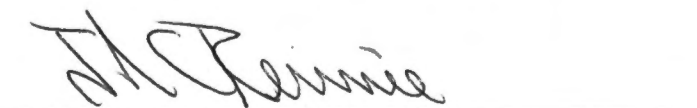
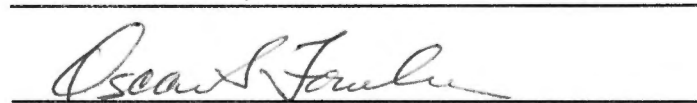
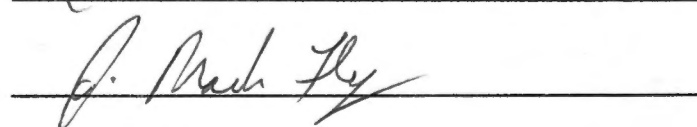


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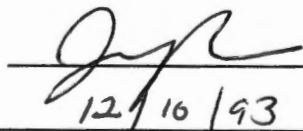

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PUBLIC ATTITUDES TOWARD FOREST MANAGEMENT PRACTICES
ON PULP AND PAPER COMPANY-OWNED FOREST LANDS
IN THE SOUTHERN APPALACHIAN REGION

A Thesis
Presented for the
Master of Science
Degree
The University of Tennessee, Knoxville

Jennifer Lee Plyler

May, 1994

AD-VET-MED.

Thesis
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P49

DEDICATION

For diversity and acceptance.

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ABSTRACT

Twenty-three community organizations participated in an educational program that addressed forest management practices on pulp and paper company-owned forest lands (for clarification, pulp and paper companies will be referred to as forest industry) in the Southern Appalachian Region. Initial attitudes were assessed using a pre-program questionnaire that focused on forest management practices on industry-owned land in the Southern Appalachian Region. An educational program was presented that addressed clearcutting, pine management, and erosion and sedimentation. The same questionnaire was then administered to identify any attitude changes that could be attributed to the educational program. This program was presented to several group-types which included church, civic, environmental, and professional groups in Asheville, North Carolina, Chattanooga, Tennessee, and Knoxville, Tennessee.

The results suggest that the study population had generally supportive attitudes about industry. The educational program produced significant changes in attitudes in that respondents were more supportive in general. Finally, the attitudes of environmental groups changed most noticeably from non-supportive to generally supportive of industries current management practices.

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CHAPTER I

INTRODUCTION

During the past decade the environmental movement has profoundly affected forest management through legislation and by influencing public opinion (Southern Timber Purchasers Council, 1992, Knoxville News-Sentinel, 1993, Doyle, 1992, Shaffer, 1991). Consequently, the public has been increasingly vocal, expressing their attitudes about how forests should be managed. Assessing public attitudes and acknowledging their importance are becoming an essential part of responsible forest management.

Historically, public lands have been the primary target of public outcry and criticism over management procedures. This public input has often resulted in new regulations. Management practices on the Cherokee National Forest in East Tennessee have been targeted by environmental groups who have initiated numerous lawsuits over issues such as: 1) below cost timber sales, 2) clearcutting, and 3) aesthetics. Litigation continues over these issues (Southern Timber Purchasers Council, 1992).

While timber harvesting continues on the Cherokee National Forest, a current proposal is that all timber harvesting cease by 1996. If adopted, this proposal will

likely affect harvesting on the Pisgah, Nantahala, Uwharrie, and Daniel Boone National Forests (Knoxville News-Sentinel, 1993).

Another example of the impacts of public attitudes toward forest management is recent activity that resulted in stopping all timber harvesting on Land Between the Lakes in western Kentucky and Tennessee. Environmental groups and private citizens filed a motion that an environmental impact statement had to be completed by Tennessee Valley Authority before any further timber harvesting occurred (Doyle, 1992). Similar to the Land Between the Lakes situation, private groups have proposed that all clearcutting on Tennessee Wildlife Resources Agency Management Areas in Tennessee be discontinued (County Clerk, Morgan Co., Tennessee, 1992).

Public lands are no longer the sole recipient of public criticism. Environmental groups are now targeting private lands and their efforts have had far-reaching effects. According to the Osgood Group Report (1992), many environmental groups believe that "forest industries are polluters." Environmental groups have aggressively challenged forest practices on private lands asserting the need for "environmental responsibility."

California provides the best examples of the degree to which extensive regulation of forest resource management can impact private landowners. According to Shaffer (1991), the California Division of Forestry and Fire Protection

developed a Timber Harvest Plan in 1973 which details regulation and restrictions of forest management practices required on privately-owned forested lands. The new Timber Harvest Plan was an attempt by California's private industries to initiate the regulation process and have an active role in developing various types of regulation.

While the California Division of Forestry is the "lead agency" that oversees the implementation of the Timber Harvest Plan, input is obtained from other state agencies such as the Department of Fish and Game, Water Quality, Geology, Archaeology, and certain county agencies. The Plan is also subject to public hearings which can greatly influence the acceptance or rejection of a timber harvest plan. Other detailed "rules" are included in the Timber Harvest Plan and must be strictly followed (Shaffer, 1991).

Shaffer (1991) outlines the laborious, lengthy, and often expensive process that landowners must follow to harvest timber on their lands. For example, Mrs. Bates (not her real name) purchased 120 acres of second growth redwood timber land in 1962 hoping to sell the timber when she reached retirement age. She owned approximately two million board feet worth an estimated half a million dollars.

She started the Timber Harvest Plan approval process October, 1990. Review teams finally approved a Plan in April, 1991. At this time, a Public Hearing was held. Mrs. Bates was faced with opposition from the Sierra Club and 30

subdivision families who stated that harvest of her timber would depreciate the values of their homes not to mention the environmental degradation caused by clearcutting. Due to diameter cut regulations and the prohibition of clearcutting, she would sell her timber but would receive 30-50 percent less for her timber than she would have received in nonregulated states. This is just one example of the extensive regulation that impact private landowners (Shaffer, 1991).

Originally, California followed a timber harvest plan using "Best Management Practices." Administrative changes occurred in which a new Director of California Division of Forestry was appointed. He was less interested in production forestry and reorganized the Board to include several "environmentalists" who shared his philosophy. The three page Timber Harvest Plan "grew" to a 200 page detailed description of forest practice rules (Shaffer, 1991).

Approval and implementation of the Plan is a lengthy process often lasting several years. It is now the consensus of forestry professionals in California that any attempts by industry to self-regulate leads to stricter government regulation making it almost impossible to implement a Timber Harvest Plan on privately-owned lands. These additional government regulations have been supported by special interest groups via public hearings (Shaffer, 1991).

Fred Hauessler¹, Land Acquisition Manager for Union Camp Paper Company, identified several regulations affecting forest management decisions on Union Camps' lands in the East. The Water Quality Act, wetland regulations, the Clean Air Act, and the Endangered Species Act are probably the most restrictive regulations that dictate management practices to be imposed on privately-owned lands.

Cubbage and Seigal (1988), also note the increasing state and local regulation of private forestry in the Eastern United States. Many states in the Northeast and South have enacted ordinances related to logging operations which are similar to the Timber Harvest Plan enacted in California. The purpose of these ordinances is to prevent property damage or to preserve amenity values. Public opinions and attitudes are critical factors affecting both the passage and implementation of regulations that control forest management of privately-owned lands (Shaffer, 1991).

There is strong agreement among forest industry leaders and legislators that industry has done a poor job in communicating to the public the specifics of forest operations and goals of certain forest practices as well as responding to the environmental concerns expressed by the public (Osgood Group Report, 1992). Industry's position has been "entirely reactive and even the reaction is weak." The

¹Personal Communication with Fred Hauessler, Land Acquisition Manager for Union Camp. January, 1993.

Southern Industrial Forest Research Council (1991) notes that political, economic, recreational and environmental issues are in need of immediate research.

The importance of forest products and the forest management practices needed to produce them should be addressed by forest industries through improved public relation programs. These public relations programs are the first step to improving communication between the forest industries, special interest groups, and the general public. But first, industry needs to assess public attitudes so that they understand public perceptions and beliefs toward forest industries and their land management practices (Southern Industrial Forestry Council, 1991).

Limited research has been conducted to address public attitudes toward forest industries and the harvesting practices implemented on their lands (American Forest Council and Southern Forestry Associations, 1986; Alabama Forestry Commission, 1992; The Osgood Report, 1992; and Tennessee Valley Authority and Auburn University, 1993). This is particularly true of pulp and paper companies who are the major forest landowners, major consumers of raw timber, and major employers in forest industries. An objective assessment of public attitudes toward the land management practices of forest industry and the degree to

which educational programs endorsed by forest industries counter misconceptions are a critical need in the current debate.

CHAPTER II

LITERATURE REVIEW

Several professional forestry associations in the Southeast were contacted requesting literature or available research in the area of public attitudes toward forest management practices on forest lands owned by pulp and paper companies. A number of respondents (Bob Issler, Georgia Forestry Association; Delos Knight, American Forest Council; Luke Popovich, American Forest Council; and Cynthia Page, Alabama Forestry Association) stated that while research has been conducted in the area of public attitudes and industry management practices, the results were proprietary and not available to the general public or other professionals.

The lack of information on this subject suggests the need for objective studies. Furthermore, the refusal to release such proprietary information is indicative of an industry that is helping create its image problem.

Only one quantitative study specifically addressed public attitudes about forest management practices on industry-owned forest lands. The Gallup Organization study was done in cooperation with the Tennessee Valley Authority and Auburn University (1993). Quantitative studies refer to research regarding relationships between two or more variables through the use of numbers. In social science

research, the variables are often opinions or concepts that are assigned numerical values in order to determine a relationship (Krueger, 1988).

Telephone interviews with 987 adults in the Tennessee Valley Region were completed by the Gallup Organization. Attitudes, knowledge, and behaviors regarding forest practices and policies were addressed in the telephone interviews (Tennessee Valley Authority and Auburn University, 1993).

The study revealed that residents of the Tennessee Valley generally accept management of forests for the production of forest products. This general support for forest management is tempered by strong concern over environment issues. Consequently, the majority of respondents supported a balance between protecting private property rights and maintaining environmental quality (Tennessee Valley Authority and Auburn University, 1993).

Overall, the survey results highlighted three major points:

- 1) Environmental concerns are extremely important and temper residents' views toward forest practices.
- 2) In general, the public approves of harvesting timber for forest products but is concerned about the environmental impact of forest management activities.

3) The views of people who own forest lands are indistinguishable from those of the general public.

Three qualitative studies addressing public attitudes have been conducted: 1) Defining Perception Gaps was conducted by The Osgood Group (1992), 2) Public Opinion Study conducted by the Alabama Forestry Commission (1992), and 3) Public Opinion Study sponsored by the American Forest Council and Southern Forestry Associations (1986).

Qualitative studies are conducted to provide insight into the attitudes, perceptions, and opinions of the participants without the benefit of number values (Krueger, 1988).

The Osgood Report (1992) was a qualitative study about perception gaps between forest industry managers and environmental activists. Interviews with leaders of environmental groups, forest industry, federal organizations, and federal legislators indicated that there are large perception gaps between forest industry managers and activists in special interest groups regarding environment protection.

Forest industry representatives believe that their organizations have not received credit for industry progress in the area of environmental protection. On the other hand, environmentalists believe that the goal of industry policy is to "frustrate, rather than support environmental protection" (The Osgood Report, 1992).

In 1992, the Alabama Forestry Commission, sponsored a survey of residents in Alabama regarding clearcutting and industries right to manage land in the Alabama Forestry Commission District. A total of 4,191 people were polled via telephone to determine public opinion of clearcutting and private landowner's rights. The accuracy of these surveys were determined by the authors to be extremely high (+/- 2 percent). Further details explaining the methodology were unavailable (Alabama Forestry Commission, 1992).

The significant finding was the contrast in attitudes toward industry-owned forest lands and "family"-owned forest lands. Respondents expressed negative views toward management practices (i.e. clearcutting) on industry-owned lands while they had positive feelings toward the same forest management practices conducted on "family"-owned lands. This study identified an apparent "perception gap" that labels forest industry as the "bad guys" (American Forest Council and Southern Forestry Association, 1986 and Alabama Forestry Commission, 1992).

The only qualitative study containing pertinent information on public attitudes toward forest industries in the Southeast was conducted in 1986 by the American Forest Council and Southern Forestry Associations (American Forest Council and Southern Forestry Associations, 1986). The study area included Alabama, Arkansas, North Carolina, Tennessee, Georgia, Florida and Mississippi. Since the

methodologies used were not documented, its' reliability cannot be evaluated (American Forest Council and Southern Forestry Associations, 1986).

The key findings were stated as follows:

- 1) Southerners are inclined to support use of forests for "productive" purposes.
- 2) Younger, more educated urban people are less supportive of industry's promise for stewardship than older less educated people.
- 3) Respondents generally support government regulation and intervention.
- 4) Individual ownerships of forested lands are viewed more positively than industry ownerships (American Forest Council and Southern Forestry Associations, 1986).

Attitudes Toward Forest Management Issues

Langenau et al. (1977 and 1980) studied the response of recreationists to clearcutting in northern lower Michigan. The study area was on state forests. Both their 1977 and 1980 sampling indicated that respondents felt clearcutting was good for most wildlife species. There was a wide range in attitudes, however, ranging from "Best thing that's happened in the state forest in 50 years" to "What we saw filled us with horror, disgust, and a deep, deep anger."

Respondent's beliefs about the effects of clearcutting included: 1) food was provided for wildlife, 2) too many trees were cut, 3) there was too much waste (i.e., slash), and 4) it would take too long for the oaks and pines to grow back.

Carlson (1976) studied attitudes of Idaho residents about timber management issues in their state. He found that the participants (91 percent) believed that timber should be managed like agricultural crops. Respondents also believed, however, that forests in the United States are being cut in a manner and at a rate that will harm the environment.

Attitude Formation and Change

Fishbein and Ajzen have published widely on research addressing attitude theory, formation, and change (Fishbein, 1967; Fishbein and Ajzen, 1975; and Ajzen, 1988). According to Fishbein (1967), Gordon Allport defined an attitude as "a learned predisposition to respond to an object or class of objects in consistently favorable or unfavorable ways." This definition can be broken down into several parts that address the whole realm of attitude theory, attitude formation, and attitude change.

The first part of the definition, "a learned predisposition" alludes to how attitudes are formed.

According to R. J. Lutz (1978), a consumer marketing researcher, learning can occur through information presented in symbolic form (words or pictures) or through direct experience. Information is encoded and some evaluative judgement is made about the information. Consequently, a value -- positive or negative, is assigned to each experience.

The next part of the attitude definition "respond favorably or unfavorably" indicates polarity. The relative tendency to respond to an object with either positive or negative affect is accompanied by the specific way each person thinks. The degree to which an individual responds or the extremity of affect comprises the affective component of attitudes (Fishbein, 1967).

Cognition and affect (feelings) are extremely important in attitude formation and attitude change. According to Fishbein and Ajzen (1975), Feslinger's theory of cognitive dissonance is often used to explain changes in attitudes. Cognitive dissonance refers to three types of elements that exist between cognitive elements, namely things a person knows about: 1) himself, 2) his behavior and 3) his surroundings. Cognitive elements could be "I know I smoke, I know smoking causes cancer, I know I enjoy smoking." The two cognitive elements "I know I smoke" and "I know smoking causes cancer" are dissonant.

The existence of dissonance, which is psychologically uncomfortable, will motivate a person to try to reduce the dissonance and achieve consonance. The strength of the pressure to reduce the dissonance is a function of the magnitude of the dissonance (Fishbein and Ajzen, 1975).

Dissonance is reduced by changing one's attitude, changing one's behavior, or increasing the reward for discrepant behavior. Consequently, in the above example, the individual can quit smoking, deny that smoking causes cancer, or convince himself that the pleasure from smoking outweighs the negative consequences (Fishbein, 1967).

Cognitive restructuring is an important component of attitude formation and change. In the above example, the individual changes his attitude about smoking or restructures his cognition. Simply, the presence of a cognitive scheme enhances a person's ability to form an attitude (Lutz, 1978).

The educational program which is a component of this thesis study offers participants an organized way of thinking of forest resource management -- a method of weighing the pros and cons. Is cognitive (re)structuring enough, however, to produce a change in attitudes?

Affective components or "emotions" play an important role in forming attitudes about forest management practices. People often attach spiritual meaning to forests. Destruction of forest and trees equates to annihilation of

something sacred. Cognitive restructuring may not be enough to overcome the affective components of attitude change.

Affect and emotions are very powerful components of attitude formation and change and their importance needs to be recognized. The affective component of attitudes is founded in classical conditioning which was introduced by the Russian physiologist Ivan Pavlov (1849-1936). Classical conditioning supports the idea that an unconditioned stimulus elicits some specific physiological response (Bem, 1976).

Pavlov's study used meat powder and dogs to illustrate classical conditioning. The meat powder was the unconditioned stimulus which automatically elicits salivation when placed in the mouth of dogs. Next, some arbitrary stimulus such as a bell was paired with the meat powder. Eventually the meat powder was removed and the dogs salivated at the ring of a bell.

According to Bem (1976), humans, too, are susceptible to classic conditioning. He suggests, however, that it is unlikely that classic conditioning explains the emotional or collective component of attitude formation. Most people have not undergone a conditioning procedure in which some experience is paired with an aversive (e.g., electric shock) or pleasurable (chocolate candy) unconditional stimulus.

Cognitive components of attitudes and emotional responses related to attitudes are frequently acquired

through semantic generalization. In reality, classical conditioning occurs when a specific stimulus elicits a specific response. Semantic generalization is when similar stimuli often elicits similar responses (Bem, 1976).

Bem (1976) reported that Volkova demonstrated the relationship between semantic generalization and attitudes. She conditioned salivation in children to the Russian word "good." "Good" was paired with cranberry puree, the unconditioned stimulus. Soon, the children would salivate at the mere mention of "good." In addition, comments implying "good" such as "The young pioneer helps his comrade" also provided salivation. Volkova demonstrated that humans can pick up emotional components of prejudice through purely verbal means rather than by direct experience as suggested by Allport.

Lutz (1978) addresses the question "attitude change or attitude formation -- what is the difference"? The difference is the initial position. If an attitude is viewed as a point on some affective continuum, then the attitude is already intact and any changes result in an attitude change. The attitude may not be on the affective continuum, however, which indicates attitude formation. The only real difference between attitude change and attitude formation is the initial position of the attitude and whether it occurs on that continuum.

Factors Influencing Attitude Change

Kelman, (1961), Fishbein and Ajzen (1975), and Ryan, (1982) identified three widely accepted factors of social influence on attitude change. First, **compliance** occurs when an individual accepts influence from another person or group of persons to achieve a favorable response or social acceptance. Secondly, similar to compliance is **identification** which occurs when an individual adopts behavior derived from another person or group because this behavior is associated with a satisfying relationship to this person or group. And thirdly, **internalization** occurs when an individual incorporates others' views into their personality and belief system. The goal is that the individual's behavior be congruent with his value system (Fishbein and Ajzen, 1975).

Examples of compliance, identification and internalization appear in Shimp and Kavas's (1984) study on coupon usage. Homemakers were more likely to use coupons if they perceived that "significant others" (parents and spouses) support coupon usage, use coupons themselves or reward (verbally) coupon usage. The actual use of coupons indicates some internalization of the influence from others.

The concepts of compliance, identification, and internalization can possibly explain attitude formation toward natural resources. For example, an individual may

choose to behave in a certain way to receive acceptance (compliance) from a particular reference group. The individual may then adopt a value or behavior (identification) accepted by that particular reference group (e.g., environmental organization). Finally, the individual may internalize this behavior or value (internalization) into his personality. Therefore, the value expressed or behavior may be a function of the individual's reference group.

Behavioral Intentions

The attitude formation theory defines two major factors that determine behavioral intentions "a personal or attitudinal factor and a social or normative factor" (Miniard and Cohen, 1981). The attitudinal factor has been discussed extensively but the social or normative factors need to be addressed.

Attitude change and the relative influence of social compliance are often measured in terms of behavioral intentions (Fishbein and Ajzen, 1975). Fishbein copes with the attitude/behavior "gap" by addressing "other variables" influencing attitude change such as: 1) "subjective norm" and 2) "normative beliefs." The basic paradigm of the Fishbein theory paradigm is that behavior is affected by

behavioral intent which in turn is affected by normative beliefs or subjective norms (Fishbein, 1967).

Subjective norms are defined as "what you" perceive others "think" and how that influences "your attitudes." Fishbein (1967) suggests that an individual's reference group (i.e., family, political party, environmental group, religious affiliation, etc.) can easily be adopted or internalized, therefore, detailing one's behavior. Often "one's perception" is inaccurate and normative beliefs become an issue. Normative beliefs are simply "what most people truly think" (Ryan, 1982).

The role of social influences, subjective norms and normative beliefs in attitude change and behavior intentions were addressed by Miniard and Cohn (1981) in their research on consumer marketing research. They questioned the relatedness of personal and normative reasons for engaging in certain behaviors. They suggested that normative belief and attitudinal factors are not independent of each other but closely related.

The theory of social influences of subjective norms and normative beliefs can be tested by examining the attitude questionnaires and demographic information in this thesis project. It is expected that attitudes among groups will be consistent. Nevertheless, some individuals may not agree with their reference groups or normative beliefs and answer statements according to their conscience.

Community Leader Theory

The "Community Leader Theory" is often used by Extension foresters as a way to persuade the public to change attitudes (Beal and Bohlem, 1981). Identifying community leaders and disseminating information to them has been an effective method of reaching the masses.

It is likely that some of the organizations selected as examples for this study have community leaders in their memberships. Although these individuals were not identified, they were presumed to have participated in the educational program and likely gained "new" information about forest management issues.

The research done by Fishbein and Ajzen (1975) in attitude formation and change is applicable to "Community Leader Theory." Normative beliefs and subjective norms are based on "significant others" which are often community leaders. Therefore, identifying community leaders and establishing rapport with them may offer foresters a direct line of communication to the general public (Beal and Bohlem, 1981).

Role of Education

A basic premise of this study was that education will change public attitudes toward the forest management

practices of industry. Research in the area of prescribed fire on public lands has been conducted that addresses the effectiveness of education in changing attitudes (Stankey, 1976; Howes and Legg, 1978; and McCool and Stankey, 1986).

Howes and Legg (1978) studied the attitudes of southern industrial foresters toward 1) public media and 2) information and education programs (I & E programs). They reported that field foresters were more favorable toward interacting with the public than were staff and administration. Those with I & E training appeared to be more: 1) media conscious, 2) sympathetic to the public, and 3) knowledgeable of I & E than non-I & E trained foresters.

Stankey (1976) and McCool and Stankey (1986) investigated the role of education on visitor attitudes toward prescribed fire and wilderness management. They reported that visitor attitudes have changed over the past decade. This change was largely attributed to increased public awareness of environmental processes through educational programs and communication.

Two studies were conducted on the Selway-Bitterroot Wilderness area in the northern Rockies. In 1971, Stankey completed a study on public attitudes and knowledge of fire management and evaluated attitudes about fire policies. Subsequently, McCool and Stankey (1986) completed a follow-up study in 1984 to assess any changes in attitudes in these

same areas. Identical questionnaires were used in each study.

In both studies the questionnaires were mailed to wilderness users. In 1971 and 1984, the percentage of responses were 84 percent and 83 percent respectively. The mail-order questionnaires contained 11 true-false questions assessing fire knowledge and nine statements proposing alternative wilderness fire suppression policies. In the 1984 study, in addition to the standard questionnaire, the participants also responded to questions about planned ignitions. The results of these studies which are presented below, indicate the need for public education and its effectiveness in changing attitudes.

In the 1971 study, the average score on the knowledge test was 53 percent. This average score increased to 64 percent in the 1984 study indicating that current wilderness users are more knowledgeable about fire effects. Nevertheless, changes in knowledge were not consistent on all questions.

In the two studies, the authors also examined factors associated with attitudes. In both studies, the only significant variable found to be related to attitudes toward fire policy was knowledge about fire effects. Although age and educational attainment were not related to attitudes, these variables were associated with level of knowledge (Stankey, 1976 and McCool and Stankey, 1986).

These studies indicate the critical role that education plays in public acceptance of fire management and fire policies. Although knowledge and public acceptance had increased, a direct cause and effect relationship was not established (Stankey, 1976 and McCool and Stankey, 1986). Other studies also indicate that a relationship exists between education in local communities and public acceptance of fire management and fire policies (Anderson et al., 1982; Baas et al., 1984; Taylor and Daniel, 1984; and Daniel and Mason, 1985).

The Tennessee Valley Authority and Auburn University (1993) study also addressed the role knowledge plays in public acceptance of forest management activities. In general, this study indicated that the public has very little knowledge of forest practices and that this lack of knowledge contributes to opposition to certain forest management practices. Nevertheless, when the public is informed, they are more supportive of management practices.

However, environmental concerns still temper support of certain forest practices (Tennessee Valley Authority and Auburn University, 1993). These research findings support the premise that an educational program will result in greater support for forest management activity on industry-owned forest lands.

CHAPTER III

OBJECTIVES

The objectives for this thesis project were to:

- 1) assess current attitudes of the public toward forest industries and their forest management practices in the Southern Appalachian Region,
- 2) develop an effective educational program specific to issues related to forest practices on industry-owned lands that can be used by industries, and
- 3) assess changes in public attitudes that can be attributed to an educational program that addresses forest management practices on industry-owned lands.

CHAPTER IV

FIELD METHODS AND PROCEDURES

Public attitudes toward the forest management activities carried out by industries were assessed using a structured educational assessment "instrument" with 23 community organizations in the western North Carolina and East Tennessee region. The instrument was also used to assess changes in attitudes toward forest management activities following an educational program explaining the forest management practices currently used on industry-owned lands.

The groups were selected from four organizational categories: 1) church, 2) civic, 3) environmental, and 4) professional. The program was presented in three urban areas: 1) Asheville, North Carolina, 2) Chattanooga, Tennessee, and 3) Knoxville, Tennessee.

Program Procedures

The educational program (Appendix A) and questionnaire (Appendix B) were developed with assistance from personnel from three pulp and paper companies; Craig Earnest, Bowater Southern Woodlands Division, Calhoun, Tennessee, Dave Todd, Champion Paper, Greenville, South Carolina, and Dan Kincaid

and John Wood, Westvaco, Wickcliffe, Kentucky. (On January 1, 1993, John Wood replaced Dan Kincaid from Westvaco²).

Each company representative identified issues of public concern specific to forest management on lands owned by industry. The common issues of high visibility were: 1) destruction of wildlife habitat, 2) use of herbicides, 3) conversion of hardwood forests to pine plantations, and 4) intensive management such as clearcutting.

Initially, the educational program included discussion of destruction of wildlife habitat, intensive management such as clearcutting, and conversion of hardwood forests to pine plantations. However, this material could not be thoroughly covered in the 40 minute program format commonly used by the public organizations being sampled. The final content of the educational program focused on pine management and clearcutting, and the associated erosion and sedimentation on industry-owned forest lands in the Southern Appalachian Region.

Two pilot tests were conducted using the Tennessee Valley Authority Forest Resource Group and The University of Tennessee Department of Forestry, Wildlife and Fisheries, (both students and faculty). The first pilot test was conducted at Tennessee Valley Authority. The forest resource group was helpful in identifying potential problems

²Personal Communication with Craig Earnest, Dave Todd, Dan Kincaid, and John Wood.

with the educational program. For example, they suggested narrowing the focus of the program to one or two issues. In addition, the program was too complicated and needed to be simplified for a "lay audience." As a result of this pilot test with the Tennessee Valley Authority Forest Resource Group, the program was changed considerably.

The second pilot test was conducted for The University of Tennessee Department of Forestry, Wildlife and Fisheries (faculty and students). Only minor changes were made as a result of this presentation. For example, most changes were limited to the semantics of the data presented. The presentations analyzed in this study were conducted from February 15 to September 21, 1993.

Study Area Selection

Urban areas were selected for the study because they provided a greater number and variety of suitable community organizations. The study areas selected were: Asheville, located in Western North Carolina; and Chattanooga and Knoxville, both located in the Tennessee River valley of East Tennessee. In addition, the proximity of these cities to industries made it more likely that participants had some exposure to issues related to industry operations.

Description of Urban Areas

Asheville, North Carolina is located in Buncombe County in Western North Carolina. It is situated in the southern part of the Blue Ridge Mountains. The population of Asheville in 1990 was 62,228. Major industries include textile manufacturers and tourism (Chamber of Commerce Asheville, 1992).

Chattanooga, Tennessee is located in Hamilton County in the Southeast section of the state, near the Georgia state line. The population of Chattanooga in 1990 was 152,466 (Chamber of Commerce Chattanooga, 1990).

Knoxville, Tennessee is located in Knox County, in the central part of the Great Valley of East Tennessee. It is the largest city in the region. The population of Knoxville in 1990 was 165,121. The economy is supported by a variety of manufacturing companies, (excluding pulp and paper companies), The University of Tennessee, and several large government agencies (i.e., Oak Ridge National Laboratory and Tennessee Valley Authority) (Chamber of Commerce Knoxville, 1992).

Selection of Group-Types

Four categories of suitable group-types were identified for this study: church, civic, environmental, and professional organizations. The selection of these group

categories for sampling maximized cultural, political, religious, social, ethnic, economic, gender, and educational diversity. Within each category, a random selection process was used to identify targeted groups that would be invited to participate.

Church Groups

Initially, the 50 largest congregations in the study region were to be considered regardless of religious affiliation. However, reliable information on congregation size was unavailable. Therefore, Lea Acuff of the Knoxville Ministerial Association and Francis Everett of the Hamilton County Baptist Association¹ offered an unofficial list of the 50 largest congregations in Knoxville and Chattanooga, Tennessee respectively.

Several church associations were contacted in Asheville, North Carolina but satisfactory information was unavailable. By default the churches in Asheville, North Carolina, were selected from the Asheville Area Phone Book (BellSouth, 1988) using personal knowledge of congregation sizes in the region (the author is from this area).

¹Personal Communication with Lea Acuff, Knoxville Ministerial Association and Francis Everett, Hamilton County Baptist Association. October 1992.

Civic Groups

A list of service organizations was obtained from the public library in each city. The total number of civic groups for each city was: Asheville, North Carolina -- 34, Chattanooga, Tennessee -- 69, and Knoxville, Tennessee -- 110. Groups were selected from the counties in which each city was located to include the total metropolitan area rather than just the city.

The mission or purpose of each group was considered in the selection process. Groups were omitted where it was evident that their focus would preclude the use of this program. For example, organizations that were identified as having specific agendas and time restraints were omitted from the sample.

Environmental Groups

A list of environmental groups was obtained from the same publication provided by the public libraries used for selection of service groups in each city. The number of environmental groups in each city were: Asheville -- 15, Chattanooga -- 5, and Knoxville -- 7. (A newspaper called Greenline, 1992 provided a list of environmental groups in Asheville). Only groups deemed politically active were included (e.g., Sierra Club), excluding more social organizations such as garden clubs.

Professional Groups

Public libraries also provided a list of professional groups in each city. The number of professional groups was Asheville, North Carolina -- 16, Chattanooga, Tennessee -- 25, and Knoxville, Tennessee -- 114.

Selection of Groups for Sample

Groups were selected within each category using a random number table. Two groups from each of the four categories in the three cities were selected for a total of 24 groups for sampling. A complete list of groups solicited for the presentation appears in Appendix C. A letter explaining the research project, inviting participation, a response form (Appendix D) and a self-addressed stamped envelope was mailed to the 24 identified groups. A chronology of the presentations, specific groups, and group addresses is shown in Appendix E.

Response Problems

As of January 28, 1993, nine responses (37 percent) were received. A second mailing of 52 form letters and response forms was conducted January 20, 1993. The response rate for the second mailing was poor. Consequently, the random selection method was abandoned and groups were

contacted according to how they appeared on the public library listing until the needed number of groups were scheduled. By July 1, 1993, 18 of the 24 scheduled presentations were completed. By August 19, 1993, 22 of the 24 scheduled presentations were completed. The last presentation was made on September 21, 1993.

The targeted number of presentations and observations for this project was 24 and 240, respectively. However, after several unsuccessful attempts to schedule a presentation with a church group in Chattanooga, Tennessee, the number of presentations was held at 23 (Table 1). The total number of respondents was 349.

There was a variety of responses from group-types when solicited to participate in the thesis project. Most program chairpersons contacted either by letter or telephone did not wish to participate in the study. Although most chairpersons stated that the time factor was a problem, others said that the agenda for the meetings would not accommodate the thesis program. For example, many groups met infrequently and meetings were usually devoted to "business" or elections. Very few chairpersons were receptive to participate in this thesis project. Those who did agree were often reluctant to do so. Program chairs were unsure if the content of the program would be "interesting" to group members while others seemed unwilling to invest the time and energy into scheduling the program

TABLE 1. Organizations Sampled and Location by Group-Type

Group Type	City
<u>Church Groups</u>	
Nazareth Baptist Church	Asheville, North Carolina
Trinity United Methodist Church	Asheville, North Carolina
Hixson United Methodist Church	Chattanooga, Tennessee
Church of Ascension	Knoxville, Tennessee
Second Presbyterian Church	Knoxville, Tennessee
<u>Civic Groups</u>	
Golden K Kiwanis	Asheville, North Carolina
Greater Reynolds Lions Club	Asheville, North Carolina
Kiwanis Club	Chattanooga, Tennessee
Optimist Club	Chattanooga, Tennessee
Rotary Club	Knoxville, Tennessee
Sertoma	Knoxville, Tennessee
<u>Environmental Groups</u>	
Madison County Environmental Alliance	Asheville, North Carolina
Sierra Club	Asheville, North Carolina
Audubon Society	Chattanooga, Tennessee
Sierra Club	Chattanooga, Tennessee
Save Our Cumberland Mountains	Knoxville, Tennessee
Trout Unlimited	Knoxville, Tennessee
<u>Professional Groups</u>	
Quota Club	Asheville, North Carolina
West Asheville Business Association	Asheville, North Carolina
Southeast Tennessee Lawyers' Association for Women	Chattanooga, Tennessee
Tennessee Society of Professional Engineers, Chattanooga Chapter	Chattanooga, Tennessee
Beta Sigma Phi, Alpha Beta Council	Knoxville, Tennessee
Society of American Foresters	Knoxville, Tennessee

(e.g., checking convenient times, receiving approval from the group, returning phone calls, etc.). Therefore, persistence by and flexibility of the author were keys to scheduling programs.

While the majority of environmental organizations were relatively easy to schedule, two representatives of different environmental groups in Knoxville specifically stated that the content of the educational program was not consistent with the objectives and goals of their particular organizations. It appeared that these representatives controlled the environmental issues that would be discussed.

Questionnaire Development

The questionnaire addressed issues that were identified by company representatives and contained in the educational program. The salient issues were: 1) intensive management such as clearcutting, 2) pine management, and 3) environmental consequences of intensive management, specifically erosion and sedimentation on industry-owned forest lands in the Southern Appalachian Region.

The actual statements included in the questionnaire were developed based on Kerlinger's (1964) construct definition. A construct is defined as a concept that has been deliberately developed for scientific purpose. For example, "intelligent" is a concept while "intelligence" is

a construct. "Intelligence" can be measured by intelligence tests, scholastic achievement, and motivation. For the purpose of this study, one construct was identified for the salient issues stated in the above paragraph. This construct was clearcutting.

Attitudes expressed about clearcutting on industry-owned forest lands can be a result of several issues. The factors associated with clearcutting were:

- 1) economics,
- 2) aesthetics,
- 3) private landowner rights,
- 4) management versus nonmanagement of forests,
- 5) species diversity, and
- 6) environmental concerns (erosion and sedimentation).

Statements were developed that addressed each of these factors within the greater construct of clearcutting. The answers that each participant marked indicated the underlying factors that helped form their attitude about clearcutting. Constructs and factors operationally defined attitudes about forest management practices.

A seven point Likert scale allowed participants to simply mark the appropriate response. Other scale systems were examined, but the available research indicated that the seven point scale was most appropriate in detecting changes in responses between the pre- and post-program questionnaires (Fishbein, 1967 and Brown and Daniel, 1990).

A response of "one" indicated "strongly agree" and a response of "seven" indicated "strongly disagree" while a response of "four" was neutral -- neither agree or disagree. In addition to these seven responses, there were two additional responses: 1) X --- indicates that the person is indifferent to the statement or issue and feels that it is unimportant and 2) O -- indicates a concern for the issue but the respondent simply does not have enough information to make an informed decision. Identical questionnaires were administered prior to and following the educational program to assess initial attitudes and to detect any changes in attitudes that could be attributed to the educational program. Instructions (explanations of the X and O responses) were given for the pre- and post-program questionnaire. See Appendix B for the pre- and post-program questionnaires.

Program Format

All program presentations were made by the author. The program format was as follows:

- 1) introduction of author,
- 2) explanation of the purpose of the presentation and the relevancy to each group, description of the program format, and an explanation of the

instructions to the audience on how to complete the questionnaires,

- 3) the pre-program questionnaire was administered,
- 4) the educational program was presented,
- 5) instructions were given for completing the post-program questionnaire, the audience was reminded that the questionnaires were identical, and the importance of being candid in indicating changes in attitudes or no changes in attitudes was emphasized. The post-program questionnaire was administered,
- 6) the audience completed the background information sheet, and
- 7) discussion if the audience had questions or comments as time permitted (Appendix F).

The program format is included in Appendix A.

Immediately following completion of the post-program questionnaire, the participants completed the background information sheet. The background information sheet provided demographic information (see Appendix G).

Statistical Analysis

Statistical Analysis System (SAS) and D-Base III were used to analyze the data. The following statistics and tests were used to interpret the data: means, standard

deviations, t-test, factor analysis, Pearson coefficient correlation, and chi-square analysis.

Responses on the seven point Likert scale were treated as interval data. This allowed for calculation of means, standard deviations of differences, and testing for the significant differences with students t-tests. A response of four was neutral. Means significantly less than four or greater than four were considered to indicate disagreement or agreement, respectively, with the question.

CHAPTER V

RESULTS AND DISCUSSION

Twenty-three presentations made over a seven month period during which 349 individuals completed the pre-and post-program questionnaire. Most audiences were attentive and appeared genuinely interested in the subject matter. However, a few audiences responded in a hostile, confrontational manner in the discussion following the program, refuting most of the information presented. They expressed concern about the program being biased saying that the program was simply touting industry's message. The writer responded to these comments by listening and not engaging in a potential confrontation. This passive response appeared to diffuse the situation and add credibility to the program.

A basic assumption in developing this study was that the public is interested in natural resource issues. This turned out to not necessarily be the case. Individuals often appeared disinterested and apathetic. Two factors may account for this disinterest. First, some people failed to understand how the presentation related to their lives even though the relevancy of the program was discussed in the introduction. In this case, forest management issues were unimportant and probably other social issues were of greater

concern. Second, many individuals may have lacked the basic understanding of natural resources and biology needed to respond to the subject matter being presented.

Although groups were informed of the time needed to complete the educational program, a few did not allow sufficient time. When this situation occurred, parts of the educational program were either condensed or omitted. In many cases, the format of the educational program was altered to accommodate the schedule of a specific group. For example, "meet and eat" groups often completed the pre-program questionnaire with a simplified set of directions without the benefit of an official introduction. Usually the introduction took place after the meal and immediately prior to the educational program. These situations (e.g., a simplified set of directions and condensed version of educational program) could not be avoided since it was unrealistic to reschedule the presentations.

Groups in which unusual situations (e.g., a simplified set of directions and condensed version of educational program) occurred were documented. The responses on the pre- and post-program questionnaires were examined carefully to determine if administration problems affected the participants responses. In comparison to groups where the program format was followed, the results did not appear to differ.

Demographic Information

Study Population

Demographic information was based on data from the background information sheet. In many instances, questions were skipped, or otherwise unanswered. Therefore, the "no response" was a significant factor (> 30 percent) for some questions. In these cases, its relevance will be discussed.

The gender breakdown was 55 percent males and 35 percent females. Ten percent failed to respond to this question. There were relatively few respondents under the age of 30. Most respondents were in the older age groups with "over 60" being the largest group (Table 2).

TABLE 2. Age Distribution*

Age Groups	Percent	n
Under 20	6.2	4
20-29	8.7	28
30-39	18.9	61
40-49	22.4	72
50-59	20.8	67
Over 60	<u>28.0</u>	<u>90</u>
	100	322

*No response = 27

Most respondents were employed. Occupations were grouped into blue collar- and white collar-type jobs. The blue collar jobs included craftspeople, service workers, laborers, and homemakers. White collar jobs included professionals, such as doctors, attorneys, engineers, managers and sales (Table 3).

TABLE 3. Employment Status and Occupational Type*

Employment Status and Occupational Choice	Percent	n
<u>Employment Status</u>		
Employed	70.7	227
Retired	23.4	75
Homemaker	2.2	7
Student	1.9	6
Unemployed	<u>1.9</u>	<u>6</u>
	100	321
*No response = 28		
<u>Occupational Type</u>		
White Collar	40.1	113
Blue Collar	<u>59.9</u>	<u>169</u>
	100	282
*No response = 67		

The most frequent household income group had an annual income between 30,000 and 39,999 dollars (Table 4). This figure may be misleading since 19 percent of the study population did not respond to this question. The low

TABLE 4. Household Income Groups*

Household Income Group	Percent	n
Under \$10,000	5.0	14
10,000-19,999	9.6	27
20,000-29,999	14.9	42
30,000-39,999	17.0	48
40,000-49,999	13.1	37
50,000-59,999	11.7	33
60,000-79,999	10.6	30
80,000-100,000	9.9	28
Over \$100,000	<u>8.2</u>	<u>23</u>
	100	282
Mean \$45,000		
Median \$48,000		
Mode \$35,000		

*No response = 67

response was likely related to two factors; 1) seating was generally such that their peers could see their answers and 2) the income question was at the top of page two of the background information sheet. After marking a response, they had to complete the remainder of the page. If the question had been placed at the bottom of a page, the response could have been marked and the page turned quickly minimizing the opportunity for people seated closely to see their neighbor's household income level.

Educational backgrounds for the study population varied. Some reported having only high school educations while others completed some college courses.

<u>Educational Background</u>	<u>Percent</u>	<u>n</u>
Completed High School or GED	28.4	99
Technical School	5.4	19
Some College	28.9	78

"No responses" comprised a major portion (n=137) of the responses on educational background. Again, this was likely due to their reluctance to provide such personal information (e.g., their educational level), especially if they did not complete high school or a secondary school. Respondents having a college education generally completed this question.

Of those who completed college (n=212), only 13 percent received degrees in natural resources. Eighteen percent had completed advanced degrees (MS and Ph.D.) in natural resources. The relatively low number of respondents who received degrees in natural resources could explain why some respondents appeared to have difficulty understanding the content of the educational program. Of the respondents receiving degrees in natural resources (15 percent), eight percent were professional foresters (e.g., members of the Society of American Foresters). If this group had been eliminated from the college background question, only seven percent of the study population would have had college degrees in natural resources. Elimination of this specific group-type probably offers a more realistic picture of respondents and their educational background.

The study population was asked to indicate the community-type of their residence while in high school as well as their current residence (Table 5). This question was used to determine the mobility of the study population.

TABLE 5. Residency Category During High School and Current Residence*

Residence	Percent	n
<u>High School</u>		
Large city	14.4	45
Suburb	18.3	57
Small city	25.0	78
Small town	17.9	56
Rural	<u>24.4</u>	<u>76</u>
	100	312
*No response = 37		
<u>Current Residence</u>		
Large city	17.9	55
Suburb	24.0	74
Small city	33.1	102
Small town	9.1	28
Rural	<u>15.9</u>	<u>49</u>
	100	308
*No response = 41		

Most respondents indicated that they resided in small cities and rural areas while in high school. Some had migrated to suburbs while others continued to live in small cities.

Although, the study population indicated a move away from the rural setting, many reported owning land other than house lots.

Of respondents who reported owning land (36 percent), the average number of acres owned per respondent was: forestland -- 75 acres and farmland -- 96 acres. Some of these landowners could be characterized as absentee landowners since many reside in urban areas. The majority (64 percent) did not own land. This higher percent of non-landowners and the uncertainty of the number of absentee landowners possibly supports mobility trends from rural areas to cities.

While mobility trends may be responsible for the relatively low number (36 percent) of landowners, the average age category for the respondents also offers a plausible explanation. The most frequent age category was "60 and over." This group of respondents could have been landowners at one time but sold their land to provide financial support in retirement. Therefore, the mobility and advanced age of respondents could both contribute to the low percent of landowners.

Eighty-seven percent of the respondents indicated that they participate in outdoor recreation using a variety of

resources as listed below;

<u>Recreational Preferences</u>	<u>Percent</u>	<u>n</u>
Non-industrial private lands	34.1	119
Backyard	48.7	170
Public Lands	71.6	250
Pulp and Paper Company-Owned Lands	15.5	54

Of those who recreate, public lands were the top choice used by most respondents (71 percent). Given the proximity and accessibility of public lands (i.e., Cherokee National Forest, Pisgah National Forest, and Great Smoky Mountain National Park) to the three locations, the high use of public lands for recreational purposes was not surprising. However, many respondents (48 percent) preferred to recreate in their backyard staying close to home and not truly engaging in traditional outdoor recreational activities (i.e. backpacking, fishing, hunting, birdwatching, etc.).

Respondents indicated their sources of information about natural resources, environmental issues, and forestry as follows:

<u>Source of Information</u>	<u>Percent</u>	<u>n</u>
Television	66.8	233
Magazines	70.5	246
Organizations	47.0	141
Friends	25.8	125
Books	45.8	157

Magazines and television were the predominate information sources. In comparison to other sources, organizations were not as important. For example, this figure may be misleading since many organizations are skillful at

manipulating the media to effectively convey their messages. In reality, organizations may serve as a major source of information, not through membership but through their programs of mass communication.

Membership in environmental groups and outdoor organizations is provided in Table 6. Most respondents were

TABLE 6. Membership and Activity Level in Environmental Organizations*

Membership/Activity Level in Environmental Groups	Percent	n
Membership	43.6	133
Nonmembership	<u>56.4</u>	<u>172</u>
	100	305
*No response = 44		
<u>Level of activity:</u>		
Inactive	17.8	24
Somewhat active	55.6	75
Very active	<u>26.7</u>	<u>36</u>
	100	135
*No response = 214		

not members of environmental organizations which could indicate a lack of interest in, and concern for environmental issues. This lack of concern was observed during some of the presentations. Therefore, the media's characterization that environmental issues are a top public priority may be unfounded.

The spiritual and religious significance of forests and trees for respondents was assessed. Often, the public is portrayed as responding emotionally to environmental issues, ignoring scientific data. The basis for the "emotions" surrounding natural resource issues could be based on spiritual or religious beliefs. For example, radical environmentalists may personify trees or forests and any destruction or harvesting of timber is viewed as "killing" a living being.

According to this study, 49 percent believed that trees or forests have spiritual and religious significance. However, it was unclear if these beliefs influenced how respondents viewed the clearcutting construct. Perhaps, in future studies spiritual and religious beliefs could be developed as a factor addressing the clearcutting construct.

In regard to meeting the wood needs of society, respondents generally did not support (81 percent) harvesting on non-industrial private forest lands (Table 7). However, when harvesting is done on both non-industrial and industry-owned lands, respondents were generally more supportive (86 percent). Although harvesting timber on non-industrial private forest lands and industry-owned lands are issues of concern for the public, traditionally public lands have been the main focus. The acceptability of harvesting on public lands was not discussed.

TABLE 7. Respondents Opinions Regarding Appropriate Sources for Supplying Our Wood Needs*

Should our wood needs come from:	Percent	n
Pulp and Paper Company-Owned Lands Only		
Yes	39.6	90
No	<u>60.4</u>	<u>137</u>
	100	227
*No response = 122		
Privately-Owned Lands (NIPF) Only		
Yes	18.7	29
No	<u>81.3</u>	<u>126</u>
	100	155
*No response = 194		
Both		
Yes	88.6	194
No	<u>11.4</u>	<u>25</u>
	100	219
*No response = 130		

At the end of the background information sheet respondents were provided with an opportunity to indicate their concerns and make suggestions regarding changes they felt should occur on industry-owned lands (Table 8). Almost 60 percent of the respondents did not respond to this question.

Responses were mixed as to whether respondents were either satisfied or dissatisfied with the management practices used by industry. The high number of "no response" may indicate a general lack of concern and interest about forest management practices on industry-owned

TABLE 8. Respondents Opinions as to Major Areas Needing Change on Industry-Owned Forest Lands*

Major Areas Needing Change on Industry-Owned Lands	Percent	n
Improve aesthetic quality	2.1	3
Provide more wildlife and recreational areas	6.4	9
Increase biodiversity	10.7	15
Decrease erosion, air pollution and improve watershed quality	15.0	21
Protect private landowner rights	2.1	3
More responsible land management	43.6	61
Decrease or cease clearcutting	15.0	21
Provide more education	3.6	5
Not enough information to answer	<u>1.4</u>	<u>2</u>
	100	140

*No response = 209

lands or the respondents simply did not have time to respond to this question since it appeared last. Few specifically stated that they did not have enough information to answer this question.

The most frequent response suggesting change was "more responsible land management." This category included several related suggestions that were grouped under "more responsible land management." These suggestions for changes included:

- 1) Industry needed to use more responsible forest management practices,
- 2) Use "best management practices", and

- 3) Focus more on sustainability and conservation management.

See Appendix H for a complete list of the demographic information for the study population.

Locations

There were considerable differences in the demographic information provided for the three locations. Noteworthy were differences in:

- 1) age groups,
- 2) income groups,
- 3) place of resident in high school and current residence, and
- 4) land ownership.

Demographic information for Asheville, Chattanooga, and Knoxville is included in Appendices I-K.

Age Groups

The age distributions for Chattanooga and Knoxville were similar (Table 9). In contrast to Asheville, the most frequent reported age group for both Chattanooga and Knoxville was 40-49, while for Asheville it was "over 60." Asheville is known as a retirement community, therefore, it is not surprising that there was a large percentage of older adults in Asheville.

TABLE 9. Age Distribution According to Locations*

AGE GROUPS	LOCATION					
	Asheville, NC Percent n	Chattanooga, TN Percent n	Knoxville, TN Percent n			
Under 20	3.2 4	0.0 0	0.0 0			
20-29	8.0 10	9.3 10	9.1 8			
30-39	16.8 21	22.2 24	18.2 16			
40-49	12.0 15	27.8 30	30.7 27			
50-59	20.0 25	19.4 21	22.7 20			
Over 60	<u>40.0</u> <u>50</u>	<u>21.3</u> <u>23</u>	<u>19.3</u> <u>17</u>			
	100 125	100 108	100 88			
*No response =	15	8	5			

Incomes

Respondents appeared to be reluctant to reveal their household income (Table 10). The failure to answer was a significant factor in each city except Knoxville. A high percentage of the respondents in both Asheville and Chattanooga failed to answer these questions making comparisons difficult. However, some general interpretations can be made.

Household income for Knoxville was significantly higher than Chattanooga and Asheville. There are several possible explanations: 1) Knoxvillians were more apt to report their household income because in many cases it was substantial, 2) the economy is based on several large government agencies (Tennessee Valley Authority, Oak Ridge National Laboratory, etc.) and the University of Tennessee. All of these

TABLE 10. Household Income Groups According to Locations*

HOUSEHOLD INCOME GROUPS	Asheville, NC		FREQUENCY (PERCENT)			
	Percent	n	Chattanooga, TN		Knoxville, TN	
	Percent	n	Percent	n	Percent	n
Under \$10,000	7.0	7	6.2	6	1.2	1
10,000-19,999	15.0	15	10.5	10	2.4	2
20,000-29,999	28.0	28	12.4	12	1.2	1
30,000-39,999	28.0	28	13.4	13	8.3	7
40,000-49,999	10.0	10	7.2	7	23.8	20
50,000-59,999	8.0	8	14.4	14	13.1	11
60,000-79,999	1.0	1	18.6	18	13.1	11
80,000-100,000	1.0	1	11.3	11	19.0	16
Over \$100,000	<u>2.0</u>	<u>2</u>	<u>6.2</u>	<u>6</u>	<u>17.9</u>	<u>15</u>
	100	101	100	97	100	84
Mean	\$38,500		\$55,000		\$55,000	
Median	\$25,000		\$50,000		\$50,000	
Mode	\$25,000		\$70,000		\$45,000	
	\$35,000					
*No response =	39		19		9	

employers tend to be higher paying as opposed to manufacturing jobs that dominate the employment market in Chattanooga and Asheville. Chattanooga offers excellent job opportunities, but high paying jobs are limited.

Asheville does not offer the same employment market as the larger metropolitan areas encompassed by Chattanooga and Knoxville. The economy is based on tourism and these jobs generally do not offer substantial incomes or mobility in the work force. In addition, a relatively large percent of the sample population from Asheville was retirees who are on

fixed incomes. This combination of factors helped explain the low household income for Asheville respondents.

The intent of the sampling procedures was not to favor one group-type over the other or select more or less "affluent groups." Nevertheless, the group-types that participated in this study were examined to determine if more "affluent" groups were sampled in Knoxville and Chattanooga in comparison to Asheville. There appeared to be no sampling bias between Asheville and Chattanooga but Knoxville offered a unique situation.

The groups in Knoxville were not necessarily composed of affluent individuals, but the areas where the groups meet were in a predominately affluent section of Knoxville -- Sequoyah Hills. Since members of these groups probably belonged because of convenience to their work or home, their membership was likely more affluent than similar groups in other locations.

Residence and Mobility

There were several differences among locations as to the place of residence during formative years and currently (Table 11). In Asheville there was very little mobility. People reported that they resided in the same place -- small cities and rural areas, most of their lives. While there seemed to be little mobility suggesting that they lived in the area in which they grew up, this may be an inaccurate

TABLE 11. Place of Residence in High School and Current Residence According to Locations*

PLACE OF RESIDENCE	LOCATION					
	Asheville, NC		Chattanooga, TN		Knoxville, TN	
	Percent	n	Percent	n	Percent	n
<u>High School</u>						
Large city	12.9	15	17.9	19	12.4	11
Suburb	12.1	14	22.6	24	21.3	19
Small city	32.8	38	20.8	22	20.2	18
Small town	16.4	19	14.2	15	24.7	22
Rural	<u>25.9</u>	<u>30</u>	<u>24.5</u>	<u>26</u>	<u>21.3</u>	<u>19</u>
	100	117	100	106	100	89
*No response =		23		10		4
<u>Current Residence</u>						
Large city	8.0	9	20.8	22	27.0	24
Suburb	8.9	10	34.9	37	30.3	27
Small city	50.0	56	23.6	25	23.6	21
Small town	11.6	13	9.4	10	5.6	5
Rural	<u>21.4</u>	<u>24</u>	<u>11.3</u>	<u>12</u>	<u>13.5</u>	<u>12</u>
	100	113	100	106	100	89
*No response =		27		10		4

assumption. For example, respondents may have grew up in a rural area in the Piedmont of North Carolina but reside currently in a rural area near Asheville. While the resident-type remained the same, the geographical location may have varied. In contrast to Asheville, both Chattanooga and Knoxville appeared to have mobile populations. People tended to migrate from rural areas to small cities and suburbs. These areas are in close proximity to more job opportunities and higher paying jobs.

Land Ownership

Land ownership of the Asheville respondents were much lower than for those in Chattanooga and Knoxville (Table 12). Land ownership is related to income level as well as

TABLE 12. Land Ownership of Respondents According to Locations

LAND OWNERSHIP TYPE	LOCATION (average acres per respondent)		
	Asheville, NC	Chattanooga, TN	Knoxville, TN
Forest land	44.7	81.8	94.4
Farm land	40.7	126.7	112.5

"life stage" of respondents. The mean household income for respondents in Asheville was \$38,500 while the mean household income for both Chattanooga and Knoxville was \$50,000 (Table 10). For example, it is possible that the respondents in Asheville are in a different stage-of-life (i.e., retirement) and investing money in land is not a priority. Younger respondents in Chattanooga and Knoxville appear to be investing money in real estate to acquire their desired life-style.

Demographic Information and Attitudes by Locations

The pre-program attitudes and changes in attitudes following the program were examined for each location.

Although several differences were identified in demographics among the three locations, these differences did not appear to significantly affect either the pre-program attitudes or changes in attitudes.

Group-Types

Analysis of the demographic information for the four group-types -- church, civic, environmental, and professional, identified several significant differences (Appendices L-O). The five demographic characteristics included were:

- 1) household income,
- 2) residence and mobility,
- 3) landownership,
- 4) membership in environmental groups, and
- 5) sources of environmental information.

Several questions on the background information addressed environmental issues. Including environmental groups as a group-type offered a unique opportunity to study differences related to such affiliations.

Household Income

In contrast to other group-types (church, civic, environmental, and professional), the mean household income was relatively low for environmental groups (Table 13). One

TABLE 13. Household Income According to Group-Types*

HOUSEHOLD INCOME GROUPS	GROUP-TYPE							
	Church %	n	Civic %	n	Environmental %	n	Professional %	n
Under \$10,000	6.2	3	0.0	0	7.4	7	5.4	4
10,000-19,999	6.2	3	7.7	5	18.9	18	1.4	1
20,000-29,999	16.7	8	7.7	5	22.1	21	10.8	8
30,000-39,999	16.7	8	10.8	7	13.7	13	27.0	20
40,000-49,999	16.7	8	15.4	10	9.5	11	13.5	10
50,000-59,999	6.2	3	12.3	8	11.6	11	14.9	11
60,000-79,999	6.2	3	10.8	7	11.6	11	12.2	9
80,000-100,000	18.8	9	15.4	10	2.1	2	9.5	7
Over \$100,000	<u>6.7</u>	<u>3</u>	<u>20.0</u>	<u>13</u>	<u>3.2</u>	<u>3</u>	<u>5.4</u>	<u>4</u>
	100	48	100	65	100	95	100	74
Mean	\$50,000		\$ 44,000		\$37,000		\$49,000	
Median	\$45,000		\$ 55,000		\$35,000		\$45,000	
Mode	\$90,000		\$100,000		\$25,000		\$35,000	
*No response =	16		23		8		20	

would expect that members with substantial incomes are necessary to provide the financial resources to support these non-profit organizations. However, these results indicate otherwise. Without a detailed financial profile of environmental groups and its members, this discrepancy cannot be evaluated. Participants of the environmental movement can possibly be characterized as generally young and idealistic. It may be that environmental organizations capitalize on the "idealism" of masses to provide financial support for their organizations.

The mode household income indicates the most frequently reported income for each group-type. Evaluation of the

modes indicates a bi-modal distribution across group-types (Table 13). For example, the mode for church and civic group-types was \$90,000 and \$100,000 respectively while the mode for environmental and professional group-types was \$25,000 and \$35,000 respectively.

The high modes for church and civic group-types appeared inconsistent with the means and median household income groups for each of these group-types. It seems that household incomes for environmental and professional group-types more accurately reflect the distribution of household incomes for most families in the Southern Appalachian Region.

Residence and Mobility

All group-types reported a migration from rural areas to small cities and suburbs except for environmental groups -- they moved to rural areas (Table 14). Perhaps this reflects their interest in the environment and nature.

Detailed Information About Environmental Groups (n=88)

Since this study was focused on public response to environmental issues on industry-owned lands, a closer look at respondents belonging to environmental groups seems warranted. The following discussion is based only on responses of individuals belonging to environmental groups. These respondents receive their information about

TABLE 14. Place of Residence in High School and Current Residence According to Group-Types*

PLACE OF RESIDENCE	GROUP-TYPE							
	Church		Civic		Environmental		Professional	
	%	n	%	n	%	n	%	n
<u>High School</u>								
Large city	9.3	5	22.7	17	17.2	17	7.1	6
Suburb	20.4	11	16.0	12	23.2	23	13.1	11
Small city	35.2	19	25.3	19	20.2	20	23.8	20
Small town	13.0	7	14.7	11	19.2	19	22.0	28
Rural	<u>22.2</u>	<u>12</u>	<u>21.3</u>	<u>16</u>	<u>20.2</u>	<u>20</u>	<u>33.3</u>	<u>19</u>
	100	54	100	75	100	99	100	84
*No response =	10		13		4		10	
<u>Current Residence</u>								
Large city	19.2	10	24.0	18	12.1	12	18.3	15
Suburb	32.7	17	28.0	21	20.2	20	19.5	16
Small city	42.3	22	33.3	25	23.2	23	39.0	32
Small town	1.9	1	6.7	5	15.2	15	8.5	7
Rural	<u>3.8</u>	<u>2</u>	<u>8.0</u>	<u>6</u>	<u>29.3</u>	<u>29</u>	<u>14.0</u>	<u>12</u>
	100	57	100	75	100	84	100	91
*No response =	12		13		4		12	

environmental, natural resource, and forestry issues from a variety of sources. On the source of information question, the audience was asked to mark all the applicable responses. These responses were as follows:

<u>Source of Information</u>	<u>Percent</u>	<u>n</u>
Television	68.9	71
Magazines	85.4	88
Organizations	86.5	77
Friends	67.0	69
Books	68.0	70

Environmental groups relied mainly on magazines and organizations as sources of information about natural resource issues while other group-types relied on television and magazines.

They indicated that their membership in environmental groups was only 88 percent. One would expect that this would have been 100 percent given that the program was being presented to an environmental group. It was possible that some people in the audience were visitors.

The level of activity most reported was "somewhat active" (59 percent). In comparison to other group-types, this percent may be high. However, it was expected that most respondents would be "very active." The level of activity "somewhat active" suggests that there are a few leaders doing most of the work while the remaining members are passive observers. It appeared that the focus (e.g., environmental issues) of environmental groups influenced responses on the pre-program attitude questionnaire and changes in attitudes.

Construct Validity

Factor Analysis

Factor analysis was used to test the construct validity of the questionnaire instrument. Factor analysis does not suggest characteristics or attitudes about the study

population. Factor analysis determines: 1) whether the questions addressed each factor that was used in developing the questionnaire and 2) if the factors addressed the clearcutting construct (Kerlinger, 1964).

Factor analysis provides three important, related values: 1) the eigenvalue, 2) the correlation value, and 3) cumulative variation. The eigenvalue gives the variation among factors. If the eigenvalue is greater than 1.00, then the variable becomes a factor. Although eigenvalues less than 1.00 are nonfactors, they are still included in the cumulative variation value. In this study there were 17 possible factors since there were 17 questions.

Correlation values indicate the way in which the study population responded to a specific question, or to a group of questions. All questions have a correlation value that corresponds to each factor creating a matrix of factors and correlation values for each question. Each factor addresses the construct, which in this case was clearcutting. If the correlation value exceeds 0.40, then the question is associated with the factor.⁴ For each factor, the questions with values greater than 0.40 formed the cluster of questions that addressed that factor. Where questions had correlation values greater than 0.40 for more than one

⁴Personal Communication with Dr. Joyce Russell, University of Tennessee, Department of Management. October, 1993.

factor the question was considered ambiguous and was omitted.

The cumulative variation explains how much variation is explained by each factor. The factors usually account for at least 80 percent of the variation while the other 20 percent is attributed to the nonfactors. Several values below 80 percent may indicate problems with the validity of the instrument.

Evaluation of the Educational Program Content Based on Attitude Change

The educational program was designed to: 1) discuss the various forest products produced by industry, 2) explain why industry manages pine trees, not hardwoods, on industry-owned lands (both biological and economic reasons), 3) explain the reason why industry clearcuts on their company-owned lands (both biological and economic reasons), and 4) identify the source of erosion and sedimentation associated with clearcutting. The intent of the educational program was to inform the audience of the reasons for current management practices used by industry.

Evaluation of Questionnaire Development Based on Theoretical Factors

The pre- and post-program questionnaires were developed based on six factors that addressed the clearcutting

construct. These factors included:

- 1) environmental concerns
- 2) aesthetics
- 3) diversity of species
- 4) management versus nonmanagement
- 5) economics
- 6) private landowner rights

The factors addressed underlying issues that may influence attitudes toward clearcutting. For example, a person may dislike clearcutting because of the appearance of a clearcut. Another person may object to clearcuts but is an advocate of private landowner rights. Therefore, private landowner rights will influence the second person's attitudes while aesthetics influences the first person's attitudes. It is important to understand the underlying issues that influences someone's attitudes about certain forest management practices.

Once these factors were identified, questions were developed that addressed each factor specifically. For clarification, the questions associated with each factor used to develop the questionnaires will be referred to as the "theoretical factors." The questions associated with each factor that were determined by factor analysis on the pre-program questionnaire will be called the "empirical results or factors."

Construct Validity: Results

Factor analysis was used to evaluate responses to both the pre- (n=123) and post- (n=106) program questionnaires. However, only the pre-program questionnaire was used to determine the validity of the questionnaires since the treatment (i.e. educational program) influenced the responses to the post-program questionnaire. Conducting factor analysis on the post-program questionnaire would not have provided accurate results about the validity of the theoretical factors. The small number of observations used (n=123) in factor analysis was because only observations in which the entire study population responded to all questions on the pre-program questionnaires were included.

Factor analysis identified different question clusters for the theoretical and the empirical factors. While some of the individual questions were not correlated with any factors on the empirical results, other questions showed a high degree of correlation with empirical factors that were different from the theoretical factors.

There were only five values in the empirical results (eigenvalues over 1.00) whereas the theoretical factors had six. The only factor that could be identified with some degree of certainty among the empirical factors was the environmental concern factor. The other factors contained a mixture of questions making it impossible to identify the subject the factor actually addressed (Table 15).

TABLE 15. Questions Associated With Theoretical and Empirical Factors

Factors	CONSTRUCT: CLEARCUTTING Significantly Related Questions
<u>Theoretical</u>	
1) environmen- tal concerns	10) The erosion and sedimentation associated with clearcutting is acceptable on pulp and paper owned forested lands. 11) Compared to agriculture, the erosion and sedimentation caused by clearcutting is acceptable. 12) Pulp and paper companies can do more to decrease the amount of erosion and sedimentation caused by clearcutting on their forested lands. 17) Overall, pulp and paper companies use environmentally sound forestry on their forested lands.
2) aesthetics	6) Aesthetics should be a major consideration when managing pulp and paper company owned forest lands. 13) Pine plantations are pretty.
3) species diversity	14) Pulp and paper company owned forests should have a variety of tree species. 15) Pine plantations are necessary to meet our wood needs.
4) management versus non- management	1) All forests should be managed. 2) Trees must be cut to provide for our basic needs (i.e., paper products, building materials).
5) economics	3) Our wood needs should be met primarily from pulp and paper company owned forest lands.

TABLE 15. Continued

Factors	CONSTRUCT: CLEARCUTTING Significantly Related Questions
5) economics (continued)	4) The cost of forest products (e.g., toilet paper lumber, cardboard boxes, etc...) should be considered when cutting trees. 5) The cost of growing and harvesting trees should be a major consideration in managing pulp and paper company owned forest lands. 9) Partial cuts (removing only a portion of the standing timber) can provide for our basic wood needs without increasing the costs of forest products significantly.
6) private landowner rights	7) Clearcutting is acceptable on pulp and paper company owned forest lands. 8) Laws should be passed to prevent clearcutting on pulp and paper company owned forest lands. 16) Pine plantations are not an acceptable use of forest lands on pulp and paper company owned lands.
<u>Empirical</u>	
1) environmen- tal concerns	7) Clearcutting is acceptable on pulp and paper company owned forest lands. 8) Laws should be passed to prevent clearcutting on pulp and paper company owned forest lands. 9) Partial cuts (removing only a portion of the standing timber) can provide for our basic wood needs without increasing the costs of forest products significantly.

TABLE 15. Continued

Factors	CONSTRUCT: CLEARCUTTING Significantly Related Questions
1) environmen- tal concerns (continued)	10) The erosion and sedimentation associated with clearcutting is acceptable on pulp and paper owned forested lands. 11) Compared to agriculture, the erosion and sedimentation caused by clearcutting is acceptable.

Three factors that help account for the differences between the theoretical and the empirical results were: 1) the logic used to develop the factors and questions, 2) the sample size, and 3) the instrument or the combination of questions. The most plausible explanation has to do with the sample size.

Usually the sample size needs to have a ratio of at least 10 observations for each question.⁵ In this case, there were 17 questions therefore the sample size needed to be at least 170. Although there were 349 respondents, only the questionnaires in which all the questions were completed were used for factor analysis (e.g., n=123). If the sample

⁵Personal Communication with Dr. Joyce Russell, University of Tennessee, Department of Management, October, 1993.

size is not at least the minimum (170), the results may be distorted making accurate interpretations difficult.

The cumulative value for the five factors was low indicating that both sample size and the instrument may have been flawed. Only 59 percent of the variation was accounted for by the five factors. This percent may indicate that the questions not did specifically address the factors. However, a larger sample size may have decreased the amount of total variation and the cumulative values would have increased accordingly (> 80 percent). Without the benefit of a larger sample, this hypothesis cannot be evaluated.

While increasing the sample size may validate the questionnaire, another solution is available. Pilot tests using adequate sample size (>170) could have offered valuable insight as to the appropriateness of the questions that addressed each factor. However, this test would have been time consuming and beyond the scope of this thesis project.

Other statistical tests (e.g., t-test and means) were used to interpret the data. Discussion of results are based on the theoretical results, not the empirical results provided by factor analysis. Given the relatively small sample size, the results from factor analysis of the empirical factors may be inaccurate. Consequently, the theoretical results provide a more reliable foundation on which to base the conclusions.

Pre-Program Attitudes

Introduction

Means of Likert scores, and students t-test were used to evaluate responses. Means of less than four indicated general disagreement while those greater than four indicated general agreement. In addition, the results were corroborated or rejected by the t-test using the five percent confidence level. Means were used to evaluate responses on both the pre- and post-program attitude questionnaires. A t-test identified significant attitude changes from the pre- to the post-program questionnaire.

Pre-Program Questionnaire Results

Discussion of the pre-program attitudes is arranged according to the factors defined by the theoretical constructs. Overall, the study population was supportive of forest management activities on industry-owned lands. In general, extreme attitudes were not evident from the questionnaire although a few individuals expressed strong opinions about forest industries in the discussion period.

The American Forest Council and Southern Forestry Association (1986) polled Florida residents about the importance of natural resource issues in comparison to other social concerns. The participants ranked social issues such as drugs in the school system, teacher's salary, commercial

development, higher on a scale of importance than forest management. It seems that social issues had a more personal impact on their lives.

For example, a single mother of three children finds drugs in her son's room. She is not going to worry about the destruction of a red cockaded woodpecker habitat. She may have an opinion but not a concern. This type of scenario may be typical for many people. It is almost a luxury for some to have the opportunity to learn about environmental issues.

Many people in the study population appeared to have difficulty understanding the relevancy of the program to their life. After this issue was discussed in the introduction, some still seemed confused and disinterested. While environmental issues are the topic of media programs, the interest of the general population may be overrated.

On the pre-program questionnaire, the study population generally agreed that all forests should be managed ($\bar{X}=5.03$) (Table 16). However, response as to how forests should be managed depended on the individual's perception of the active management versus nonmanagement factor. Perceptions of management activities varied widely from one respondent to another. Their perceptions of the various degrees of management were all appropriate.

An example of active management includes partial cuts and clearcutting. The study population agreed that trees

TABLE 16. Mean of Likert Scores and Sample Size for the Pre-Program Questionnaires. Scale of Likert Scores: 1 = Strongly disagree, 4 = Neutral, and 7 = Strongly agree. Total Number of Respondents = 349.

QUESTION	MEAN OF LIKERT SCORES	SAMPLE SIZE n
1) All forests should be managed.	5.03	325
2) Trees must be cut to provide for our basic needs (i.e., paper products, building materials).	5.54	340
3) Our wood needs should be met primarily from pulp and paper company owned forest lands.	4.34	305
4) The cost of forest products (e.g., toilet paper lumber, cardboard boxes, etc...) should be considered when cutting trees.	5.03	292
5) The cost of growing and harvesting trees should be a major consideration in managing pulp and paper company owned forest lands.	5.25	317
6) Aesthetics should be a major consideration when managing pulp and paper company owned forest lands.	5.08	302
7) Clearcutting is acceptable on pulp and paper company owned forest lands.	3.65	314
8) Laws should be passed to prevent clearcutting on pulp and paper company owned forest lands.	4.05	307

TABLE 16. Continued

QUESTION	MEAN OF LIKERT SCORES	SAMPLE SIZE n
9) Partial cuts (removing only a portion of the standing timber) can provide for our basic wood needs without increasing the costs of forest products significantly.	5.06	282
10) The erosion and sedimentation caused by clearcutting is acceptable on pulp and paper owned forested lands.	2.50	321
11) Compared to agriculture, the erosion and sedimentation caused by clearcutting is acceptable.	2.74	302
12) Pulp and paper companies can do more to decrease the amount of erosion and sedimentation caused by clearcutting on their forested lands.	5.76	318
13) Pine plantations are pretty.	4.76	312
14) Pulp and paper company owned forests should have a variety of tree species.	5.20	278
15) Pine plantations are necessary to meet our wood needs.	5.01	276
16) Pine plantations are not an acceptable use of forest lands on pulp and paper company owned lands.	3.32	261
17) Overall, pulp and paper companies use environmentally sound forestry on their forested lands.	3.94	250

need to harvested to meet our basic wood needs ($\bar{X}=5.54$).

They also supported the use of partial cuts ($\bar{X}=5.06$). The study population was willing to accept harvesting trees and partial cuts but questioned the necessity of clearcutting on industry-owned lands.

The environmental factor was a primary concern. Related issues included the sedimentation and erosion associated with clearcutting. Although respondents supported the harvesting of trees, clearcutting was not the preferred method. It appeared that the major objection to this management practice (i.e., clearcutting) was the respondent's perception of the environmental consequences.

Respondents generally felt that the erosion and sedimentation caused by clearcutting was not acceptable ($\bar{X}=2.50$). Even in the context of other land management practices such as agriculture, respondents indicated that erosion and sedimentation were still not acceptable ($\bar{X}=2.54$). In addition, most felt that industry could do more to decrease the amount of erosion and sedimentation caused by clearcutting ($\bar{X}=5.76$). Overall, most respondents generally supported current management practices used by industry but were neutral about whether industry uses environmentally sound forest management practices.

Erosion and sedimentation may not be the issue. The issue may be an image problem. The Alabama Forestry

Commission (1992) compared the public's perceptions of industry-owned lands and "family-owned" lands. They found that the public viewed forest practices on "family-owned" lands more positively and were more likely to support management practices on these types of lands. The public believed that people who have "family-owned" lands would not use practices that were not environmentally sound. It appears that the respondents in this study responded to the "image" of industry, not the environmental impacts of their forest practices.

It is possible that the study population responded, not to environmental issues but to the perceived image of "forest industries." However, this is unlikely given that in the pre-program, they generally supported the current practices of forest industry. Consequently, the environmental concern factor appears to be a legitimate concern while the "image" of forest industry is more nebulous. Including a factor addressing the image of forest industry would have helped evaluate respondent's perception of forest industry.

The aesthetic factor was important to the study population. Respondents felt that aesthetic quality should not be compromised. They agreed that aesthetics should be a major consideration when managing industry-owned lands ($\bar{X}=5.08$). However, aesthetic quality is a product of one's perception. What appeals to one person may appear "ugly or

devastating" to another. For example, the aesthetic value of pine plantations was assessed. The study population generally agreed that pine plantations are pretty ($\bar{X}=4.76$) even though plantations were often characterized as monocultures or biological deserts in discussion sessions.

Maintaining aesthetic quality and using environmentally sound forestry can be achieved by using partial cuts. The economic reality is that while industry may receive some support from the public, product costs will increase. However, in the long run, this compromise may prove to be cost effective given that public support may decrease the likelihood of costly lawsuits.

A Tennessee Valley Authority and Auburn University study (1993) documents public concern for aesthetic quality. It suggests that the public's view of forest management practices are tempered by environmental concerns and the perceived aesthetic quality of practices. Respondents in this study indicated similar pre-program attitudes in that they agree that forest products are important and a basic need but aesthetic quality and environmentally sound forestry need to be considered.

Biodiversity or species diversity is a major concern of environmentalists. The United States Department of Agriculture Forest Service is currently attempting to adapt multi-species management plans through ecosystem management. The species diversity factor examined attitudes about

whether industry should manage a variety of tree species. The study population agreed that species diversity should be maintained ($\bar{X}=5.20$). However, they also agreed that pine plantations are necessary to meet our wood needs ($\bar{X}=5.00$) and are an acceptable use of industry-owned lands ($\bar{X}=5.03$). They felt that a mixture of natural pines, hardwoods, and pine plantations would be desirable.

Respondents appeared to understand the economic factor. They supported the idea that economic needs to be considered when growing and harvesting trees ($\bar{X}=5.25$) and producing forest products ($\bar{X}=5.03$). However, their support of current methods of obtaining these products is questionable. While the public agrees with the need to harvest trees, they also indicate that the environmental concern and aesthetic factors are equally important. This is the current challenge for forest industry.

The "private-landowner-rights" factor was associated with regulation and whether industry should have the freedom to manage their lands independent of external influences (e.g., regulation). Current regulation is in the form of the Endangered Species Act, wetlands regulation, the Water Quality Act, etc. Respondents were neutral about the need for clearcutting, and essentially neutral ($\bar{X}=4.05$) on whether laws should be passed to prevent clearcutting on industry-owned lands.

Construct: Clearcutting

The clearcutting construct was addressed by six factors. These factors included; 1) management versus nonmanagement, 2) environmental concerns, 3) aesthetics, 4) species diversity, 5) economics, and 6) private landowner rights. Based on the responses to the pre-program questionnaire, attitudes about the clearcutting construct are closely associated with both the environmental concern and aesthetic factors. It appears that these two factors strongly influenced respondents' attitudes.

An Exception: Environmental Groups

Environmental groups offered a special situation. Many, if not all, the issues discussed in the program and addressed on the questionnaires should have been of particular concern to this group-type. Therefore, their responses should have been different from these of other group-types.

However, environmental groups responded the same as other group-types with the exception of the degree to which they agreed or disagreed (Table 17). The issues in which the degree of responses changed were associated with the environmental concern factor. On all of the questions addressing this factor, their mean scores were extreme. Their responses may be a result of members sharing similar values about the environment. This may be why they join

TABLE 17. Mean of Likert Scores and Sample Size for the Pre-Program Questionnaire for the Environmental Group-Type. Scale of Likert Scores: 1 = Strongly disagree, 4 = Neutral, and 7 = Strongly agree. Total Number of Respondents = 103.

QUESTION	MEAN OF LIKERT SCORES	SAMPLE SIZE n
1) All forests should be managed.	4.90	95
2) Trees must be cut to provide for our basic needs (i.e., paper products, building materials).	5.49	99
3) Our wood needs should be met primarily from pulp and paper company owned forest lands.	4.73	94
4) The cost of forest products (e.g., toilet paper lumber, cardboard boxes, etc...) should be considered when cutting trees.	5.31	80
5) The cost of growing and harvesting trees should be a major consideration in managing pulp and paper company owned forest lands.	5.25	90
6) Aesthetics should be a major consideration when managing pulp and paper company owned forest lands.	5.50	92
7) Clearcutting is acceptable on pulp and paper company owned forest lands.	2.66	92
8) Laws should be passed to prevent clearcutting on pulp and paper company owned forest lands.	4.66	92

TABLE 17. Continued

QUESTION	MEAN OF LIKERT SCORES	SAMPLE SIZE n
9) Partial cuts (removing only a portion of the standing timber) can provide for our basic wood needs without increasing the costs of forest products significantly.	5.38	77
10) The erosion and sedimentation caused by clearcutting is acceptable on pulp and paper owned forested lands.	1.85	96
11) Compared to agriculture, the erosion and sedimentation caused by clearcutting is acceptable.	1.95	85
12) Pulp and paper companies can do more to decrease the amount of erosion and sedimentation caused by clearcutting on their forested lands.	6.34	95
13) Pine plantations are pretty.	3.89	95
14) Pulp and paper company owned forests should have a variety of tree species.	5.57	84
15) Pine plantations are necessary to meet our wood needs.	4.60	78
16) Pine plantations are not an acceptable use of forest lands on pulp and paper company owned lands.	3.63	77
17) Overall, pulp and paper companies use environmentally sound forestry on their forested lands.	2.77	71

environmental groups-to learn about environmental issues, and participate in decisions related to the environment.

Awareness of environmental issues has grown significantly over the past decade. Followers of the environmental movement are more involved in the legislative process and have the financial and political resources to influence it. Simply, many environmental groups have the clout and power to initiate changes in laws and legislation. Consequently, presenting programs on environmental issues to environmental groups may be an effective way to bridge the communication gap and possibly change the attitudes of some members.

Changes In Attitudes

Two statistical variables were used to analyze the changes in attitudes: 1) the paired t-test of pre- and post-program Likert scores determined if a change occurred and 2) the comparison of mean Likert scores of the post-program questionnaire with those on the pre-program questionnaire provided information on the direction of the change. Changes in attitudes and the direction in which changes occurred determined the effectiveness of the educational program and identified factors that need to be addressed in future educational programs. Consequently, assessment of the post-program attitudes and changes in

attitudes offers an opportunity to analyze the salient issues expressed by a better informed audience.

Changes in Attitudes

Comparison of the pre- and post-program questionnaires was used to identify changes in attitude toward the study factors (Table 18). Changes in attitudes are discussed according to the factor-types defined in the development of the theoretical questionnaire. Overall, attitude changes did occur with respondents becoming more supportive of current management practices used by forest industry. It appeared that the educational program was effective in raising the knowledge and awareness level of the audience.

The only factor for which change did not occur was aesthetics. The study population continued to expect that aesthetic quality be a major consideration when cutting trees (from 5.11 to 5.03). The study population was more supportive about the appearance of pine plantations on the post-program question (from 4.74 to 4.82) although this change was not statistically significant.

Reponse to the aesthetic factor is largely dependent on an individual's perception. Facts and information may alter how a person sees something but rarely does education change whether an object appears "ugly" or "pretty." The lack of change with the aesthetic factor is not surprising given the types of slides that were shown. The slides included

TABLE 18. Comparison of Means of Likert Scores on the Pre- and Post-Program Questionnaires. Means of Likert Scores Based on Respondents that Responded to Questions on Both the Pre- and Post-Program Questionnaires. Scale of Likert Scores: 1 = Strongly Disagree, 4 = Neutral, and 7 = Strongly Agree. An * Indicates Significance at 5 Percent Confidence Level. Total Number of Respondents = 349.

QUESTION	MEANS OF LIKERT SCORES		SAMPLE SIZE n	STANDARD DEVIATION OF DIFFERENCE
	Pre	Post		
1) All forests should be managed.	5.06	5.29	302	.7716*
2) Trees must be cut to provide for our basic needs (i.e., paper products, building materials).	5.55	5.92	318	.0700*
3) Our wood needs should be met primarily from pulp and paper company-owned forest lands.	4.29	5.03	287	.1051*
4) The cost of forest products (e.g., toilet paper lumber, cardboard boxes, etc...) should be considered when cutting trees.	5.04	5.45	272	.0904*
5) The cost of growing and harvesting trees should be a major consideration in managing pulp and paper company-owned forest lands.	5.23	5.48	300	.0909*
6) Aesthetics should be a major consideration when managing pulp and paper company-owned forest lands.	5.11	5.03	284	.0867

Table 18. Continued

QUESTION	MEANS OF LIKERT SCORES		SAMPLE SIZE n	STANDARD DEVIATION OF DIFFERENCE
	Pre	Post		
7) Clearcutting is acceptable on pulp and paper company-owned forest lands.	3.62	4.79	294	.1213*
8) Laws should be passed to prevent clearcutting on pulp and paper company-owned forest lands.	4.02	3.23	282	.1344*
9) Partial cuts (removing only a portion of the standing timber) can provide for our basic wood needs without increasing the costs of forest products significantly.	5.04	4.10	246	.1219*
10) The erosion and sedimentation caused by clearcutting is acceptable on pulp and paper company-owned forested lands.	2.45	3.48	292	.1266*
11) Compared to agriculture, the erosion and sedimentation caused by clearcutting is acceptable.	2.71	4.12	274	.1343*
12) Pulp and paper companies can do more to decrease the amount of erosion and sedimentation caused by clearcutting on their forested lands.	5.82	5.69	289	.0889
13) Pine plantations are pretty.	4.74	4.82	295	.0884
14) Pulp and paper company-owned forests should have a variety of tree species.	5.18	4.69	251	.1035*

Table 18. Continued

QUESTION	MEANS OF LIKERT SCORES		SAMPLE SIZE n	STANDARD DEVIATION OF DIFFERENCE
	Pre	Post		
15) Pine plantations are necessary to meet our wood needs.	5.04	5.41	259	.0950*
16) Pine plantations are not an acceptable use of forest lands on pulp and paper company-owned lands.	3.32	2.95	245	.1139*
17) Overall, pulp and paper companies use environmentally sound forestry on their forested lands.	4.01	4.52	225	.0994*

examples of intensive management such as clearcutting, prescribed fire, and use of herbicides on industry-owned lands. Actually seeing these slides probably reinforced the importance of aesthetic quality.

The visual quality of intensive management practice is often overlooked or minimized by industry. There is the idea that if people understand the biological processes of forest resource management, they will accept these practices regardless of how they "look." However, people often respond to what they see not necessarily what they hear. The most educated person can understand the biological processes and accept these practices but still see clearcuts

as "ugly." The question remains, "How much are attitudes influenced by aesthetic quality?"

Support for the economic factor increased following the program. Respondents generally believed that the economics of forest management were extremely important. They agreed that the costs associated with growing and harvesting trees ($\bar{X}=5.48$) and producing forest products ($\bar{X}=5.45$) should be a major consideration on industry-owned lands.

The economics of extensive management (i.e. partial cuts) was explained in detail in the program. Respondents attitudes changed significantly toward less support of the use of partial cuts. They were generally neutral about the use of partial cuts (from 5.04 to 4.10) after the program. This change in attitude could be related to the higher costs associated with partial cuts since they appeared to understand economic factors.

The environmental factor continued to be a major area of concern. The educational program attempted to inform the public about the biological principles on which forest practices are based and the environmental consequences of such practices -- specifically, the reason pines are managed and why clearcutting is the preferred harvest method. In addition, the source of erosion and sedimentation associated with clearcutting was explained. Examples of road systems adhering to "Best Management Practices" were presented as well as examples of poorly built roads. Finally,

sedimentation figures were used to compared the sedimentation yield over time with other land management treatments.

Changes in attitudes toward the erosion and sedimentation caused by clearcutting were evident when comparing the pre- and post-program questionnaires. Although respondents still believed that the amount of erosion and sedimentation caused by clearcutting was excessive (from 2.45 to 3.48), they were generally more supportive of clearcutting despite its environmental impacts. When compared to agriculture, the erosion and sedimentation from clearcutting was more acceptable following the program (from 2.71 to 4.12). Perhaps the most important issue related to environmental concerns was the degree to which the study population perceived that industry makes an effort to improve the environmental soundness of their management practices.

The study population's attitudes about industries efforts to decrease the amount of erosion and sedimentation did not change significantly as a result of the program. Respondents believed that industry could do more to decrease the amount of erosion and sedimentation as reported on the post-program questionnaire ($\bar{X}=5.69$).

The study population generally agreed with industry's overall efforts to use environmentally sound practices ($\bar{X}=4.52$). This was a significant change from pre-program

attitudes from a neutral position to a supportive one (from 4.01 to 4.52).

Decreased concern about the environmental factor was likely due to the content of the educational program. The program specifically discussed the source of erosion and sedimentation associated with clearcutting and road construction. Perhaps, the most effective part of the educational program was placing clearcutting in context with other land management treatments (i.e. agriculture and urban development). Respondents were able to see the sediment yields over time in a context that is often overlooked or ignored. As a result, they understood that there are other land management treatments that are more environmentally damaging than clearcutting.

The management versus nonmanagement factor provided insight into forest management activities. There was a significant change in attitude on this factor. The study population indicated more support of the management of forests on the post-program questionnaire (from 5.06 to 5.29). Respondents also agreed that trees should be harvested to provide for our basic needs (from 5.55 to 5.92). Overall, respondents generally supported the active management of forests resources.

Although the program focused on clearcutting, respondents believed that other forms of management are more acceptable (e.g., partial cuts). Their support of active

management should not be misconstrued as support for intensive management on all industry-owned lands. It is difficult to determine the definition of management given the wide range of perceptions as to what constitutes management. Perhaps the question about active management could have been more specific so that respondents had a common picture of what constitutes management.

The "private landowner rights" factor examined attitudes about forest management issues on industry-owned lands and whether these practices should be regulated. The program apparently caused changes in attitude toward this factor. In the pre-program questionnaire, the study population supported the management of pine plantations on industry-owned lands ($\bar{X}=5.90$). This support increased significantly (.05 level) on the post-program questionnaire ($\bar{X}=6.86$).

Findings regarding private landowner rights were probably contingent on whether the practices carried out are considered acceptable to the study population. Landowners who used partial cuts would probably receive more support than a landowner clearcutting. An important distinction is between "support" for landowner rights and advocating regulation on private lands. Respondents indicated on the post-program questionnaire that regulation should not be used to prevent clearcutting on industry-owned lands (from 4.07 to 3.23). It appears that they understand the value of

intensive management in obtaining forest products. This was a significant change from the neutral attitudes expressed in the pre-program questionnaire.

The final factor addressed was species diversity. Here again, changes in attitude occurred. Respondents believed that pine plantations are necessary to obtain forest products (from 5.32 to 6.95). In addition, they reported less supportive attitudes on the post-program questionnaire (from 5.18 to 4.69) regarding management for a variety of tree species. This was a change from the pre-program questionnaire ($\bar{X}=5.20$) in which respondents supported species diversity on industry-owned lands. Respondents generally supported industry's efforts to produce forest products through single-species management.

Public complacency can be a major problem for industry. Societies' attitudes toward natural resources and awareness of environmental issues have changed significantly over the past decade. Public involvement with these issues has increased since the beginning of the environmental movement in the 1960's. Industry must respond to these changes in public involvement. Industry is at a crossroads. They can either choose to be proactive and respond, or ignore the public's concerns and continue down a potentially dangerous path that could lead to increased regulation.

An appropriate response would be to change current forest management practices. Changes would include "softer

touch silviculture." Costs for extensive management could be offset by exploring more effective and efficient ways to recycle forest products. Balancing economic realities with environmental concerns is a challenging task. Inevitably, the costs of forest products will increase.

An Exception: Environmental Groups

Environmental groups provided significantly different responses on several factors from those of the study population. Of particular interest was the direction in which their attitudes changed (Table 19). In general, they became more supportive of all factors (management versus nonmanagement, environmental concerns, economics, and private landowner rights) following the program except for the aesthetic factor. The species diversity offered a special situation in which the changes occurred on some questions while no significant changes occurred on other questions. The changes were unexpected considering the lack of support for those factors on the pre-program questionnaire.

Changes in Likert scores on questions addressing species diversity were contradictory. Respondents were more supportive of single-species management on the post-program questionnaire (from 5.50 to 5.19). However, they reported neutral attitudes about the necessity of pine plantations (from 3.88 to 3.97). Although, more supportive attitudes

TABLE 19. Comparison of Means of Likert Scores on the Pre- and Post-Program Questionnaires for Environmental Group-Types. Means of Likert Scores Based on Respondents that Responded to Questions on Both the Pre- and Post-Program Questionnaires. Scale of Likert Scores: 1 = Strongly Disagree, 4 = Neutral, and 7 = Strongly Agree. An * Indicates Significance at 5 Percent Confidence Level. Total Number of Respondents = 103.

QUESTION	MEANS OF LIKERT SCORES		SAMPLE SIZE n	STANDARD DEVIATION OF DIFFERENCE
	Pre	Post		
1) All forests should be managed.	4.94	4.98	91	.1229
2) Trees must be cut to provide for our basic needs (i.e., paper products, building materials).	5.48	5.76	96	.1328
3) Our wood needs should be met primarily from pulp and paper company-owned forest lands.	4.65	5.23	90	.2078*
4) The cost of forest products (e.g., toilet paper lumber, cardboard boxes, etc...) should be considered when cutting trees.	5.33	5.42	75	.1397
5) The cost of growing and harvesting trees should be a major consideration in managing pulp and paper company-owned forest lands.	5.21	5.11	87	.1542
6) Aesthetics should be a major consideration when managing pulp and paper company-owned forest lands.	5.50	5.19	89	.1342*

Table 19. Continued

QUESTION	MEANS OF LIKERT SCORES		SAMPLE SIZE n	STANDARD DEVIATION OF DIFFERENCE
	Pre	Post		
7) Clearcutting is acceptable on pulp and paper company-owned forest lands.	2.61	3.62	88	.2350*
8) Laws should be passed to prevent clearcutting on pulp and paper company-owned forest lands.	4.65	3.72	85	.2377*
9) Partial cuts (removing only a portion of the standing timber) can provide for our basic wood needs without increasing the costs of forest products significantly.	5.39	4.81	69	.2068*
10) The erosion and sedimentation caused by clearcutting is acceptable on pulp and paper company-owned forested lands.	1.81	2.69	92	.2270*
11) Compared to agriculture, the erosion and sedimentation caused by clearcutting is acceptable.	1.97	3.44	83	.2539*
12) Pulp and paper companies can do more to decrease the amount of erosion and sedimentation caused by clearcutting on their forested lands.	6.35	6.10	92	.1618
13) Pine plantations are pretty.	3.88	3.97	93	.1730
14) Pulp and paper company-owned forests should have a variety of tree species.	5.59	5.29	79	.1959

Table 19. Continued

QUESTION	MEANS OF LIKERT SCORES		SAMPLE SIZE n	STANDARD DEVIATION OF DIFFERENCE
	Pre	Post		
15) Pine plantations are necessary to meet our wood needs.	4.62	4.90	74	.1768
16) Pine plantations are not an acceptable use of forest lands on pulp and paper company-owned lands.	3.64	3.36	74	.1976
17) Overall, pulp and paper companies use environmentally sound forestry on their forested lands.	2.75	3.33	65	.1897*

were expressed toward single-species management, members did not totally agree that pines should be the preferred species.

Perhaps one explanation has to do with the knowledge level of environmental groups. Most were familiar with the management issues on public lands. Species diversity or biodiversity is a "hot topic" on the agenda of many environmental groups. One of the three points of disagreement in the pending lawsuit against the United States Department of Agriculture Forest Service on the Cherokee National Forest is the issue of species diversity.

It was not surprising that they were reluctant to fully support pine plantations.

In this same lawsuit a second issue is aesthetic quality. Environmental groups felt that the aesthetic quality was an important factor. The same reasons used to explain attitudes toward aesthetic factor can be cited here. It does not appear that membership in environmental groups predisposed them to view the aesthetic factor differently than the general study population.

Summary of Group-Type Responses

Certain group-types were more receptive to the educational program. Civic, environmental, and professional group-types were as a whole more responsive and interested in the issues discussed. Church group-types offered a special situation. Almost all of the presentations for church groups were conducted on Sunday morning at the regular scheduled adult Sunday School classtime. Often, it appeared that many church members had difficulty connecting the educational program with religious and biblical issues. This response was not surprising since this presentation did not adhere to the standard religious programs presented on Sunday morning. A brief explanation of the "spiritual/moral" responsibility to conserve natural resources was included but this explanation was apparently

inadequate. While civic, environmental, and professional groups are an appropriate audience for this presentation, church groups are not recommended as an appropriate audience.

The educational program was developed as a tool to be used by industry. However, whether industry can schedule such presentations is questionable. The author had a clear advantage, being a graduate student -- not employed by industry. Group-types may question the objectivity of the program if presented by industry personnel and see industry's efforts as a way to "sell" their current management practices. As a result, industry may have difficulty arranging presentations.

Summary of Changes for Project

There are many changes that could be made in this thesis study that would have improved the overall effectiveness of the educational programs. Among them are:

- 1) inviting proactive environmental group members to participate in developing the educational program and questionnaires,
- 2) conduct pilot tests on an environmental group,
- 3) conduct pilot tests on the pre- and post-program questionnaires,
- 4) increase sample size, and

- 5) include a factor addressing the image of forest industries on the pre- and post-program questionnaires.

Missing Cases, No Opinion, and Undecided Responses Pre- and Post-Program Questionnaires

The pre- and post-program questionnaires included two responses that did not use the standard 1-7 Likert scale. These were:

- 1) X= No Opinion-indicates indifference to the statement or subject; it is unimportant and,
- 2) O= Undecided-Indicates a strong concern for the issue but simply do not have enough information to make an informed decision.
- 3) No response indicated that the questions were unanswered.

"No responses" generally increased for questions from the pre-program to the post-program questionnaires. This increase was largely because many participants left prior to completing the post-program questionnaire.

The "no opinion" response consistently decreased from the pre- to the post-program attitude questionnaire. This suggests that respondents generally changed their positions from one of disinterest to awareness of forest management issues. This was a positive result of the program. The concern may have been present but the participants were

unaware of the issues over which to be concerned. The program helped define and clarify issues that were important.

Undecided responses decreased from the pre- to the post-program questionnaire. Apparently, the program was effective in disseminating information and in providing the study population with the necessary information to make more informed decisions (Appendix P).

Respondents Perception of Knowledge Gained and Attitude Change

The study population was asked to respond to the following statements:

- 1) Did this presentation change your attitudes about forest management on pulp and paper company-owned forests lands?
- 2) After this presentation, are you more knowledgeable about forest management on pulp and paper company-owned forests lands?

These statements were intended to assess respondent's perception of knowledge gained and changes in attitudes toward current forest management practices used on industry-owned land. A chi square test was used to identify significant correlations between the two questions and determine if the perception of changes in knowledge and attitudes reported by respondents were consistent with the

actual changes in attitudes supported by statistical analysis (Appendix U).

The response, "a very little change in attitude" and "some changes in knowledge", indicated that the participants learned some new information. However, the increased knowledge did not necessarily change their attitudes. This was a small, significant percent (eight percent).

This result is not consistent with other research as well as this study. Stankey (1976) and McCool and Stankey (1986), reported that wilderness users had more positive attitudes toward the use of prescribed fire after an educational program. The main selling point about fire management is that it is considered "natural" while harvesting trees is "cultural." Therefore, people are more likely to accept the use of fire since fire is seen as part of the "natural landscape." The effectiveness of educational programs in producing more accepting attitudes is supported by other research (Anderson, et al., 1982; Baas, et al., 1984; Taylor and Daniel, 1984; and Daniels and Mason, 1985).

While some respondents reported significant knowledge gains, they also reported that attitude changes did not result. It is difficult to evaluate why attitude changes did not occur without questioning these individuals.

A Pearson coefficient correlation was used to determine whether respondents' perception of attitude change indicated

by their responses was consistent with the actual changes in attitudes from the pre- and post-program attitude questionnaire (based on t-test results). The Pearson coefficient correlation indicated that the perceived attitude changes and actual attitude changes were highly correlated ($r=0.20332$).

CHAPTER VI

SUMMARY AND CONCLUSIONS

Summary

An educational program and pre- and post-program questionnaires were developed that addressed current forest management practices on industry-owned forest lands. The purpose of the study included:

- 1) assess current attitudes toward forest management practices on industry-owned lands,
- 2) assess changes in attitudes that could be attributed to the educational program, and
- 3) develop an effective educational program that can be used by industry as an educational tool.

The study results indicate that the public generally supports clearcutting on industry-owned land. In addition, more supportive attitudes toward the forest practices of industry would result from well-planned educational programs. The program was effective in influencing attitudes. The intent of the educational program was "to sell" current practices used by industry. Although this was generally accomplished, there were several practices/concepts for which support was not obtained.

Disinterest or lack of concern for forest management issues were evident in this study. Although the relevancy of the educational program was explained, some respondents appeared to have difficulty understanding how the content of the program related to their lives. Other social concerns may take precedence over natural resource issues.

Perhaps environmental groups comprise the most influential and widespread organizations involved with natural resource issues. Efforts should be made to communicate openly with these groups about forest management on industry-owned lands. This effort appears to be worthwhile since this study indicates that a majority of the members of environmental groups were supportive of industries' current management practices after the program, more so than other group-types.

Members of environmental groups and forestry professionals share similar interests -- both are concerned about the environment and the impact of forest management practices. Members of these groups have some knowledge about natural resources issues -- whether accurate or inaccurate. Building on this knowledge base is possible.

Efforts to establish a working relationship with environmental groups could prove to be beneficial to industry. Most members did not appear firmly committed to opposing clearcutting, therefore, they may be easily influenced by a "good" education program.

Conclusions

Several conclusions appear to be warranted from this study. They are:

- 1) although the vocal minority suggests that the public does not accept industries' forest management practices, according to this study, current attitudes of the study population support the current management practices used by industry,
- 2) changes in attitudes for the study population did occur as a result of the educational program in that individuals became more supportive of industries' current management practices,
- 3) visual quality and the environmental impacts of clearcutting should be a primary concern of forest industry,
- 4) although environmental groups are often seen as unsupportive of forest industry and their current management practices, in this study these groups, more so than other group-types, showed a significant change in attitude following the educational program: they were more supportive of industry and their management practices, and
- 5) efforts to establish better relationships with environmental groups will likely be rewarding for industry.

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LITERATURE CITED

LITERATURE CITED

- Alabama Forestry Commission. 1992. 1992 Public opinion survey. Publisher and City unknown.
- Ajzen, Icek. 1988. Attitudes, personality and behavior. Stratford: Open University Press.
- American Forest Council. 1991. The american forests: Facts and figures for 1991. Washington, DC: American Forest Council.
- American Forest Council & Southern Forestry Associations. 1986. Key findings: 1986 Public opinion survey. Washington, DC: American Forest Council.
- Anderson, L.M., Levi, D.J., Daniel, T.C. & Dieterich, J.H. 1982. The aesthetic effects of prescribed burning: A case study. United States Department of Agriculture Forest Service Res. Note RM-415, 5.
- Baas, J., Hass, Glenn E., Rose, David M., and Loomis, Ross J. 1985. A pilot study of visitor knowledge and support for prescribed burning at Grand Canyon National Park. In Proceedings -- Symposium and workshop on wilderness fire. United States Department of Agriculture Forest Service Gen. Tech. Rep. INT-182, 310-314.
- Beal, George M. & Bohlem, Joe M. 1981. The diffusion process. Special Report No. 18. Ames, IA: Iowa State University of Science and Technology.
- BellSouth Asheville Area Phone Book. 1988. The real yellow pages, church listings. Asheville, NC: BellSouth Advertising and Publishing Corporation.
- Bem, Daryl J. 1970. Beliefs, attitudes, and human affairs. Belmont, CA: Brooks/Cole Publishing Company.
- Brown, Thomas C. & Daniel, Terry C. 1990. Scaling of ratings: Concepts and methods. United States Department of Agriculture Forest Service Res Paper RM-293, 21.
- Carlson, John E. 1976. Public preferences towards natural resources use in Idaho. University of Idaho Ag. Exp. Sta. Res. Bulletin No. 94.

- Chamber of Commerce, Asheville, North Carolina. 1992.
Newcomer's guide. Asheville, NC: Western North
Carolina Guides and Printing, 3(2).
- Chamber of Commerce, Chattanooga, Tennessee. 1992.
Southeast Tennessee valley demographics. Chattanooga,
TN: The American Chamber of Commerce Researchers
Association.
- Chamber of Commerce, Knoxville, Tennessee. 1992. Tennessee
community data. Knoxville, TN: Tennessee Department
of Economic and Community Development.
- County Clerk, Morgan Co. Tennessee. 1992, September.
Resolution regarding clearcutting of timber on state of
Tennessee wildlife management areas.
- Cubbage, Frederick W. & Siegal, William C. 1988. State
and local regulation of private forestry in the East.
Northern Journal of Applied Forestry, 5(2), 103-108.
- Daniels, O.L. & Mason, L.D. 1985. Management implications
of ignition source in park and wilderness fire
management programs. In proceedings -- Symposium and
workshop on wilderness fire. United States Department
of Agriculture Forest Service Gen. Tech. Rep. INT-182,
95-97.
- Doyle, Larry. 1992, November. Timber harvest suspended at
LBL. KT SAF Newsletter. Society of American Foresters
Publication No. 223.
- Fishbein, Martin. 1967. Readings in attitudes theory and
measurement. New York: John Wiley & Sons.
- Fishbein, Martin & Ajzen, Icek. 1975. Belief, attitude,
intention, and behavior: An introduction to theory and
research. London: Addison-Wesley Publishing Company.
- "Greenline." 1992. Greenline directory of citizen activism,
V (7).
- Howes, Linda Ann & Legg, Michael L. 1978. Attitudes of
southern industrial foresters toward information and
education programs. Proc. Ann. Conf. S.E. Association
Foresters and Wildlife Agencies. 32, 745-754.
- Kelman, Herbert C. 1961. Process of opinion change.
Public Opinion Quarterly, 25, 37-78.
- Kerlinger, Fred N. 1964. Foundations of behavioral
research. New York: Holt, Rinehart & Winston, Inc.

- Knoxville News-Sentinel. 1993, June 6. "U.S. Forest Service proposes a logging halt on 62 forests."
- Krueger, Richard A. 1988. A practical guide for applied research. London: Sage Publication.
- Langenau, Edward E. Jr., Jamsen, Gale C., & Levine, Ralph L. 1977. The stability of attitudes toward clearcutting among landowners in Rosecommon County, Michigan. Forest Science, 23 (4).
- Langenau, Edward E. Jr., O'Quin, Karen, & Pavendeck. 1980. The response of forest recreationists to clearcutting in northern lower Michigan: A preliminary report. Forest Science, 26 (1).
- Lutz, R.J. 1978. Attitude change or attitude formation? An unanswered question. Journal of Consumer Research, 4, 271-278.
- McCool, S.F. & Stankey, G. 1986. Visitor attitudes toward wilderness fire management policy -- 1971-1984. United States Department of Agriculture Forest Service Res. Pap. INT-357.
- Miniard, Paul W. & Cohen, Joel B. 1981. An examination of the Fishbein-Ajzen behavioral intention model's concepts and measures. Journal of Exp. Social Psychology, 4 (17), 309-339.
- Osgood Group Report. 1992. Defining perception gaps: A study of issues for the American Paper Institute. Publisher unknown.
- Patric J.H. 1976. Soil erosion in the eastern forest. Journal of Forestry, 74, 671-677.
- Patric, J.H., Evans, J.O., & Helvey, D.J. 1984. Summary of sediment yield data from forested land in the United States. Journal of Forestry, 82, 101-104.
- Ryan, Michael J. 1982. Behavioral intention formation: The interdependency of attitudinal and social influence variables. Journal of Consumer Research, 9, 263-278.
- Shaffer, Robert M. 1991, Fall. Forestry by regulation: California style. Virginia Forests.
- Shimp, Terrance A. & Kavas, Alice. 1984. The theory of reasoned action to applied coupon usage. Journal of Consumer Research, 11, 795-809.

- Society of American Foresters. 1989. Recommended changes in silviculture terminology. Silviculture Working Group (D2). Publisher unknown.
- Southern Industrial Forest Research Council. 1991. Publisher unknown.
- Southern Timber Purchasers Council. 1992, May. Special report. Southern Environmental Law Center Lawsuit on Cherokee National Forest Plan.
- Spurr, Stephen H. & Barnes, Burton V. 1980. Forest ecology. New York: Ronald Press Company.
- Standard Industrial Classification Manual. 1987. Springfield, VA: National Technical Information Service. PB-87-1000012.
- Stankey, G.H. 1976. Wilderness fire policy: An investigation of visitor knowledge and beliefs. United States Department of Agriculture Forest Service Res. Pap. INT-180.
- Taylor, J.G. & Daniel, T. 1984. Prescribed fire: Public education and perception. Journal of Forestry, 82 (6), 361-65.
- Tennessee Forestry Association Note. 1992. These products come from harvested trees."
- Tennessee Valley Authority & Auburn University. 1993, August. Attitudes toward forest practices and policies. Gallup Organization.
- United States Department of Agriculture Forest Service. 1977. Forest statistics of the United States. Washington, DC: U.S. Government Printing Office.
- Yoho, N.S. 1980. Forest management and sediment production in the south -- A review. Southern Journal of Applied Forestry, 27-35.

APPENDICES

APPENDIX A

EDUCATIONAL PROGRAM CONTENT

Introductory Statement

Good morning/afternoon, my name is Jennifer Plyler and I am a graduate student in the Department of Forestry, Wildlife, and Fisheries, at The University of Tennessee, Knoxville. I received a B.A. degree in psychology/sociology from U.T.K. in 1987 and entered the forestry program in August, 1991. I have combined my background in the social sciences with forestry to study the social aspects of forest resource management. The information that you provide today will comprise a significant part of the data base that I will analyze for my thesis research.

I entered the forestry profession because I wanted to do my part in making sure that foresters use environmentally sound forest management practices and I have a particular interest in trying to understand the concerns of the public. I had and still have many unanswered questions about forestry and the impact of certain management practices on the environment. This thesis project has been an excellent learning tool to sort through the "facts" that will allow me to make informed decisions.

I don't believe that anyone can deny, even foresters from pulp and paper companies, that certain management practices cause damage to the environment (i.e. erosion, habitat damage, soil damage etc.). However, I believe that these undesirable effects can be minimized if sound forest management practices are used. I support environmentally sound forestry in order to maintain an appropriate standard of living. I am a consumer of forest products. I want to have my paper products and an aesthetically pleasing forest environment in which to recreate.

The information presented is based on information that is supported by published scientific research. This thesis project is not funded by industry. However, industry personnel served as consultants to identify issues specific to pulp and paper company owned-lands in the Southeast.

The program also consists of two attitude questionnaires pertaining to forest management on forest industry-owned lands, a background information sheet, and a short educational program about forest management on pulp and paper company owned-lands in the Southeast. You have all the questionnaires in your possession. You will complete the first questionnaire in a few moments. The

APPENDIX A CONTINUED

second questionnaire and background information sheet will be completed at the end of the educational program. Remember, do not sign any of the questionnaires or background information sheets.

A primary purpose of the questionnaires is to determine whether this program influences your attitudes in any way. The two questionnaires are identical therefore the success of this study is completely dependent on your being very candid and frank in your responses. When you have completed the first questionnaire, please turn it over. At the end of the program, leave the questionnaire and background information sheet at your seat and I will collect them.

I will be presenting the educational program to several groups as part of my thesis research. I will send your group a summary of the results. The information obtained will be completely confidential. Individual respondents cannot be identified and thus you and your organization remain anonymous.

Your participation and time are greatly appreciated. Due to the time constraint, please hold all questions until the end of the program. Thank you for your cooperation.

Now, turn to the pre-program questionnaire and let's review the directions. You will have five minutes to complete the pre-program questionnaire. The response X, O, and 4 were explained.

[PRE-PROGRAM QUESTIONNAIRE]

Title Introduction

The focus of this program is on pulp and paper company-owned forest lands in the Southeast not the West. Pulp and paper companies are the large landowners in forest industries. I will be discussing pine management on pulp and paper company-owned lands. A large majority of this program will focus on pine plantation management and clearcutting. It is not my intention to advocate clearcutting. There are alternative methods of managing forests but pulp and paper companies management techniques are largely limited to clearcutting in the Southeast.

APPENDIX A CONTINUED

Forest Products Exercise

Everyone, please stand up. I want you to sit down when I name a forest product that you have used this week.

- 1) explosives
- 2) photo films
- 3) cardboard boxes
- 4) computer paper
- 5) newsprint
- 6) toilet paper

The reason I did this exercise is to illustrate the importance of forest products in your life.

List of Forest Products

The following is a list of forest products produced by pulp and paper companies. These products are obtained from pine trees (Tennessee Forestry Association Note, 1992 and Standard Industrial Classification Manual, 1987).

Paper Products

- 1) newsprint
- 2) computer paper
- 3) books, magazines
- 4) toilet paper
- 5) cardboard boxes
- 6) writing paper

Chemicals

- 1) explosives
- 2) photo films

Fuels

Who produces forest products? What companies can you think of that produce forest products?

Answer: Pulp and paper companies which will be the focus of this presentation. There are different types of timberlands in the Southeast and I will review these briefly.

There are many different types of forested land in the United States. The program will be focused on forested lands in the Southeast.

APPENDIX A CONTINUED

Types of Forest Lands and Management Objectives

Non-Industrial Private Forest Lands (NIPF)

These lands are owned by private citizens (not industry-owned). Some NIPF lands are managed for timber to be sold to forest product companies. However, the objectives for these lands are determined by the landowner. Only the landowner can implement forest management on NIPFs. Seventy percent of the timberlands in the Southeast are NIPFs (American Forest Council, 1991).

Public Lands -- Federal and State

Lands set aside by the state and federal government that are to serve the needs of the people and managed for the people. Two Federal agencies that are major land managers in the eastern United States are the Forest Service and the Park Service. In the Southeast ten percent of the timberlands are public lands (United States Department of Agriculture, 1977 and American Forest Council, 1991).

Pulp and Paper Companies

Twenty percent ownership in the Southeast. The focus of this presentation and discussion will be pulp and paper company-owned lands. Pulp and paper manage softwoods such as pines which make paper products. Pulp and paper companies in the Southeast include Champion, Bowater, Union Camp, Georgia Pacific and International.

Pulp and paper companies provide a wide range of paper goods to the public. Although private companies have the right to manage their lands, these corporations are responsible to the public and their shareholders. Their primary goal is profit from timber production. Pulp and paper companies produce the most fiber per year over a short period of time.

Why do industry (pulp and paper companies) manage pine trees rather than hardwoods?

The answer is twofold: Biological and economic. Industry manages pines because they have long fibers that hold the pulp together during the pulping process. They also manage pines because these trees are fast growing and can grow on a variety of sites.

The economic reasons will be addressed later.

APPENDIX A CONTINUED

Forest Succession (Spurr and Barnes, 1980)

In order to understand why industry manages pine trees, an understanding of forest succession is necessary.

A forest ages much like you and I. We pass through different stages of development. Forests have similar stages of development. These stages are termed pioneer, transition, and climax.

I will focus on the pioneer stage of development since this is where pulp and paper companies concentrate their efforts.

A pioneer stage of development is the period of regrowth following some type of disturbance which can be fire, a clearcut, tornado damage, or an insect infestation such as pine bark beetle damage which is common here in the South.

The trees that grow on disturbed sites are called shade intolerant trees because they need full sunlight in order to grow satisfactorily.

Pine trees are pioneer species or shade intolerant trees. Pioneer species are fast growing and short lived. They can exploit a variety of site conditions.

Forest succession begins with some type of disturbance such as the clearcut in this slide. The pines and other shade intolerant trees such as yellow-poplar and black locust exploit these sites.

Eventually, these pioneer trees or shade intolerant trees die and other more shade tolerant trees replace them such as the shade tolerant oaks and hickories (point out dying pines and foreground seedlings of shade tolerant oaks and hickories).

The following is an example of forest succession in the pioneer stage. This is a clearcut at the Fernow Experiment Station in West Virginia at year one, two, and year eight⁶.

Review: Industry manages pines because they are fast growing trees with long fibers, and they can exploit a variety of

⁶Personal Communication with Gordon White, Registered Forester, Huntsville, Alabama.

APPENDIX A CONTINUED

site conditions. There are also the economic reasons which I'll discuss later.

Why do industry (pulp and paper companies) use intensive management such as clearcutting (Society of American Foresters, 1989)?

There are two major reasons: biological, pines need full sunlight in order to grow satisfactorily and clearcutting allows for genetic improvement and economic, maximum production on fewer number of acres.

This is an example of intensive management. This is a clearcut. The land has been cleared, treated with chemicals, burned, and genetically improved pine seedlings have been planted.

Heavy machinery such as a roller chopper is often used to clear the land.

Therefore, a clearcut allows seedlings to grow in full sunlight.

Clearcuts also allow for genetic improvement much like the farmer who uses genetically improved crops.

Once an area has been cleared, nursery seedlings are planted.

This is a loblolly pine plantation with genetically improved nursery seedlings at year one, two, four, and ten⁷.

At age 30, these trees will be harvested by clearcutting. The trees are removed by shears (this is not a 30 year old loblolly pine but an example of the shears used) and de-limbed. This is an area that has been clearcut but not prepared for planting yet.

The trees are hauled to a pulp and paper company where they are processed, and chipped up to make a variety of paper products (paper roll). Eventually, newsprint is produced.

⁷Personal Communication With Joe Hughes, Weyerhaeuser Corporation.

APPENDIX A CONTINUED

The other reason that I mentioned as a reason that pulp and paper companies manages pines and uses clearcutting is economic which we all know is a important factor.

We all read the Sunday paper but how many acres of trees does it take to produce one edition of the Knoxville Sunday News-Sentinel for the city of Knoxville?

Knoxville News Sentinel and Times: How Many Acres of Trees Does it Take to Make the Sunday Paper?*

One cord of wood equals one ton of paper.

The Sunday paper weighs an average of 2.5 pounds and circulation on Sunday is approximately 181,079. $181,079 \times 2.5 \text{ lbs} = 4,526,751 \text{ lbs}$ or 226 tons.

Extensive management = 226 tons = 226 cords and .5 cords per acre per year X 30 year pulpwood rotation = 15 cords per acre = 226 divided by 15 = 15 acres.

Intensive management = 226 tons = 226 cords and 2 cords per acre per year X 30 year pulpwood rotation = 60 cords per acre = 226 divided by 60 = 3.76 or 4 acres.

In this example, pulp and paper companies can minimize their landholdings by clearcutting, decrease the amount of money spent on land taxes while maximizing production and profit over a shorter period of time.

So let's go back to the clearcut that the pine trees were harvested from and the process begins again whereby the land is cleared. Genetically improved seedlings are planted on land prepared by burning and chemicals to remove any competition (point out seedlings). In 30 years, this pine plantation will be harvested to produce a variety of forest products.

There are environmental and ecological consequences of pine management and intensive management such as clearcutting. The public is concerned about such issues as destruction of wildlife habitat, fragmentation of forests,

*Personal Communication with Craig Earnest, Bowater Southern Woodlands Division.

Personal Communication with Circulation Department, Knoxville News-Sentinel, Knoxville, TN.

APPENDIX A CONTINUED

changing the species composition (hardwood to pines), sedimentation, erosion, and the appearance of clearcut areas just to name a few. These concerns are real and should be addressed by pulp and paper companies in their management plans.

Unfortunately, time only permits me to focus on one of these issues; erosion and sedimentation.

Let's review the definitions of erosion and sedimentation.

Define Terms:

Erosion - movement of soil from point A to point B.

Sedimentation - delivery of soil particles into streams.

What causes the erosion and sedimentation (Patric, 1976, Patric et. al, 1984; and Yoho, 1980)?

Clearcutting causes some erosion but the majority of erosion and sedimentation is caused by the harvest roads and use of these roads.

These are examples of poorly built roads where there is run-off, water build-up, and eroded banks as depicted in these slides.

There is also a correct way to build roads as depicted in these slides. Re-seeding the roads with orchard grass and clover provide an excellent source of wildlife food while also decreasing the chances for erosion and sedimentation to occur. In addition, being sensitive to stream side management zones (SMZ) is critical. SMZ's are areas where harvest roads cannot be built within 60 to 100 feet of any stream or watershed.

Conclusion: The road system, improper road installation and use of harvest roads cause the majority of erosion and sedimentation not tree cutting. Let's consider for a minute the sedimentation and erosion impact of other land management practices such as agriculture and urban development.

A comparison of these land management practices is quite interesting.

Comparison of agriculture and clear-cutting over a 30 year period.

APPENDIX A CONTINUED

<u>LAND MANAGEMENT PRACTICE</u>	<u>SEDIMENT YIELD</u> <u>**OVER 30 YEAR**</u>
SCS acceptable limit 5 tons/acre/year X 30=	150
Clearcut	.17-1.35 (once every 30 years)
Agriculture	12.6-1290 (every year for 30 years)
Active Construction	1,440-6,540 (about 3-5 years)

In the context of other land management practices, clearcutting and the associated sedimentation and erosion can be more fully understood. This is not meant to advocate clearcutting but only put it in the context of other land management practices so that it can be more fully understood.

Closing Statement: Review

Pulp and paper companies produce forest products that we all use on a daily basis. These products are an important part of our lives. These companies manage pine plantations because pines have the long fibers needed to hold the paper together during the pulping process. Pines are also a fast growing species that exploit a variety of sites thereby producing economic gains with shorter rotations. Pines have the ability to efficiently utilize the energy of full sunlight while growing on a variety of site conditions making them highly productive.

Clearcutting is used as a method of regenerating shade intolerant trees or "sun demanding trees." Intensive management such as clearcutting provides maximum production on fewer acres over a shorter period of time. The negative consequences of clearcutting and intensive management cannot be ignored. However, the majority of sedimentation and erosion are caused by improper road installation and use of harvest roads. These impacts can be minimized if proper management practices are employed.

Thank you for your attention and time -- please complete the second questionnaire and background information sheet at this time.

APPENDIX A CONTINUED

Review instructions (X, O, and 4) for post-program questionnaire. You will notice that the questionnaires are identical. It is very important that you be totally frank and honest in answers. If you felt that the educational program influenced your attitudes either negatively or positively, please indicate a change. However, if your attitudes remained the same, please indicate that no changes occurred. The success of this study is completely dependent on you being frank in your responses.

[POST-PROGRAM QUESTIONNAIRE AND BACKGROUND INFORMATION]

APPENDIX B

Department of Forestry, Wildlife, & Fisheries The University of Tennessee-Knoxville

PRE-PROGRAM ATTITUDE QUESTIONNAIRE

The following is a list of statements pertaining to forest management on **pulp and paper company owned-lands**. Indicate the extent to which you agree or disagree with the statements. Please respond quickly, circling the first response that comes to mind. You will have approximately five minutes to complete this section. Once you have finished, please turn over your sheet. **DO NOT** change your responses once you have marked them. Below is an example of the statement and answer format.

X = No Opinion

- 1 = Strongly Disagree**
- 2 = Disagree**
- 3 = Somewhat Disagree**
- 4 = Neither Disagree nor Agree**
- 5 = Somewhat Agree**
- 6 = Agree**
- 7 = Strongly Agree**

O = Undecided

Example statement:

Computers can be frustrating **X** 1 2 3 4 5 6 7 **O**
to operate.

X No opinion indicates that you are indifferent to the statement or subject and feel that it is unimportant.

4 Neither Disagree nor Agree indicates that you have enough information to make an informed decision but retain a neutral position on the issue stated.

O Undecided indicates that you have a strong concern for the issue but simply do not have enough information to make an informed decision.

APPENDIX B CONTINUED

PRE

****REMEMBER, PULP AND PAPER COMPANY OWNED LANDS IN THE SOUTHEAST ONLY****

- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| 1) All forests should be managed. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 2) Trees must be cut to provide for our basic needs (i.e. paper products, building materials). | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 3) Our wood needs should be met primarily from pulp and paper company-owned lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 4) The cost of forest products (e.g. toilet paper lumber, cardboard boxes, etc...) should be considered when cutting trees. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 5) The cost of growing and harvesting trees should be a major consideration in managing pulp and paper company-owned forests. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 6) Aesthetics should be a major consideration when managing pulp and paper company-owned forests. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 7) Clearcutting is acceptable on pulp and paper company-owned lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 8) Laws should be passed to prevent clearcutting on pulp and paper company-owned lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 9) Partial cuts (removing no more than half the standing timber) can provide for our basic wood needs without increasing the costs of forest products significantly. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |

APPENDIX B CONTINUED

PRE

****REMEMBER, PULP AND PAPER COMPANY-OWNED LANDS IN THE SOUTHEAST ONLY****

- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| 10) The erosion and sedimentation caused by clearcutting is acceptable on pulp and paper company-owned forest lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 11) Compared to agriculture, the erosion and sedimentation caused by clearcutting is acceptable. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 12) Pulp and paper companies can do more to decrease the amount of erosion and sedimentation caused by clearcutting on their forested lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 13) Pine plantations are pretty. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 14) Pulp and paper company-owned forests should have a variety of tree species. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 15) Pine plantations are necessary to meet our wood needs. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 16) Pine plantations are not acceptable use of forest lands on pulp and paper company-owned lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 17) Overall, pulp and paper companies use environmentally sound forestry on their forested lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |

APPENDIX B CONTINUED

Department of Forestry, Wildlife, & Fisheries
The University of Tennessee-Knoxville

POST-PROGRAM ATTITUDE QUESTIONNAIRE

The following is a list of statements pertaining to forest management on pulp and paper company owned-lands in the Southeast. Indicate the extent to which you agree or disagree with the statements. Please respond quickly, circling the first response that comes to mind. You will have approximately five minutes to complete this section. Once you have finished, please turn over your sheet. **DO NOT** change your responses once you have marked them. Below is an example of the statement and answer format.

X = No Opinion

- 1 = Strongly Disagree
- 2 = Disagree
- 3 = Somewhat Disagree
- 4 = Neither Disagree nor Agree
- 5 = Somewhat Agree
- 6 = Agree
- 7 = Strongly Agree

O = Undecided

Example statement:

Computers can be frustrating X 1 2 3 4 5 6 7 O
to operate.

X No opinion indicates that you are indifferent to the statement or subject and feel that it is unimportant.

4 Neither Disagree nor Agree indicates that you have enough information to make an informed decision but retain a neutral position on the issue stated.

O Undecided indicates that you have a strong concern for the issue but simply do not have enough information to make an informed decision.

APPENDIX B CONTINUED

POST

****REMEMBER, PULP AND PAPER COMPANY-OWNED LANDS IN THE SOUTHEAST ONLY****

- | | | | | | | | | | |
|--|---|---|---|---|---|---|---|---|---|
| 1) All forests should be managed. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 2) Trees must be cut to provide for our basic needs (i.e. paper products, building materials). | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 3) Our wood needs should be met primarily from pulp and paper company-owned lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 4) The cost of forest products (e.g. toilet paper lumber, cardboard boxes, etc...) should be considered when cutting trees. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 5) The cost of growing and harvesting trees should be a major consideration in managing pulp and paper company-owned forests. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 6) Aesthetics should be a major consideration when managing pulp and paper company-owned forests. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 7) Clearcutting is acceptable on pulp and paper company-owned lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 8) Laws should be passed to prevent clearcutting on pulp and paper company-owned lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 9) Partial cuts (removing no more than half the standing timber) can provide for our basic wood needs without increasing the costs of forest products significantly. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |

APPENDIX B CONTINUED

POST

****REMEMBER, PULP AND PAPER COMPANY-OWNED LANDS IN THE SOUTHEAST ONLY****

- | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 10) The erosion and sedimentation caused by clearcutting is acceptable on pulp and paper company-owned forest lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 11) Compared to agriculture, the erosion and sedimentation caused by clearcutting is acceptable. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 12) Pulp and paper companies can do more to decrease the amount of erosion and sedimentaion caused by clearcutting on their forested lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 13) Pine plantations are pretty. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 14) Pulp and paper company-owned forests should have a variety of tree species. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 15) Pine plantations are necessary to meet our wood needs. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 16) Pine plantations are not acceptable use of forest lands on pulp and paper company-owned lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |
| 17) Overall, pulp and paper companies use environmentally sound forestry on their forested lands. | X | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 0 |

APPENDIX C

ORGANIZATIONS SOLICITED FOR PROGRAM PRESENTATION

Asheville, North Carolina

<u>Church Groups (n=50)</u>	<u>Response (Yes or No)</u>
1) Nazareth First Baptist Church	Yes
2) Trinity United Methodist Church	Yes
3) Antioch Christian Church	No
4) First Presbyterian Church	No
5) New Bridge Baptist Church	No
6) West Asheville Presbyterian Church	No
7) South Bumcombe Baptist Church	No
 <u>Civic Groups (n=34)</u>	
1) Golden K Kiwanis	Yes
2) Greater Reynolds Lions Club	Yes
3) Valley Spring Lions Club	No
4) Toastmasters, Asheville	No
5) Altrusa	No
6) Fraternal Order of Eagles	No
7) Asheville Civitan	No
8) Lions, Asheville Breakfast	No
9) Rotary, Asheville Downtown	No
10) Toastmasters, Swannanoa Valley	No
11) South Bumcombe Arden Kiwanis	No
 <u>Environmental Groups (n=15)</u>	
1) Sierra Club	Yes
2) Madison County Environmental Alliance	Yes
3) WNC Alliance, Asheville Office	No
4) French Broad River Foundation	No
5) Clean Water Fund of North Carolina	No
6) Citizens for Safe Drinking Water	No
7) Trout Unlimited	No
8) Pigeon River Action Group	No
 <u>Professional Groups (n=16)</u>	
1) West Asheville Business Association	Yes
2) Quota Club	Yes
3) Asheville Junior Women's Club	No
4) Professional Secretaries International	No
5) American Association of University Women	No

APPENDIX C CONTINUED

Chattanooga, Tennessee

<u>Church Groups (n=53)</u>	<u>Response (Yes or No)</u>
1) Hixson United Methodist Church	Yes
2) White Oak Baptist Church	No
3) Saint Peter and Paul Catholic Church	No
4) Berean Baptist Church	No
5) East Ridge Baptist Church	No
6) First Baptist Church of Hixson	No
7) Highland Park Baptist Church	No
8) Grace Baptist Church	No
9) First Baptist Church	No
10) First Presbyterian Church of Chattanooga	No
<u>Civic Groups (n=69)</u>	
1) Optimist Club of Chattanooga	Yes
2) Kiwanis Club of Chattanooga	Yes
3) Scenic City Optimist Club of Chattanooga (could not accommodate schedule)	Yes
4) Dalewood Lioness Club	No
5) Chattanooga Junior League	No
6) Pilot Club of Chattanooga	No
7) Lookout Mountain Protection Association	No
8) Riverland Civitan Club	No
9) Eastgate Sertoma Club	No
<u>Environmental Groups (n=5)</u>	
1) Chattanooga Audubon Club	Yes
2) Sierra Club	Yes
<u>Professional Groups (n=25)</u>	
1) Tennessee Society of Professional Engineers, Chattanooga Chapter	Yes
2) Southeast Tennessee Lawyers' Association for Women	Yes
3) American Institute of Architects	No
4) Chattanooga Hamilton Medical Society Auxiliary	No
5) Chattanooga Area Pharmacists Society	No
6) Chattanooga Hamilton County Medical Association	No
7) Chattanooga Psychological Association	No
8) Chattanooga-Hamilton County Veterinary Association	No
9) Chattanooga Engineers Club	No
10) American Society of Heating, Refrigerating, and Air Conditioning Engineers	No

APPENDIX C CONTINUED

Knoxville, Tennessee

<u>Church Groups (n=50)</u>	<u>Response (Yes or No)</u>
1) Church of Ascension	Yes
2) Second Presbyterian Church	Yes
3) Fountain City United Methodist Church	No
4) Laurel Church of Christ	No
5) St. John's Cathedral	No
6) First Presbyterian Church	No
7) Central Baptist Church of Bearden	No
8) Arlington Baptist Church	No
 <u>Civic Groups (n=110)</u>	
1) Sertoma, North Knoxville	Yes
2) Rotary Club	Yes
3) Sertoma, East Towne Group	No
4) Junior League of Knoxville	No
5) Knoxville Area Urban League	No
6) Volunteer Republican Women's Club, Inc.	No
7) Toastmasters, Fountain City	No
 <u>Environmental Groups (n=7)</u>	
1) Trout Unlimited	Yes
2) Save Our Cumberland Mountains	Yes
3) Tennessee Citizens for Wilderness Planning	No
4) Ducks Unlimited	No
5) Sierra Club	No
6) Audobon Society	No
7) Quail Unlimited	No
8) Tennessee Ornithological Society	No
 <u>Professional Groups (n=114)</u>	
1) Beta Sigma Phi, Alpha Beta Council	Yes
2) Society of American Foresters	Yes
3) Quota Club	No
4) Reserve Officers Association, Knoxville Chapter	No
5) Women in Communications, Knoxville Chapter	No
6) American's Womens Business Association, Four Seasons Chapter	No
7) AWBA, Chilhowee Bandstand Chapter	No
8) East Tennessee Lawyers Association for Women	No

APPENDIX D

LETTER REQUEST AND RESPONSE FORM

Group President or Program Chair,

My name is Jennifer Plyler and I am a graduate student at the University of Tennessee in the Department of Forestry, Wildlife, and Fisheries. Prior to entering the forestry program at U.T. in August, 1991, I was working on a doctorate in Clinical Psychology in Chicago, Illinois. I have combined my background in the social sciences with my forestry training in developing the thesis study that is subject of this letter.

In the past decade, the environmental movement has intensified and public awareness of our forest resources has increased dramatically. I am very concerned about our environment and the impact that obtaining "needed" forest products has on it. Of particular interest is the public's involvement in forest resources management issues that are repeatedly expressed in the media, politics, and the judicial system. My thesis study project addresses some of these issues.

As part of my thesis study, I would like to present a program and discussion on forest resource management on industry-owned lands to your organization at one of your regularly scheduled meeting times. The program will last 35-40 minutes. Participants would be asked to complete two questionnaires, a background information sheet, and listen to an educational program that presents general information about forestry. The information obtained will be used in my thesis study to evaluate public attitudes of forestry issues. After the data are collected, I will send your organization a summary of the results of the completed project. Both organizations and individuals would be kept completely confidential.

I am planning to present this program to selected audiences from January, 1993 to August, 1993. Please keep in mind that I would need a minimum of 35-40 minutes to complete the program. In addition, I need an audience of at least 10 people to ensure the validity of the results.

I hope that you can assist me in making this thesis project a success. If you are able to accommodate this request, I will phone you in the next few weeks.

APPENDIX D CONTINUED

If you have any questions, please do not hesitate to contact me at The University of Tennessee (615) 974-0857 or home (615) 577-6327. I look forward to hearing from you soon.

Sincerely,

Jennifer Plyler

UNIVERSITY OF TENNESSEE-KNOXVILLE
THESIS STUDY: PUBLIC ATTITUDES
JENNIFER PLYLER

Response Form

_____ Yes, we are interested in participating in the program for your thesis project.

If yes, please phone me at (your number) _____
preferred time of day/night? _____

_____ No, we cannot accommodate our program for your thesis project.

Please place in the envelope provided and mail. Be sure and write your group name and city. Thanks for your response.

APPENDIX E

CHRONOLOGY OF GROUP PRESENTATIONS AND THEIR ADDRESSES

Trout Unlimited n=27
C/O Daniel Pitts and Rick Murphee
10522 Eagle Glen Drive
Knoxville, TN 37922
(615) 971-2601

Audubon Society n=12
C/O Delores Wood
900 N. Sanctuary Road
Chattanooga, TN 37421
(615) 892-1499

Kiwanis Club n=13
C/O Tripp Smith
Radisson Read House
Broad Street and ML King Blvd.
Chattanooga, TN 37402
(615) 265-3181

Rotary Club n=19
C/O Todd Williams
North Mutual Life
Suite 300
300 W. Summit Hill Drive
Knoxville, TN 37902
(615) 525-7997
(615) 637-8378

Sertoma Club n=6
C/O Earl Hall
7039 Maynardville Hwy.
Knoxville, TN 37918
(615) 922-4255

Sierra Club n=17
C/O Larry Dunn
1920 Campbell Drive
Chattanooga, TN 37312
(615) 472-0100

Dr. Ed Buckner n=11
C/O First Presbyterian Church Adult Sunday School Class
Kingston Pike
Knoxville, TN 37917

APPENDIX E CONTINUED

Trinity United Methodist Church n=23
C/O Sallyanne McVay
587 Haywood Road
Asheville, NC 28806

Nazareth First Baptist Church n=19
C/O Pastor Charles Mosely
146 Pine Street
Asheville, NC 28801

Bill Griffin n=22
C/O Asheville Golden K Kiwanis Club
11 Mann Road
Asheville, NC 28805

Mr. Johnie Clark n=9
C/O Greater Reynolds Lions Club
134 Liberty Street
Asheville, NC 28803

Iris Sesko n=14
C/O Professional Engineers Society
Rm 205 City Hall
Chattanooga, TN 37402

Sierra Club n=23
C/O David Blanchard-Reid
124 Mockingbird Rd.
Swannanoa, NC 28778
(704) 686-3211

Church of The Ascension n=5
Roger Clapp
C/O ORNL
P.O. Box 2008
Oak Ridge, TN 37831-6038

Madison County Environmental Alliance n=8
Marion Wallin
P.O. Box 411
Marshall, NC 28753

Quota Club
Margaret Carter n=9
17 Wimbley Rd.
Asheville, NC 28804

APPENDIX E CONTINUED

Optomist Club n=21
C/O Berto Chauncey
1212 McCallie Ave
Chattanooga, TN 37401

Hixson United Methodist Church n=10
C/O Barbara Berwanger
P.O. Box 45
Hixson, TN 37434

SAF Breakfast Meeting n=15
C/O Matt Bennett
P.O. Box 1747
Knoxville, TN 37901

East Tennessee Women's Lawyers Association n=13
C/O Diane Arnst & Lynn Beckman
3511 Roseville Blvd
Chattanooga, TN 37407

Beta Sigma Phi Council n=9
C/O Fawnee Dinsmore
1400 Woodlawn Rd.
Lenoir City, TN 37771

Save Our Cumberland Mountains n=14
C/O Maureen O' Connell and Maria Price
P.O. Box 479
Lake City, TN 37769

West Asheville Business Association n=35
C/O Frank Foster
417 Patton Ave.
First Commercial Bank
Asheville, NC 28806

APPENDIX F

NOTES FROM THESIS PRESENTATIONS

February 1993 - June 1993

<u>Dates</u>	<u>Group Name</u>	<u>Comments</u>
2/18/93	Trout Unlimited Knoxville, TN	1) planting pin oaks 2) alternative fuel sources
3/7/93	Audubon Society Chattanooga, TN	1) industries monopolizing landownership 2) taxes on industry-owned land 3) alternative fuel fibers 4) recycling 5) decrease pines (biological deserts/hardwood-low quality "junk trees") 6) chemically dependent forests -- water quality 7) Bowater, exports of raw materials 8) chip mills 9) public or private lands -- audience made no distinction 10) deforestation 11) biodiversity 12) answer is to decrease consumption and wastefulness
3/9/93	Kiwanis Club Chattanooga, TN	1) chip mills -- against
3/10/93	Rotary Club Knoxville, TN	1) deforestation in South America 2) do you work for P & P company 3) directions to pre-program questionnaire were not given due to time

APPENDIX F CONTINUED

3/18/93	Sertoma Club Knoxville, TN	1) recycling and impact on trees 2) partial cuts and economic impact 3) managing hardwoods and economic effect 4) educational program presented while group ate lunch -- many interruptions
4/15/93	Sierra Club Chattanooga, TN	1) recycling and impact on trees 2) erosion and sedimentation continued road construction 3) chemicals 4) education /academic -- what is the focus? procurement? 5) alternative fiber sources 6) objectivity of presentation 7) alternatives to clearcutting 8) pine/hardwood management and fiber quality
4/18/93	Second Presbyterian Church Knoxville, TN	1) questions on erosion slide 2) types of environmental groups -- selection process
4/21/93	Trinity United Methodist Church Asheville, NC	none
4/25/93	Nazareth Baptist Church Asheville, NC	none

APPENDIX F CONTINUED

4/26/93	Kiwanis Golden K Club Asheville, NC	1) chemicals 2) concern for conversion of hardwoods to pines 3) clearcutting 4) forest succession 5) Pigeon River and dioxin poison 6) erosion
4/26/93	Lions Club Asheville, NC	none
5/21/93	Chattanooga Society of Professional Engineers Chattanooga, TN	1) NIPF 2) Export figures
5/27/93	Sierra Club Asheville, NC	1) alternative fiber- hemp 2) biodiversity issues
6/6/93	Church of Ascension Knoxville, TN	none
6/8/93	Madison County Environmental Alliance Asheville, NC	1) slash 2) recycle 3) concern private landowner rights
6/14/93	Quota Club Asheville, NC	1) concerns about clearcutting
6/25/93	Optimist Club Chattanooga, TN	1) defoliation of spruce/fir
6/27/93	Hixson United Methodist Church Chattanooga, TN	1) use of chemicals 2) practices on NIPF lands
7/7/93	SAF Knoxville, TN	1) forest succession 300 yrs 2) erosion figure 3) groups and prelim- inary results

APPENDIX F CONTINUED

7/13/93	East Tennessee Women's Lawyers Association Chattanooga, TN	1) chip mills 2) erosion and sedi- mentation was not addressed due to time 3) slash
7/13/93	Beta Sigma Phi Knoxville, TN	1) slash 2) clearcut positive comments 3) erosion and sedi- mentation were briefly addressed due to time
8/10/93	Save Our Cumberland Mountains Chattanooga, TN	1) erosion 2) buffer zones 3) herbicide use and effects 4) chip mills
9/21/93	West Asheville Business Association Asheville, NC	1) recycling

APPENDIX G

BACKGROUND INFORMATION SHEET

Please complete the following information in the space provided. If you are unsure about a question, answer it to the best of your ability. You have approximately five minutes to complete this section. In accordance with The University of Tennessee Confidentiality Policy, this information will be used for the purpose of research only. Do not write your name on this paper.

1. Did this presentation change your attitudes about forest management on pulp and paper company-owned forest lands (circle response)?

1 2 3 4 5

- 1 = No Significant Changes
2 = Very Little Changes
3 = Neutral
4 = Some Changes
5 = Significant Changes

3 Neutral indicates that you have enough information to make an informed decision but retain a neutral position on the issue stated.

2. After this presentation, are you more knowledgeable about forest management on pulp and paper company-owned forest lands (circle response)?

1 2 3 4 5

- 1 = No Significant Knowledge Gained
2 = Very Little Knowledge Gained
3 = Neutral
4 = Some Knowledge Gained
5 = Significant Knowledge Gained
-

1. Age: under 20 _____
 20-29 _____
 30-39 _____
 40-49 _____
 50-59 _____
 60 & over _____

Gender: Male _____ Female _____

APPENDIX G CONTINUED

2. Occupation Status: (Please check only one)

employed _____	If retired or unemployed,
self-employed _____	state usual occupation _____
retired _____	
homemaker _____	If employed, please state
student _____	occupation and title. Specify
unemployed _____	what you do -- not where you
	work. _____

3. Present Household Income: (Please check only one)

under 10,000 _____	50,000-59,999 _____
10,000-19,999 _____	60,000-79,999 _____
20,000-29,999 _____	80,000-100,000 _____
30,000-39,999 _____	over 100,000 _____
40,000-49,999 _____	

1. Educational Background (check ones which apply).

high school graduate or GED _____

technical school _____

completed some college courses _____

2. College _____ Advanced Degree _____

Major _____

What was your advanced degree? _____

3. Have you had any formal courses in the following: (check all that apply for high school and college).

<u>Courses</u>	<u>High School</u>	<u>College</u>
biology	_____	_____
zoology	_____	_____
botany	_____	_____
ecology	_____	_____
wildlife biology	_____	_____
forestry	_____	_____
environmental science	_____	_____
others (list) _____		

1. During high school, where did you reside?

large city _____

suburb _____

small city _____

small town _____

rural area _____

APPENDIX G CONTINUED

Where do you reside now?

large city _____

suburb _____

small city _____

small town _____

rural area _____

2. Do you or your family own a farm or forested land?

yes _____ no _____

If yes, how many acres? farm? _____

forest? _____

-
1. Do you use the forest for outdoor recreation?

yes _____ no _____

2. If yes, on what lands do you use to recreate (check all that apply)?

non-industry private woodlot _____

backyard _____

public lands (i.e state and national parks and
forests _____

pulp and paper company-owned forests lands _____

-
1. Where do you currently get your information about forestry, the environment, and natural resources (check all that apply)?

TV _____

magazines _____

organizations _____

friends _____

books _____

2. Do you currently belong to any natural resource, outdoor, or environmental groups?

yes _____ no _____

If yes, please answer number 3.

3. Indicate the extent of your inactivity or activity in these groups (circle response).

1 2 3

1 = Very Inactive

2 = Somewhat Active

3 = Very Active

APPENDIX G CONTINUED

4. Do forests or trees hold any religious or spiritual significance in your life? yes ____ no ____
-

1. Do you expect all of your wood needs to come from pulp and paper company-owned forest lands? yes ____ no ____ privately-owned lands? yes ____ no ____ Both? yes ____ no ____

2. What changes, if any would you like to see on pulp and paper company-owned forest lands?
-
-

APPENDIX H

SUMMARY OF DEMOGRAPHIC INFORMATION (n=349)*

<u>AGE</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Under 20	1.2	4
20-29	8.7	28
30-39	18.9	61
40-49	22.4	72
50-59	20.8	67
Over 60	<u>28.0</u>	<u>90</u>
	100	322

*No response = 27

<u>Gender</u>		
Male	61.5	195
Female	<u>38.5</u>	<u>122</u>
	100	317

*No response = 32

<u>OCCUPATION STATUS</u>		
Employed	53.3	171
Self-employed	17.4	56
Retired	23.4	75
Homemaker	2.2	7
Student	1.9	6
Unemployed	<u>1.9</u>	<u>6</u>
	100	321

*No response = 28

<u>Occupation</u>		
Professional	49.6	132
Managers	15.4	42
Clerical/sales	7.7	21
Craftsperson	6.2	17
Service workers	4.8	13
Laborers	3.7	10
Natural resources	7.7	21
Homemaker	3.3	9
Miscellaneous	<u>1.6</u>	<u>4</u>
	100	269

*No response = 80

APPENDIX H CONTINUED

<u>PRESENT HOUSEHOLD INCOME</u>	<u>TOTAL PERCENT</u>	<u>n</u>
under 10,000	5.0	14
10,000-19,999	9.6	27
20,000-29,999	14.9	42
30,000-39,999	17.0	48
40,000-49,999	13.1	37
50,000-59,999	11.7	33
60,000-79,999	10.6	30
80,000-100,000	9.9	28
over 100,000	<u>8.2</u>	<u>23</u>
	100	282

*No response = 67

<u>EDUCATIONAL BACKGROUND</u>		
High school/GED	28.4	99
Technical school	5.4	19
Completed some college courses	20.9	73

<u>College Major</u>		
Natural resources	13.7	29
Other disciplines	<u>86.3</u>	<u>183</u>
	100	212

*No response = 137

<u>What was your advanced degree?</u>		
Natural resources	18.9	17
Other disciplines	<u>81.1</u>	<u>7</u>
	100	9

*No response = 259

<u>Have you had any courses in natural resources in: (Average Number)</u>		
High School	1.14	
College	1.34	

<u>During high school, where did you reside?</u>		
Large city	14.4	45
Suburb	18.3	57
Small city	25.0	78
Small town	17.9	56
Rural	<u>24.4</u>	<u>76</u>
	100	312

*No response = 37

APPENDIX H CONTINUED

<u>Where do you reside now?</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Large city	17.9	55
Suburb	24.0	74
Small city	33.1	102
Small town	9.1	28
Rural	<u>15.9</u>	<u>49</u>
	100	308

*No response = 41

<u>Do you or your family own a farm or forested land?</u>		
Yes	36.7	113
No	<u>63.3</u>	<u>195</u>
	100	308

*No response = 41

<u>If yes, how many acres?</u>		
Average acres forest	75.4	
Average acres farm	96.0	
<u>Do you use the forest for outdoor recreation?</u>		
Yes	87.5	265
No	<u>12.5</u>	<u>38</u>
	100	303

*No response = 46

<u>If yes, on what lands do you recreate?</u>		
NIPF	34.1	119
Backyard	51.3	170
Public Lands	28.4	250
Pulp and Paper Company-Owned Lands	84.5	54

<u>Where do you currently get your information about forestry, the environment, and natural resources?</u>		
TV	33.2	233
Magazines	29.5	246
Organizations	53.0	141
Friends	64.2	125
Books	55.0	157

APPENDIX H CONTINUED

Do you currently belong to any natural resource, outdoor or environmental groups?

	<u>TOTAL PERCENT</u>	<u>n</u>
Yes	43.6	133
No	<u>56.4</u>	<u>172</u>
	100	305

*No response = 44

Indicate the extent of your activity or inactivity in these groups.

Very inactive	17.8	24
Somewhat active	55.6	75
Very active	<u>26.6</u>	<u>36</u>
	100	135

*No response = 214

Do forests or trees hold any religious or spiritual significance in your life?

Yes	49.0	123
No	<u>51.0</u>	<u>128</u>
	100	251

*No response = 98

Do you expect all your wood needs to come from pulp and paper company-owned forest lands only?

Yes	39.6	90
No	<u>60.4</u>	<u>137</u>
	100	227

*No response = 122

Privately-owned lands only?

Yes	18.7	29
No	<u>81.3</u>	<u>126</u>
	100	155

*No response = 194

Both?

Yes	88.6	194
No	<u>11.4</u>	<u>25</u>
	100	119

*No response = 130

APPENDIX H CONTINUED

What changes if any, would you
like to see on pulp and paper
company-owned forest lands?

	<u>TOTAL PERCENT</u>	<u>n</u>
Improve aesthetic quality	2.1	3
Provide more wildlife and recreational areas	6.4	9
Increase biodiversity	10.7	15
Decrease erosion, air pollution and improve watershed quality	15.0	21
Protect private landowner rights	2.1	3
More responsible land management	43.6	61
Decrease or cease clearcutting	15.0	21
Provide more education	3.7	5
Not enough information to answer	<u>1.4</u>	<u>2</u>
	100	140

*No response = 209

APPENDIX I

SUMMARY OF DEMOGRAPHIC INFORMATION FOR ASHEVILLE, NORTH CAROLINA (n=140)*

<u>AGE</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Under 20	3.2	4
20-29	8.0	10
30-39	16.8	21
40-49	12.0	15
50-59	20.0	25
Over 60	<u>40.0</u>	<u>50</u>
	100	125

*No response = 15

<u>Gender</u>		
Male	56.6	69
Female	<u>43.4</u>	<u>53</u>
	100	122

*No response = 18

<u>OCCUPATION STATUS</u>		
Employed	38.9	49
Self-employed	17.5	22
Retired	37.3	47
Homemaker	1.6	2
Student	3.1	4
Unemployed	<u>1.6</u>	<u>2</u>
	100	126

*No response = 14

<u>Occupation</u>		
Professional	41.2	40
Managers	15.5	15
Clerical/sales	12.4	12
Craftsperson	7.2	7
Service workers	7.2	7
Laborers	5.2	5
Natural resources	5.2	5
Homemaker	4.1	4
Miscellaneous	<u>2.0</u>	<u>3</u>
	100	98

*No response = 42

APPENDIX I CONTINUED

<u>PRESENT HOUSEHOLD INCOME</u>	<u>TOTAL PERCENT</u>	<u>n</u>
under 10,000	7.0	7
10,000-19,999	15.0	15
20,000-29,999	28.0	28
30,000-39,999	28.0	28
40,000-49,999	10.0	10
50,000-59,999	8.0	8
60,000-79,999	1.0	1
80,000-100,000	1.0	1
over 100,000	<u>2.0</u>	<u>2</u>
	100	100

*No response = 40

<u>EDUCATIONAL BACKGROUND</u>		
High school/GED	34.5	48
Technical school	7.2	10
Completed some college courses	18.7	26
<u>College Major</u>		
Natural resources	11.7	7
Other disciplines	<u>88.3</u>	<u>53</u>
	100	60

*No response = 80

<u>What was your advanced degree?</u>		
Natural resources	5.9	1
Other disciplines	<u>94.1</u>	<u>16</u>
	100	17

*No response = 123

<u>Have you had any courses in natural resources in: (Average Number)</u>		
High School	0.87	
College	0.94	

<u>During high school, where did you reside?</u>		
Large city	12.9	15
Suburb	12.0	14
Small city	32.8	38
Small town	16.4	19
Rural	<u>25.9</u>	<u>30</u>
	100	116

*No response = 24

APPENDIX I CONTINUED

<u>Where do you reside now?</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Large city	8.0	9
Suburb	8.9	10
Small city	50.0	56
Small town	11.6	13
Rural	<u>21.4</u>	<u>24</u>
	100	112

*No response = 28

<u>Do you or your family own a farm or forested land?</u>		
Yes	27.2	31
No	<u>72.8</u>	<u>83</u>
	100	114

*No response = 26

<u>If yes, how many acres?</u>		
Average acres forest	44.7	
Average acres farm	40.7	

<u>Do you use the forest for outdoor recreation?</u>		
Yes	83.0	93
No	<u>17.0</u>	<u>19</u>
	100	112

*No response = 28

<u>If yes, on what lands do you recreate?</u>		
NIPF	23.7	33
Backyard	34.5	48
Public Lands	59.0	82
Pulp and Paper Company-Owned Lands	4.3	6

<u>Where do you currently get your information about forestry, the environment, and natural resources?</u>		
TV	59.0	82
Magazines	61.9	86
Organizations	40.4	42
Friends	28.1	39
Books	35.3	49

APPENDIX I CONTINUED

Do you currently belong to any natural resource, outdoor or environmental groups?

	<u>TOTAL PERCENT</u>	<u>n</u>
Yes	36.0	40
No	<u>64.0</u>	<u>71</u>
	100	111

*No response = 29

Indicate the extent of your activity or inactivity in these groups.

Very inactive	7.0	3
Somewhat active	65.1	28
Very active	<u>27.9</u>	<u>12</u>
	100	43

*No response = 97

Do forests or trees hold any religious or spiritual significance in your life?

Yes	67.1	53
No	<u>32.9</u>	<u>26</u>
	100	79

*No response = 61

Do you expect all your wood needs to come from pulp and paper company-owned forest lands only?

Yes	49.4	40
No	<u>50.6</u>	<u>41</u>
	100	81

*No response = 59

Privately-owned lands only?

Yes	26.9	14
No	<u>73.1</u>	<u>38</u>
	100	52

*No response = 88

Both?

Yes	89.2	66
No	<u>10.8</u>	<u>8</u>
	100	74

*No response = 66

APPENDIX J CONTINUED

<u>PRESENT HOUSEHOLD INCOME</u>	<u>TOTAL PERCENT</u>	<u>n</u>
under 10,000	6.2	6
10,000-19,999	10.3	10
20,000-29,999	12.4	12
30,000-39,999	13.4	13
40,000-49,999	7.2	7
50,000-59,999	14.4	14
60,000-79,999	18.6	18
80,000-100,000	11.3	11
over 100,000	<u>6.2</u>	<u>6</u>
	100	97

*No response = 19

<u>EDUCATIONAL BACKGROUND</u>		
High school/GED	28.4	28
Technical school	5.4	5
Completed some college courses	20.9	24
<u>College Major</u>		
Natural resources	6.0	5
Other disciplines	<u>94.0</u>	<u>78</u>
	100	83

*No response = 33

<u>What was your advanced degree?</u>		
Natural resources	5.7	2
Other disciplines	<u>94.3</u>	<u>33</u>
	100	35

*No response = 81

<u>Have you had any courses in natural resources in: (Average Number)</u>		
High School	1.14	
College	1.34	

<u>During high school, where did you reside?</u>		
Large city	17.9	19
Suburb	22.6	24
Small city	20.8	22
Small town	14.2	15
Rural	<u>24.5</u>	<u>26</u>
	100	106

*No response = 10

APPENDIX J CONTINUED

<u>Where do you reside now?</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Large city	20.8	22
Suburb	34.9	37
Small city	23.6	25
Small town	9.4	10
Rural	<u>11.3</u>	<u>12</u>
	100	106

*No response = 10

<u>Do you or your family own a farm or forested land?</u>		
Yes	39.0	41
No	<u>61.0</u>	<u>64</u>
	100	105

*No response = 11

<u>If yes, how many acres?</u>		
Average acres forest	75.4	
Average acres farm	96.0	
<u>Do you use the forest for outdoor recreation?</u>		
Yes	84.6	88
No	<u>15.4</u>	<u>16</u>
	100	104

*No response = 12

<u>If yes, on what lands do you recreate?</u>		
NIPF	38.8	45
Backyard	55.2	64
Public Lands	72.4	84
Pulp and Paper Company-Owned Lands	23.3	27

<u>Where do you currently get your information about forestry, the environment, and natural resources?</u>		
TV	70.7	82
Magazines	70.7	82
Organizations	47.1	48
Friends	38.8	45
Books	46.6	54

APPENDIX J CONTINUED

Do you currently belong to any natural resource, outdoor or environmental groups?

	<u>TOTAL PERCENT</u>	<u>n</u>
Yes	44.8	47
No	<u>55.2</u>	<u>58</u>
	100	105

*No response = 11

Indicate the extent of your activity or inactivity in these groups.

Very inactive	23.4	11
Somewhat active	42.6	20
Very active	<u>34.0</u>	<u>16</u>
	100	47

*No response = 69

Do forests or trees hold any religious or spiritual significance in your life?

Yes	43.5	37
No	<u>56.5</u>	<u>48</u>
	100	85

*No response = 31

Do you expect all your wood needs to come from pulp and paper company-owned forest lands only?

Yes	34.6	27
No	<u>65.4</u>	<u>51</u>
	100	78

*No response = 38

Privately-owned lands only?

Yes	15.4	8
No	<u>84.6</u>	<u>44</u>
	100	52

*No response = 64

Both?

Yes	86.8	66
No	<u>13.2</u>	<u>10</u>
	100	76

*No response = 40

APPENDIX J CONTINUED

What changes if any, would you
like to see on pulp and paper
company-owned forest lands?

	<u>TOTAL PERCENT</u>	<u>n</u>
Improve aesthetic quality	0.0	0
Provide more wildlife and recreational areas	8.2	4
Increase biodiversity	14.3	7
Decrease erosion, air pollution and improve watershed quality	8.2	4
Protect private landowner rights	0.0	0
More responsible land management	42.9	21
Decrease or cease clearcutting	24.4	12
Provide more education	2.0	1
Not enough information to answer	<u>0.0</u>	<u>0</u>
	100	49

*No response = 67

APPENDIX K CONTINUED

<u>Where do you reside now?</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Large city	27.0	24
Suburb	30.3	27
Small city	23.6	21
Small town	5.6	5
Rural	<u>13.5</u>	<u>12</u>
	100	89

*No response = 4

<u>Do you or your family own a farm or forested land?</u>		
Yes	46.6	41
No	<u>53.4</u>	<u>47</u>
	100	88

*No response = 5

<u>If yes, how many acres?</u>		
Average acres forest	94.4	
Average acres farm	112.5	
<u>Do you use the forest for outdoor recreation?</u>		
Yes	96.5	83
No	<u>3.5</u>	<u>3</u>
	100	86

*No response = 7

<u>If yes, on what lands do you recreate?</u>		
NIPF	43.0	40
Backyard	61.3	57
Public Lands	89.2	83
Pulp and Paper Company-Owned Lands	22.6	21

<u>Where do you currently get your information about forestry, the environment, and natural resources?</u>		
TV	73.1	68
Magazines	82.8	77
Organizations	54.8	51
Friends	43.0	40
Books	57.0	53

APPENDIX K CONTINUED

Do you currently belong to any natural resource, outdoor or environmental groups?

	<u>TOTAL PERCENT</u>	<u>n</u>
Yes	52.3	46
No	<u>47.7</u>	<u>42</u>
	100	88

*No response = 5

Indicate the extent of your activity or inactivity in these groups.

Very inactive	22.2	10
Somewhat active	60.0	27
Very active	<u>17.8</u>	<u>8</u>
	100	45

*No response = 48

Do forests or trees hold any religious or spiritual significance in your life?

Yes	38.4	33
No	<u>61.6</u>	<u>53</u>
	100	86

*No response = 7

Do you expect all your wood needs to come from pulp and paper company-owned forest lands only?

Yes	34.3	23
No	<u>65.7</u>	<u>44</u>
	100	67

*No response = 26

Privately-owned lands only?

Yes	14.0	7
No	<u>86.0</u>	<u>43</u>
	100	50

*No response = 43

Both?

Yes	89.7	61
No	<u>10.3</u>	<u>7</u>
	100	68

*No response = 25

APPENDIX K CONTINUED

What changes if any, would you
like to see on pulp and paper
company-owned forest lands?

	<u>TOTAL PERCENT</u>	<u>n</u>
Improve aesthetic quality	6.5	3
Provide more wildlife and recreational areas	6.5	3
Increase biodiversity	6.5	3
Decrease erosion, air pollution and improve watershed quality	17.4	8
Protect private landowner rights	6.5	3
More responsible land management	41.4	19
Decrease or cease clearcutting	6.5	3
Provide more education	6.5	3
Not enough information to answer	<u>2.2</u>	<u>1</u>
	100	46

*No response = 47

APPENDIX L

SUMMARY OF DEMOGRAPHIC INFORMATION FOR CHURCH GROUP-TYPE (n=64)*

<u>AGE</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Under 20	5.3	3
20-29	1.8	1
30-39	14.0	8
40-49	15.8	9
50-59	26.3	15
Over 60	<u>36.8</u>	<u>21</u>
	100	57

*No response = 7

<u>Gender</u>		
Male	42.6	23
Female	<u>57.4</u>	<u>31</u>
	100	54

*No response = 10

<u>OCCUPATION STATUS</u>		
Employed	50.0	28
Self-employed	5.4	3
Retired	30.4	17
Homemaker	5.4	3
Student	5.4	3
Unemployed	<u>3.4</u>	<u>2</u>
	100	56

*No response = 8

<u>Occupation</u>		
Professional	52.3	23
Managers	9.1	4
Clerical/sales	4.5	2
Craftsperson	4.5	2
Service workers	9.1	4
Laborers	6.8	3
Natural resources	2.3	1
Homemaker	11.4	5
Miscellaneous	<u>0.0</u>	<u>0</u>
	100	44

*No response = 20

APPENDIX L CONTINUED

<u>PRESENT HOUSEHOLD INCOME</u>	<u>TOTAL PERCENT</u>	<u>n</u>
under 10,000	6.2	3
10,000-19,999	6.2	3
20,000-29,999	16.7	8
30,000-39,999	16.7	8
40,000-49,999	16.7	8
50,000-59,999	6.2	3
60,000-79,999	6.2	3
80,000-100,000	18.9	9
over 100,000	<u>6.2</u>	<u>3</u>
	100	48

*No response = 16

<u>EDUCATIONAL BACKGROUND</u>		
High school/GED	35.9	23
Technical school	4.7	3
Completed some college courses	20.3	13
<u>College Major</u>		
Natural resources	6.1	2
Other disciplines	<u>93.9</u>	<u>31</u>
	100	33

*No response = 31

<u>What was your advanced degree?</u>		
Natural resources	20.0	2
Other disciplines	<u>80.0</u>	<u>8</u>
	100	10

*No response = 54

<u>Have you had any courses in natural resources in: (Average Number)</u>		
High School	1.14	
College	1.06	

<u>During high school, where did you reside?</u>		
Large city	9.3	5
Suburb	20.4	11
Small city	35.2	19
Small town	13.0	7
Rural	<u>22.1</u>	<u>12</u>
	100	54

*No response = 10

APPENDIX L CONTINUED

<u>Where do you reside now?</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Large city	19.2	10
Suburb	32.7	17
Small city	42.3	22
Small town	1.9	1
Rural	<u>3.9</u>	<u>2</u>
	100	52

*No response = 12

<u>Do you or your family own a farm or forested land?</u>		
Yes	27.8	15
No	<u>72.2</u>	<u>39</u>
	100	54

*No response = 10

<u>If yes, how many acres?</u>	
Average acres forest	44.7
Average acres farm	148.5

<u>Do you use the forest for outdoor recreation?</u>		
Yes	81.6	40
No	<u>18.4</u>	<u>9</u>
	100	49

*No response = 15

<u>If yes, on what lands do you recreate?</u>		
NIPF	20.3	13
Backyard	39.1	25
Public Lands	59.4	38
Pulp and Paper Company-Owned Lands	9.4	6

<u>Where do you currently get your information about forestry, the environment, and natural resources?</u>		
TV	75.0	48
Magazines	64.1	41
Organizations	29.7	19
Friends	32.8	21
Books	34.4	22

APPENDIX L CONTINUED

Do you currently belong to any natural resource, outdoor or environmental groups?

	<u>TOTAL PERCENT</u>	<u>n</u>
Yes	14.0	7
No	<u>86.0</u>	<u>43</u>
	100	50

*No response = 14

Indicate the extent of your activity or inactivity in these groups.

Very inactive	57.1	4
Somewhat active	42.9	3
Very active	<u>0.0</u>	<u>0</u>
	100	47

*No response = 57

Do forests or trees hold any religious or spiritual significance in your life?

Yes	58.3	28
No	<u>41.7</u>	<u>20</u>
	100	48

*No response = 16

Do you expect all your wood needs to come from pulp and paper company-owned forest lands only?

Yes	46.3	19
No	<u>53.7</u>	<u>22</u>
	100	41

*No response = 23

Privately-owned lands only?

Yes	29.6	8
No	<u>70.4</u>	<u>19</u>
	100	27

*No response = 37

Both?

Yes	78.8	26
No	<u>21.2</u>	<u>7</u>
	100	33

*No response = 31

APPENDIX L CONTINUED

What changes if any, would you
like to see on pulp and paper
company-owned forest lands?

	<u>TOTAL PERCENT</u>	<u>n</u>
Improve aesthetic quality	0.0	0
Provide more wildlife and recreational areas	0.0	0
Increase biodiversity	5.0	1
Decrease erosion, air pollution and improve watershed quality	16.9	3
Protect private landowner rights	0.0	0
More responsible land management	66.7	12
Decrease or cease clearcutting	11.4	2
Provide more education	0.0	0
Not enough information to answer	<u>0.0</u>	<u>0</u>
	100	18

*No response = 46

APPENDIX M

SUMMARY OF DEMOGRAPHIC INFORMATION FOR CIVIC GROUP-TYPE (n=88)*

<u>AGE</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Under 20	0.0	0
20-29	5.3	4
30-39	18.7	14
40-49	24.0	18
50-59	13.3	10
Over 60	<u>38.7</u>	<u>29</u>
	100	75

*No response = 13

<u>Gender</u>		
Male	80.3	61
Female	<u>19.7</u>	<u>15</u>
	100	76

*No response = 12

<u>OCCUPATION STATUS</u>		
Employed	44.2	34
Self-employed	23.4	18
Retired	32.4	25
Homemaker	0.0	0
Student	0.0	0
Unemployed	<u>0.0</u>	<u>0</u>
	100	77

*No response = 11

<u>Occupation</u>		
Professional	51.7	31
Managers	15.0	9
Clerical/sales	15.0	9
Craftsperson	3.3	2
Service workers	6.7	4
Laborers	5.0	3
Natural resources	3.3	2
Homemaker	0.0	0
Miscellaneous	<u>0.0</u>	<u>0</u>
	100	60

*No response = 28

APPENDIX M CONTINUED

<u>PRESENT HOUSEHOLD INCOME</u>	<u>TOTAL PERCENT</u>	<u>n</u>
under 10,000	0.0	0
10,000-19,999	7.7	5
20,000-29,999	7.7	5
30,000-39,999	10.8	7
40,000-49,999	15.4	10
50,000-59,999	12.2	8
60,000-79,999	10.8	7
80,000-100,000	15.4	10
over 100,000	<u>20.0</u>	<u>13</u>
	100	65

*No response = 23

<u>EDUCATIONAL BACKGROUND</u>		
High school/GED	19.3	17
Technical school	4.5	4
Completed some college courses	17.0	15
<u>College Major</u>		
Natural resources	5.9	3
Other disciplines	<u>94.1</u>	<u>48</u>
	100	51

*No response = 37

<u>What was your advanced degree?</u>		
Natural resources	0.0	0
Other disciplines	<u>100.0</u>	<u>18</u>
	100	18

*No response = 70

<u>Have you had any courses in natural resources in: (Average Number)</u>		
High School	1.14	
College	0.77	

<u>During high school, where did you reside?</u>		
Large city	22.7	17
Suburb	16.0	12
Small city	25.3	19
Small town	14.7	11
Rural	<u>21.3</u>	<u>16</u>
	100	75

*No response = 13

APPENDIX M CONTINUED

<u>Where do you reside now?</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Large city	24.0	18
Suburb	28.0	21
Small city	33.3	25
Small town	6.7	5
Rural	<u>8.0</u>	<u>6</u>
	100	75

*No response = 13

<u>Do you or your family own a farm or forested land?</u>		
Yes	32.0	24
No	<u>68.0</u>	<u>51</u>
	100	75

*No response = 13

<u>If yes, how many acres?</u>	
Average acres forest	98.8
Average acres farm	99.9

<u>Do you use the forest for outdoor recreation?</u>		
Yes	82.2	60
No	<u>17.8</u>	<u>13</u>
	100	73

*No response = 15

<u>If yes, on what lands do you recreate?</u>		
NIPF	25.0	22
Backyard	45.5	40
Public Lands	61.4	54
Pulp and Paper Company-Owned Lands	10.2	9

<u>Where do you currently get your information about forestry, the environment, and natural resources?</u>		
TV	63.6	56
Magazines	62.5	58
Organizations	20.5	18
Friends	14.8	13
Books	29.5	26

APPENDIX M CONTINUED

Do you currently belong to any natural resource, outdoor or environmental groups?

	<u>TOTAL PERCENT</u>	<u>n</u>
Yes	16.4	12
No	<u>83.6</u>	<u>61</u>
	100	73

*No response = 15

Indicate the extent of your activity or inactivity in these groups.

Very inactive	26.7	4
Somewhat active	60.0	9
Very active	<u>13.3</u>	<u>2</u>
	100	15

*No response = 73

Do forests or trees hold any religious or spiritual significance in your life?

Yes	25.0	17
No	<u>75.0</u>	<u>51</u>
	100	68

*No response = 20

Do you expect all your wood needs to come from pulp and paper company-owned forest lands only?

Yes	41.5	22
No	<u>58.5</u>	<u>31</u>
	100	53

*No response = 35

Privately-owned lands only?

Yes	18.9	7
No	<u>81.1</u>	<u>30</u>
	100	37

*No response = 51

Both?

Yes	87.3	48
No	<u>12.7</u>	<u>7</u>
	100	55

*No response = 33

APPENDIX M CONTINUED

What changes if any, would you
like to see on pulp and paper
company-owned forest lands?

	<u>TOTAL PERCENT</u>	<u>n</u>
Improve aesthetic quality	0.0	0
Provide more wildlife and recreational areas	0.0	0
Increase biodiversity	18.8	3
Decrease erosion, air pollution and improve watershed quality	25.0	4
Protect private landowner rights	0.0	0
More responsible land management	50.0	8
Decrease or cease clearcutting	0.0	0
Provide more education	6.2	1
Not enough information to answer	<u>0.0</u>	<u>0</u>
	100	16

*No response = 72

APPENDIX N

SUMMARY OF DEMOGRAPHIC INFORMATION FOR ENVIRONMENTAL GROUP-TYPE (n=103)*

<u>AGE</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Under 20	1.0	1
20-29	12.9	13
30-39	15.8	16
40-49	32.7	33
50-59	21.8	22
Over 60	<u>15.8</u>	<u>16</u>
	100	101

*No response = 2

<u>Gender</u>		
Male	59.0	59
Female	<u>41.0</u>	<u>41</u>
	100	100

*No response = 3

<u>OCCUPATION STATUS</u>		
Employed	59.6	59
Self-employed	14.1	14
Retired	17.2	17
Homemaker	4.0	4
Student	3.0	3
Unemployed	<u>2.1</u>	<u>2</u>
	100	99

*No response = 4

<u>Occupation</u>		
Professional	50.6	45
Managers	15.7	14
Clerical/sales	5.6	5
Craftsperson	9.0	8
Service workers	5.6	5
Laborers	3.4	3
Natural resources	5.6	5
Homemaker	2.2	2
Miscellaneous	<u>2.3</u>	<u>2</u>
	100	89

*No response = 14

APPENDIX N CONTINUED

<u>PRESENT HOUSEHOLD INCOME</u>	<u>TOTAL PERCENT</u>	<u>n</u>
under 10,000	7.4	7
10,000-19,999	18.9	18
20,000-29,999	22.1	21
30,000-39,999	13.7	13
40,000-49,999	9.5	9
50,000-59,999	11.6	11
60,000-79,999	11.6	11
80,000-100,000	2.4	2
over 100,000	<u>3.4</u>	<u>3</u>
	100	95

*No response = 8

<u>EDUCATIONAL BACKGROUND</u>		
High school/GED	26.2	27
Technical school	4.9	5
Completed some college courses	22.3	23
<u>College Major</u>		
Natural resources	12.7	9
Other disciplines	<u>87.3</u>	<u>62</u>
	100	71

*No response = 32

<u>What was your advanced degree?</u>		
Natural resources	10.0	3
Other disciplines	<u>90.0</u>	<u>27</u>
	100	30

*No response = 73

<u>Have you had any courses in natural resources in: (Average Number)</u>		
High School	1.31	
College	2.01	

<u>During high school, where did you reside?</u>		
Large city	17.2	17
Suburb	23.2	23
Small city	20.2	20
Small town	19.2	19
Rural	<u>20.2</u>	<u>20</u>
	100	99

*No response = 4

APPENDIX N CONTINUED

<u>Where do you reside now?</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Large city	12.1	12
Suburb	20.2	20
Small city	23.2	23
Small town	15.2	15
Rural	<u>29.3</u>	<u>29</u>
	100	99

*No response = 4

<u>Do you or your family own a farm or forested land?</u>		
Yes	45.4	44
No	<u>54.6</u>	<u>53</u>
	100	97

*No response = 6

<u>If yes, how many acres?</u>		
Average acres forest	69.9	
Average acres farm	78.1	
<u>Do you use the forest for outdoor recreation?</u>		
Yes	93.7	90
No	<u>6.3</u>	<u>6</u>
	100	96

*No response = 7

<u>If yes, on what lands do you recreate?</u>		
NIPF	51.5	53
Backyard	61.2	63
Public Lands	87.4	90
Pulp and Paper Company-Owned Lands	22.3	23

<u>Where do you currently get your information about forestry, the environment, and natural resources?</u>		
TV	68.9	71
Magazines	85.4	88
Organizations	86.5	77
Friends	67.0	69
Books	68.0	70

APPENDIX N CONTINUED

Do you currently belong to any natural resource, outdoor or environmental groups?

	<u>TOTAL PERCENT</u>	<u>n</u>
Yes	88.0	88
No	<u>12.0</u>	<u>12</u>
	100	100

*No response = 3

Indicate the extent of your activity or inactivity in these groups.

Very inactive	7.0	6
Somewhat active	59.3	51
Very active	<u>33.7</u>	<u>29</u>
	100	86

*No response = 17

Do forests or trees hold any religious or spiritual significance in your life?

Yes	65.1	56
No	<u>34.9</u>	<u>30</u>
	100	86

*No response = 17

Do you expect all your wood needs to come from pulp and paper company-owned forest lands only?

Yes	35.1	26
No	<u>64.9</u>	<u>48</u>
	100	74

*No response = 29

Privately-owned lands only?

Yes	19.2	10
No	<u>80.8</u>	<u>42</u>
	100	52

*No response = 51

Both?

Yes	88.9	64
No	<u>11.1</u>	<u>8</u>
	100	72

*No response = 31

APPENDIX N CONTINUED

What changes if any, would you
like to see on pulp and paper
company-owned forest lands?

	<u>TOTAL PERCENT</u>	<u>n</u>
Improve aesthetic quality	1.4	1
Provide more wildlife and recreational areas	8.3	6
Increase biodiversity	13.9	10
Decrease erosion, air pollution and improve watershed quality	15.3	11
Protect private landowner rights	1.4	1
More responsible land management	36.1	26
Decrease or cease clearcutting	18.1	13
Provide more education	4.2	3
Not enough information to answer	<u>1.4</u>	<u>1</u>
	100	72

*No response = 31

APPENDIX O

SUMMARY OF DEMOGRAPHIC INFORMATION FOR PROFESSIONAL GROUP-TYPE (n=94)*

<u>AGE</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Under 20	0.0	0
20-29	11.2	10
30-39	25.8	23
40-49	13.5	12
50-59	22.5	20
Over 60	<u>27.0</u>	<u>24</u>
	100	89

*No response = 5

<u>Gender</u>		
Male	59.8	52
Female	<u>40.2</u>	<u>35</u>
	100	87

*No response = 7

<u>OCCUPATION STATUS</u>		
Employed	56.2	50
Self-employed	23.6	21
Retired	18.0	16
Homemaker	0.0	0
Student	0.0	0
Unemployed	<u>2.2</u>	<u>2</u>
	100	89

*No response = 5

<u>Occupation</u>		
Professional	45.6	36
Managers	19.0	15
Clerical/sales	6.3	5
Craftsperson	6.3	5
Service workers	1.3	1
Laborers	16.5	13
Natural resources	2.5	2
Homemaker	2.5	2
Miscellaneous	<u>0.0</u>	<u>0</u>
	100	79

*No response = 15

APPENDIX O CONTINUED

<u>PRESENT HOUSEHOLD INCOME</u>	<u>TOTAL PERCENT</u>	<u>n</u>
under 10,000	5.4	4
10,000-19,999	1.4	1
20,000-29,999	10.8	8
30,000-39,999	27.0	20
40,000-49,999	13.5	10
50,000-59,999	14.9	11
60,000-79,999	12.1	9
80,000-100,000	9.5	7
over 100,000	<u>5.4</u>	<u>4</u>
	100	74

*No response = 20

<u>EDUCATIONAL BACKGROUND</u>		
High school/GED	34.0	32
Technical school	7.4	7
Completed some college courses	23.4	22
<u>College Major</u>		
Natural resources	26.3	15
Other disciplines	<u>73.7</u>	<u>42</u>
	100	57

*No response = 37

<u>What was your advanced degree?</u>		
Natural resources	37.5	12
Other disciplines	<u>62.5</u>	<u>20</u>
	100	32

*No response = 62

<u>Have you had any courses in natural resources in: (Average Number)</u>		
High School	0.96	
College	1.36	

<u>During high school, where did you reside?</u>		
Large city	7.1	6
Suburb	13.1	11
Small city	23.8	20
Small town	22.6	19
Rural	<u>33.4</u>	<u>28</u>
	100	84

*No response = 10

APPENDIX O CONTINUED

<u>Where do you reside now?</u>	<u>TOTAL PERCENT</u>	<u>n</u>
Large city	18.3	15
Suburb	19.5	16
Small city	39.0	32
Small town	8.5	7
Rural	<u>14.7</u>	<u>12</u>
	100	82

*No response = 12

<u>Do you or your family own a farm or forested land?</u>		
Yes	36.6	30
No	<u>63.4</u>	<u>52</u>
	100	82

*No response = 12

<u>If yes, how many acres?</u>		
Average acres forest	83.0	
Average acres farm	91.8	
<u>Do you use the forest for outdoor recreation?</u>		
Yes	88.2	75
No	<u>11.8</u>	<u>10</u>
	100	85

*No response = 9

<u>If yes, on what lands do you recreate?</u>		
NIPF	33.0	31
Backyard	44.7	42
Public Lands	72.3	68
Pulp and Paper Company-Owned Lands	17.0	16

<u>Where do you currently get your information about forestry, the environment, and natural resources?</u>		
TV	61.7	58
Magazines	66.0	62
Organizations	45.8	27
Friends	23.4	22
Books	41.5	39

APPENDIX O CONTINUED

Do you currently belong to any natural resource, outdoor or environmental groups?

	TOTAL PERCENT	n
Yes	31.7	26
No	<u>68.3</u>	<u>56</u>
	100	82

*No response = 12

Indicate the extent of your activity or inactivity in these groups.

Very inactive	37.0	10
Somewhat active	44.4	12
Very active	<u>18.6</u>	<u>5</u>
	100	27

*No response = 67

Do forests or trees hold any religious or spiritual significance in your life?

Yes	44.9	22
No	<u>55.1</u>	<u>27</u>
	100	49

*No response = 45

Do you expect all your wood needs to come from pulp and paper company-owned forest lands only?

Yes	39.0	23
No	<u>61.0</u>	<u>36</u>
	100	59

*No response = 35

Privately-owned lands only?

Yes	10.3	4
No	<u>89.7</u>	<u>35</u>
	100	39

*No response = 55

Both?

Yes	94.9	56
No	<u>5.1</u>	<u>3</u>
	100	59

*No response = 35

APPENDIX O CONTINUED

What changes if any, would you
like to see on pulp and paper
company-owned forest lands?

	<u>TOTAL PERCENT</u>	<u>n</u>
Improve aesthetic quality	5.9	2
Provide more wildlife and recreational areas	8.8	3
Increase biodiversity	2.9	1
Decrease erosion, air pollution and improve watershed quality	8.8	3
Protect private landowner rights	5.9	2
More responsible land management	44.3	15
Decrease or cease clearcutting	17.6	6
Provide more education	2.9	1
Not enough information to answer	<u>2.9</u>	<u>1</u>
	100	34

*No response = 60

APPENDIX P

NO RESPONSE, UNDECIDED, AND NO OPINION RESPONSES FOR THE PRE- AND POST-PROGRAM QUESTIONNAIRES

* - No response, O - Undecided and, X - No Opinion

<u>QUESTION</u>	<u>*</u>		<u>O</u>		<u>X</u>	
	<u>pre</u>	<u>post</u>	<u>pre</u>	<u>post</u>	<u>pre</u>	<u>post</u>
1) All forests should be managed.	4	23	18	5	2	2
2) Trees must be cut to provide for our basic needs (i.e., paper products, building materials).	6	20	1	2	2	2
3) Our wood needs should be met primarily from pulp and paper company-owned forest lands.	3	14	38	15	3	7
4) The cost of forest products (e.g., toilet paper lumber, cardboard boxes, etc...) should be considered when cutting trees.	3	15	47	17	7	4
5) The cost of growing and harvesting trees should be a major consideration in managing pulp and paper company-owned forest lands.	4	15	21	7	7	2
6) Aesthetics should be a major consideration when managing pulp and paper company-owned forest lands.	4	20	30	18	13	6
7) Clearcutting is acceptable on pulp and paper company-owned forest lands.	2	15	29	11	4	2
8) Laws should be passed to prevent clearcutting on pulp and paper company-owned forest lands.	2	17	31	16	9	3

APPENDIX P CONTINUED

<u>QUESTION</u>	*		O		X	
	<u>pre</u>	<u>post</u>	<u>pre</u>	<u>post</u>	<u>pre</u>	<u>post</u>
9) Partial cuts (removing only a portion of the standing timber) can provide for our basic wood needs without increasing the costs of forest products significantly.	4	17	57	34	6	11
10) The erosion and sedimentation caused by clear-cutting is acceptable on pulp and paper company-owned forested lands.	3	18	20	15	5	6
11) Compared to agriculture, the erosion and sedimentation caused by clear-cutting is acceptable.	2	20	35	13	10	5
12) Pulp and paper companies can do more to decrease the amount of erosion and sedimentation caused by clearcutting on their forested lands.	4	21	17	14	10	7
13) Pine plantations are pretty.	6	17	12	7	19	8
14) Pulp and paper company-owned forests should have a variety of tree species.	17	28	31	21	23	7
15) Pine plantations are necessary to meet our wood needs.	6	15	54	13	13	3
16) Pine plantations are not an acceptable use of forest lands on pulp and paper company-owned lands.	11	21	61	13	16	6

APPENDIX P CONTINUED

<u>QUESTION</u>	*		O		X	
	<u>pre</u>	<u>post</u>	<u>pre</u>	<u>post</u>	<u>pre</u>	<u>post</u>
17)Overall, pulp and paper companies use environment-ally sound forestry on their forested lands.	13	15	66	39	20	9

APPENDIX Q

PERCEPTION OF ATTITUDE CHANGES AND KNOWLEDGE GAINED AS REPORTED IN BACKGROUND INFORMATION (n=349)

		KNOWLEDGE GAINED					
		0	1	2	3	4	5
ATTITUDE CHANGE	0	36	0	0	1	4	0
	1	1	18	7	0	12	5
	2	0	1	3	2	29	0
	3	1	1	1	5	5	3
	4	2	0	2	2	99	60
	5	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>7</u>	<u>42</u>
TOTAL 349		40	20	13	10	156	110

LEGEND

- 0 = No response
- 1 = No significant changes in knowledge or attitude
- 2 = Very little changes in knowledge or attitude
- 3 = Neutral changes in knowledge or attitude
- 4 = Some changes in knowledge or attitude
- 5 = Significant changes in knowledge or attitude

VITA

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