were 37 respondents (26 percent) who attended the National 4-H Forestry Invitational. There were 55 respondents (38 percent) who participated in 4-H club forestry education program, and there were 51 respondents (36 percent) who were 4-H members but who had not participated in forestry projects in any way.

Scores on the knowledge test could range anywhere from 0 to 21. Based upon data reported in Table V, there was a significant relationship between scores on

TABLE V. Relationship Between Respondent Groups and Scores on the General Forestry Knowledge Test

Group	Respondent Group	
	n	$\bar{x}^*$
. National 4-H Forestry Invitational Participants	37	17.65A
. 4-H Members - Forestry Education Program	55	13.29B
. 4-H Members - No Forestry Education Program	51	10.82C

$f = 35.13$ $df = 2, 140$ $p > .001$

*Range = 0 to 21; 0 = 0 percent test score, 21 = 100 percent test score

Test scores with different letters beside them are significantly different as determined by the Duncan's Multiple Range Test.

the forestry general knowledge test and level of respondent ($f = 35.13$ $df = 3, 140$ $p > .001$). The Duncan's Multiple Range test indicated that all three groups were significantly different. Invitational participants scored significantly higher ($\bar{x} = 17.7$) on the test than did 4-H members participating only in the 4-H forestry education program ($\bar{x} = 13.3$). Further, 4-H members who participated in the 4-H forestry education program scored significantly higher on the general knowledge test than did 4-H members who did not participate in the forestry education program at all ($\bar{x} = 10.8$).

Relationship Between Respondent Groups and Participants' Attitude About Forest Issues and Practices

All three groups of respondents completed the Likert-type scales with a range of 1 to 5 developed to measure attitudes about a wide range of forestry issues.

Attitudes About General Forestry Issues

A Likert-type scale with a range of 1 to 5 was developed to measure the attitude of the respondent groups toward different forest issues. There were seven questions that the three groups responded to in order to measure this attitude. Although these items were originally grouped for interpreting as an overall attitude score regarding general forestry issues, a low internal consistency score for the scale indicated each item should be interpreted separately. Each item was rated by respondents and interpreted separately.

Based upon the data reported in Table VI, there is no reason to believe there is a relationship between the respondent groups and their responses regarding any of the forestry issues statements. Generally, the respondent groups tended to agree that, "Forests should be managed to produce forest products such as lumber." They agreed that, "Like any other crop, trees should be cut and replanted to produce goods for consumers." They tended to believe that, "The amount of forests in the United States is less than 50 years ago". They also tended to believe that, "There are fewer hardwoods grown in the United States today than 50 years ago"; and that, "There are more pine trees grown in the place of hardwood trees in the United States today than

TABLE VI. Relationship Between Respondent Groups and Participants' Attitude About Forest Issues

Variable Group	n	$\bar{x}^*$	f	df	p
. Forests should be managed to produce forest products such as lumber.			.53	2,137	.59
. Invitational Participants	37	2.05			
. Forestry Participants	53	2.26			
. 4-H Participants Only	50	2.30			
. Like any other crop, trees should be cut and replanted to produce goods for consumers.			.20	2,139	.82
. Invitational Participants	37	1.95			
. Forestry Participants	54	2.09			
. 4-H Participants Only	51	2.06			
. The amount of forests in the U.S. is less than 50 years ago.			1.67	2,139	.19
. Invitational Participants	37	2.62			
. Forestry Participants	54	2.41			
. 4-H Participants Only	51	2.16			
. There are fewer hardwood trees grown in the U.S. today than 50 years ago.			1.49	2,139	.23
. Invitational Participants	37	2.60			
. Forestry Participants	54	2.24			
. 4-H Participants Only	51	2.31			

*1=Strongly Agree; 2=Agree; 3=Undecided; 4=Disagree; 5=Strongly Disagree

TABLE VI. (continued)

Variable Group	n	$\bar{x}^*$	f	df	p
. There are more pine trees grown in the place of hardwood trees in the U.S. today than 50 years ago.			.05	2,139	.95
. Invitational Participants	37	2.22			
. Forestry Participants	53	2.28			
. 4-H Participants Only	50	2.30			
. Private forest owners have the right to do as they please with their property, even if it hurts the environment.			.34	2,139	.72
. Invitational Participants	37	3.87			
. Forestry Participants	54	3.67			
. 4-H Participants Only	51	3.69			
. Limitations should be placed on what private forest owners can do with their property, in order to protect the environment.			.56	2,139	.57
. Invitational Participants	37	2.41			
. Forestry Participants	54	2.39			
. 4-H Participants Only	51	2.18			

*1 = Strongly Agree; 2 = Agree; 3 = Undecided; 4 = Disagree; 5 = Strongly Disagree

50 years ago". They disagreed with the statement that, "Private forest owners have the right to do as they please with their property, even if it hurts the environment". Finally, they agreed with the statement, "Limitations should be placed on what private forest owners can do with their property, in order to protect the environment".

Attitude Toward Use of Prescribed Burning

Attitude of the respondent groups toward the use of prescribed burning was measured with a scale composed of six items. Using a similar Likert-type rating as described previously, scale scores could have ranged from 6 to 30 with a score of 6 indicating the most favorable attitude toward the use of prescribed burning. As reported in Table VII, there is a statistically significant relationship between the respondent groups and attitude toward the use of prescribed burning ($f = 7.95$ $df = 2, 137$ $p > .001$). The Duncan's Multiple Range test indicated that participants in the National 4-H Forestry Invitational had a significantly more positive attitude toward the use of prescribed burning than did either of the two comparison groups. However, those respondents participating in only the forestry education program did not differ significantly from other 4-H members with regard to their attitude.

Attitude Toward Use of Chemical Weed Control

Attitude of the respondent groups toward the use of chemical weed control was measured with 6 items and scores were interpreted the same as with their attitude toward the use of prescribed burning. Again, scores could range from 6 to 30 with a score of six indicating a very positive attitude toward the use of chemical weed control. Based upon the data reported in Table VIII, there is no reason to conclude that there is a significant relationship between respondent groups and scores on the attitude scale. Overall, each respondent group had a slightly negative attitude toward the use of chemical weed control. Scores for all three groups were slightly on the negative side of the midpoint of 18.

TABLE VII. Relationship Between Respondent Groups and Attitude Toward Use of Prescribed Burning

Group	Respondent Group	
	n	$\bar{x}^*$
. National 4-H Forestry Invitational Participants	37	12.27 A
. 4-H Members - Forestry Education Program	53	14.96 B
. 4-H Members - No Forestry Education Program	50	16.76 B
$f = 7.95 \quad df = 2, 137 \quad p > .001$		

*Range = 6 to 30; 6 = most positive, 30 = most negative

Scale scores with different letters beside them are significantly different as determined by the Duncan's Multiple Range Test.

TABLE VIII. Relationship Between Respondent Groups and Attitude Toward Use of Chemical Weed Control

Group	Respondent Group	
	n	$\bar{x}$
. National 4-H Forestry Invitational Participants	36	21.97
. 4-H Members - Forestry Education Program	55	21.22
. 4-H Members - No Forestry Education Program	51	22.33
$f = 7.95 \quad df = 2, 139 \quad p = .615$		

*Range = 6 to 30; 6 = most positive, 30 = most negative

Attitude Toward the Use of Clearcutting

Attitude of the respondent groups toward the use of clearcutting was measured with 6 items and scores were interpreted the same as with their attitude toward the use of prescribed burning. Scores could range from 6 to 30 with a score of six indicating a very positive attitude toward the use of clearcutting. Based upon the data in Table IX, there is no reason to conclude that there is a significant relationship between respondent groups and scores on the attitude scale. Scores hovered around the midpoint indicating all three groups were somewhat undecided about their attitude toward the use of clearcutting.

Attitude Toward the Regulation of Tree Cutting

The attitude of the respondent groups toward the regulation of tree cutting was measured using a Likert-type rating. There were four items and scale scores could range from 4 to 20 with a score of four indicating the most favorable attitude toward the regulation of tree cutting. As reported in Table X, National Forestry Invitational participants had a significantly more favorable attitude toward the regulation of tree cutting than did those 4-H member participating only in the 4-H forestry education program. However, regular 4-H members did not differ significantly from either of the other two groups. ($f = 3.19$, $df = 2, 140$, $p = .044$).

TABLE IX. Relationship Between Respondent Groups and Attitude Toward the Use of Clearcutting

Group	Respondent Group	
	n	$\bar{x}^*$
. National 4-H Forestry Invitational Participants	36	19.81
. 4-H Members - Forestry Education Program	54	18.15
. 4-H Members - No Forestry Education Program	51	20.24
$f = 2.11 \quad df = 2, 138 \quad p = .125$		

*Range = 6 to 30; 6 = most positive, 30 = most negative

TABLE X. Relationship Between Respondent Groups and Attitude Toward Regulation of Tree Cutting

Group	Respondent Group	
	n	$\bar{x}^*$
. National 4-H Forestry Invitational Participants	37	8.54 A
. 4-H Members - Forestry Education Program	55	10.05 B
. 4-H Members - No Forestry Education Program	51	8.94 AB
$f = 3.19 \quad df = 2, 140 \quad p = .044$		

*Range = 4 to 20; 4 = most positive, 20 = most negative

Scale scores with different letters beside them are significantly different as determined by the Duncan's Multiple Range Test.

Attitude Toward the Balance Between Environment and Economy

There were three separate questions included in Table XI relating to the respondent groups and their attitude toward the balance between the environment and the economy. Each item was rated by the respondent groups using the same 5 item scale. Based upon data reported in Table XI, there is no reason to conclude that the three groups differ with regard to their attitude toward the balance between the environment and the economy. Overall, the respondent groups tended to agree that "the environment should be protected, even if it hurts the economy" ($f = .24$, $df = 2$, 140 , $p = .788$), while they tended to disagree with the statement, "The economy should be more important than the environment to protect jobs and other economic considerations for consumers" ($f = .61$, $df = 2$, 140 , $p = .545$). However, all respondent groups agreed with the statement that, "There should be a balance between the protection of the environment and the importance of the economy" ($f = .51$, $df = 2$, 140 , $p = .610$).

Perception of the General Public's Knowledge of Forestry Practices

Differences among the three groups regarding perception of the general public's knowledge of forestry practices are described in Table XII. Each respondent rated one item using a Likert-type scale. Based upon data reported in Table XII, there is no reason to conclude that the three groups differ with regard to their attitude toward the general public's knowledge of forestry practices. Overall, the respondent groups tended to agree that, "The general public does not have enough information to make decisions about forestry practices".

TABLE XI. Relationship Between Respondent Groups and Attitude Toward the Balance Between Environment and Economy

Variable Group	n	$\bar{x}^*$	f	d,f	p
. The environment should be protected, even if it hurts the economy.			.24	2,140	.788
. Invitational Participants	37	2.35			
. Forestry Participants	55	2.49			
. 4-H Participants Only	51	2.43			
. The economy should be more important than the environment to protect jobs and other economic considerations for consumers.			.61	2,140	.545
. Invitational Participants	37	3.68			
. Forestry Participants	55	3.55			
. 4-H Participants Only	51	3.45			
. There should be a balance between the protection of the environment and the importance of the economy.			.51	2,140	.610
. Invitational Participants	37	1.70			
. Forestry Participants	55	1.89			
. 4-H Participants Only	51	1.84			

*1 = Strongly Agree; 2 = Agree; 3 = Undecided; 4 = Disagree; 5 = Strongly Disagree

TABLE XII. Relationship Between Respondent Groups and Perception of General Public's Ability to Make Informed Decisions about Forestry Practices

Group	Respondent Group	
	n	$\bar{x}^*$
. National 4-H Forestry Invitational Participants	37	2.05
. 4-H Members - Forestry Education Program	55	2.15
. 4-H Members - No Forestry Education Program	49	2.25

$f = .35$ $d, f = 2, 138$ $p = .703$

*1=Strongly Agree; 2=Agree; 3=Undecided; 4=Disagree; 5=Strongly Disagree

Relationship Between Respondent Groups and Career Choice

To complete the fifth objective, all three groups were asked to respond to a question about their planned career choice. Out of the total 129 who responded, there were 33 (25.6 percent) who attended the National 4-H Forestry Invitational. There were 47 (36.4 percent) who participated in the 4-H forestry education program, and there were 49 (38.0 percent) who were 4-H members but who had not participated in forestry projects in any way.

Responses received were placed into three categories: definitely related to forestry, possibly related to forestry, and definitely not related to forestry. Data in Table XIII describe the responses given by the three groups of respondents. Of the responses received by those who participated in the Invitational, 9 (27.3 percent) planned a forestry career, 9 (27.3 percent) planned a career possibly related to

Table XIII. Relationship Between Respondent Groups and Career Choice

Career Choice	Respondent Group					
	<u>Group 1</u> No. Percent		<u>Group 2</u> No. Percent		<u>Group 3</u> No. Percent	
· Forestry Career	9	27.3	5	10.6	2	4.1
· Forestry Related Career	9	27.3	7	14.9	11	22.4
· Non-Forestry Career	<u>15</u>	<u>45.4</u>	<u>35</u>	<u>74.5</u>	<u>36</u>	<u>73.5</u>
Total	33	100.0	47	100.0	49	100.0

Chi-Square = 13.24, df = 4, p > .01

Group 1 = National 4-H Forestry Participants

Group 2 = 4-H Members - Forestry Education Program

Group 3 = 4-H Members - No Forestry Education Program

forestry, and 15 (45.4 percent) planned a non-forestry related career. Of the responses from those who participated in the 4-H forestry education program but did not attend the Invitational, 5 (10.6 percent) planned a career related to forestry, 7 (14.9 percent) planned a career possibly related to forestry, and 35 (74.5 percent) who planned a career not related to forestry. Of the responses received from 4-H members who did not participate in the forestry education program in any way, 2 (4.1 percent) planned a forestry related career, 11 (22.4 percent) planned a career possibly related to forestry, and 36 (73.5 percent) planned a career not related to forestry.

The chi-square test indicated a significant relationship between the three response groups at the .01 level. Although most of the total number of respondents

planned a career not related to forestry, those who participated in the National 4-H Forestry Invitational were more likely to plan a forestry related career than were those in the other two groups. Further, those participating in the forestry education program were more likely to plan a forestry related career than were those 4-H members not participating in any forestry education program (Chi-Square = 13.24, $df = 4$, $p > .01$).

CHAPTER V

SUMMARY OF MAJOR FINDINGS

Statement of the Problem

Education is often assumed by educators to be good or worthwhile. Educators also assume that others share their belief that education is valuable and worthy of public support. The International Paper Foundation, not to be confused with the International Paper Company, has supported and contributed to the National 4-H Forestry Invitational for the past 14 years. The educational leaders who have participated in the Invitational and have used their time and talents to coach young people across our nation agree that the students have benefitted from participation. This study was aimed at determining a way to measure the benefits students have received from the National 4-H Forestry Invitational.

The purpose of the study was to assess the views of Invitational participants and 4-H non-participants and use the data to provide information about the nature and worth of the program.

Purpose and Objectives

There were five objectives involved in the purpose of this study. Demographic data were collected to describe the respondent groups. The three groups studied were those participating in the National 4-H Forestry Invitational, 4-H members who were involved in the forestry education program but did not attend the

Invitational, and 4-H members who were not involved in the forestry education program in any way. The perceived benefits of those participating in the Invitational were identified. The study utilized the three respondent groups to explore differences in knowledge of forest practices and attitudes about forest practices. Lastly, the study investigated the relationship between the three groups with regard to their planned career choice.

Sample for the Study

The population for the study was typical 4-H members across the nation in the past and future. Three specific groups of 4-H members were sampled. The first group of 69 Invitational participants was randomly selected from participants that attended the National 4-H Forestry Invitational during the years of 1991 to 1993. The second and third groups were identified and randomly selected by extension educators involved with the Invitational during the three years. The second group of 89 4-H members was randomly selected from participants in the 4-H forestry education program that did not attend the Invitational. The third group of 93 4-H members was randomly selected from 4-H members who did not participate in the forestry program in any way. Individuals in the three groups were mailed a questionnaire. The 4-H members in the second and third groups were mailed a modified questionnaire from the one designed for the Invitational participants. To adjust for an anticipated higher response rate from Invitational participants, a slightly larger number of participants was requested for the two comparison groups.

Instrumentation

The questionnaire mailed to participants had eight parts. The first part requested demographic and personal data. The second part contained 6 semantic differential statements regarding opinions about the National 4-H Forestry Invitational. Part three contained 10 Likert-type statements regarding perceived benefits of respondents who participated in the National 4-H Forestry Invitational. Part four contained 2 Likert-type statements developed to measure how the Invitational gave participants' incentive to be involved in the 4-H Club. The fifth part contained 12 Likert-type opinion statements regarding participation in the 4-H Club. Part six contained 34 Likert-type attitude statements concerning forestry management practices. The seventh part consisted of a general forestry knowledge test with 21 multiple-choice questions, and the eighth part requested additional comments.

The questionnaire mailed to 4-H members not involved in the forestry program and those involved but not participating in the Invitational had four parts. The questionnaire was similar to the one developed for the Invitational participants, with the exception of the exclusion of any items relating to participation in the Invitational itself.

The questionnaire was reviewed by the researcher's graduate committee and submitted to the Human Subjects Committee at The University of Tennessee, Knoxville, for approval. After approval of the instrument by the Human Subjects Committee, the instrument was pilot tested. For the pilot test, there were five teams randomly selected from the teams that attended the National 4-H Forestry Invitational from the years 1991-1993. The two comparison groups were provided by extension

educators as stated above. There were a total of 74 4-H members in the pilot test. Of the questionnaires mailed in the pilot study, 19 attended the National 4-H Forestry Invitational, 26 were involved in the 4-H forestry education program but did not attend the Invitational, and 29 were 4-H members that did not participate in the forestry education program in any way. Reliability coefficients were considered acceptable. Some questions were reworded to improve comprehension of the survey instrument.

Data Collection Procedures

There were 18 teams randomly selected from Invitational participants during the years 1991-1993 to participate in the actual study. The three groups derived from the extension educators for the study were mailed a numbered questionnaire with a self-addressed stamped envelope provided for returning the questionnaire. An explanatory letter giving directions and describing the study accompanied each questionnaire. Appropriate follow-up procedures were used in the study. An overall usable response rate of 57 percent was obtained.

Data Analysis

Data for the study were analyzed using the Statistical Package for the Social Sciences (SPSS Release 4.1) on the IBM 3081 mainframe computer at The University of Tennessee Computing Center. Acceptable alpha levels were established at 0.05 a priori.

Appropriate descriptive statistics and inferential tests were used to report data. Also, appropriate reliability coefficients were calculated in an attempt to study the research instrument itself.

Major Findings, Conclusions, and Recommendations

The findings of the study are reported to coincide with the research objectives in Chapter IV. Following is a summary of the objectives and findings:

Research Objective 1: to describe the three respondent groups regarding demographic characteristics.

The study revealed 42.7 percent of the respondents were males and 57.3 percent were females. The greatest number of respondents (42.3 percent) resided in a rural area, but not on a farm. The next greatest number of respondents (31.7 percent) resided on a farm. There were more respondents from Alabama than any other state, but there were three teams randomly selected from Alabama for each of the three years of study, 1991 to 1993. The greatest number of respondents planned to go to college (53.8 percent) or graduate school (39.8 percent). There were more respondents (69.9 percent) who had been in the 4-H Club five years or more than any other length of time.

Most of the respondents had a farm or rural background. However, general forestry knowledge could be of interest to those of a more urban background. **Program planners may want to publicize the 4-H forestry education program so nontraditional students with urban backgrounds can be better informed of opportunities for participation.**

Research Objective 2: to determine the perception of participants regarding benefits received from the National 4-H Forestry Invitational.

The overall attitude score regarding the National 4-H Forestry Invitational by participants could range from 6 to 42 with a midpoint of 30. The mean score for all participants was 10.43. Findings indicate that an overall positive attitude regarding the Invitational by participants. **Therefore, the 4-H forestry education program planners should consider it appropriate to keep the Invitational as part of their 4-H forestry education program.**

Perceptions of Invitational participants regarding how young people benefit from the National 4-H Forestry Invitational were also very positive. The mean scores ranged from 1.35 to 1.84 on a scale of 1 to 5 with 1=strongly agree, 2=agree, 3=undecided, 4=disagree, and 5=strongly disagree. The highest rated benefit statement was that the National 4-H Forestry Invitational helps young people "Recognize the value of the environment ($\bar{x} = 1.35$, s.d. = .48)"; and the lowest rated that the Invitational "Develop leadership talents and abilities ($\bar{x} = 1.84$, s.d. = .96).

Of the 37 Invitational participants that responded to the perceptions regarding how young people benefitted from the Invitational, they were all in agreement that there was a positive benefit. It could be considered that the Invitational is providing a basis of the philosophy of the 4-H Club to supplement formal education with real hands-on situations. However, it is unclear if the Invitational caused participants to recognize the value of the environment or if they had learned this from other sources.

Also, as the benefit regarding leadership is the lowest rated by participants, it is questionable whether the Invitational is indeed instilling leadership skills into the participating youth. **Program planners may want to consider further studying the contest regarding its capacity to teach leadership talents and abilities.**

The Invitational participants were also asked how the National 4-H Forestry Invitational gave them incentive to be involved in the 4-H Club or the 4-H forestry education program. Of these two areas, there was a slightly more positive mean score for the 4-H forestry education program (3.54) than for the 4-H Club (3.46) on a scale of 1 to 5 with 1=no incentive provided, 2=very little incentive provided, 3=some incentive provided, 4=much incentive provided, 5=very much incentive provided. Findings show the Invitational gave slightly more incentive or reason to be involved in the 4-H forestry education program than to be involved in the 4-H Club. **However, the 4-H forestry education program may have given young people interested in forestry an important reason to be involved in the 4-H Club.**

Research Objective 3: to study the difference between the three respondent groups regarding the knowledge of forest practices.

The relationship between the respondent groups and the scores on the general forestry knowledge test were considered for objective three. According to the mean scores determined, there was a significant difference between the three groups surveyed. The Duncan's Multiple Range Test was used to determine the significant differences between each group of respondents (Invitational participants, 4-H members involved in the forestry education program but not in the Invitational, and 4-H members not involved in the forestry education program). The score for the test

could range from 0 to 21. Respondents who attended the Invitational had the highest mean score of 18, those involved in the 4-H forestry education program but not involved in the Invitational had a mean score of 13, and the lowest mean score of 11 was from respondents who were 4-H members but had not participated in the forestry education program in any way.

The Invitational participants had the highest mean score and the lowest score was that of the respondents who had not participated in the forestry education program in any way. These findings show that Invitational participants had a greater knowledge of general forestry practices than did those who did not participate in the Invitational. Further, those who participated in the 4-H forestry education program had a greater general knowledge of forestry practices than did 4-H members who did not participate in the 4-H forestry education program in any way. **From these findings, the researcher concludes that the Invitational is indeed having significant impact upon participants' knowledge of general forestry practices.**

Research Objective 4: to investigate the differences between the three respondent groups regarding attitudes about forest issues.

The relationship between the respondent groups and participants' attitude about forest issues was used to determine attitudes between Invitational participants and respondents who did not attend the Invitational. There were seven dependent variables regarding general forest issues for which questionnaire recipients could respond. Based on the data reported, there was no reason to believe there was a relationship between the respondent groups and their responses regarding any of the forestry issues statements. The respondent groups agreed that, "Forests should be

managed to produce forest products such as lumber". They also agreed that, "Like any other crop, trees should be cut and replanted to produce goods for consumers".

Overall, there was a similar attitude by the three groups that, "The amount of forests in the United States is less than 50 years ago"; and, "There are fewer hardwood trees grown in the United States today than 50 years ago". We can conclude from the data reported that the three groups were in agreement with their perception that, "There are more pine trees grown in the place of hardwood trees in the United States today than 50 years ago". **As these may be considered false statements, this may be an area regarding forestry knowledge that the program planners may want to restructure or reemphasize.**

Respondent groups disagreed that, "Private forest owners have the right to do as they please with their property, even if it hurts the environment"; and agreed that, "Limitations should be placed on what private forest owners can do with their property, in order to protect the environment." Responses to these statements are consistent with the idea that all 4-H members are concerned about the environment. Although Invitational participants indicated that they perceive the contest helps young people recognize the importance of the environment, other 4-H members appear to share in this understanding.

In addition to the seven variables regarding general forest issues, there were also other forest practices addressed. A summary follows of findings of the relationship between the respondent groups and other forest practices.

The study revealed that there was a significant relationship between the respondent groups and their attitude toward the use of prescribed burning. There

were six statements summated into one dependent variable to determine attitude toward prescribed burning. Scores could range from 6 to 30 with a midpoint of 18. The low range of the scale indicated an attitude of strongly agreeing with the practice of prescribed burning, while the high range of the scale indicated a strongly negative attitude. The Duncan's Multiple Range Test was used to determine the significant differences between the Invitational participants and the two comparison groups. The Invitational participants had the lowest mean score (12.27) indicating a positive attitude toward the use of prescribed burning. The 4-H members who did not participate in the forestry education program had the highest mean score (16.76) indicating a less positive attitude than Invitational participants or 4-H members involved in the forestry education program (14.96). It should be noted that all three groups had a positive attitude toward the use of prescribed burning. **However, those who participated in the Invitational were significantly more positive in their attitude than the other two groups. It was concluded that the Invitational is contributing to that positive attitude.**

Based upon data revealed in this study, it is concluded that all three groups of respondents tend to have a negative attitude toward the use of chemical weed control. There is no evidence to suggest that the Invitational is impacting upon that attitude. **Program planners may want to consider modifying presentation of educational content, if it is their goal to characterize the use of chemical weed control as an acceptable practice.**

The relationship between the respondent groups and their attitude toward the use of the use of clearcutting was studied. There were six statements summated into

one dependent variable to determine attitude toward clearcutting. Scores ranged from 6 to 30 with a midpoint of 18. The low range of the scale indicated a strongly agreeable attitude of the use of clearcutting, while the high range of the scale indicated a strongly disagreeable attitude. According to the mean scores, there was no significant difference between the groups surveyed. All three groups tended to be somewhat "uncommitted" toward the use of this practice. **As with the attitude toward the use of chemical weed control, it appears that the Invitational is not impacting participants' attitude regarding clearcutting. Program planners may want to consider the Invitational respondents' "uncommitted" attitude toward clearcutting as they evaluate educational content.**

The study revealed that there was a significant difference in the relationship between the respondent groups and their attitude toward the regulation of tree cutting. There were four statements summated into one dependent variable to determine attitude toward tree cutting. Scores had a range of 4 to 20 with a midpoint of 12. The low range of the scale indicated a strongly agreeable attitude toward the regulation of tree cutting, while the high range of the scale indicated a strongly disagreeable attitude. The Duncan's Multiple Range Test was used to determine the significant difference between the three groups surveyed. The Invitational participants had the lowest mean score (8.54) indicating a positive attitude toward the regulation of tree cutting. The 4-H members who did not participate in the forestry education program also had a lower mean score (8.94) indicating a less positive attitude than Invitational participants but not significantly different. The 4-H members involved in

the forestry education program had the highest mean score (10.05) indicating a less positive attitude toward regulation of tree cutting than the other two groups. However, although the attitude of 4-H members involved in the forestry education program was significantly different than Invitational participants, it was not found to be significantly different than the 4-H members who did not participate in the forestry education program. Findings from this part of the study are inconclusive and should be interpreted with caution. Although not identified in the pilot study, it was obvious that participants were somewhat confused when answering these questions. It is questionable whether the respondent groups clearly understood the statements related to "tree cutting" as referring to a commonly accepted practice of selective harvesting of timber. Further, the use of the term "regulated" may have confused respondents. **Further study of this attitude is recommended prior to making any conclusions about respondents' attitudes toward the common forestry practice of tree cutting.**

The relationship of the environment to the economy was also addressed as a factor in the relationship between the respondent groups and forest issues. The study determined there was no significant relationship between the respondent groups and their attitude toward the environment as related to the economy. There were three questions of issue determined as dependent variables to which respondents could answer. The respondent groups agreed that, "The environment should be protected, even if it hurts the economy". They disagreed with the statement, "The economy should be more important than the environment to protect jobs and other economic considerations for consumers". Finally, all three groups were in agreement that,

"There should be a balance between the protection of the environment and the importance of the economy". Although there is no evidence to suggest that the Invitational is impacting upon their attitude, it is concluded that all respondents appear to have a perception that there needs to be a proper balance between the protection of the environment and the economy. However, in cases where decisions must impact upon one or the other, the environment should be considered of greater importance.

Each group surveyed was asked to respond to a question regarding whether the general public had enough information to make decisions about forestry practices. **All three groups were in agreement that the general public does not have enough information to make decisions about forestry practices. This finding is consistent with other studies. Much remains to be done regarding the education of the general public.**

Research Objective 5: to investigate the differences between the participants and non-participants regarding planned career choice.

All three groups were asked to respond to a question about their planned career choice. There were a total of 129 who responded to this question with 33 (25.6) percent) who attended the National 4-H Forestry Invitational, 47 (36.4 percent) who participated in the 4-H forestry education program, and 49 (38.0 percent) who were 4-H members but who had not participated in the 4-H forestry education program in any way. The researcher placed responses in three categories: definitely related to forestry, possibly related to forestry, and definitely not related to forestry. Out of responses received, most respondents planned a career not related to forestry. However data showed those who participated in the National 4-H Forestry Invitational

were more likely to plan a forestry related career than were those in the other two groups. Although one may argue that this is due to the fact 4-H members interested in forestry careers simply choose to be more active in the forestry education programs, the existence of this relationship is worthy of mentioning. Participants in the Invitational are more likely to choose to enter forestry related careers than are 4-H members who do not participate in the Invitational.

Recommendations for Further Study

Data presented in this study can be used to strengthen the hypothesis that the National 4-H Forestry Invitational is indeed impacting positively upon its participants. There is evidence in support of the conclusions that participants perceive the contest to be impacting them positively. Further, there is evidence to suggest that participants have a greater understanding of knowledge related to forestry practices. There are even data to suggest that the Invitational is having a positive impact upon certain specific attitudes about forestry practices, and it appears that participants in the Invitational are more likely to plan careers in the forest related industries. Above and beyond those recommendations listed in the previous section, the following are recommended for additional study:

- 1) Additional study needs to be conducted before we can understand 4-H members' attitudes toward the practice of selective tree cutting.
- 2) This study should be replicated periodically in an effort to continually assess the benefits of participation in the National 4-H Forestry Invitational.

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APPENDICES

31.3.1

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APPENDIX A

QUESTIONNAIRE FOR NATIONAL 4-H FORESTRY
INVITATIONAL PARTICIPANTS

1. We would like to know a little bit about you personally. This information will be used only for purposes of characterizing our respondents, and your personal responses will never be linked with your identity.

Please check one:

1. ☐ MALE ☐ FEMALE

2. What year did you participate in the National 4-H Forestry Invitational?

☐ 1991 ☐ 1992 ☐ 1993

3. What grade in school had you just completed the year you participated in the Invitational?

☐ 9th ☐ 10th ☐ 11th ☐ 12th

4. At which level(s) did you compete before participating in the National 4-H Forestry Invitational?
(Check all which apply)

☐ County ☐ State ☐ Other (please specify)

☐ District ☐ Regional ☐

5. Which best describes where you live?

☐ A farm	☐ Small city (10,000 to 50,000 population)
☐ Rural area, but not on a farm	☐ Medium size city (50,000 to 100,000 population)
☐ Town (under 10,000)	☐ Large city or metropolis (over 100,000 population)

6. Which state do you live in?

7. How far do you plan to go in your education? (check only one)

☐ High School ☐ Vocational School ☐ College ☐ Graduate School

8. If you made a career choice right now, what would it be?

9. Has the Invitational positively affected your career choice?

☐ Yes ☐ No ☐ Don't Know

Please go to next page...

10. How long have you participated in the 4-H Forestry program?

___ 0yr ___ 1 yr ___ 2yrs ___ 3yrs ___ 4yrs ___ 5 or More yrs

11. How long have you participated in the 4-H Club?

___ 0yr ___ 1 yr ___ 2yrs ___ 3yrs ___ 4yrs ___ 5 or More yrs

12. What other areas of competition have you been involved in the 4-H Club?

13. In which areas have you been exposed to forestry issues? (check all that apply)

___ Family ___ School ___ 4-H ___ Volunteer Work

___ Community Events ___ Literature (newspaper, magazines, books)

___ Other: _____

II. The following is a list of adjective pairs which indicate extreme opinions about the National 4-H Forestry Invitational. Please think about the National 4-H Forestry Invitational and place a check on each scale evaluating your general attitude about the camp. Please place your mark in the middle of a space:

Like This Not Like This
: ___: ✓ : ___: ✓ :

THE NATIONAL 4-H FORESTRY INVITATIONAL

- | | | |
|----------------|-----------------------------|----------------|
| 1. Important | ___:___:___:___:___:___:___ | Unimportant |
| 2. Competitive | ___:___:___:___:___:___:___ | Noncompetitive |
| 3. Enjoyable | ___:___:___:___:___:___:___ | Unenjoyable |
| 4. Beneficial | ___:___:___:___:___:___:___ | Not Beneficial |
| 5. Informative | ___:___:___:___:___:___:___ | Uninformative |
| 6. Practical | ___:___:___:___:___:___:___ | Impractical |

Please go to next page...

III. Below is a list of statements regarding the objectives of the National 4-H Forestry Invitational. Please indicate your attitude concerning these objectives by circling the appropriate number located to the right of each statement.

	Strongly				Strongly
	Agree	Agree	Undecided	Disagree	Disagree

THE NATIONAL 4-H FORESTRY INVITATIONAL
HELPS YOUNG PEOPLE:

EXAMPLE:

Acquire self-confidence

1	2	3	4	5
----------	---	---	---	---

(By circling "1", you are saying that you strongly agree that 4-H Forestry helps young people acquire self-confidence.)

- | | | | | | |
|--|---|---|---|---|---|
| 1. Gain new knowledge, skills, and attitudes through "real life experiences" | 1 | 2 | 3 | 4 | 5 |
| 2. Develop leadership talents and abilities | 1 | 2 | 3 | 4 | 5 |
| 3. Become better stewards of the earth | 1 | 2 | 3 | 4 | 5 |
| 4. Recognize the value of the environment | 1 | 2 | 3 | 4 | 5 |
| 5. Learn techniques concerning land use management | 1 | 2 | 3 | 4 | 5 |
| 6. Understand how forest management contributes to the economy and human welfare | 1 | 2 | 3 | 4 | 5 |
| 7. Appreciate nature for enjoyment | 1 | 2 | 3 | 4 | 5 |
| 8. Apply conservation principles | 1 | 2 | 3 | 4 | 5 |
| 9. Strengthen personal standards and citizenship ideals | 1 | 2 | 3 | 4 | 5 |
| 10. Cultivate desire and ability to cooperate with others | 1 | 2 | 3 | 4 | 5 |

IV. We would like to know what has given you the incentive to be involved in the 4-H Club. Please answer the following statements by circling the appropriate number located to the right of each statement:

THE NATIONAL 4-H FORESTRY INVITATIONAL
GAVE ME A REASON TO BE INVOLVED IN:

- | | | | | | |
|---------------------------------------|------------|---|----------|---|------|
| | Not at All | | Somewhat | | Very |
| 1. The 4-H Club | 1 | 2 | 3 | 4 | 5 |
| 2. The 4-H Forestry Education Project | 1 | 2 | 3 | 4 | 5 |

Please go to next page...

V. How important has each of the following been to your continued participation in the 4-H Club? Please answer by circling the appropriate number located to the right of each statement:

	Not at All		Somewhat		Very
I PARTICIPATE (PARTICIPATED) IN THE 4-H CLUB TO:					
1. Develop skills in forestry	1	2	3	4	5
2. Learn techniques involving forestry practices	1	2	3	4	5
3. Compete in local contests	1	2	3	4	5
4. Compete in county contests	1	2	3	4	5
5. Compete in state contests	1	2	3	4	5
6. Compete with a team	1	2	3	4	5
7. Participate in a 4-H Forestry education project	1	2	3	4	5
8. Earn recognition	1	2	3	4	5
9. Acquire self-confidence	1	2	3	4	5
10. Participate in the 4-H Forestry Invitational	1	2	3	4	5
11. Explore occupational opportunities in forestry	1	2	3	4	5
12. Other (Specify) _____	1	2	3	4	5

VI. Below is a list of statements regarding forestry issues. Please indicate your attitude concerning these statements by circling the appropriate number located to the right of each statement:

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Forests and Forest Products:					
1. Forests should be managed to produce forest products such as lumber.	1	2	3	4	5
2. Like any other crop, trees should be cut and replanted to produce goods for consumers.	1	2	3	4	5
3. The amount of forests in the United States is less than 50 years ago.	1	2	3	4	5
4. There are fewer hardwood trees grown in the United States today than 50 years ago.	1	2	3	4	5
5. There are more pine trees grown in the place of hardwood trees in the United States today than 50 years ago.	1	2	3	4	5

Please go to next page...

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Forests and Forest Products: (cont'd)					
6. Private forest owners have the right to do as they please with their property, even if it hurts the environment.	1	2	3	4	5
7. Limitations should be placed on what private forest owners can do with their property, in order to protect the environment.	1	2	3	4	5

Prescribed burning is a practice used to burn leaves, debris, and small vegetation on the forest floor to remove (under safe burning conditions and with minimal damage to the forest) flammable materials to reduce the effects of wildfires under dry weather conditions.

Prescribed burning should be allowed:

8. On land owned by individuals.	1	2	3	4	5
9. By lumber or paper companies.	1	2	3	4	5
10. On public land owned by the government.	1	2	3	4	5

Prescribed burning:

11. Is unnecessary.	1	2	3	4	5
12. Harms wildlife.	1	2	3	4	5
13. Destroys forests and their natural beauty.	1	2	3	4	5

Chemical weed control is a process of using herbicides during the seed planting or nursery stock transplant stage to lessen the need and cost of handweeding to keep seedlings from being smothered by faster-growing plants.

Chemical weed control should be allowed:

14. On land owned by individuals.	1	2	3	4	5
15. By lumber or paper companies.	1	2	3	4	5
16. On public land owned by the government.	1	2	3	4	5

Chemical weed control:

17. Produces water pollution.	1	2	3	4	5
18. Produces air pollution.	1	2	3	4	5
19. Endangers wildlife.	1	2	3	4	5
20. Presents a risk to humans.	1	2	3	4	5

Please go to next page...

Clearcutting is the harvesting of large plots of mature trees with surrounding trees left standing to provide seeds to restock the area or furnish shelter for replanted nursery stock.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Clearcutting should be allowed:					
21. On land owned by individuals.	1	2	3	4	5
22. By lumber or paper companies.	1	2	3	4	5
23. On public land owned by the government.	1	2	3	4	5
Clearcutting:					
24. Presents risk to loss of resources.	1	2	3	4	5
25. Presents risk of soil erosion.	1	2	3	4	5
26. Threatens the land's beauty.	1	2	3	4	5

Tree cutting is a practice used for lumber, recreation, watershed protection, or to encourage growth of other trees.

Tree cutting should be regulated:

27. On private land.	1	2	3	4	5
28. To protect streams and water.	1	2	3	4	5
29. To protect threatened and endangered species.	1	2	3	4	5
30. To preserve the beauty of the forest.	1	2	3	4	5

Environment and the Economy:

31. The environment should be protected, even if it hurts the economy.	1	2	3	4	5
32. The economy should be more important than the environment to protect jobs and other economic considerations.	1	2	3	4	5
33. There should be a balance between the protection of the environment and the importance of the economy.	1	2	3	4	5

General Public Perception:

34. The general public does not have enough information to make decisions about forestry practices.	1	2	3	4	5
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Please go to next page...

VII. For us to get an idea of your knowledge about forestry, please circle the one answer which best fits the following descriptions:

EXAMPLE:

The International 4-H Forestry Invitational is held in:

- a. Utah
- b. Florida
- ☒ c. West Virginia (By circling "c", you have indicated the correct answer.)
- d. Oklahoma

1. The forestry term 'T.S.I.' stands for:

- a. Timber per Square Inch
- b. Timber Standing Inches
- c. Timber Stored Inside
- d. Timber Stand Improvement.

2. Multiple-land-use is a term used to indicate:

- a. that trees and birds are able to coexist with each other.
- b. that there are many different kinds of tree species planted in the area.
- c. the management of timber, wildlife, and recreation in an integral, consolidated program.
- d. the management of the environment with buildings, plants and animals.

3. The forestry term H.B.F. represents:

- a. Harvested board foot.
- b. Hollow board foot.
- c. Hymenopter buoliana frontalis.
- d. Harvested bowl forest.

4. A term used to indicate the establishment, development, care and reproduction of stands of timber is:

- a. Silviculture.
- b. Multiple-land-use.
- c. Sustained development.
- d. National forest management.

5. The term D.B.H. stands for the diameter of a tree:

- a. before the ground height or at chest height.
- b. diameter of a tree at breast height or 4.5 feet above ground.
- c. before harvest or 3.0 feet above ground
- d. beginning at 4.5 feet above ground and heading up the tree 6 more inches.

Please go to next page...

6. A clinometer is a device which measures:
 - a. circumference.
 - b. width.
 - c. depth.
 - d. height.

7. Dominant, co-dominant, intermediate, and suppressed refers to:
 - a. conifers.
 - b. conservation.
 - c. crown class.
 - d. cull.

8. The diameter of a tree is measured:
 - a. at the line of sight where it falls on the tree.
 - b. at the tree trunk 4.5 feet above ground.
 - c. at the tree scale of the stick 3.5 feet above ground.
 - d. at the zero end of the stick 1.0 feet above ground.

9. Conifers are in the group of plants having seeds borne on open scales known as:
 - a. angiosperms.
 - b. endosperms.
 - c. terrasperms.
 - d. gymnosperms.

10. A serious fungus disease that has caused the destruction of many thousands of American Elms is:
 - a. German Elm Blight.
 - b. Lichen.
 - c. Dutch Elm Disease.
 - d. European Elm Disease.

11. The usually fatal fungus disease of oak trees which symptoms include wilting and discoloration of the leaves is known as:
 - a. Oak Wilt.
 - b. Fire Blight.
 - c. Leafhopper.
 - d. Rodent.

12. This is NOT a method of insect control:
 - a. chemical sprays.
 - b. larvae replenishment.
 - c. swamp drainage.
 - d. sterilization techniques.

Please go to next page...

13. To give off vapor containing waste products through pores or stomata is:
- a. inspiration.
 - b. perspiration.
 - c. lamination.
 - d. transpiration.
14. The process by which soil and minerals are worn away by climatic agents such as wind and water is:
- a. exposure.
 - b. transpiration.
 - c. erosion.
 - d. germination.
15. Leaves of conifers are called:
- a. needles.
 - b. leaves.
 - c. cones.
 - d. laterals.
16. A dibble is used for:
- a. planting trees.
 - b. dribbling insecticide.
 - c. counting wildlife.
 - d. measuring trees.
17. Insects and disease destroy a great deal of timber, but "this" destroys more.
- a. arboriculture.
 - b. forest cuttings.
 - c. woodworking.
 - d. wild fires.
18. The thickness of annual rings of trees reveals:
- a. environmental conditions during a trees lifetime.
 - b. the age of the tree.
 - c. the summer wood.
 - d. the winter wood.
19. Seedling, sprout, mixed and plantation refers to:
- a. forest type.
 - b. stocking.
 - c. grazing damage.
 - d. stand origin.

Please go to next page...

20. Reproduction, sapling, pole, and sawtimber refers to:

- a. land capability.
- b. size distribution.
- c. slope of planting.
- d. site of slope.

21. A caliper, diameter tape, or tree scale stick are three ways to:

- a. draw sap from a tree.
- b. decide the shape of a tree.
- c. measure the diameter of a tree.
- d. measure the height of a tree.

VIII. Is there anything else you would like to say about the National 4-H Forestry Invitational? If so, please use the space below for that purpose. Also, any comment you wish to make which you think may help improve the Invitational in the future will be appreciated.

Thank you for your time. Your contribution is greatly appreciated.

Please return this questionnaire in the enclosed self-addressed stamped envelope today.

QUESTIONNAIRE FOR OTHER 4-H MEMBERS

- I. We would like to know a little bit about you personally. This information will be used only for purposes of characterizing our respondents, and your personal responses will never be linked with your identity.

Please check one:

1. ☐ MALE ☐ FEMALE

2. Which best describes where you live?

☐ A farm	☐ Small city (10,000 to 50,000 population)
☐ Rural area, but not on a farm	☐ Medium size city (50,000 to 100,000 population)
☐ Town (under 10,000)	☐ Large city or metropolis (over 100,000 population)

3. Which state do you live in?

4. How far do you plan to go in your education? (check only one)

☐ High School	☐ Vocational School	☐ College	☐ Graduate School
--------------------------------------	--	----------------------------------	--

5. If you made a career choice right now, what would it be?

6. How long have you participated in the 4-H Club?

☐ 0yr	☐ 1 yr	☐ 2yrs	☐ 3yrs	☐ 4yrs	☐ 5 or More yrs
------------------------------	-------------------------------	-------------------------------	-------------------------------	-------------------------------	--

7. What areas of competition in 4-H have you been involved in?

8. In which areas have you been exposed to forestry issues? (check all that apply)

☐ Family	☐ School	☐ 4-H	☐ Volunteer Work
☐ Community Events	☐ Literature (newspaper, magazines, books)		
☐ Other: _____			

Please go to next page...

II. We would like to know how important each of the following has been (was) to your continued participation in the 4-H Club. Please circle the appropriate number located to the right of each statement.

	Not at All		Somewhat		Very
EXAMPLE:					
The 4-H Club is fun	1	2	3	4	5

(By circling "4", you are saying that you agree that the 4-H Club is fun.)

I PARTICIPATE (PARTICIPATED) IN THE 4-H CLUB TO:

1. Develop skills in forestry	1	2	3	4	5
2. Learn techniques involving forestry practices	1	2	3	4	5
3. Compete in local contests	1	2	3	4	5
4. Compete in county contests	1	2	3	4	5
5. Compete in state contests	1	2	3	4	5
6. Compete with a team	1	2	3	4	5
7. Participate in a 4-H Forestry education project	1	2	3	4	5
8. Earn recognition	1	2	3	4	5
9. Acquire self-confidence	1	2	3	4	5
10. Participate in the 4-H Forestry Invitational	1	2	3	4	5
11. Explore occupational opportunities in forestry	1	2	3	4	5
12. Other (Specify) _____	1	2	3	4	5

Please go to next page...

III. Below is a list of statements regarding forestry issues. Please indicate your attitude concerning these statements by circling the appropriate number located to the right of each statement:

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Forests and Forest Products:					
1. Forests should be managed to produce forest products such as lumber.	1	2	3	4	5
2. Like any other crop, trees should be cut and replanted to produce goods for consumers.	1	2	3	4	5
3. The amount of forests in the United States is less than 50 years ago.	1	2	3	4	5
4. There are fewer hardwood trees grown in the United States today than 50 years ago.	1	2	3	4	5
5. There are more pine trees grown in the place of hardwood trees in the United States today than 50 years ago.	1	2	3	4	5
6. Private forest owners have the right to do as they please with their property, even if it hurts the environment.	1	2	3	4	5
7. Limitations should be placed on what private forest owners can do with their property, in order to protect the environment.	1	2	3	4	5

Prescribed burning is a practice used to burn leaves, debris, and small vegetation on the forest floor to remove (under safe burning conditions and with minimal damage to the forest) the flammable materials to reduce the effects of wildfires under dry weather conditions.

Prescribed burning should be allowed:

8. On land owned by individuals.	1	2	3	4	5
9. By lumber or paper companies.	1	2	3	4	5
10. On public land owned by the government.	1	2	3	4	5

Prescribed burning:

11. Is unnecessary.	1	2	3	4	5
12. Harms wildlife.	1	2	3	4	5
13. Destroys forests and their natural beauty.	1	2	3	4	5

Please go to next page...

Chemical weed control is a process of using herbicides during the seed planting or nursery stock transplant stage to lesson the need and cost of handweeding to keep seedlings from being smothered by faster-growing plants.

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Chemical weed control should be allowed:					
14. On land owned by individuals.	1	2	3	4	5
15. By lumber or paper companies.	1	2	3	4	5
16. On public land owned by the government.	1	2	3	4	5

Chemical weed control:

17. Produces water pollution.	1	2	3	4	5
18. Produces air pollution.	1	2	3	4	5
19. Endangers wildlife.	1	2	3	4	5
20. Presents a risk to humans.	1	2	3	4	5

Clearcutting is the harvesting of large plots of mature trees with surrounding trees left standing to provide seeds to restock the area or furnish shelter for replanted nursery stock.

Clearcutting should be allowed:

21. On land owned by individuals.	1	2	3	4	5
22. By lumber or paper companies.	1	2	3	4	5
23. On public land owned by the government.	1	2	3	4	5

Clearcutting:

24. Presents risk to loss of resources.	1	2	3	4	5
25. Presents risk of soil erosion.	1	2	3	4	5
26. Threatens the land's beauty.	1	2	3	4	5

Tree cutting is a practice used for lumber, recreation, watershed protection, or to encourage growth of other trees.

Tree cutting should be regulated:

27. On private land.	1	2	3	4	5
28. To protect streams and water.	1	2	3	4	5
29. To protect threatened and endangered species.	1	2	3	4	5
30. To preserve the beauty of the forest.	1	2	3	4	5

Please go to next page...

	Strongly Agree	Agree	Undecided	Disagree	Strongly Disagree
Environment and the Economy:					
31. The environment should be protected, even if it hurts the economy.	1	2	3	4	5
32. The economy should be more important than the environment to protect jobs and other economic considerations.	1	2	3	4	5
33. There should be a balance between the protection of the environment and the importance of the economy.	1	2	3	4	5
General Public Perception:					
34. The general public does not have enough information to make decisions about forestry practices.	1	2	3	4	5

IV. For us to get an idea of your knowledge about forestry, please circle the one answer which best fits the following descriptions:

EXAMPLE:

The International 4-H Forestry Invitational is held in:

- a. Utah
- b. Florida
- ☒ c. West Virginia (By circling "c", you have indicated the correct answer.)
- d. Oklahoma

1. The forestry term 'T.S.I.' stands for:

- a. Timber per Square Inch
- b. Timber Standing Inches
- c. Timber Stored Inside
- d. Timber Stand Improvement.

2. Multiple-land-use is a term used to indicate:

- a. that trees and birds are able to coexist with each other.
- b. that there are many different kinds of tree species planted in the area.
- c. the management of timber, wildlife, and recreation in an integral, consolidated program.
- d. the management of the environment with buildings, plants and animals.

3. The forestry term H.B.F. represents:

- a. Harvested board foot.
- b. Hollow board foot.
- c. Hymenopter buoliana frontalis.
- d. Harvested bowl forest.

Please go to next page...

4. A term used to indicate the establishment, development, care and reproduction of stands of timber is:
 - a. Silviculture.
 - b. Multiple-land-use.
 - c. Sustained development.
 - d. National forest management.

5. The term D.B.H. stands for the diameter of a tree:
 - a. before the ground height or at chest height.
 - b. diameter of a tree at breast height or 4.5 feet above ground.
 - c. before harvest or 3.0 feet above ground.
 - d. beginning at 4.5 feet above ground and heading up the tree 6 more inches.

6. A clinometer is a device which measures:
 - a. circumference.
 - b. width.
 - c. depth.
 - d. height.

7. Dominant, co-dominant, intermediate, and suppressed refers to:
 - a. conifers.
 - b. conservation.
 - c. crown class.
 - d. cull.

8. The diameter of a tree is measured:
 - a. at the line of sight where it falls on the tree.
 - b. at the tree trunk 4.5 feet above ground.
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 - a. angiosperms.
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10. A serious fungus disease that has caused the destruction of many thousands of American Elms is:
 - a. German Elm Blight.
 - b. Lichen.
 - c. Dutch Elm Disease.
 - d. European Elm Disease.

Please go to next page...

11. The usually fatal fungus disease of oak trees which symptoms include wilting and discoloration of the leaves is known as:
- Oak Wilt.
 - Fire Blight.
 - Leafhopper.
 - Rodent.
12. This is NOT a method of insect control:
- chemical sprays.
 - larvae replenishment.
 - swamp drainage.
 - sterilization techniques.
13. To give off vapor containing waste products through pores or stomata is:
- inspiration.
 - perspiration.
 - lamination.
 - transpiration.
14. The process by which soil and minerals are worn away by climatic agents such as wind and water is:
- exposure.
 - transpiration.
 - erosion.
 - germination.
15. Leaves of conifers are called:
- needles.
 - leaves.
 - cones.
 - laterals.
16. A dibble is used for:
- planting trees.
 - dribbling insecticide.
 - counting wildlife.
 - measuring trees.
17. Insects and disease destroy a great deal of timber, but "this" destroys more.
- arboriculture.
 - forest cuttings.
 - woodworking.
 - wild fires.

Please go to next page...

18. The thickness of annual rings of trees reveals:
- a. environmental conditions during a trees lifetime.
 - b. the age of the tree.
 - c. the summer wood.
 - d. the winter wood.
19. Seedling, sprout, mixed and plantation refers to:
- a. forest type.
 - b. stocking.
 - c. grazing damage.
 - d. stand origin.
20. Reproduction, sapling, pole, and sawtimber refers to:
- a. land capability.
 - b. size distribution.
 - c. slope of planting.
 - d. site of slope.
21. A caliper, diameter tape, or tree scale stick are three ways to:
- a. draw sap from a tree.
 - b. decide the shape of a tree.
 - c. measure the diameter of a tree.
 - d. measure the height of a tree.

Thank you for your time. Your contribution is greatly appreciated.

Please return this questionnaire in the enclosed self-addressed stamped envelope today.

APPENDIX B

June 30, 1994

Extension Leader Names
Title
Address
City, State Zip

Dear Extension Leader:

As you know, attending the National 4-H Forestry Invitational at the Jackson's Mill 4-H Camp in West Virginia is the culmination of a lot of hard work for members in the 4-H Forestry program. Over the past 13 years, nearly 1,000 4-H members have participated in this important educational event. We have developed a survey designed to determine the impact of the 4-H Forestry Invitational and the other components of the 4-H forestry education program upon those young people who have participated over the years.

The reason we are writing you is to solicit your help in our study. We would greatly appreciate it if you would take a look at the names and addresses on the attached list and verify that they are indeed those individuals who participated in the National 4-H Invitational within the last three years. Please make any corrections which are necessary and then return the list to us using the enclosed self-addressed stamped envelope by July 14, 1994. Do not be concerned if all of your teams from the past three years are not listed, since those identified represent only a random sample.

We also ask that you help us identify the names and addresses of two other kinds of 4-H members in your area who would be willing to participate in our study. First, we would like to identify a few of your 4-H forestry education program members who have not attended the National Invitational. These individuals might be young people who serve as "alternates" or scored slightly less on any preliminary contests you had prior to selecting members to attend the Invitational. Next, we would like to identify a few 4-H members who have not participated in the 4-H forestry education program in any way (perhaps some 4-H members who have been active in other projects). Since it is likely that those who have not participated in the Invitational may not respond as often as those who have participated, we would ask that you identify one or two more individuals for each of the other comparison groups that have not participated in the Invitational than those 4-H members who have participated. (For example, if you have three Invitational participants, we would like you to identify four or five forestry program participants who have never attended the Invitational and four or five 4-H members who have never participated in the forestry program at all.)

All three groups of young people will receive short questionnaires at the same time within the next month. The groups of non-participants will serve as comparison groups for our study so that we can learn more about the specific benefits of participating in the National Invitational and the 4-H forestry education program, in general. We would ask that you pick the young members to serve in the comparison groups totally at random, with the exception of the criteria we identified previously. You might simply use 4-H membership rosters to identify these young people. **Once you've verified the participants' names and addresses and identified the names and addresses of the other 4-H members to serve in our comparison groups, simply return the lists to us in the enclosed self-addressed stamped envelope.**

Page 2
4-H Forestry Invitational

Since other phases of the research cannot be completed until we receive your confirmed list of names and addresses, we greatly appreciate your prompt attention to our request by July 14, 1994. Please don't hesitate to call either Ms. Bonita Sparks at (615)239-6231 or Mr. Larry Tankersley at (615)974-7164, if you have any questions or concerns about our study. We'll be happy to provide you with a summary of our study if you desire. Simply indicate you'd like a copy when you return the list of names.

Sincerely,

Larry Tankersley
Extension Associate
U.T. Dept. of Forestry,
Wildlife, and Fisheries

Bonita Sparks
Graduate Student
U.T. Agriculture and
Extension Education

Encls

4-H National Forestry Invitational Study Participants

Make any necessary corrections to names and addresses on the lines immediately under each piece of existing information. (Please print)

<u>Invitational Participant</u>	<u>Yr. Participated</u>	<u>Address</u>	<u>Check if correct</u>
1. e.g. Barry White	1992	1234 First Street Sometown, AL 55555	_____
_____	_____	_____ _____	
2. <Provided>	1992	< >	_____
_____	_____	_____ _____	
3. <Provided>	1992	< >	_____
_____	_____	_____ _____	
4. <Provided>	1992	< >	_____
_____	_____	_____ _____	

(Please list the other requested names and address in the spaces indicated on the following pages.)

Names and Addresses of 4-H members who have participated in your 4-H forestry education program but who have NOT attended the National Forestry Invitational
(Please Print)

<u>Name</u>	<u>Address</u>
1. _____	_____ _____ _____
2. _____	_____ _____ _____
3. _____	_____ _____ _____
4. _____	_____ _____ _____
5. _____	_____ _____ _____
6. _____	_____ _____ _____

Please go to next page...

Names and Addresses of 4-H members who have NOT participated in your 4-H forestry education program in any way (Please Print)

<u>Name</u>	<u>Address</u>
1. _____	_____ _____ _____
2. _____	_____ _____ _____
3. _____	_____ _____ _____
4. _____	_____ _____ _____
5. _____	_____ _____ _____
6. _____	_____ _____ _____

Thank you again for your assistance in our study!

September 1, 1994

Participants' Names
 Address
 City, State Zip

Dear 4-H Forestry Invitational Participant:

I'm sure you have a feeling of accomplishment as you think back to when you attended the National Forestry Invitational at Jackson's Mill 4-H Camp in West Virginia. The Invitational is the culmination of many long hours of hard work and learning about our forest industry for hundreds of young folks such as you. We would like for you to tell us about some of the perceptions you have regarding the Invitational. We would also like to know a little regarding what you've learned about the forestry industry.

As a former Invitational participant, you have been identified to help us in a national study regarding the impact of the National 4-H Forestry Invitational upon 4-H members. **Please take the time necessary to complete the enclosed questionnaire.** Then, return it to us in the postage-paid envelope which is included in this mailing. First, we want to know exactly what you thought of your experiences during the Invitational. Then, we want to ask you some questions about forestry and the forest industry in order to see how answers to these questions from a large group of Invitational participants compare to the answers from a similar group of young people who have not participated in the 4-H Forestry program. Please read each question and answer it to the best of your ability. However, you should answer each question from memory. **This is NOT a test!** Please answer the questions without help from other references such as teachers, parents, or dictionaries. Your answers will only be useful to us if you answer without any help. Your individual responses will be used to compare your knowledge and attitudes about forestry issues with other 4-H members. Simply answer each question to the best of your ability and return the questionnaire to us in the enclosed envelope. Your name will never be linked to your individual responses. We will only report "average" responses from a large group of 4-H members such as yourself during our final report.

The Extension Forestry Specialist in your state will be sent a copy of the overall study results once it is completed. You can contact him/her if you would like to see them, or you may receive a copy of the study summary by simply writing "Copy of Results Requested" and your name and address on the back of your return envelope. (Please do not put your name or request on the questionnaire itself.)

Thank you for taking time to read this letter. Feel free to call either Ms. Bonita Sparks, (615)239-6231, or Mr. Larry Tankersley, (615)974-7164, if you have any questions or concerns. We would greatly appreciate your participation in our study and the return of your completed questionnaire. However, your participation is completely voluntarily. We would ask that you return the questionnaire to us by September 15, 1994, even if you choose to not answer it. Doing so will help us reduce the number of additional mailings we have to make to assure that everyone has an opportunity to respond. **We have selected only a small number of people for this study, so your participation is very important.**

Sincerely,

Larry Tankersley
 Extension Associate
 U.T. Dept. of Forestry,
 Wildlife, and Fisheries

Bonita Sparks
 Graduate Student
 U.T. Agriculture and
 Extension Education

Encl

September 1, 1994

4-H Names
Address
City, State Zip

Dear 4-H Member:

Your name and address was given to us by a member of the extension service in your state as someone who may be willing to help us in a national study to learn more about young people such as you and what you know about the forest industry and the many issues which relate to forestry. It is NOT necessary that you have previously participated in the 4-H forestry education program to participate in our study. However, depending upon which group of 4-H members you represent in our study, you may have participated in some aspects of the 4-H forestry education program at the local or state level.

Please take the time necessary to complete the enclosed questionnaire. Then, return it to us in the postage-paid envelope which is included in this mailing. Please read each question and answer it to the best of your ability. However, you should answer each question from memory. This is NOT a test! Please answer the questions without help from other references such as teachers, parents, or dictionaries. Your answers will only be useful to us if you answer without any help. Your individual responses will be used to compare your knowledge and attitudes about forestry issues with other 4-H members. Simply answer each question to the best of your ability and return the questionnaire to us in the enclosed envelope. Your name will never be linked to your individual responses. We will only report "average" responses from a large group of 4-H members such as yourself during our final report.

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Sincerely,

Larry Tankersley
Extension Associate
U.T. Dept. of Forestry,
Wildlife, and Fisheries

Bonita Sparks
Graduate Student
U.T. Agriculture and
Extension Education

Encl

September 17, 1994

4-H Names
Address
City, State Zip

Dear 4-H Member:

Approximately two weeks ago, you should have received a questionnaire regarding forestry issues. We are sending the questionnaire again to those whose response we have not received. If you have not mailed the questionnaire, we would greatly appreciate your prompt completion and return in the envelope provided by October 1, 1994. It is NOT necessary that you have previously participated in the 4-H forestry education program to participate in our study.

Please take the time necessary to complete the enclosed questionnaire. Then, return it to us in the postage-paid envelope which is included in this mailing. Please read each question and answer it to the best of your ability. However, you should answer each question from memory. This is NOT a test! Please answer the questions without help from other references such as teachers, parents, or dictionaries. Your answers will only be useful to us if you answer without any help. Your individual responses will be used to compare your knowledge and attitudes about forestry issues with other 4-H members. Simply answer each question to the best of your ability and return the questionnaire to us in the enclosed envelope. Your name will never be linked to your individual responses. We will only report "average" responses from a large group of 4-H members such as yourself during our final report.

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Sincerely,

Larry Tankersley
Extension Associate
U.T. Dept. of Forestry,
Wildlife, and Fisheries

Bonita Sparks
Graduate Student
U.T. Agriculture and
Extension Education

Encl

VITA

Bonita Baker Sparks was born on January 2, 1955, to Danial A. and Ruth M. Baker of Butler County, Hamilton, Ohio. She graduated from Oak Ridge High School, Oak Ridge, Tennessee, in June 1973, and from Berea College, Berea, Kentucky, with a Bachelor of Science degree in Agriculture in May 1977. While at Berea, she worked on the Berea College Farms and was active in the Agriculture Union as secretary and on the Agriculture Student Advisory Council. She later went on to attend South Dakota State University with course work in Agriculture Education while teaching Vocational Agriculture at Sturgis High School, Sturgis, South Dakota. As a vocational agriculture educator, she was a co-leader of FFA. While in South Dakota, she also took course work at Black Hills State College. After leaving South Dakota, she attended New Mexico State University before returning to Tennessee to the Knoxville area.

After taking course work at Tennessee Wesleyan, Bonita entered The University of Tennessee in Knoxville, Tennessee, in January 1991 to begin graduate studies. While working full time, she continued her studies and became a member of Gamma Sigma Delta national honor society in Spring 1994.

Presently, she is living in the Kingsport, Tennessee, area. In May 1995, she graduated with her Master's of Science Degree in Agricultural and Extension Education.