Georgia Fiber Supply Projections:
Determining the Availability and Quality of the Hardwood and Softwood Resource

FY 97 Consortium Project Final Report

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FY97 Final Report
The University of Georgia,
Daniel B. Warnell School of Forest Resources
and
Valdosta State University

Cooperators include
USDA Forest Service, Southeastern Forest Experiment Station,
the Georgia Forestry Association, and Georgia forest products industries

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Executive Summary

Objective #1: To assess the adequacy and availability of current hardwood and softwood fiber supplies in Georgia and the ten resource regions within the state.

Detailed resource assessments using the new 1996 Forest Inventory and Analysis (FIA) data is currently being made for the state of Georgia, the five forest survey units and the 10 sub-survey units used in previous studies. Comparisons with 1988 conditions are being made in order to highlight shifts and changes in forest conditions.

Despite a delay in receiving the FIA data, to date, data for the Southwest Georgia forest survey unit has been received and preliminary analysis shows:

1). A 13,000 acre annual increase in planting has occurred in Southwest Georgia since the last survey period (1988). Planted pine stands occupy .7 million acres, a .2 million acre increase since the 1988 survey. Of the planted pine stands, almost 400 thousand acres are in the 0-10 year old age class.

2). Timberland under forest industry control dropped by 15%, whereas nonindustrial private (NIPF) ownership in Southwest Georgia is at 87%, 17% greater than the average, south wide NIPF timberland ownership of 70%.

3). Removals of softwood growing stock has increased 17% since 1988, averaging 132 million cubic feet annually. Softwood growth-to-removals ratio is 92%.

4). Removals of hardwood growing stock has increased 11% since 1988, averaging 34 million cubic feet annually. Hardwood growth-to-removals ratio is 165%.

Objective #2: To assess the attitude and knowledge of Georgia citizens concerning forestry and environmental issues.

The purpose of our study was to determine what the Georgia public wants for, and what it knows about, its forests through a series of attitudinal and knowledge questions. The issues covered by the questionnaire included the use of various silvicultural practices, perceptions of private and public forest management, the proper balance between the environment and the economy, and the role of government regulations in forest management. Out of 1192 calls, 861 completed surveys were recorded, giving a response rate of 72%.

Noteworthy results:

1). To the contradiction of many other environmental surveys, our results demonstrate that a majority of Georgians are not greatly concerned with the way forests in Georgia are being treated.

2). When asked how they viewed the management of trees, 71% of the respondents agreed that trees are like any other crop and should be harvested and replanted to provide consumer goods.

3). When asked which had precedence, the environment or the economy, 73% of the respondents felt that both were important but that the environment should come first.

4). Respondents were asked their opinions on two silvicultural methods, prescribed burning and herbicide use. Prescribed burning was viewed more favorably with a 69% majority agreeing with its use. The use of herbicides in site preparation was less favorably viewed; only 39% of the sample agreed with its use.

4). Results show that 67% of the respondents felt private property owners did not have the right to do as they pleased with their forests regardless of environmental consequences. Further, 89% stated that private property rights were important only if they do not harm the environment. However, 78% of respondents felt that forest landowners should be compensated for economic losses caused by government regulations that prevented the harvesting of their trees.

5). Regarding questions of forest cover, 54% of the respondents felt that the amount of pine coverage in their local area was decreasing, and 64% felt that the land occupied by hardwood forests in their local area was decreasing.

Deliverables

1). Preliminary Analysis of Southwest Georgia 1996 FIA Data
2). The Georgia Public and its Forest: Attitudes and Knowledge Regarding Forest Resource Use
3). Public Perception of Forest Resource Use in Georgia

Future Research

To continue with further analysis of our prior objectives, we find that the following future research is needed.

Objective #1: To assess the adequacy and availability of current hardwood and softwood fiber supplies in Georgia and the ten resource regions within the state. Depending on future funding, there is a need to re-evaluate the survey and sub-survey levels after the new Forest Service,

Southern Annual Forest Inventory Statistics (S/AFIS) reports are completed. Likewise, re-evaluation and coordination with SOFAC and other universities regarding the methodology used for short and intermediate timber supply forecasting after S/AFIS survey methods are understood.

Objective 2: To assess the attitude and knowledge of Georgia citizens concerning forestry and environmental issues. There is a need to undertake an in-depth interview with a sub-sample of survey participants to further explore the results of our three prior landowner and public surveys.

Attachments

Southwest Georgia 1996 Preliminary FIA Summary

The Georgia Public and its Forest: Attitudes and Knowledge Regarding Forest Resource Use

Public Perception of Forest Resource Use in Georgia

Southwest Georgia
1996 Preliminary FIA Summary

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Forests cover 52% of the land area in Southwest Georgia (figure 1). Timberland, defined as forest land capable of producing 20 cubic feet of industrial wood per acre per year, accounts for most of the forested land. In the 22-county area, timberland totals almost 2.9 million acres, a 9 percent increase since the 1988 survey. The increase in timberland can be attributed to a 13,000 acre annual increase in planting over the last survey period. Of the total reforestation and afforestation, 25,000 acres involved the planting and natural reversion of non-forest land.

Planted pine stands account for an increasing share of the total pine forest-type in Southwest Georgia. Natural pine stands occupy 0.6 million acres, whereas planted pine stands occupy 0.7 million acres, a 0.2 million acre increase in pine plantations since the 1988 survey. Of these, roughly 400 thousand acres are in the 0-10 year old age class, again emphasizing the recent increase in acres planted annually.

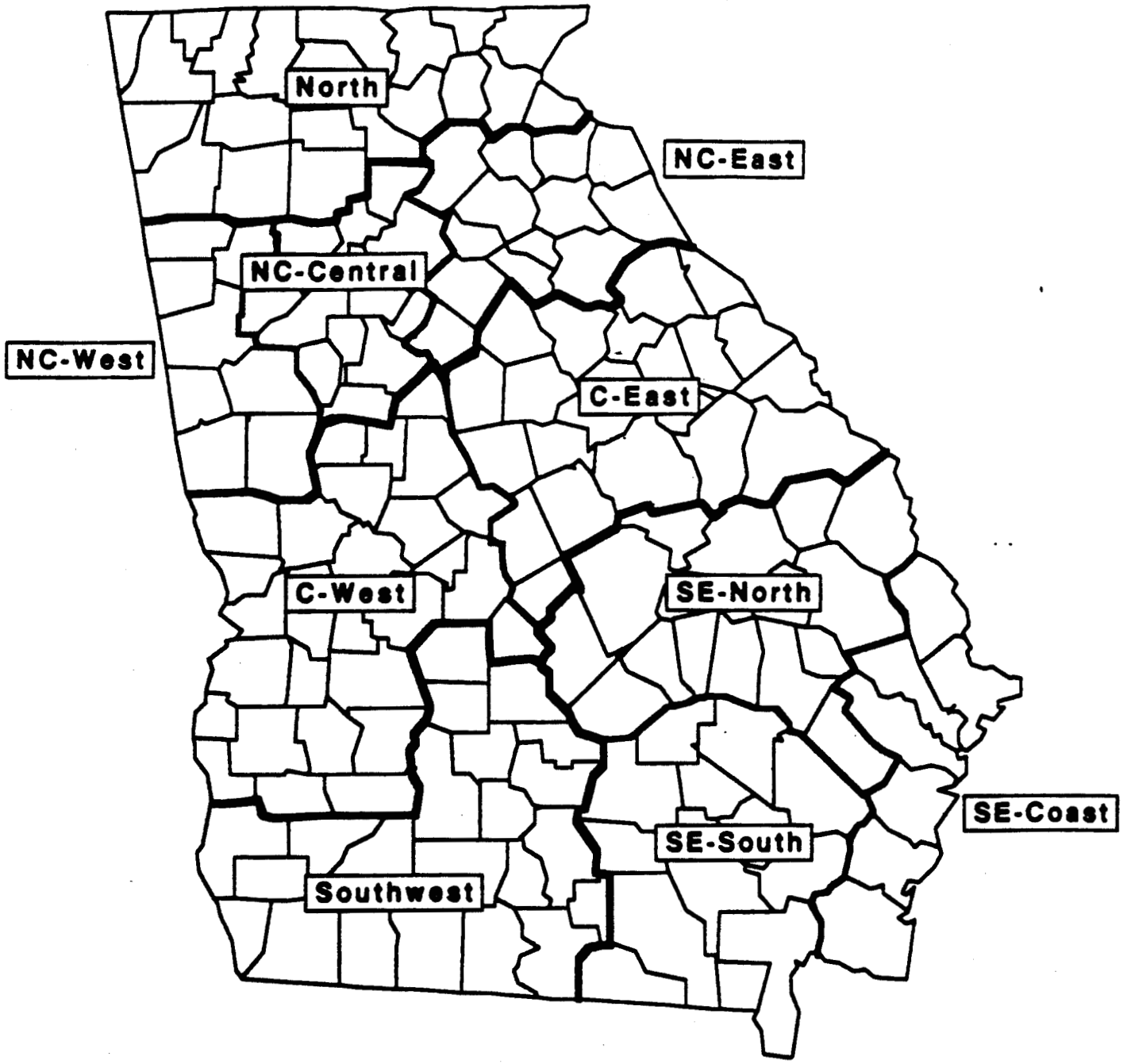
Softwood and hardwood inventory, growth, and removals data is tabulated into table 1 and table 2 attached. In Southwest Georgia, softwood inventory of growing stock is 2009 million cubic feet, a 1 million cubic foot increase from the 1988 survey. Softwood removals are 132.2 million cubic feet, 6.3% of the softwood growing stock inventory which is a 1% increase in removals as a percent of inventory from the 1988 survey. Total softwood inventory is growing at a rate of 121.9 million cubic feet.

Forest industry owns 328 thousand acres of timberland, a 15% drop from 1988's 384 thousand acres. A large portion of the prior industry-owned timberland is reported to have moved into institutional timberland investments, where corporate holdings increased 88% from the prior survey from 213 thousand acres to 402 thousand acres. Nonindustrial private (NIPF) owner's share of the total timberland in the region is 87%, a percentage share 17% greater than the average NIPF owner's holdings south wide.

In summary, the noteworthy change in Southwest Georgia from the 1988 survey is the substantial increase in planted pine acres, particularly the reversion of

non-forest land into timberland, increasing the total timberland acreage in Southwest Georgia. Further analysis as to the role the Conservation Reserve Program (CRP) may have had in increasing the timberland acreage in Southwest Georgia in particular is of interest.

Georgia forest resource regions



Note: North, North Central, Central, Southwest, and Southeast divisions correspond to FIA survey units

Figure 1.

Softwood Growth, Removal & Inventory Southwest Georgia 1989 & 1996

	Public Softwood		NIPF Softwood		Industry Softwood		Total Softwood	
	1989	1996	1989	1996	1989	1996	1989	1996
Growth Million cubic feet	.9	3.1	72.1	94.1	24.3	24.7	97.3	121.9
Removals Million cubic feet	2.7	3.7	82.8	104	25.7	24.5	111.2	132.2
Inventory Million cubic feet	32	72	1653	1656	316	281	2001	2009
G/I %	2.8	4.3	4.4	5.7	7.7	8.8	4.8	6.06
G/R %	33.3	83.78	87	90.5	94.5	100	87.5	92.2
R/I %	8.4	5.1	5.0	6.3	8.1	8.7	5.5	6.6
I/R	11.9	19.61	20	15.87	12.34	11.49	18.18	15.15

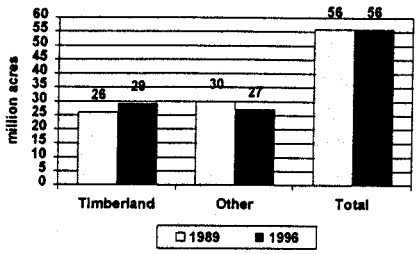
Table 1.

Hardwood Growth, Removal & Inventory Southwest Georgia 1989 & 1996

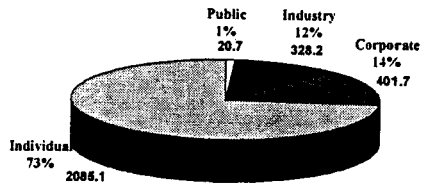
	Public Hardwood		NIPF Hardwood		Industry Hardwood		Total Hardwood	
	1989	1996	1989	1996	1989	1996	1989	1996
Growth Million cubic feet	.8	1.6	36.6	49.7	3.3	4.2	40.7	55.5
Removals Million cubic feet	0	0	26.8	28.4	3.3	5.1	30.1	33.5
Inventory Million cubic feet	24	55	1240	1557	115	110	1379	1722
G/I %	3.3	2.9	1.5	3.2	2.9	3.8	2.9	3.2
G/R %	-	-	70.9	175	100	82.3	135	166
R/I %	0	0	2.1	1.8	2.9	4.6	2.2	1.9
I/R	0	0	46.27	54.8	34.85	21.57	45.45	52.63

Table 2.

Southwest Georgia Land Area
1989 and 1996



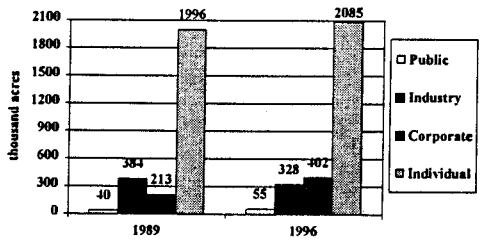
Timberland Ownership
Southwest Georgia, 1996
thousand acres



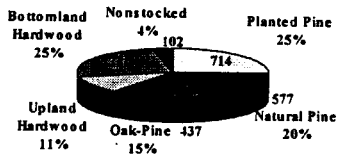
Total = 5.6 million acres

SWGA3

Timberland Ownership Acreage
Southwest Georgia
1989 and 1996



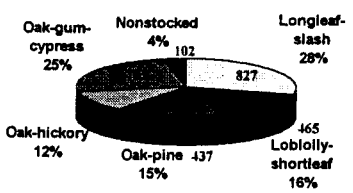
Timberland Types
Southwest Georgia, 1996
thousand acres



Total = 5.6 million acres

SWGA 11

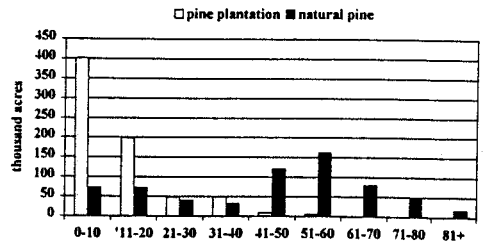
Forest-Type Groups
Southwest Georgia, 1996
thousand acres



Total = 5.6 million acres

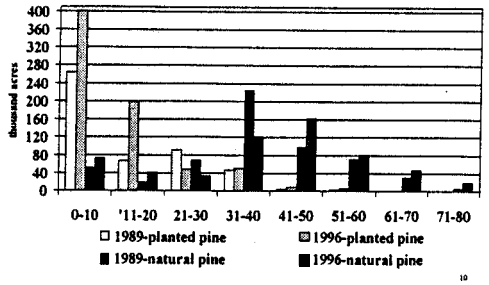
SWGA4

Pine Timberland Area by Stand-Age Class
Southwest Georgia, 1996
All Owners



SWGA12

Pine Age Class Structure
Southwest Georgia
1989 and 1996



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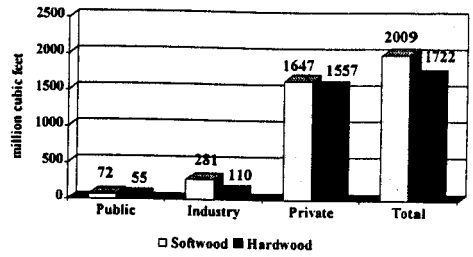
Ownership of Growing Stock Inventory
Southwest Georgia, 1996



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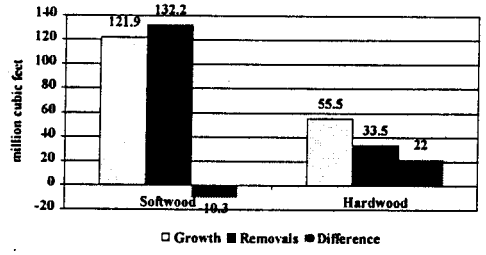
Growth and Removals of Growing Stock by
All Owners
Southwest Georgia, 1996



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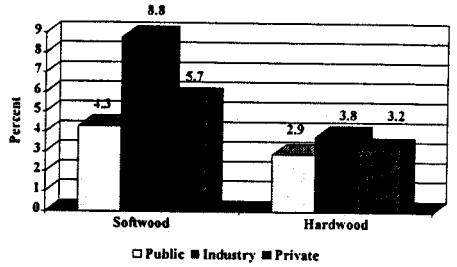
Growth as a Percent of Ownership Inventory
Southwest Georgia, 1996



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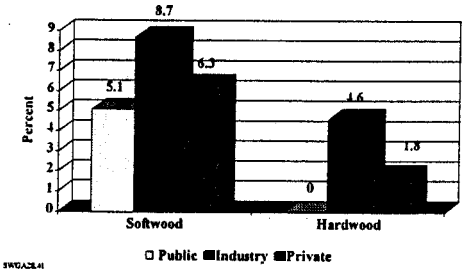
Removals as a Percent of Ownership
Inventory
Southwest Georgia, 1996



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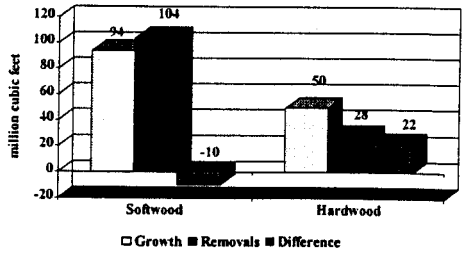
Growth and Removals of Growing Stock by
Nonindustrial Private Owners
Southwest Georgia, 1996



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The Georgia Public and its Forest:

Attitudes and Knowledge Regarding Forest Resource Use

by

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INTRODUCTION

Since the 1970's, environmentalism has been viewed by many as a passing fad that would not continue to hold the public interest or that would suffer a backlash from industry and conservatives. However, the predicted backlash has not materialized and environmental concerns retain a prominent place in the public issues forum. The environmental movement is neither a crisis issue nor limited to a fringe population. Rather, research has documented the public's continued interest in the environment and their growing concern with forestry in particular. This becomes increasingly apparent as public dissatisfaction and criticism of forest management has become more vocal since the environmental movement began.

Continued economic growth and the resulting encroachment on previously undeveloped land and forests has caused increasing public concerns. These include issues of sustainability, wildlife protection, and wetlands conservation. In many areas, this has led to increased regulations and other constraints to forest management. The purpose of our study was to determine what the Georgia public wants and what it knows about its forests through a series of attitudinal and knowledge questions. It is hoped this information will identify public concerns and allow management to better address the most contentious or misunderstood issues concerning forest management and use.

There have been a number of environmental polls, on everything from oil exploration to scenic interpretations, but relatively few on forest resource issues in the Southeast, and Georgia in particular. Considering Georgia's leading role in timber and wood products, and its changing demographics, it represents a good opportunity to study public opinion and knowledge regarding forest issues.

Several factors have led to Georgia's current position of timber primacy; the conversion of thousands of acres of farmland to forest, the industry shift from the Northwest to the Southeast, and a series of social and economic changes beginning in the

1960's. These changes raised development and growth rates, establishing the infrastructure necessary to support expanding industries, including the timber products industry. The economy has grown as well, with major businesses like Coca-Cola, Georgia Pacific, Cable News Network, and United Parcel Service basing their headquarters in Atlanta. Now a major metropolitan area, Atlanta has become even more well known since the 1996 Olympics. Its popularity and growth present attractive opportunities for people in surrounding areas.

Accompanying the growth is a widening gap between rural and urban populations, created by migration from farms and rural areas to the suburbs and cities. As a result, Georgia's demographic structure has shifted to represent a more concentrated urban population with a smaller, diffuse rural population. It is a diverse population that is increasingly concerned about the environment.

Part of the campaign to ensure the viability of the forests and the industries that depend on them was found in the 1989 proposal of the Conservation Use Amendment, or Amendment 3. Amendment 3 was created and promoted by a coalition of conservation, industry, and private forest landowners who worked cooperatively to redesign the law to tax timber only at the time of harvest. The passage and continued support of Amendment 3 gave an indication of Georgians' positive attitudes regarding forests and forest owners.

METHODOLOGY

A random sample of Georgia residents, 18 years of age or older, was taken for a telephone survey. The surveys took approximately 15 minutes to complete and were administered from April 10 to May 16, 1996, between 5:30 and 9:30 p.m. on the first four working days of each week. To ensure that the survey was administered to a representative sample of the Georgia population, phone numbers and replicates were obtained from Survey Sampling, Inc. The interviewers employed the Standardized Survey Interviewing style of questioning in order to ameliorate the introduction of interviewer

bias. Out of 1192 calls, 861 completed surveys were recorded, giving a response rate of 72%. Seventeen surveys lacked complete data, leaving 844 for the final analysis.

The issues covered by the questionnaire included various silvicultural practices, perceptions of private and public forest management, the proper balance between the environment and the economy, and the role of government regulations in forest management. The responses were analyzed according to various demographic characteristics, such as age, gender, education level, race, residence, and forest land ownership.

The survey was based on two earlier surveys, one by Bliss et al. (1997) in conjunction with Auburn University, and one administered by the Georgia Forestry Association five years ago. Final changes, question design, and coding were implemented by Valdosta State and University of Georgia personnel.

The completed surveys were coded and then entered into a computerized database management system. Response frequencies and population percentages were derived from the database and formed the summary statistics tables. Any percentages that did not total 100% were the result of rounding error. Valid percentages were those created by excluding the Don't Know/Refused/Not Applicable responses, which are also defined as non-responses. Valid percentages were often the ones used in the statistical analysis, except in situations where the number of non-responses was unusually large. Chi-square tests were the primary methods of testing statistical significance.

RESULTS

A summary of the survey demographics is found in Table 1. The majority (62%) of respondents were female. Respondent ages were distributed in a rather uniform fashion with 24% less than 30 years old, 48% between 30 and 50 years old, and the remaining 28% over 50 years old. A total of 87% of the sample had graduated from high school, and 30% had completed college or continued further. The survey was heavily represented by Caucasians, who accounted for 70% of the sample. African-Americans made up 26%

of the sample and those in the "other" category comprised the remaining 4%. Urban areas represented the majority with 55% of the sample residing in urban and suburban areas, while the remaining 45% were classified as rural. Only a very small percentage, 16% of the sample population, were designated as forest land owners.

(Place Table 1. here)

These numbers closely mirror the actual demographic statistics for the state of Georgia, with the exception of the representation of men and women and the number of rural and urban residents. The actual division among men and women is closer to 48% and 51%, respectively. The percentage of urban residents is closer to 63% of the population.

To the contradiction of many other environmental surveys, our results demonstrate that the majority of Georgians are not greatly concerned with the way forests in Georgia are being treated. The only two demographic characteristics that are significantly correlated with concern are residence and forest ownership. Surprisingly, we found that significantly more forest owners and rural residents are concerned with the treatment of Georgia's forests than are urban dwellers (Fig. 1).

(Place Fig. 1 here)

At the same time, 54% of the respondents felt that the amount of pine coverage in their local area was decreasing, and 63% felt that the land occupied by hardwood forests in their local area was decreasing. Although there is less pine being replanted than harvested, in all areas of the state hardwood growth exceeds harvests, including areas where it is intensively harvested for pulp and paper production. The respondents' answers seem to reveal their lack of certainty regarding the amount of forest cover type.

Only 74% of respondents have seen or heard of clearcutting. After explaining to the remaining 26% who did not know what clearcutting was, the respondents were then asked if they thought clearcutting should be allowed on private, commercial, or

government owned land. Commercial land had the highest number of positive responses with 64% agreeing with the practice of clearcutting. On privately owned land, 54% of respondents felt that clearcutting should be allowed. The number dropped considerably for government owned land, with only 31% agreeing with clearcutting When the respondents were told to assume that the trees would grow back, the answers changed in an unexpected manner. Rather than increasing, the percentage of those who agreed with the practice of clearcutting decreased for all three types of land ownership and the percentages of non-responses increased dramatically. This indicates a substantial uncertainty by the public of the implications of silvicultural practices.

In addition to clearcutting, respondents were asked their opinions on two other silvicultural methods, prescribed burning and herbicide use. Prescribed burning was viewed more favorably with a 69% majority agreeing with its use. The use of herbicides in site preparation was less favorably viewed; only 39% of the sample agreed with its use (Fig. 2).

(Place Fig. 2 here)

When asked which had precedence, the environment or the economy, 73% of the respondents felt that both were important but that the environment should come first. Only 13% said that both were important but the economy should come first. When asked how they viewed trees, 71% of the respondents agreed that trees are like any other crop and should be harvested and replanted to provide consumer goods. In accordance with this relatively pro-economic view, the majority of respondents favored development of all the forest industries listed in Figure 3. The number in support of the development of such industries ranged from 63% supporting the exportation of cut lumber, to 85% supporting the development of tourism.

(Place Fig. 3 here)

Private property rights were secondary when compared to possible environmental harm, and 67% felt that private property owners did not have the right to do as they pleased with their forests regardless of environmental consequences. An 89% majority stated that private property rights were important only if they do not harm the environment. Correspondingly, 85% said that private property rights should be limited if necessary to protect the environment. However, 78% of respondents felt that forest landowners should be compensated for economic losses caused by government regulations that prevented them from harvesting their trees. This points out that although the public feels private landowners should be regulated, they also feel landowners should be compensated for any financial hardship that they incur by adhering to the rules.

When asked if there should be more state and local timber regulations 47% said yes, and when questioned about government regulations for specific purposes, the percentage of positive responses increased, with a large majority of the public supporting regulation of harvesting on private land for a variety of reasons (Fig. 4). This seems surprising when the majority of respondents stated that they thought landowners were doing a good job in several different land management scenarios.

(Place Fig. 4 here)

Overall, Georgians had a positive view of the job landowners are doing in replacing trees after the harvest (71%), protecting wildlife (68%), ensuring enough natural areas for the future (61%), conserving natural resources (69%), growing and harvesting trees in ways that are environmentally sound (75%), and making land available for the public to enjoy (77%) (Fig. 5).

(Place Fig. 5 here)

A majority of 58% felt that timber land owners pay a fair share of property taxes, and 28% said they pay too much. The majority of respondents were not able to estimate

the percentage of land owned by small non-industrial owners and commercial land owners, with 62% and 63% respectively, giving Don't Know or non-response answers (Fig. 6). In reality, private non-industrial forest owners hold about 68% of Georgia's timber land, industry holds 25%, and government owned land makes up the remaining 7%.

(Place Fig. 6 here)

When asked how they regard timber land owners, 49% responded favorably, 11% unfavorably, and 40% did not have an opinion either way. Similarly, 53% regarded the forest products industry favorably, 14% unfavorably, and 33% said they did not have an opinion either way (Fig. 7).

(Place fig. 7 here)

As we hypothesized, a significantly higher proportion of forest owners than non-forest owners had a favorable opinion of both timberland owners and forest products companies. The same percentage of forest owners (62%) have a favorable opinion of both industrial and non-industrial timber landowners, but significantly fewer non-forest owners, 52% and 46% respectively, have favorable opinions of such forest owners. Men also comprise a larger proportion of the favorable responses than women, but the difference is significant only in relation to timberland owners.

The high number of neutral responses regarding public opinion of timberland owners and the forest products industry may indicate that a considerable number of people do not feel they know enough to even give an opinion, let alone a critical assessment. This uncertainty is also evident in the high frequency of non-responses when asked about the amount of taxes that timberland owners pay.

When questioned about the primary benefit of timber and forest land in Georgia, the majority of respondents (56%) cite building materials and wood products, with paper as the most often cited product. The second most popular response (21%) includes forestry's impact on the economy and its provision of jobs (Fig. 8).

(Place fig. 8 here)

DISCUSSION

Our results indicate that many conclusions of previous environmental surveys do not always apply to Georgia. This is perhaps due to its unique position in the forest products industry, or its changing demographic scheme. An unexpected result, which contradicts the results of previous surveys, is that the majority of respondents do not express great concern regarding the treatment of forests in Georgia. Almost every survey and article dealing with the environment or natural resource issues reports a consistent, strong theme of environmental concern.

A possible explanation for this finding may rest with the wording of our survey question; it specifically asks if respondents have 'any concerns about the way forests in Georgia are being treated.' Another is that the definition of the term 'concern' may be misconstrued. It can refer to a vested interest in forest issues, or apprehension about the management of the forests. Therefore, the response to the concern question may depend on the respondent's interpretation to the question. For our purposes the apprehension definition is assumed to be the one chosen most often by the respondents, and it forms the basis for our analysis.

It is probable that as the leader in pulp and paper production in the U.S. and the largest timber producing state in the Southeast, the public associates the forest industry's success with sound management practices. Support for this can be found in figure 5, where the results indicate that the majority of people feel forest landowners are doing a good job in several different areas of forest management, from replacing trees after harvest to protecting wildlife. The majority of the sample also supports the future development of various forest industries, including the construction of lumber mills and the exportation of cut lumber. The fact that almost two-thirds of the state is forested could be another explanation for the lower than expected level of concern. The relatively large amount of

forest cover, combined with the variety of public outreach programs such as Project Learning Tree, may also contribute to a more positive image of those in the forestry community.

While a considerable majority of the sample is supportive of the forest products industries, approximately one-third of the respondents said that they did not have either a favorable or an unfavorable opinion of timber landowners and the forest products industry. These numbers may indicate that although a sizable majority are relatively satisfied with forest management in Georgia, many do not know who to attribute that to - forest industry, private landowners, or government regulation. Another possible conclusion is that those who fall within the neutral category represent a group that perhaps should be concentrated on in future education efforts.

In contrast to high levels of support for current forest management practices and the rather pragmatic definition of trees as similar to an agricultural crop, there is also a high level of support for government regulation of harvesting on private forest land. In addition, 47% of the sample feel there should be more regulations in Georgia. When questioned on what types of new regulations were needed, the responses focused on harvesting limits, regeneration guidelines, and enforcement issues.

It may be worthwhile to clarify what regulations currently exist, how these are being adhered to, and by whom. There is quite a bit of misconception regarding who owns the majority of forest land in Georgia. It may be possible that if the majority of people feel the land is being managed well, but do not realize that private non-industrial landowners are responsible for a good deal of that, then that misconception may account for private landowner's relatively low approval rating. The respondents' perception of forest land ownership is the opposite of what it is in reality. Over 60% of the respondents could not give any answer to the question regarding percent of forest ownership and most of those who did respond had the ratio incorrect.

It is this apparent paradox that leads us to believe that the public is not confident in their understanding of forestry in Georgia. The uncertainty present in their responses regarding where to allow clearcutting when they are told the trees will grow back, the partitioning of forestland ownership, their opinions of forest products companies, and private timberland owners, all seem to suggest that there are areas where public education and information may be needed.

We hypothesized that rural residents and forest owners would regard forest management practices more favorably than urban residents and non-forest owners. In both cases our hypotheses have been shown to hold true. Forest owners and rural residents consistently exhibit more support of silvicultural practices and private property rights, and considerably less support for government regulation of forest practices. Our explanation rests upon the assumption that people who live in rural areas or who own forest land are more utilitarian oriented and knowledgeable about forestry issues. Presumably they are more aware of forest management practices because they are familiar with them through personal associations, forest industry location, employment opportunities, and a closer affinity with the land. This may also explain why they exhibit more concern about the forests. Their familiarity with the land allows them to see both the good and the bad forest practices. In addition, they are more likely to be affected by any new forest regulations.

Although Bliss et al. (1997) caution against the assumption that forest owners and non-forest owners are two distinct and different groups of people, we do see some indication of just such a result in our study. However, it should be noted that many of the deviations, though significant, do not represent major differences on all of the issues present in the survey. Often, the majority of both groups have the same response and it is the degree of support or non-support that differs significantly. This same relationship applies to all the significant differences we found.

Though the majority of respondents report a knowledge of clearcutting, the number of people who have never seen or heard of it is fairly high (26%), and lends credence to our hypothesis that many Georgians possess incomplete knowledge of forest practices. We found that respondents who are female, over 50, and urban residents, are more likely to have never seen or heard of clearcutting.

It may be necessary to assess the forest products industry's methods of disseminating information, and the methods employed by environmental groups as well. By doing this, it could be possible to see how people pick and choose what they believe is accurate and relevant information used to frame their decisions. These same methods can then be used to clarify misconceptions or reach target audiences that display a lower level of comprehension regarding environmental and forest issues.

To summarize, our results show that the general public has a fairly positive image of people within and associated with the forest products industry. A majority also have a knowledge of and support more forest management practices than we had anticipated. Although, this study points to some possible areas that should be addressed by those in the forest industry, it appears that those employed in the forestry sector have begun to realize that informing and involving the public is necessary for good public relations and improved community cooperation.

TABLE 1. Survey Demographics.

Characteristics**	Respondents			
	n	%	Valid n	Valid %
Age				
Under 30	199	23.6	199	23.9
30 - 50	400	47.4	400	48.0
Over 50	235	27.8	235	28.2
DK/RF/NA(1)	10	1.2	0	0.0
	844	100.0	834	100.0
Gender				
Male	311	36.9	311	37.8
Female	512	60.7	512	62.2
DK/RF/NA(1)	21	2.5	0	0.0
	844	100.1*	823	100.0
Education				
Some H.S.	107	12.7	107	12.9
H.S. graduate	233	27.6	233	28.0
Some post-secondary	239	28.3	239	28.8
College graduate	252	29.9	252	30.3
DK/RF/NA(1)	13	1.5	0	0.0
	844	100.0	831	100.0
Race				
White	569	67.4	569	69.6
African-American	213	25.2	213	26.0
Other	36	4.3	36	4.4
DK/RF/NA(1)	26	3.1	0	0.0
	844	100.0	818	100.0
Residence				
Rural	372	44.1	372	45.1
Urban	450	53.3	450	54.5
Other	3	0.4	3	0.4
DK/RF/NA(1)	19	2.3	0	0.0
	844	100.1*	825	100.0
Forest Land Owner				
Yes	130	15.4	130	15.6
No	704	83.4	704	84.4
DK/RF/NA(1)	10	1.2	0	0.0
	844	100.0	834	100.0

***Result of rounding error.**

****Derived from survey questions 1, 2, 37, 38, 40, & 43.**

1. DK/RF/NA includes Don't Know, Refused, or No Answer.

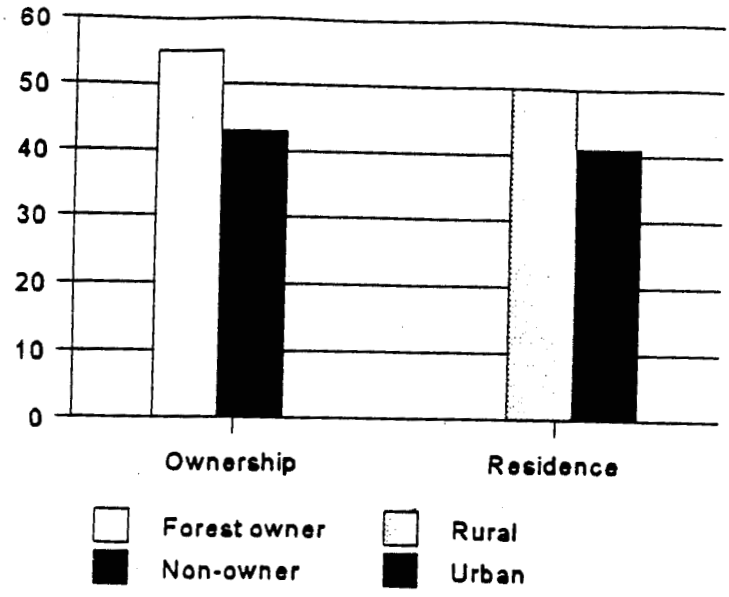

Figure 1. Relationship between level of concern and ownership and residence.

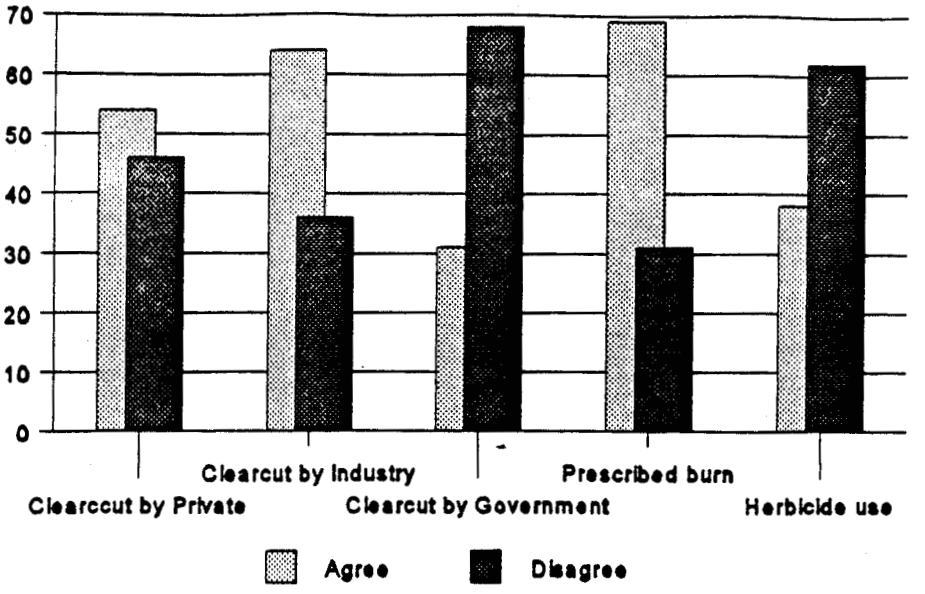

Figure 2. Opinions on Various Forest Management Activities.

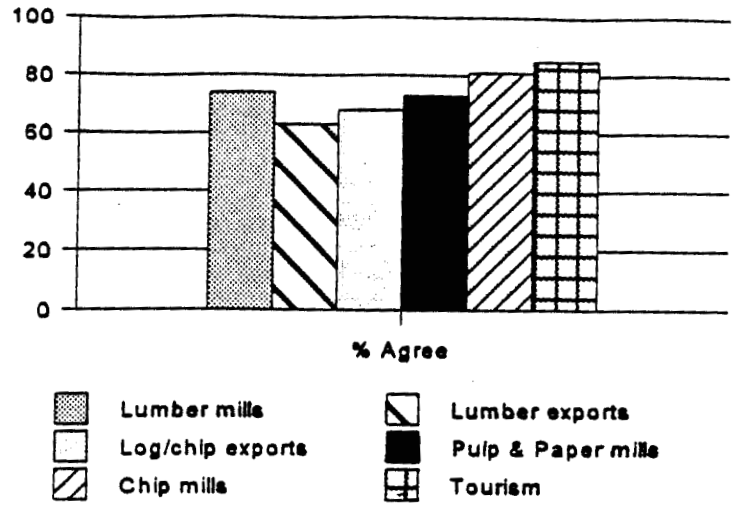

Figure 3. Sector Development Attitudes.

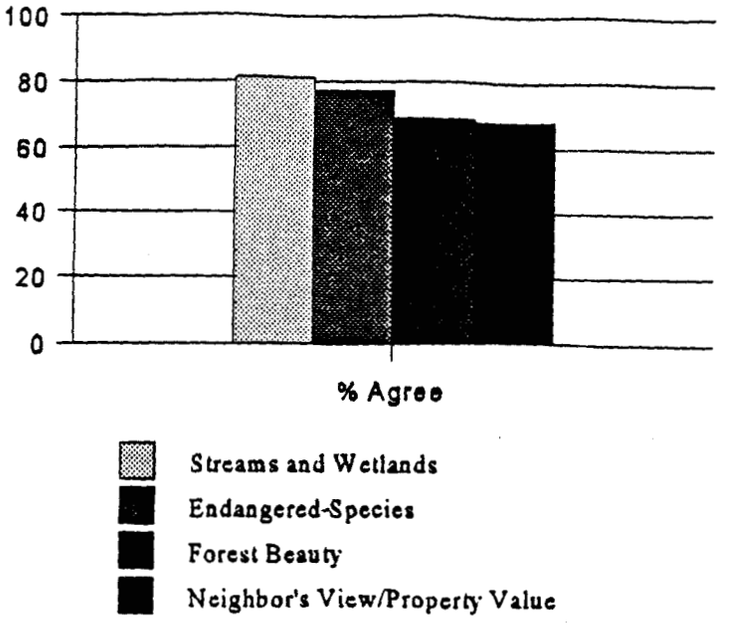

Figure 4. Public perception of government regualtion of harvesting on private land.

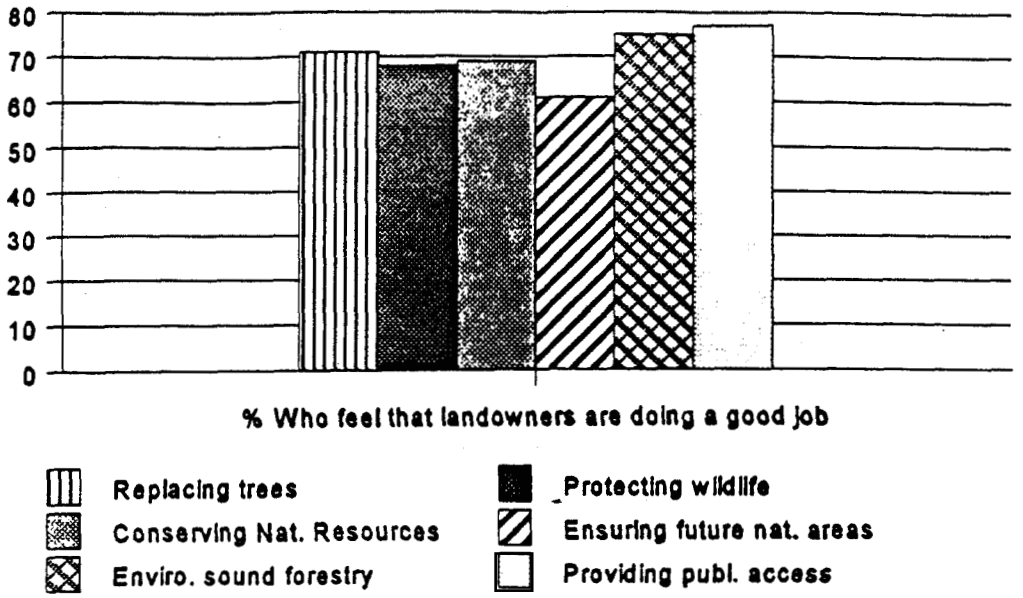

Figure 5. How Georgians feel landowners are doing in:

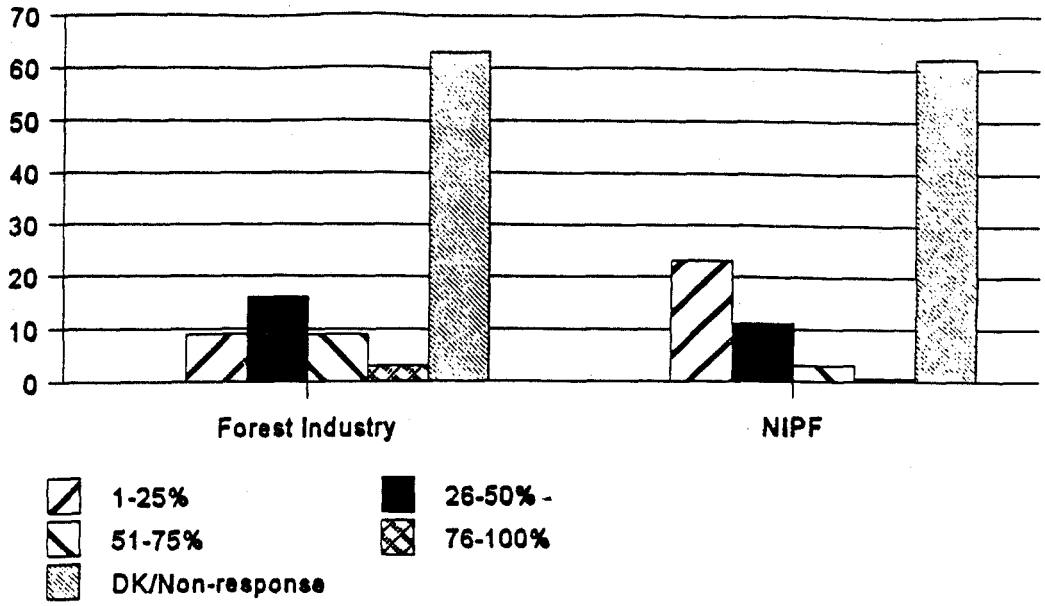

Figure 6. Public perception of Forest Land Ownership Distribution.

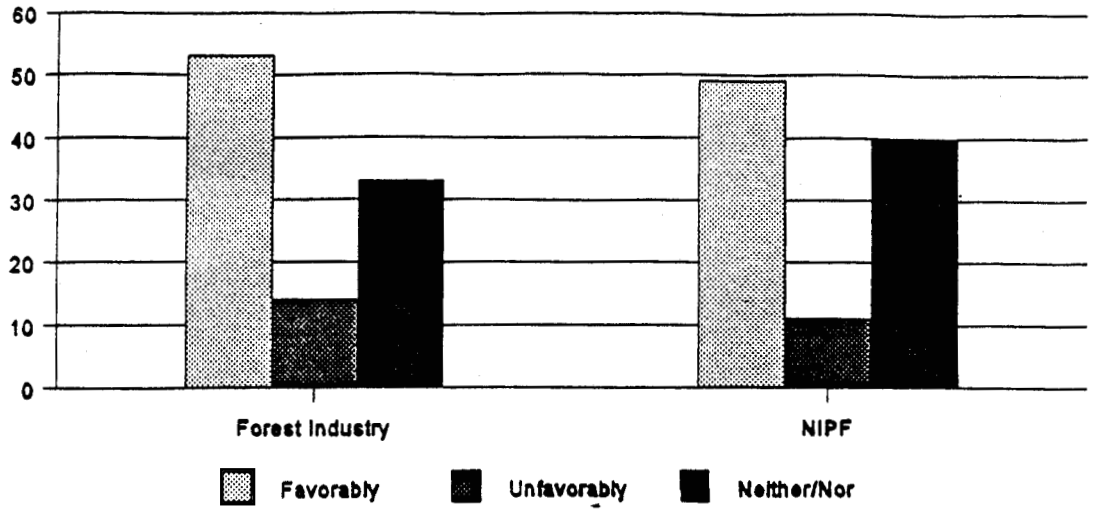

Figure 7. How Georgians regard the Forest Products Industry and private timber owners.

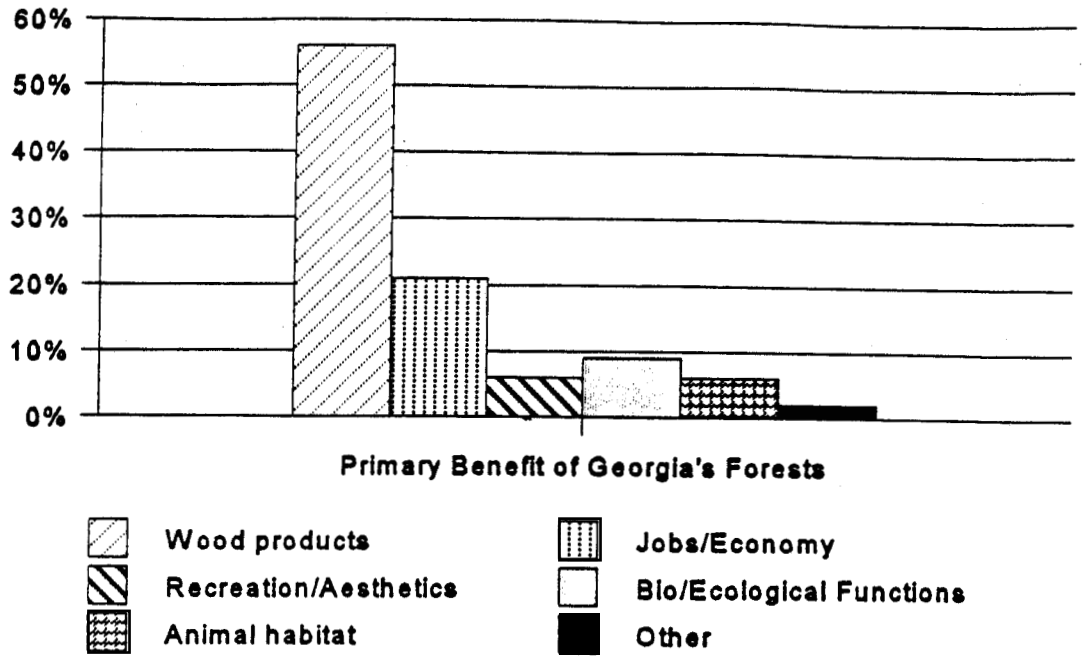

Figure 8. Most often cited timberland and forest benefits.

Public Perception of Forest Resource Use in Georgia

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Our study was based on a random telephone survey of the Georgia public. Its purpose was to assess the attitudes and knowledge of the public regarding forest resource use. Respondent's answers were coded and summarized, providing the basis for our analysis. We analyzed the survey responses according to specific demographic characteristics such as gender, age, education, residence, and forest ownership. We found that gender, residence, and forest ownership were the only variables that exhibited significant, consistent differences. Men, forest owners, and rural residents were more likely to be utilitarian-oriented regarding forest resource use and more supportive of private property rights.

Keywords Utilitarian, forest management, Georgia, public opinion, telephone survey, environmental attitudes and knowledge, silvicultural practices

Introduction

A growing segment of the population is concerned about the environment and the management

of our natural resources. More and more people are challenging agency decisions and traditional uses of natural resources, especially forests. A number of surveys have shown the continued importance the environment has as a national issue.

While the environment ranks below health care, defense, and the budget, it has remained in the top 5 or 6 issues on the national agenda (Hendee, 1984a). As natural resources continue to be sought after by competing interests, conflicts have arisen and there is a growing need for a more integrated management regime that can incorporate public opinion and values in the formation of future policy efforts.

The notion of public participation and using public opinion to aid in forest policy decision making has received a great deal of interest in the last twenty years. The idea of polling the public on environmental issues in general has been going on since the 1970's (Sample, 1993). A telephone survey can act as a particularly effective means of gauging public opinion. They are quick, relatively inexpensive, and provide a broad representation of the population to be sampled. Public opinion polls concerning the environment and natural resource utilization can supply considerable data on the probable reception of new forest policies. For this reason, people associated with and working in the forestry community have expressed interest in incorporating the results of public surveys into their management strategies.

Our study looks at the attitudes and knowledge of the Georgia public as expressed in a public telephone survey. The respondents were questioned about a variety of natural resource issues including silvicultural practices, private property rights, and government regulation of harvesting. The responses were then analyzed according to specified demographic variables in

order to determine their effect, if any, on the participant's answers. Our purpose was to determine the Georgia public's attitudes and knowledge of forest resource issues. It is hoped that such data will clarify public opinion on contentious natural resource issues and possible elucidate new tactics for better public relations.

Hypotheses

Our study included seven hypotheses that dealt with environmental concern, age, gender, education, residence, forest ownership, and forest knowledge. Considering the proliferation of survey data that demonstrates high levels of public concern and interest in the environment (Hendee 1984a, Gillroy 1986, & Roper Organization 1993), we predicted that a majority of the survey population will be concerned with the treatment of forests in Georgia.

Like Bliss et al. (1997), we examined the relationship between forest ownership and approval of forest management practices. We hypothesized that those who owned forest land would be more likely to approve of forest resource utilization. Although Bliss et al.'s study did not reveal significant differences between Non-industrial private forest (NIPF) owners and the general public regarding all of the topics covered in their survey, they did find that significantly more non-forest owners (77%) than NIPF owners (67%) approved the restriction of private property rights in order to protect the environment.

Bliss et al. found a similar situation when they analyzed survey responses according to residence. Though there was not a significant difference overall, they did find that significantly less rural (72.6%) than urban (80.0%) residents supported the limitation of private property rights to protect the environment.

For our study, we hypothesized that rural residents would be more utilitarian oriented than urban residents, and that they would have a higher acceptance of forest management practices. In support of our residence hypothesis, Tremblay and Dunlap (1978) state that urban residents are more likely than rural residents to be concerned about the environment.

Gender was a less definitive variable than residence or ownership, but after reviewing several studies looking at the effect of gender on survey response, including MacDonald et al.'s (1994) and Mohai's (1991), we hypothesized that women would be less utilitarian oriented than men.

In an analysis of several national surveys, Anthony (1982) maintained that age, education, and ideology were the only three variables significantly, though marginally, correlated with environmental concern. He found that younger, more well-educated respondents tended to be more environmentally concerned, but that those two variables would not necessarily act as predictors of environmental concern. We hypothesized that older people and those who had completed higher levels of education would be more utilitarian oriented and supportive of forest management practices than those who were younger and less educated.

The hypothesis that we feel brings all the different variables together is the overriding perception that the public is not well informed concerning forest resource management. We postulate that people who comprehend little of the reasoning behind particular silvicultural practices will be less inclined to approve of their use. In the Southern Appalachian Assessment (1990) study, they found that regional knowledge of forest practices was low, but residents' preferences were clear.

Methodology

Our study was based on a random telephone survey of adults in Georgia. The surveys were conducted from April 10 to May 16, 1996, Monday through Thursday. The surveys took approximately 15 minutes to administer and calls were made between the hours of 5:30 and 9:30 p.m. The Standardized Survey Interviewing (SSI) style, which does not allow the interviewer to deviate from the survey script, was used in order to prevent the introduction of interviewer bias. The survey questionnaire was based on surveys by Bliss et al. (1997) and the Georgia Forestry Association. Final changes, question design, and coding were implemented by Valdosta State and University of Georgia personnel. Out of 1192 total calls, 861 were completed, giving a 72% response rate. Because 17 surveys were dropped due to insufficient data, 844 surveys were used in the final analysis.

After the completed surveys were coded and entered into a computerized database management system, response frequencies and population percentages were computed and formed our summary statistics. Any percentages that did not total 100% were the result of rounding error. Valid percentages were those created by excluding the Don't Know/Refused/Not Applicable responses, which are also defined as non-responses. Valid percentages were often the ones used in the statistical analysis, except in situations where the number of non-responses was unusually large. SAS (SAS Institute Inc.) was used to complete the statistical analysis, and Chi-square tests were the primary methods of testing statistical significance.

Results and Discussion

Our sample population was comprised of slightly higher numbers of female and rural residents

than is actually found in Georgia, but otherwise the demographics of the sample closely resemble those of Georgia (see Table 1).

(Place Table 1 here)

Perhaps one of the most surprising results of our study is that the majority of Georgians are not overly concerned with the treatment of forests in Georgia, and when broken down by demographics, the results are the opposite of what we predicted. Significantly more forest owners (55%) and rural residents (50%) than non-forest owners (43%) and urban residents (41%) reported concern about Georgia's forests. It's possible that the lower than expected levels of concern are the result of a misinterpretation of the term "concern," or that the question context influenced the respondent's answer.

Looking at other response data, there is more evidence of a general satisfaction with forest management in Georgia and a support for the introduction of new forest industries. This satisfaction is indicated by the high percentage of favorable responses when people are asked about how landowners are doing in replacing trees after harvest (71%), protecting wildlife (68%), ensuring enough natural areas for the future (61%), conserving natural resources (69%), growing and harvesting trees in ways that are environmentally sound (75%), and making forest land available for the public to enjoy (77%). The range of people who favor the development of new forest industries ranges from 63% who favor the exportation of cut lumber to 85% who favor the development of the tourism industry.

The positive responses were not as high when respondents were asked their opinion of NIPF owners and industrial forest owners. This can be explained by the high number of non-

responses to those questions. In both cases, approximately one-third of those surveyed did not have an opinion either way, 49% of the sample have a favorable opinion of NIPF owners, and 53% of the sample have a favorable opinion of the timber industry. As can be expected, significantly more forest owners (62%) than non-forest owners (46%) exhibit a favorable opinion of private forest owners. The situation is similar when forest and non-forest owners were asked their opinions of industrial forest owners, with favorable responses accounting for 62% and 52% of the respective populations. There are also significantly more men (56%) than women (44%) who have a favorable opinion of private forest owners.

In other economic scenarios, the respondents demonstrate an inconsistency in their attitudes and values regarding the balance between the environment and the economy. When forced to choose between the environment and the economy, 72% of respondents feel that both are important, but that the environment has precedence over the economy. Only 13% of the population feel that both are important, but that the economy has precedence.

Yet when questioned on the primary benefit of timber and forest land in Georgia, wood and wood products, primarily paper, were cited by 56% of the sample as the number one benefit. Provision of jobs/economic benefits received the second highest number of responses, with 21% of the sample naming it as the most important benefit (see Figure 1).

(Place Figure 1 here)

Considering all the recent publicity regarding alternative forest uses and values, like existence value, it was rather unexpected to have such a high percentage of respondents (71%) say that they agree 'that trees are like any other crop and should be harvested and replanted to

provide consumer goods'. In the demographic analysis, gender was the only variable that produced significant differences, with more men (77%) than women (67%) agreeing with the previous statement.

In an apparent contradiction to the relatively pro-forestry sentiments described above, the public also seems to favor increased forest regulation with 47% stating that there should be more local and state timber regulations. When questioned on what types of new regulations were needed, the responses focused on harvesting limits, regeneration guidelines, and enforcement issues. The respondents also express strong preferences regarding the use of various silvicultural preferences. Herbicide application and prescribed burning elicited opposite responses from the public. A 69% majority agree with prescribed burning, while 62% disagree with herbicide use.

The only significant differences are found by gender and education level. More men (76%) than women (64%) agree with the use of prescribed burning, but they tend to deviate less from each other's responses concerning herbicide use, so the difference is not significant. Significantly more respondents with less than a high school degree, agree with herbicide use than those in the three other educational levels. Acceptance of herbicide application ranges from 35% of those with college degrees or greater, to 51% of those with less than 12 years of education.

Additionally, over one-quarter of the respondents said that they had never seen or heard of clearcutting. After explaining to the 26% who were unaware of clearcutting, all of the respondents were questioned on whether or not clearcutting should be allowed on privately, commercially, or federally owned land (see Table 2A). In conjunction, the respondents were then asked what their response would be if they knew the trees would grow back. Rather than

increasing the number of positive responses, the statement seemed to further confuse the respondents and non-responses became the majority answer (see Table 2B). From these responses, it appears that the general public does not fully comprehend the methods used in applied forestry. In each case of land ownership, more men than women feel clearcutting should be allowed, but the difference is significant only with regard to individually owned land.

(Place Tables 2A & 2B here)

Most respondents feel similarly about the role of government to regulate and control the land use practices of private property owners. The majority feels that government regulation and limitation of private property rights is warranted when the integrity of the environment is at issue. However, a 78% majority feels that private property owners should be compensated when such regulations limit their allowable harvest and cause economic losses. When categorized by age and residence the response variance becomes significant, with the percentage of respondents who feel 'that private property owners have the right to do as they please with their forests regardless of what it does to the environment' increasing form 28% to 40% as age increases from those under 30 years old to those over 50 years of age. More rural (38%) than urban residents (30%) express this same sentiment.

More people who live in rural areas (38%) than urban residents (30%) agree that the rights of private property owners take precedence over environmental regulation. As the age levels increase, so do the proportions of people who agree that the rights of private property owners should not be limited. The two statements concerning the regulation of private property

rights have a negative correlation with age.

When the reasons for government regulation of harvesting practices are specified, all the demographic variables exhibit significant differences. The highest variation occurs in the age category. In each case, proportionately fewer older respondents than younger respondents agree with government regulation of private land to protect endangered species, stream and wetland integrity, forest beauty, and aesthetics. Forest owners, men, rural residents, and people with less than 12 years of education all exhibit less support for government regulation of private land.

Almost half of the survey population gave a non-response when asked about timberland owners' taxes. There is significant difference in the answers given by people in different educational categories. Those with less than a high school education feel timberland owners pay too much (38%), but as educational level rises the proportion decreases to 21% of those with college or post-graduate degrees. Not surprisingly, significantly more forest owners (43%) than non-forest owners (24%) feel that timberland owners pay too much in taxes. More rural residents than urban residents think that timberland owners pay too much, but the rural residents who feel this way do not represent the majority and the difference is not significant. In every case the majority feels that timberland owners pay a fair share of property taxes.

Conclusions

To summarize, we conclude that significant trends exist which support our hypotheses about gender, residence, and forest ownership. Men, rural residents, and forest landowners consistently show more support for forest management practices and private property rights. Our hypotheses that education would demonstrate significant results and that the majority of

Georgians would have concerns about the management and treatment of forests, are not supported. Although we do encounter some significant associations with age, no discernible trends are consistently present. The associations we do see focus more on individual's rights than on forestry or environmental issues, so its affect on policy appears to be negligible.

From our results, it appears that forestry is a rather unique topic where the traditional methods of education are not sufficient to truly inform the public. The emotional and spiritual bonds that people associate with forests and nature heavily influence people's perceptions and serve as the basis with which they judge many of the current forest practices. Rather than perceiving and understanding the utility of particular forest management regimes, people tend to respond to the residual effects, particularly the aesthetic ones, of such forest practices.

Perhaps a better way of informing the public, would be to combine traditional educational methods such as lectures, public meetings, slide shows, et cetera, with hands-on experience and visits to harvesting operations in a variety of stages. A study in the 6/97 JOF found that the number of people who would support certain silvicultural practices was significantly higher after they had received a tour of harvested areas in different stages of regrowth, than those who had been exposed to the traditional avenues of public education. Most of the people who participated in the study were landowners and had a vested interest in such operations, which may account for their positive response to the tours. While it may be that this type of education is probably not the answer for a large majority of the general public, it could be an option for small groups of concerned citizens and legislators.

The timber industry in Georgia has a large impact on the state's economy and employment situation that has not escaped the notice of its residents. Their dependence on the forests and the products they supply has created an atmosphere that is both supportive and

protective of its forests. They are willing to sacrifice to ensure that land continues to be kept forested and they are also willing to impose and support new regulations to protect those forests. It is this give and take between economic benefits and natural amenities that has given Georgia its unique position today. As a leader in the forest products industry and one of the states with the largest proportion of forest cover, it is entering into a delicate balancing act between the demand for forest products, forest recreation areas, and forest preservation. How the people of Georgia respond to proposed legislation regarding the regulation and use of their forests may clarify options that other states could employ as they enter similar debate over forest resource allocation.